smma

05/01/2025

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Veatriki Dagkalakou Veatriki.Dagkalakou@massschoolbuildings.org
Project Manager
Massachusetts School Building Authority (MSBA)
40 Broad Street, Suite 500
Boston, Massachusetts 02109

Wilmington Elementary School
MSBA No. 202003420015 / SMMA No. 22127

RE: Schematic Design Report Submission

Dear Veatriki:

Attached please find the Module 4 Schematic Design submission to the MSBA. The team has followed the guidelines set forth in Module 4 to develop this submission.

As Owner's Project Manager, we certify that we have reviewed and coordinated the materials, the submittal is complete and conforms to MSBA requirements and confirm that the District has approved the materials for submission to the MSBA.

We look forward to reviewing the information contained in this submission with you and your team.

Please contact me at 781.910.2793 if you have any questions, comments, or would like to schedule a meeting.

Sincerely,

Julie Leduc
Director of OPM Services
SMMA
jleduc@smma.com
781.910.2793

CC: Robin McElaney, MSBA; L.Dore, R.Philip, Dore+Whittier Architects; School Building Committee

Enclosures: Schematic Design Report

smma

05/01/2025

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Mr. Michael McGurl
Director of Capital Planning
Massachusetts School Building Authority (MSBA)
40 Broad Street, Suite 500
Boston, Massachusetts 02109

Wilmington Elementary School / SMMA No. 22127
RE: DESE Submission

Dear Mr. McGurl:

The District is pursuing execution of a Project Scope and Budget Agreement for the MSBA approved Schematic Design for the Wilmington Elementary School project in Wilmington, Massachusetts. The District's 2024/2025 enrollment is 2,817. The design enrollment for the proposed school project is 755 students plus PreK. The existing Wildwood Early Childhood Center currently serves grades PreK-K, Woburn Street School serves grades 1-3 and North Intermediate School serves grades 4-5 and is proposed to serve District grades PreK-5 for the North side of Wilmington.

In accordance with M.G.L. c.70B, MSBA staff assembled the documents required for the review of the special education program at Wilmington Elementary School. The following are attached per the "Submittal Requirements":

- A letter from Superintendent Dr. Glenn Brand of the Wilmington Public School District describing its special education program.
- Proposed space summary that includes the existing facility, proposed spaces, and MSBA guidelines based on the agreed upon design enrollment. The first page of this summary indicates a total of 19,010 square feet of space dedicated to the delivery of special education.
- The floor plans for the proposed 165,035 square foot Wilmington Elementary School.
- A complete Special Education Adjacency Table.

I have reviewed the attached documents and confirm that the District's School Building Committee has officially approved the attached submittal on April 15, 2025 and verify that the space summary matches the floor plan and is complete and conform to the MSBA requirements as described in Module 4 – Schematic Design Guidelines.

Sincerely,

Julie Leduc

Julie Leduc
Director of OPM Services / SMMA
jleduc@smma.com / 781.910.2793

CC: Wildwood School Building Committee

Enclosures: see above listed documents

Glenn Brand, Ed.D.
Superintendent of Schools

Christine Elliott
Assistant Superintendent for
Curriculum & Staff Development

Paul Ruggiero
Assistant Superintendent of

WILMINGTON PUBLIC SCHOOLS
161 Church Street | Wilmington, MA 01887
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Christine Murray
Interim Director of Student Support Services

Andrea Stern Armstrong
Director of Human Resources

Kenneth Lord
Director of Technology & Digital Learning

A school and community partnership that provides an inclusive, respectful, and collaborative learning environment where all stakeholders are engaged in the development of the whole child.

April 16, 2025

Department of Elementary and Secondary Education
Matthew Deninger, Director of Resource Allocation Strategy and Planning
135 Santilli Highway
Everett, MA 02149

Project: Wilmington PK-5 Elementary School
Subject: Schematic Design DESE Submission: Special Education Delivery Methodology

Dear Mr. Deninger,
The following documentation reflects the Special Education Delivery Methodology of the Wilmington Public Schools (WPS) including information regarding the current, proposed, and specialized programs for the proposed new consolidated elementary school in Wilmington. Also included are the following:

- Educational Space Summary
- Space Summary Deviations Narrative
- Proposed Floor Plans
- Special Education Adjacency Table

WPS has made the appropriate provisions for children with disabilities in congruence with Section 1 of Chapter 71B and adheres to the federal and state laws that guarantee the rights of all students' access to the general education curriculum. The WPS philosophy is to embrace the inclusion of students with disabilities in all aspects of school life by including them in the general education environment to the fullest extent possible. This approach has been actualized via significant investment over many years in the development of a broad spectrum of in-district programming.

Wilmington's robust and comprehensive range of Special Education programs and services ensure that 98.1%* of enrolled students can be educated within the district. The very small number (1.9% of the student population) of students who are educated in out-of-district placements is indicative of the success of this approach and reflects our commitment to creating an inclusive educational environment that, to the maximum extent feasible, educates students in their home community. Special education services are provided to eligible students and are designed to remediate deficit areas, support the development of new skills, and allow students to gain the skills to access the general education curriculum in the least restrictive environment possible. The services and staffing available across the District are allocated annually based on

Notice of Non-Discrimination
All educational and non-academic programs, activities and employment opportunities at Wilmington Public Schools are offered without regard to race, color, sex, religion, national origin, ethnicity, sexual orientation, gender identity, homelessness, age and/or disability, and any other class or characteristic protected by law.

the service delivery needs identified on the Individualized Education Plans (IEPs) of the special education population being served at each school. WPS offers programs and services for students ages ranging from 3 to 22.

WPS provides qualifying students with a variety of related services including speech and language, occupational therapy, physical therapy, counseling, and behavior support. These programs and services are designed to increase the opportunity for students to receive robust special education services within the district. The inclusive nature of the programs and services provide a collaboration to augment opportunities and enhance the support disabled children receive to maximize access to the general education setting.

The design of the new building will improve the District's ability to make curriculum accessible to all children, including those with disabilities. A new facility will provide specially designed spaces that are ADA compliant and employ Universal Design architectural features to be accessed by the students who most require these supports. Dedicated Special Education rooms will be positioned throughout the building and either embedded within or in proximity to grade level neighborhoods whenever possible to minimize travel distances and to keep students receiving services among their peers. The intentional placement of rooms and the provisions for universal room features will provide the flexibility needed to meet the ever-changing needs of students and the inclusion priorities of the District.

Thank you for your consideration of this application.

Sincerely,

Glenn Brand
Superintendent of Schools

Christine Murray
Int. Director of Student Support Services

Kathleen Bissell
Principal, Wildwood Early Childhood Center

Stacey Scott
Principal, Woburn Street Elementary School

Diane Carreiro
Principal, North Intermediate School

** Based upon October 1, 2024 enrollment report with DESE.*

SPECIAL EDUCATION DELIVERY METHODOLOGY

Wilmington Public Schools adheres to federal and state laws that guarantee the rights of all students to access the general education curriculum. The philosophy of the Wilmington Public Schools is to embrace the inclusion of students with disabilities in all aspects of the community and school life, including the general education environment, to the fullest extent possible. Special education services are provided to eligible students. They are designed to remediate deficit areas, support the development of new skills, and allow students to gain the skills to access the general education curriculum in the least restrictive environment possible.

CURRENT SPECIAL EDUCATION PROGRAMS

Special Education Programming by School for the 2024-2025 School Year

Boutwell ECC **Pre-K & K**	**Wildwood ECC** **Pre-K & K**	**Shawsheen** **Grades 1-3**	**Woburn** **Grades 1-3**	**West Int.** **Grades 4 & 5**	**North Int.** **Grades 4 & 5**	**Middle School** **Grades 6-8**	**High School** **Grades 9-12**
Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center
		Language-Based	Language-Based	Language-Based	Language-Based	Language-Based (4)	Language-Based (3)
		Stepping stones	STAGES	Stepping Stones	STAGES	Student Support (1) & Transitions (1)	Evolution (2)
	Strides (3)	Strides (2)		Strides		Strides	Strides
Drive in services	Drive In services						
						Lifeskills	Lifeskills
							Postgrad
Integrated Preschool	Integrated Preschool						

Related Services/Therapies:

- Occupational Therapy
- Physical therapy
- Speech and language Therapy
- Clinical Staff (School counselors, school psychologists, social workers, adjustment counselors and Social Emotional Learning and Family Engagement Specialists)
- Applied Behavioral Analyst (ABA) Therapy
- Board Certified Behavior Analysts
- Adaptive Physical Education
- Teacher of Visually Impaired
- Teacher of the Deaf
- Audiologist
- Orientation and Mobility Specialist

Deficiencies:

- All three schools identified in the potential project require significant improvement in the physical space to provide all related services. Currently, many related service providers do not have dedicated workspaces or shared spaces for servicing students, including our school psychologists, occupational therapists, physical therapists, and speech and language providers. While services are being provided in compliance with student IEPs in all settings, significant improvements in the amount and quality of space for staff offices, student services, and staff/parent consultation are needed.
- In all three buildings, there is limited space for facilitating in-person IEP meetings and virtual and phone conferences to meet with parents and caregivers. Currently, service providers at all three schools share one classroom for both their office and service delivery space. Making confidentiality of student services, collaboration, and case management an ongoing challenge.
- As the Wildwood Early Childhood Center is currently split among two schools, the special education teacher that supports these enrolled students is now providing inclusion and pull-out services in two schools.
- Given the age of all three elementary schools, there are no extended learning spaces, no small rooms or spaces to provide services near student classrooms, and in most cases, services are not provided in the same space every time due to demands on open spaces by multiple staff.
- While the Wildwood houses three specialized classrooms for students with Autism, there is no sensory room and no motor space for students who receive such services, causing OT and PT to occur in classrooms and hallways.
- There are currently no dedicated calming spaces for students who may be dysregulated.
- Lack of handicap accessible facilities which limits program placement

Other Program Needs:

- Expand preschool programming
- Safe outdoor spaces = handicap accessible, developmentally appropriate play structures, contained play spaces.

PROPOSED SPECIAL EDUCATION PROGRAMS

Programs that will continue:

- Pre-Kindergarten Early Learning Center (ELC)
- Inclusion
- Partial inclusion
- PLC, ILC (for students with autism and intellectual impairments)
- The therapeutic learning program (previously called "JEMS", currently located in Jenkins Elementary School, but will be incorporated into the project and relocated)

Programs Additions/Enhancement:

- Expand Pre-Kindergarten programming.
- Additional opportunities for therapies, related services, sensory breaks and calming spaces to be in close proximity to classrooms.
- Access to technology.
- Access to hands-on, multi-sensory, project-based learning that allows flexibility, collaboration, and student choice.
- Multiple spaces to allow for various meetings to take place simultaneously.
- Multiple spaces to allow for varied sized learning groups to meet at the same time.
- Opportunities for flexible scheduling.
- Opportunities for increased community engagement and collaboration.
- Opportunities for families to attend school functions
- Assisted listening technology in each classroom for hearing impaired accessibility, as well as general use throughout the educational spaces of the proposed project.

List programs and services that would be moved from within the District (from which school they are being moved) as a result of the proposed project

- Wildwood: Inclusion & Learning Center, Integrated Preschool
- Woburn Street: Inclusion & Learning Center, STAGES
- North: Inclusion & Learning Center, STAGES
- Shawsheen: STRIDES
- West: STRIDES
- Occupational Therapy
- Physical therapy
- Speech and language Therapy

- Clinical Staff (School counselors, school psychologists, social workers, adjustment counselors and Social Emotional Learning and Family Engagement Specialists)
- Applied Behavioral Analyst (ABA) Therapy
- Board Certified Behavior Analysts
- Adaptive Physical Education
- Teacher of Visually Impaired
- Teacher of the Deaf
- Audiologist
- Orientation and Mobility Specialist

Programs to be Discontinued:

The district is not discontinuing programming. Given a new building will have accessibility throughout the school, the STRIDES program at the Shawsheen and West will be consolidated and relocated to the new building. This will allow students to continue with their peers, negating the need to move the cohort across town after kindergarten.

Total Number of Special Education Students to be Served in the New Building:

- 185 projected students

Previous Coordinated Program Review:

Previously, every six (6) years, the District participated in a Coordinated Program Review (CPR) from the Massachusetts Department of Elementary and Secondary Education (MADESE). Currently, this audit process has been split into an every three-year Tiered Focus Monitoring (TFM) process. The last Coordinated Program Review (CPR) that included special education facilities was held in the 2017 - 2018 school year, and the findings under Special Education Indicator #55 “Facilities” were found to be partially implemented.

Deficiencies:

The DESE requires that District buildings meet the following regulatory requirements:

Special Education Facilities and Classrooms

The school district provides facilities and classrooms for eligible students that:

- Maximize the inclusion of such students into the life of the school;
- Provide accessibility in order to implement fully each student’s IEP;

- Are at least equal in all physical respects to the average standards of general education facilities and classrooms;
- Are given the same priority as general education programs in the allocation of instructional and other space in public schools in order to minimize the separation or stigmatization of eligible students and are not identified by signs or other means that stigmatize such students.

Wilmington Special Education CPR findings in 2018 included:

- SE 3 Special requirements for determination of specific learning disability- Partially Implemented
- SE 6 Determination of transition services -Partially Implemented
- SE 7 Transfer of parental rights at age of majority and student participation and consent at the age of majority- Partially Implemented
- SE 47 Procedural requirements applied to students not yet determined to be eligible for special education- Partially Implemented
- SE 54 Professional development- Partially Implemented
- SE 55 Special education facilities and classrooms- Partially Implemented
- SE 56 Special education programs and services are evaluated-Partially Implemented

During this review, SE 55 Special Education facilities and classrooms were identified for corrective action. Noted was that the Middle School STRIDES classroom needed to be relocated to be more in the life of the school environment. Additionally noted was, “At the Boutwell Early Childhood Center, observations indicated that two speech and language therapists, one school adjustment counselor, and one occupational therapist share an office. A review of schedules indicated that four to six students simultaneously receive services from three to four different staff, which creates auditory and visual distractions.” These were remedied during the corrective action stage of the process.

The District participated in the Tiered Focus Monitoring (TFM), and the onsite component of this process was completed on February 6, 2024. The District received the report on April 25, 2024 and the district was in full compliance with the ADA and other requirements of the law.

Remedy:

Ensure that special education students have equitable spaces based on their needs through a planned building design.

All specialized programs will continue. Currently, the district does not accept students through school choice or any type of outside tuition basis.

To accommodate the proposed programs and services, the preferred design alternative should provide:

- Dedicated space for Occupational and Physical Therapies

- Small group rooms and other environments for a range of therapies for individual and small group sessions
- Safe and private areas for counseling, including but not necessarily limited to Adjustment Counselor offices, small group rooms
- Sensory areas to provide opportunities for motor breaks
- Calming areas for de-escalating students
- Small group teaching areas
- Individual teaching and assessment areas
- Areas for teaching life skills including eating, toileting, cleaning, resting and recreation
- Areas to assess students for special education services
- Safe, clutter-free hallways to facilitate student and staff movement throughout the building, taking into consideration potential need for adaptive equipment (i.e. wheelchairs, walkers, etc.)
- Areas for having meetings with parents, teams and consultants
- Natural light
- Easy access to outdoor learning and play spaces
- Contained, safe outdoor learning and play spaces
- Various storage space to reduce visual clutter
- Access to technology to augment communication
- Sound-treated or sound-resistant spaces
- Environmental adaptation for noise reduction
- Range of student seating (therapy balls, “wobble” stools, standing desks, small group tables, individual desks)
- Air quality/air conditioning for students with medical needs.

The proposed substantially separate classrooms will be scheduled the same as the general education classrooms in order to encourage peer interactions arriving at school, eating lunch with peers in the cafeteria, participating in “specials” (like Art, Music, etc.) with their peers and dismissal at the same time. Students in the substantially separate programs will be included with peers in the general education classroom to the greatest extent, per their needs and their IEPs. There will be 5 to 8 students in the substantially separate classroom with a lead teacher who is certified in moderate or intensive special needs, along with multiple paraprofessionals. The student to staff ratio will be less than 2:1, with some programs having closer to a 1:1 ratio. If the group size exceeds 8, the district will ensure sufficient staffing to comply with DESE regulations. In addition to the special education teacher and paraprofessionals, related service providers such as OT, PT and SLP will provide students services either within the substantially separate classroom, general education setting, or the therapist’s office.

Local Review Process:

- The District met with the design team several times and in several different settings to review and discuss decisions related to the number, type, and location of special education spaces. Descriptions of those times and settings are provided below.

- Visioning – Visioning session #3 included an activity where special educators documented the type and features associated with self-contained classrooms, break-out spaces, therapy environments, and support service spaces. Participants included Special Education Teachers, Therapists, Student Support Service professionals, and the Director of Special Education.
- Programming Meetings – Departmental meetings to discuss room sizes, counts, features, and geographic locations occurred in both the PDP and PSR phases primarily at the Working Group, whose members included the Director of Special Education, the Assistant Superintendent of Curriculum and Instruction, three building principals, and the Superintendent. These meetings continued into the Schematic Design phase with updates on the location and features of special education spaces.
- Schematic Design – The Design Team facilitated several days of end user group meetings with the special educators and other professionals who will be occupying individual spaces or suites of spaces to discuss the final location of rooms and their detailed interior features (casework, furniture, technology, markerboards, tackboards, acoustics, connections to adjacent spaces, etc.).
- Presentations were made throughout the PDP, PSR, and Schematic Design phases to the Working Group, the School Building Committee, School Committee, and the general public communicating the location and features of spaces serving special education students.

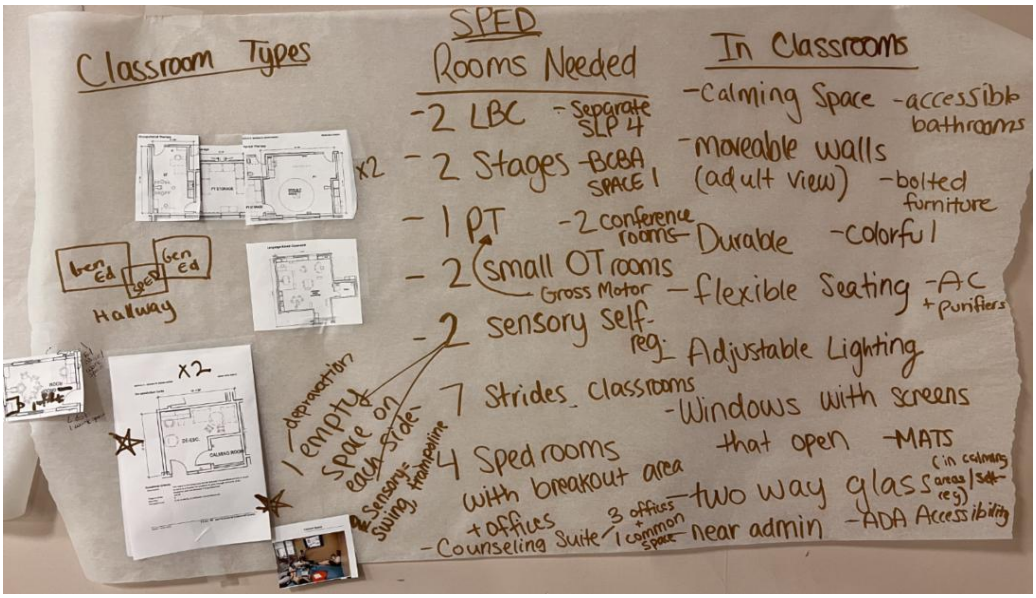


Figure 1 – Sample Work Product, Visioning

Rationale for Location of Special Education Facilities within the Proposed Building:

Several factors led to decisions about where to locate specific programs and specific spaces. All of these factors align with the District's overall goal of creating an inclusive facility that serves the needs of all students.

- Position self-contained classrooms with their grade level peers in their grade level learning community to the greatest extent possible.
- Position small group rooms between each pair of classrooms to reduce travel time and stigma associated with academic and social / emotional supports.
- Position extended learning areas adjacent to general education and special education classrooms to the greatest extent possible

Lower Elementary Wings:

- The Learning Centers are centrally located in the Kindergarten, 1st and 2nd grade level groupings adjacent to the Reading Specialists and with direct access to the extended learning area.
- Small Group Rooms are typically shared between two classrooms, with doorways directly off the classrooms, which will help them to function as an extension of the learning environment. Children receiving services will essentially not have to leave the learning environment to meet with a specialist or provider.
- The only differentiating factor in the design of the small group rooms are those located on the south end of the south academic wing. They are the only ones that are not shared between two classrooms, due to their position and given the odd number of classrooms within each wing. As a result, these small group rooms are designed with a door connecting directly to the corridor for shared use.
- Two of the four Speech and Language Rooms are located on the first level as they will be shared between the PreK and Kindergarten grade level groupings. Typically younger students receive more Speech and Language services than the older students.
- School Psychologist is centrally located in the PreK wing and adjacent to the Strides classrooms.
- Three Self-Contained SPED Rooms will house the Strides Program on the first level and are integrated within the PreK and Kindergarten grade level groupings, with children of a comparable age range to those in the program. Each has an ensuite Calming space and Toilet, with direct adjacency and access to an extended learning area directly outside its door.
- Three Self-Contained SPED Rooms will house the Strides, Stages and Language-based programs on the second level and are integrated within the 1st and 2nd grade level groupings, with children of a comparable age range to those in the program. Each has direct adjacency and access to an extended learning area directly outside its door. Strides and Stages classrooms also have ensuite Calming spaces and Toilets.
- BCBA (Board certified Behavioral Analysts) shared office #245 is centrally located between the three levels, as it will be shared between all grades over the three levels.
- The Occupational/Physical Therapy (OT/PT) Suite is centrally located to the whole school as it serves the entire age range population. It is located to favor the lower elementary side of the building, as typically younger students receive more OT/PT services than the older students. It is directly adjacent to the Gymnasium, as sometimes PT requires a larger movement space, or PT will collaborate closely with the PE teachers to coordinate service delivery. OT/PT is also adjacent to, to the courtyard, to take advantage of outdoor space and accessible play equipment in good weather.

Upper Elementary Wing:

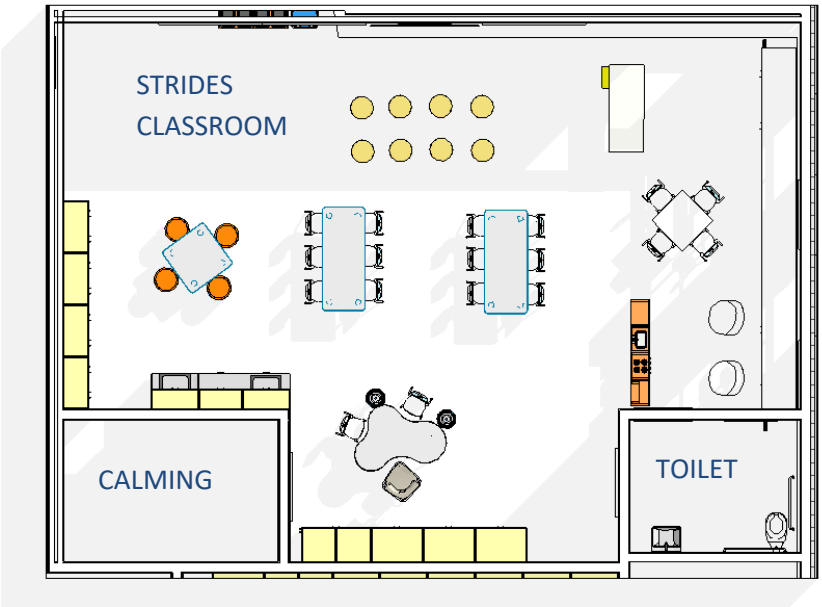
- Two Self-Contained SPED Rooms will house the Strides program on the third level and are integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. Each has direct adjacency and access to an extended learning area directly outside its door. Strides classroom also has ensuite Calming space and Toilet.
- A Self-Contained SPED Room will house the Stages program on the third level and is integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. It has direct adjacency and access to an extended learning area directly outside its door. Stages classroom also has ensuite Calming space and Toilet.
- A Self-Contained SPED Room will house the Language-based program on the third level and is integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. It has direct adjacency and access to an extended learning area directly outside its door.
- Small Group Rooms are typically shared between two classrooms, with doorways directly off the classrooms, which will help them to function as an extension of the learning environment. Children receiving services will essentially not have to leave the learning environment to meet with a specialist or provider.
- The Learning Centers are centrally located with the grade level groupings with direct access to an extended learning area.
- Speech and Language Rooms are centrally located between grade level groupings and in close proximity to stairwells as they will be shared between the grade levels.

Design Response Overview

The current design responds to all the desires and educational intent described in the narrative above, many of which are relevant not only for students with special needs but for all students.

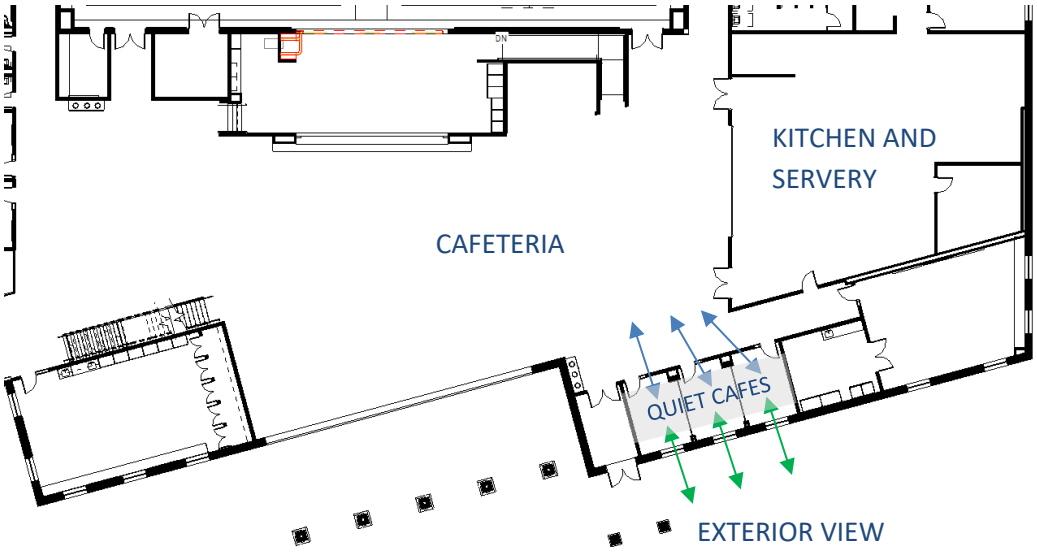
- Purpose-designed spaces for the Strides, Stages and Language-based programs are included in the project.
- These spaces are positioned within the academic areas and embedded with the general classrooms serving their grade level peers. Each of the self-contained classrooms are sized to be identical to general classrooms, will have the same views, access to extended learning spaces, and technology resources as general classrooms. These spaces will also have access to a small group room accessed from within the classroom just like their general classroom peer spaces. Strides and Stages classrooms also include a calming space. The illustration

below is a sample self-contained special education classroom and depicts some of the features that are possible in this suite.



Sample Self-contained Classroom – Conceptual Features and Layout

- In addition to classroom environments, the design includes dedicated OT/PT space.
- A wide variety of learning environments are included in design to reduce stigma for students needing supports. Small group rooms are located between each pair of classrooms to allow students to receive supports in an acoustically separate space and without the need to remove them from their classroom to travel to a distant office. Similarly, and depending on students' needs, extended learning spaces allow students visual and acoustical breaks from the general classroom environment.
- Extended learning areas in the design are positioned immediately outside general and special education classrooms but are intentionally not all identical. Some are larger and more suited to movement activities, large group instruction, and sensory stimulation. Others are smaller and expect to be outfitted for small group activities, student choices, counseling activities, and sensory deprivation.
- A key feature of the preferred alternative is the courtyard space. For all students, but particularly for students with special needs, access to a protected outdoor learning environment ensures a safe and fully accessible opportunity to interact with nature.
- Another key feature is the quiet cafes in the cafeteria. For all students, but particularly for students with special needs, opportunity to participate in the mid-day lunch experience within a quieter, calming space.



Partial Floor Plan, Quiet Cafes –Access to Cafeteria, Kitchen and Exterior Views

Grade and School Configuration Policies:

- As noted above, the school is divided into Lower Elementary Wings, Shared Core Spaces zone, and an Upper Elementary Wing.
- The Lower Elementary Wing houses PreK and K on level 1; and Grades 1 and 2 on Level 2
- The Upper Elementary wing houses Grade 3, 4 and 5 on Level 3
- This grade configuration is unlike the other elementary schools in the District as it consolidates six grade groupings under one roof intentionally to eliminate transitions at the elementary ages and allow students with special support needs to remain with their peers.

Grade Range Zoning Diagram of the Building

SPECIALIZED PROGRAM

List of Specialized Programs:

- Integrates Preschool classrooms
- STRIDES Classrooms
- Stages Classrooms
- Language-Based Classrooms

List of Collaboratives:

- Wilmington is a member of the SEEM Collaborative and also participates in other collaboratives as a non-member, including Valley and CREST. While the district is a member and participates in collaboratives, the District does not plan to house any collaborative programs nor provide dedicated space to collaboratives as part of the project for any of the agreed-upon enrollments.
- Wilmington does accept non-resident students from other districts on a tuition basis.

List of Alternative Education Programs:

- N/A

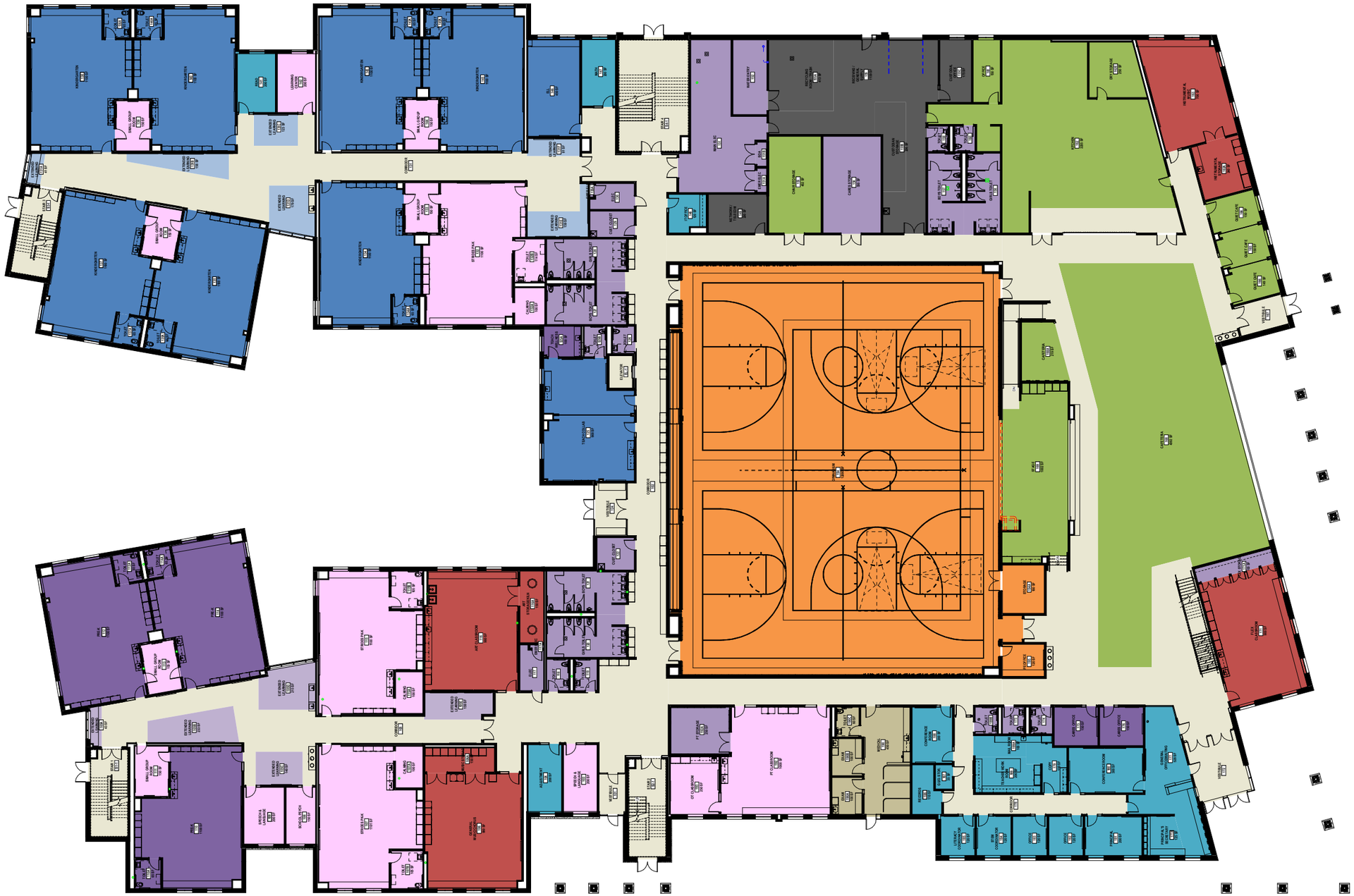
Narrative on Early Childhood Education Programs:

- The district provides an Early Childhood program for students who receive special education services at no cost to parents, as well as non- special education eligible students on a tuition basis if selected through a lottery system. The district currently has two Early Childhood Centers, Boutwell and Wildwood. Currently there are two integrated Pre-Kindergarten classrooms and three substantially separate Pre-Kindergartens at each location.
- The district has up to 8 students within each substantially separate classroom, and up to 90 preschool students within the integrated program. Each integrated classroom has a morning and an afternoon session with each session having a maximum of 15 students. The proposed plan is to relocate and expand the Pre-Kindergarten program within the new school by adding a third full-day integrated preschool classroom. This would increase the capacity by 15 students and reduce our wait list to enter the program.

Relationships with Other Private or Public Entities:

- CARES is a before and after school extended day program for students enrolled in the Wilmington Public Schools. The program does accept students formally identified as special education students.

The floor plans that follow are intended to illustrate the spatial relationships within the proposed building.



PROGRAM FLOOR PLAN

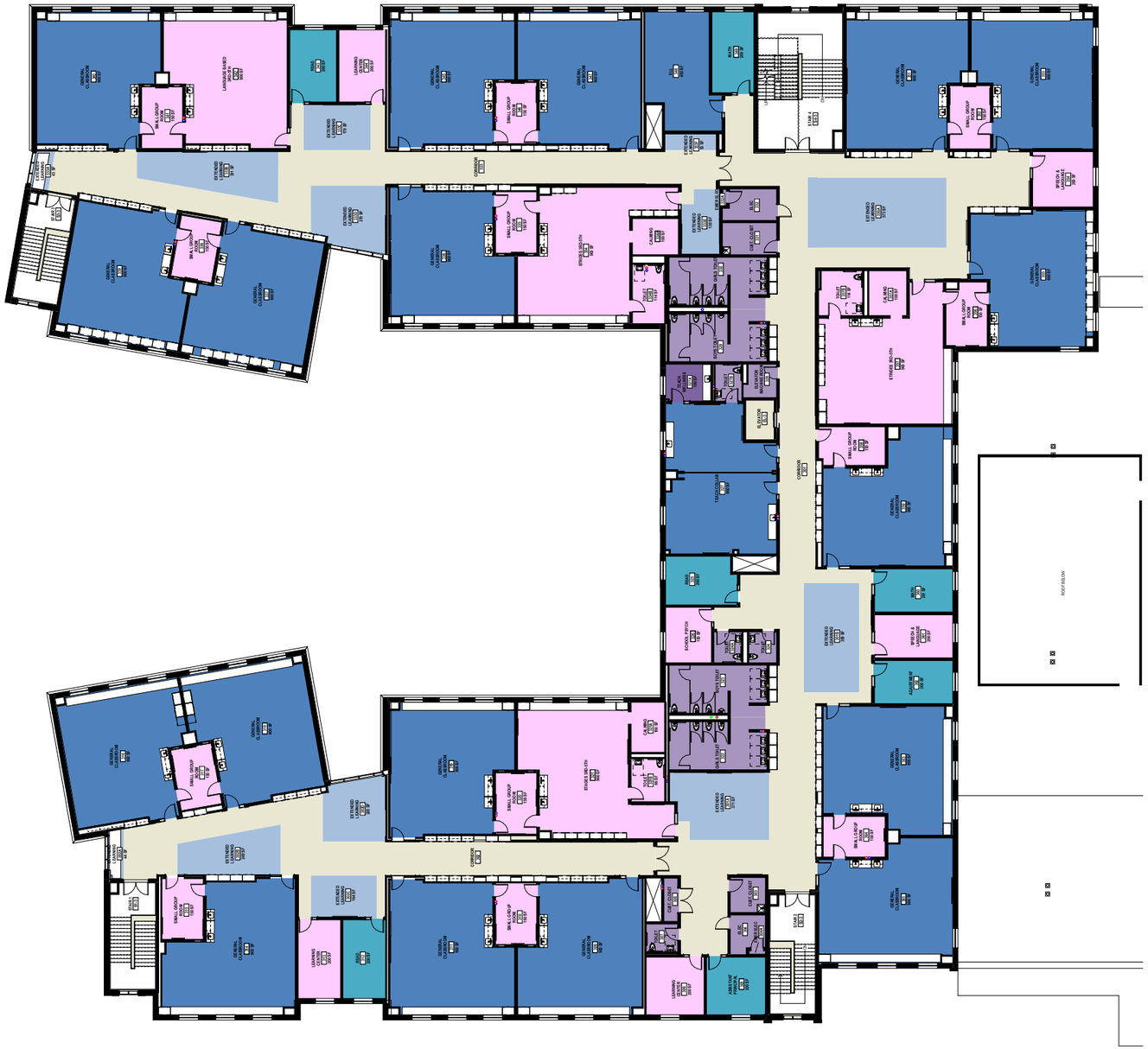
LEVEL 1

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

ROOF BELOW
ROOF BELOW
ROOF BELOW



N

0 16' 32' 64'

SCALE: 1/32"=1'-0"

PROGRAM FLOOR PLAN

LEVEL 3

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

Educational Space Summary

The space summary on the following pages contains an itemization of the proposed spaces needed to deliver the District's educational program for grades PreK-5th using the MSBA's latest edition elementary school space summary template.

Room labels unique to the District and/or that vary from MSBA room names are identified with a yellow highlight. Total gross floor area, or gross square feet (GSF), are shown at the bottom of the table for the proposed conditions.

The District and the Design Team worked together to align proposed spaces with MSBA square footage guidelines for individual program areas and the total gross square footage to the greatest extent possible. However, some deviations do exist. All deviations were deemed necessary by the District to serve the educational program and are explained in detail on the pages following the space summary.

Some changes to the design have occurred since the submission of the Preferred Schematic Report. With further input from the District, some new spaces have been added to the project that subdivided larger program areas, and other program spaces have moved location within the plans to meet design and functional goals and requirements. The essence of the overall building planning and individual spatial relationships have remained intact.

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Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
CORE ACADEMIC	**44,259**			**0**			**45,700**			**45,700**			**10,450**			**35,250**	STE Guidelines Policy
(List rooms of different sizes separately)																	
Kindergarten Classroom with Toilet				0	varies	7	8,156	varies	7	8,156	varies	0	-244	1,200	7	8,400	1,100 NSF (minimum size) - 1,300 NSF (maximum size); Minimum of (2) sinks required per Kindergarten Classroom
Rm. 134					1165												
Rm. 135					1165												
Rm. 137					1165												
Rm. 138					1165												
Rm. 140					1165												
Rm. 143					1165												
Rm. 145					1166												
General Classroom (Grades 1-6)				0	900	30	27,000	varies	30	27,000	varies	3	1,350	950	27	25,650	900 NSF (minimum size) - 1,000 NSF (maximum size); Minimum of (2) sinks required per General Classroom
Rm. 206																	
Rm. 208																	
Rm. 211																	
Rm. 213																	
Rm. 215																	
Rm. 216																	
Rm. 233																	
Rm. 234																	
Rm. 236																	
Rm. 237																	
Rm. 242																	
Rm. 244																	
Rm. 309																	
Rm. 311																	
Rm. 314																	
Rm. 316																	
Rm. 318																	
Rm. 319																	
Rm. 336																	
Rm. 337																	
Rm. 339																	
Rm. 340																	
Rm. 345																	
Rm. 347																	
Rm. 351																	

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	**Existing Totals**	**PROPOSED PROGRAM**															
		EXISTING TO REMAIN / RENOVATED			**NEW CONSTRUCTION**			**TOTAL**			**VARIATION TO MSBA GUIDELINES**			**MSBA GUIDELINES (DO NOT MODIFY)** **(Refer to Educational Facility Planning for additional information)**			
ROOM TYPE		**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**COMMENTS**
Rm. 353																	
Rm. 355																	
Rm. 359																	
Rm. 363																	
Rm. 365																	
Science, Technology, Engineering (STE) Room (Grades 3-6) Rm. 256				0	1,080	1	1,080	1,080	1	1,080	0	0	0	1,080	1	1,080	1,080 NSF (minimum size); Refer to the 2018 STE Guidelines for additional information.
STE Storage Room - Rm. 256A				0	120	1	120	120	1	120	0	0	0	120	1	120	Minimum of (1) 120 NSF STE Storage Room required per STE Room; Refer to the 2018 STE Guidelines for additional information.
ELL Classroom - Rm 146, Rm 348				0	450	2	900	varies	2	900	varies	2	900				
Teacher Collaboration - Rm 125, Rm 224, Rm 327				0	900	3	2,700	varies	3	2,700	varies	3	2,700				
Extended Learning K																	
Rm. 131A					41	1	41	41	1	41	41	1	41				
Rm. 131B					158	1	158	158	1	158	158	1	158				
Rm. 131C					123	1	123	123	1	123	123	1	123				
Rm. 131D					179	1	179	179	1	179	179	1	179				
Rm. 131E					162	1	162	162	1	162	162	1	162				
Rm. 131F					81	1	81	81	1	81	81	1	81				
Extended Learning 1st-5th				0													
Rm. 205A					58	1	58	58	1	58	58	1	58				
Rm. 205B					243	1	243	243	1	243	243	1	243				
Rm. 205C					163	1	163	163	1	163	163	1	163				
Rm. 205D					292	1	292	292	1	292	292	1	292				
Rm. 205E					212	1	212	212	1	212	212	1	212				
Rm. 230A					43	1	43	43	1	43	43	1	43				
Rm. 230B					261	1	261	261	1	261	261	1	261				
Rm. 230C					140	1	140	140	1	140	140	1	140				
Rm. 230D					262	1	262	262	1	262	262	1	262				
Rm. 230E					154	1	154	154	1	154	154	1	154				
Rm. 230F					172	1	172	172	1	172	172	1	172				
Rm. 301A					371	1	371	371	1	371	371	1	371				
Rm. 301B					359	1	359	359	1	359	359	1	359				
Rm. 302A					44	1	44	44	1	44	44	1	44				
Rm. 302B					249	1	249	249	1	249	249	1	249				
Rm. 302C					164	1	164	164	1	164	164	1	164				
Rm. 302D					228	1	228	228	1	228	228	1	228				
Rm. 333A					43	1	43	43	1	43	43	1	43				
Rm. 333B					331	1	331	331	1	331	331	1	331				
Rm. 333C					179	1	179	179	1	179	179	1	179				
Rm. 333D					270	1	270	270	1	270	270	1	270				
Rm. 333E					139	1	139	139	1	139	139	1	139				
Rm. 333F					50	1	50	50	1	50	50	1	50				
Rm. 350A					573	1	573	573	1	573	573	1	573				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
SPECIAL EDUCATION	9,553			0			19,010			19,010			9,950			9,060	Special Education spaces require DESE review and approval.
(List rooms of different sizes separately)																	
Self-Contained Special Education Classroom				0	Varies	10	9,600	Varies	10	9,600	Varies	4	3,900	950	6	5,700	900 NSF (minimum size) - 1,300 NSF; equal to the size of the proposed General Classrooms that serve the same student population.
Strides Program PK-K - Rm 107, Rm 115. Rm 132				0	1100	3		1,100	3								
Strides Program 1st-2nd - Rm 231				0	900	1		900	1								
Strides Program 3rd-5th - Rm 334, Rm 357				0	900	2		900	2								
Stages Program 1st-2nd - Rm 218				0	900	1		900	1								
Stages Program 3rd-5th - Rm 321				0	900	1		900	1								
Language-Based Program 1st-2nd - Rm 239				0	900	1		900	1								
Language-Based Program 3rd-5th - Rm 342				0	900	1		900	1								
Self-Contained Special Education Toilet Room				0	varies	8	840	varies	8	840	varies	26	480	60	6	360	
Strides Program PK-K Toilet - Rm 107B				0	105	1											
Rm 115B					105	1											
Rm 132B					114	1											
Strides Program 1st-2nd Toilet - Rm 231B				0	116	1											
Strides Program 3rd-5th Toilet - Rm 334B				0	114	1											
Rm 357B					114	1											
Stages Program 1st-2nd Toilet - Rm 218B				0	86	1											
Stages Program 3rd-5th Toilet - Rm 321B				0	86	1											
Learning Center				0	200	6	1,200	200	6	1,200	-300	2	-800	500	4	2,000	1/2 size of a General Classroom
Rm 142																	
Rm 210																	
Rm 241																	
Rm 306																	
Rm 313																	
Rm 344																	
Small Group Room				0	150	26	3,900	varies	26	3,900	varies	24	2,900	500	2	1,000	1/2 size of a General Classroom
Rm 111				0													
Rm 113				0													
Rm 133				0													
Rm 136				0													
Rm 139				0													
Rm 144				0													
Rm 207				0													
Rm 212				0													
Rm 214				0													
Rm 217				0													
Rm 232				0													
Rm 235				0													
Rm 238				0													
Rm 243				0													
Rm 310				0													
Rm 315				0													
Rm 317				0													
Rm 320				0													
Rm 335				0													
Rm 338				0													
Rm 341				0													
Rm 346				0													
Rm 352				0													
Rm 356				0													
Rm 358				0													
Rm 364				0													
Calming				0	100	8	800	100	8	800	varies	8	800				
Rm 107A																	
Rm 115A																	
Rm 132A																	
Rm 218A																	
Rm 231A																	
Rm 321A																	
Rm 334A																	
Rm 357A																	
OT Classroom/Office - Rm 193				0	250	1	250	250	1	250	250	1	250				
PT Classroom Rm 192				0	1,000	1	1,000	1,000	1	1,000	1,000	1	1,000				
School Psychologists - Rm 108, Rm 326				0	150	2	300	varies	2	300	varies	2	300				
BCBA Office/Team Chairs - Rm 245				0	320	1	320	320	1	320	320	1	320				
Speech & Language - Rm 103, Rm 109, Rm 354, Rm 361				0	200	4	800	varies	4	800	varies	4	800				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	Existing Totals	PROPOSED PROGRAM										MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL			VARIATION TO MSBA GUIDELINES					
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
Public Day Education Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
Collaborative Program Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
ART & MUSIC	5,655			0			5,075			5,075			0			5,075	
Art Classroom (25 seats) - Rm 116				0	980	1	980	980	1	980	-20	-1	-1,020	1,000	2	2,000	Assumed schedule: 2 times per week per student
Art Workroom with Storage and Kiln - Rm 116A				0	150	1	150	150	1	150	0	-1	-150	150	2	300	
General Music / Chorus (25-50 seats) - Rm 106				0	980	1	980	980	1	980	-220	-1	-1,420	1,200	2	2,400	Assumed schedule: 2 times per week per student
General Music Storage - Rm 106A				0	150	1	150	150	1	150	75	-4	-225	75	5	375	
Music Practice / Ensemble				0	0	0	0	0	0	0	0	0	0				
Instrumental Music - Rm 163				0	700	1	700	700	1	700	700	1	700				
Instrumental Storage - Rm 163A				0	240	1	240	240	1	240	240	1	240				
Flex Classrom - Music - Rm 171				0	900	1	900	900	1	900	900	1	900				
Flex Classrom - Art - Rm 257				0	975	1	975	975	1	975	975	1	975				
HEALTH & PHYSICAL EDUCATION	8,913			0			12,300			12,300			6,000			6,300	Excess Physical Education Spaces Policy
Gymnasium - Rm 194				0	12000	1	12,000	12,000	1	12,000	6,000	0	6,000	6,000	1	6,000	
Gym Storeroom - Rm 194A				0	180	1	180	180	1	180	30	0	30	150	1	150	
PE Office ~~with Shower and Toilet~~ - Rm 195				0	120	1	120	120	1	120	-30	0	-30	150	1	150	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
MEDIA CENTER	2,265			0			4,068			4,068			0			4,068	
Media Center / Reading Room - Rm 252				0	3,859	1	3,859	3,859	1	3,859	-208	0	-208	4,068	1	4,068	
Librarian Workroom - Rm 252A				0	209	1	209	209	1	209	209	1	209				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
DINING & FOOD SERVICE	13,620			0			9,458			9,458			0			9,458	
Cafeteria / Dining - Rm 168 and Rm 168A				0	4,611	1	4,611	4,611	1	4,611	-1,052	0	-1,052	5,663	1	5,663	Based on 2 lunch seatings - 15 NSF per seat
Stage - Rm 169				0	1,002	1	1,002	1,002	1	1,002	2	0	2	1,000	1	1,000	
Chair / Table / Equipment Storage Rm 153				0	452	1	452	452	1	452	0	0	0	452	1	452	
Kitchen - Rm 162				0	2,255	1	2,255	2,255	1	2,255	200	0	200	2,055	1	2,055	1,600 NSF for first 300 students + 1 NSF per additional student
Dry Storage - Rm 162E					250	1	250	250	1	250	250	1	250				
Kitchen Office - Rm 161				0	150	1	150	150	1	150	150	1	150				
Staff Lunch Room - Rm 251				0	289	1	289	289	1	289	0	0	0	289	1	289	20 NSF per student
Quiet Café Area				0	varies	3	449	varies	3	449	varies	3	449				
Rm 164				0	150		0	150	0	0	150	0	150				
Rm 165				0	150		0	150	0	0	150	0	150				
Rm 166				0	149		0	149	0	0	149	0	149				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM											VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL											
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS			ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
MEDICAL	603			0	710		710			710					0			710	
Medical Suite Toilet - Rm 190C				0	60	1	60	60	1	60			0	0	0	60	1	60	
Nurses' Office / ~~Waiting Room~~ Exam - Rm 190A				0	100	1	100	100	1	100			-150	0	-150	250	1	250	
Examination Room / ~~Resting~~ Office - Rm 190B				0	100	1	100	100	1	100			0	-3	-300	100	4	400	
Medical / Waiting Area / Resting Area - Rm 190				0	450	1	450	450	1	450			450	1	450				
~~Resting Area~~				0	0	1	0	0	1	0			0	1	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
ADMINISTRATION & GUIDANCE	5,113			0			5,548			5,548					2,658			2,890	
General Office / Waiting Room with Toilet - Rm 177				0	528	1	528	528	1	528			0	0	0	528	1	528	
Teachers' Mail and Time Room - Rm 189A				0	100	1	100	100	1	100			0	0	0	100	1	100	
Copy Room - Rm 179				0	150	1	150	150	1	150			0	0	0	150	1	150	
Records Room - Rm 186				0	110	1	110	110	1	110			0	0	0	110	1	110	
Principal's Office with Conference Area - Rm 181				0	200	1	200	200	1	200			-175	0	-175	375	1	375	
Principal's Secretary / Waiting - Rm 177A				0	125	1	125	125	1	125			0	0	0	125	1	125	
Assistant Principal's Office - Rm 223, Rm 305				0	200	2	400	varies	2	400			varies	1	280	120	1	120	
Supervisory / Spare Office - Rm 182, Rm 183				0	120	2	240	120	2	240			0	1	120	120	1	120	
Conference Room				0	varies	2	500	varies	2	500			250	1	250	250	1	250	
Conference Room - Rm 180					300	1													
Conference Room - Rm 188					200	1													
School / Adjustment Counselors -Rm 104, Rm 246, Rm 362				0	200	3	600	200	3	600			50	0	150	150	3	450	
Guidance Storeroom - Rm 187				0	35	1	35	35	1	35			0	0	0	35	1	35	
Teachers' Work Room - Rm 189				0	200	1	200	200	1	200			-328	0	-328	528	1	528	
Reading Specialists - rm 141, 209, 240, 312, 325, 343				0	200	6	1,200	200	6	1,200			200	6	1,200				
Math Tutors				0	200	4	800	varies	4	800			varies	4	800				
Rm 147																			
Rm 222																			
Rm349																			
Rm 360																			
IT Technician Office - Rm 148				0	120	1	120	120	1	120			120	1	120				
Literacy Coordinator - Rm 185				0	120	1	120	120	1	120			120	1	120				
STEM Coordinator - Rm 184				0	120	1	120	120	1	120			120	1	120				
[Enter room type here]				0			0	0	0	0			0	0	0				
CUSTODIAL & MAINTENANCE	486			0			2,355			2,355					0			2,355	
Custodian's Office - Rm 155C				0	175	1	175	175	1	175			25	0	25	150	1	150	
Custodian's Workshop				0	0	0	0	0	0	0			-375	-1	-375	375	1	375	
Custodian's Storage - Rm 155B				0	206	1	206	206	1	206			-169	0	-169	375	1	375	
Recycling Room / Trash - Rm 155A				0	413	1	413	413	1	413			13	0	13	400	1	400	
Receiving and General Supply Rm 155				0	1,159	1	1,159	1,159	1	1,159			807	0	807	352	1	352	
Storeroom				0	0	0	0	0	0	0			-503	-1	-503	503	1	503	
Network / Telecom Room -Rm 149				0	200	1	200	200	1	200			0	0	0	200	1	200	
Custodian Storage - Rm 248					202	1	202	202	1	202			202	1	202				
[insert room type here]				0			0	0	0	0			0	0	0				
OTHER	2,765			0			5,800			5,800					5,800			0	
(List rooms separately below)							5,800												
Pre-Kindergarten Classroom with Toilet (if applicable)				0	varies	3	3,510	varies	3	3,510			varies	3	3,510	1,200	0	-	1,100 NSF (minimum size) - 1,300 NSF (maximum size)
Rm 110					1165														
Rm 112					1173														
Rm 114					1172														
Extended Learning PK				0	varies	5	790	varies	5	790			varies	5	790				
Rm 105A					43														
Rm 105B					233														
Rm 105C					140														
Rm 105D					215														
Rm 105E					159														
Teacher Wellness Room - Rm 125A, 224A, 327A				0	100	3	300	100	3	300			100	3	300				
CARES program Coorinator Office - Rm 175				0	150	1	150	150	1	150			150	1	150				
CARES Site Coorinator Office - Rm 176					150	1	150	150	1	150			150	1	150				
Health Classroom - Rm 204				0	900	1	900	900	1	900			900	1	900				
[Enter room type here]				0			0	0	0	0			0	0	0				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 4/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	COMMENTS
Total Building Net Floor Area (NFA)	93,310			0			130,004			130,004			54,809			71,165	Total Building Net Floor Area (NFA)
Proposed Student Capacity / Enrollment														# of Grades	6	725	Total Enrollment (Enter Design Enrollment)
														K	1	109	Kindergarten Enrollment
														Grade 1	1	253	Lower Elementary School Enrollment (Grades 1-2)
														Grade 2	1	330	Lower Elementary School Enrollment (Grades 1-2)
														Grade 3	1		
														Grade 4	1		
														Grade 5	1		
														Grade 6	0		
NON-PROGRAMMED SPACES		% of GFA		0	% of GFA		93,081	% of GFA		93,081							Complete this Category with Schematic Design Submittal
Office / Occupied Rooms (List rooms separately below)																	
PT Storage Rm (ESEA		0	0		0	0.2%	150	0	0.2%	150							
CARES Storage - Rm 150		0	0		0	0.1%	100	0	0.1%	100							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
Unassigned BISP / SP Spaces		0	0		0	0.0%		0	0.0%	0							
Unassigned Closets, Supply Rooms, and Storage Rooms		0	0		0	0.0%		0	0.0%	0							
Toilet Rooms		0	0		0	0.0%		0	0.0%	0							
Circulation (corridors, stairs, ramps and elevators)		0	0		0	0.0%		0	0.0%	0							
Remaining[3]		0	0	0	0	32.9%	54,350	0	32.9%	54,350							
Total Building Gross Floor Area (GFA)[2]	168,634			0			183,085			183,085			93,360			108,475	Total Building Gross Floor Area (GFA)[2]
Grossing Factor (GFA / NFA)				#DIV/0!			1.41			1.41			0.84			1.41	Grossing Factor (GFA / NFA)

		PDP	PDS	SD	Difference
1	Individual Room Net Floor Area (NFA)	107,900	103,870	103,035	1,017
2	Total Building Gross Floor Area (GFA)				
3	Remaining				

Architect Certification

I hereby certify that all of the information provided in the "Proposed Space Summary" is true, complete and accurate and, except as approved in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.

Name of Architecture Firm: Dore + Whittier

Name of Principal Architect: Donald M Walter

Signature of Principal Architect: Donald M Walter

Digitally signed by Donald M Walter
DN: C=US, E=dwalter@doreandwhittier.com, O="Dore & Whittier", CN=Donald M Walter
Date: 2025.04.18 19:08:59-04'00'

Date: 4/18/25

Deviations From MSBA Guidelines – 755 Students + 100 PreK

The proposed space summary identifies a need of 165,035 GSF at a net to gross multiplier of 1.5 to serve the educational program, a deviation of 55,560* GSF from the MSBA guidelines for K-5th grade population of 755 students + approximately 100 PreK students. The narrative that follows offers evidence and support for these deviations.

Below is a summary of the initial proposed Space Summary as it has progressed through the MSBA process:

	Existing Wildwood, Woburn St and North Int. Schools Combined	PDP	Preferred Schematic Report	Schematic Design Report
Program Area	TOTAL NSF	TOTAL NSF	TOTAL NSF	TOTAL NSF
Core Academic	36,096	45,700	45,700	45,700
Special Education	11,300	19,010	19,010	19,010
Art & Music	6,315	4,040	4,040	5,082
Health & Physical Education	9,772	12,300	12,300	12,300
Media Center	2,265	4,068	4,068	4,068
Dining & Food Service	13,620	9,458	9,458	9,458
Medical	603	710	710	710
Administration & Guidance	5,582	5,308	5,308	5,548
Custodial & Maintenance	2,654	2,355	2,355	2,355
Other	2,764	6,100	6,100	5,800
TOTAL NSF	90,972	110,240	110,240	110,024
TOTAL GSF	138,614	163,573	163,573	165,035

* It is important to note that the MSBA Space Summary Template for this enrollment is based on a net to gross multiplier of only 1.46.

CORE ACADEMIC

The core academic program category totals 45,700 NSF, a deviation of +10,450 NSF from the MSBA guideline. The proposed space summary deviates from MSBA guidelines in four key ways: general classrooms, ELL classrooms, teacher collaboration spaces, and extended learning areas.

The first deviating factor relates to additional classrooms. Under a consolidated student population, the District requests thirty general classrooms for grades 1st – 5th, a deviation of three classrooms from the MSBA guidelines of twenty-seven general classrooms for grades 1st – 5th. The need for additional classrooms is a direct result of the District's local class size guidelines and current class models which are presented in detail in the educational program narrative.

The second factor leading to the deviation in Core Academic square footage is a demographic shift in Wilmington that has resulted in more students who qualify for English Language Learner services and programs. The proposed space summary deviates from MSBA guidelines by providing two half-sized classroom spaces to accommodate these services totaling 900 NSF.

The third factor leading to the deviation in Core Academic square footage is the additional space requested to support professional collaboration among faculty and staff. The district requests three 900 NSF Teacher Collaboration Spaces, one centrally located on each level. These spaces are to serve for common planning time, data meetings, and professional development spaces. They may also house a few hoteling desks for volunteers and itinerant staff if they don't have a professional home base elsewhere in the project. It is important to note that the district has tuned the space allocation since PSR to better meet its specific needs. After further review, the district realized the number of educators are more evenly distributed over three levels than originally anticipated. The number of Teacher Collaboration spaces was reduced from six to three while maintaining the same overall square footage of 2,700 NSF and evenly distributing on each level. The three teacher collaboration spaces are now centrally located between academic wings on each floor for greater access and flexibility of use.

The final factor in the deviation between the proposed space for Core Academics and the MSBA guidelines for this category is the additional space requested for Extended Learning. The needs and intent for this space are explained in the educational program narrative. The proposed Core Academic area includes thirty Extended Learning areas of varying sizes and locations totaling 5,744 NSF. This is a 456 SF decrease from PSR as some area from Kindergarten extended learning was allocated back to the Kindergarten classrooms and does not change the net square footage of the Core academic category.

The District is proposing three Pre-Kindergarten classrooms to support the current program and expand the program's offering with a full day class. At the PSR submittal, all of the net square footage associated with Pre-Kindergarten classrooms were recategorized into the "Other" category and remains there in the Schematic Design submittal.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

SPECIAL EDUCATION

The Special Education program category totals 19,010 NSF, a deviation of +9,950 NSF from the MSBA guidelines. Several District-specific programs and services contribute to much of this deviation, including dedicated space to support programs like the substantially separate, self-contained Strides program and services such as Occupational Therapy and Physical Therapy all outlined in the Special Education sub-section of the Educational Program Narrative. PT Storage was removed based on MSBA PDP comments to "Non-programmed Spaces" category.

The remaining deviation in square footage is a result of the district's request for twenty-six (26) small group rooms and a request for a series of spaces associated with support service professionals: School Psychologists, Speech and Language Pathologists, and Board-Certified Behavioral Analysists all of which exclusively serve students with special needs. Small group rooms are located between pairs of classrooms to serve as supplemental instructional environments that are physically and visually connected directly to, but acoustically separate from, the general classroom. These spaces would primarily serve students who receive supports from professionals beyond the general classroom teacher but would also be a critical resource to general education teachers for small group activities and differentiated instruction consistent with Universal Design for Learning.

It should be noted that the toilet room for the Stages Program serving 3rd – 5th grades was not accounted for in the PSR submittal and has since been added to the program. However design progress has reallocated square foot area between individual toilet rooms within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal to accommodate the additional toilet room.

The overall NSF of this category remains unchanged since the PSR submittal.

ART & MUSIC

The art and music program category totals 5,075 NSF, indicating an increase of 1,035 NSF in this category from PSR, and alignment with the MSBA guidelines.

The increase in the category total since PSR is the result of on-going programming meetings with end users and further analysis of scheduling and operational use for a PK-5 configuration. The functional needs for art and music spaces vary significantly, warranting a second flex space and assigning a primary function to each flex space in the program, one for art on the second level and the other for

music on the first level. When not in use by these programs, flex rooms can serve as a multi-purpose space for other programs and a resource for the CARES program and community after-school.

It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

HEALTH & PHYSICAL EDUCATION

The health & physical education program category totals 12,300 NSF, a deviation of +6,000 NSF from the MSBA guidelines. The overall NSF of this category remains unchanged since the PSR submittal.

MEDIA CENTER

The media center program category totals 4,068 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area within this category as the design was further developed to account for a workroom.

DINING & FOOD SERVICE

The dining and food services program category totals 9,458 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as the design was further developed. As articulated in PDP and PSR, the District directed the Design Team to size the dining room to accommodate all kindergarten through 5th grade students in three seatings. Given the plan to operate three seatings rather than two, the reduced square footage in the dining room will still be able to accommodate enrollment growth in the future.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

MEDICAL

The medical program category totals 710 NSF, which aligns with MSBA guidelines. The overall NSF of this category remains unchanged since the PSR submittal.

ADMINISTRATION & GUIDANCE

The administration & guidance program category totals 5,548 NSF, a deviation of +2,658 NSF from the MSBA Guidelines and increase of +240 NSF since PSR. It is important to note that the district has increased the proposed NSF to tune this category for its specific local needs. The deviation is related to providing office and instructional spaces for student support service providers who serve both general and special education students. Since PSR, an audit of spaces recognized two professionals originally identified in the District's Educational Plan, a Literacy Coordinator and STEM Coordinator, and allocated space within administration, increasing this category by +240 NSF.

CUSTODIAL AND MAINTENANCE

The custodial and maintenance program category totals 2,355 NSF, which is equal to the MSBA Guidelines.

This category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category.

OTHER

Items in the "other" category total 5,800 NSF, a decrease of -300 NSF since PSR. Much of this deviation from results from providing (3) Prekindergarten general education classrooms, PreK extended learning areas, CARES spaces associated with the after-school program including (1) 150 NSF program coordinator office and (1) 150 NSF site coordinator office and a dedicated Health classroom at 900 NSF. The final deviation is the result of providing (3) 100 NSF teacher wellness spaces which are meant to accompany teacher collaboration spaces and serve as places to conduct a private/confidential phone call and double as a lactation space. The reduction from six to three wellness rooms since PSR correlates directly to the reduction in teacher collaboration spaces discussed in the Core Academic category.

It is important to note, however, that design progress has reallocated square foot area between the PreK extended learning areas and the PreK classrooms as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal. The reallocation results in a decrease of 210 NSF in the PreK extended learning area.

NON-PROGRAMMED SPACES

Items in the "Non-programmed Spaces" category were added based on previous comments from MSBA:

PT Storage 250 NSF

Cares Storage 500 NSF

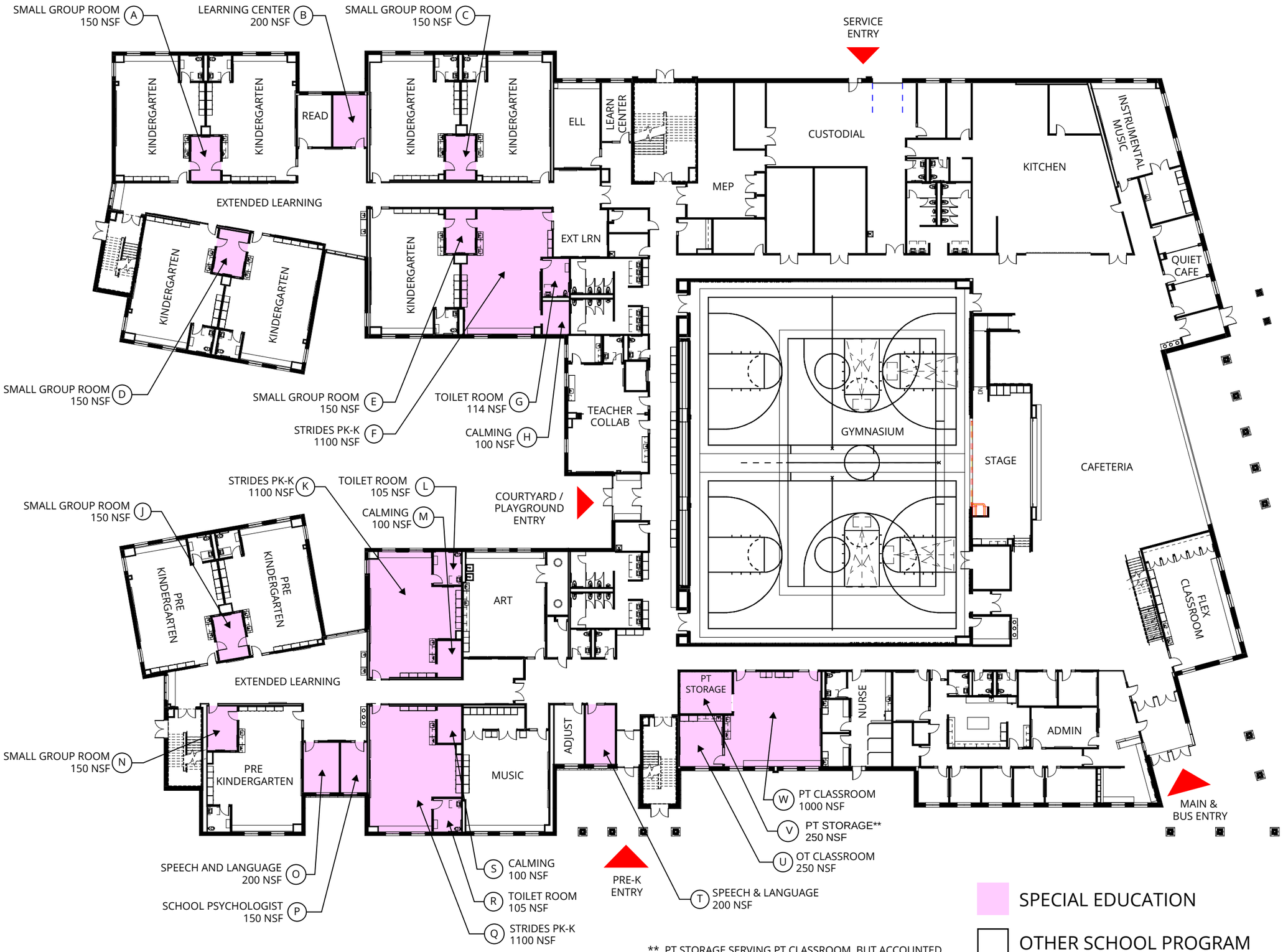
This category remains unchanged since the PSR submittal.

SUMMARY

In summary, the District and the Design team are proposing 110,024 NSF and 165,035 GSF to satisfy the educational program. These square footages deviate from the MSBA guidelines by 34,859 NSF and 55,560 GSF.

Floor Plans

The following pages provide colored floor plans identifying the locations of all Special Education Spaces.



DESE FLOOR PLAN

LEVEL 1

DORE + WHITTIER

DESE FLOOR PLAN

LEVEL 2

N

LANGUAGE BASED 1ST-2ND 900 NSF (Y)
LEARNING CENTER 200 NSF (Z)
SMALL GROUP ROOM 150 NSF (AA)
BCBA OFFICE 320 NSF (AB)
SMALL GROUP ROOM 150 NSF (X)
SMALL GROUP ROOM 150 NSF (AC)
SMALL GROUP ROOM 150 NSF (AD)
STRIDES 1ST-2ND 900 NSF (AE)
CALMING 100 NSF (AG)
TOILET ROOM 116 NSF (AF)
STAGES 1ST-2ND 900 NSF (AK)
CALMING 100 NSF (AL)
SMALL GROUP ROOM 150 NSF (AJ)
TOILET ROOM 86 NSF (AM)
SMALL GROUP ROOM 150 NSF (AH)
SMALL GROUP ROOM 150 NSF (AN)
LEARNING CENTER 200 NSF (AO)
SMALL GROUP ROOM 150 NSF (AP)

GENERAL CLASSROOM
READ
ADJUST
EXTENDED LEARNING
EXT LRN
TEACHER COLLAB
ASSIST
MATH
HEALTH
CUSTODIAL BELOW
MEP
ROOF
GYMNASIUM BELOW
CAFETERIA BELOW
STAFF LUNCH
FLEX CLASSROOM
STE CLASSROOM
LIBRARY

SPECIAL EDUCATION

OTHER SCHOOL PROGRAM

DORE + WHITTIER

N

DESE FLOOR PLAN

LEVEL 3

SPECIAL EDUCATION

OTHER SCHOOL PROGRAM

DORE + WHITTIER

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Floor 1					
Small Group Room/ Reading	500	Small Group Room	A	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Resource Room	500	Learning Center	B	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	C	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	D	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	E	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides PK-K	F	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	G	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	H	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	J	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides PK-K	K	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	L	105	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	M	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	N	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	O	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
*Unique to District	Select SF	School Psychologist	P	150	Space for clinician to assist with educational and psychological evaluations and provide individual counseling to students on Individualized Education Programs (IEP); located near grade level communitIES.
Self-Contained Sped	950	Strides PK-K	Q	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	R	105	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	S	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
*Unique to District	Select SF	Speech and Language	T	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
*Unique to District	Select SF	OT Classroom	U	250	A space capable of supporting a wide range of occupational therapy activities. Space is positioned centrally to the entire building but slightly biased towards lowest grade grouping in order to reduce travel distance for earliest learners.
Unique to District	*Select SF*	*PT Storage***	*V*	*250*	*Dedicated storage closet for PT equipment and supplies.* ***Because it serves the PT Classroom it has been included in the DESE plan illustration and Special Education Space Adjacency Table, but has been accounted for under "non-programmed spaces" on the MSBA Space Summary Template. As such, this space is not included in the total category sqaure footage calculation below.*
*Unique to District	Select SF	PT Classroom	W	1000	A space capable of supporting a wide range of physical therapy activities. Space is positioned centrally to the entire building but slightly biased towards lowest grade grouping in order to reduce travel distance for earliest learners.
Floor 2					
Small Group Room/ Reading	500	Small Group Room	X	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	Select SF	Language Based 1st-2nd	Y	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Resource Room	500	Learning Center	Z	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AA	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	BCBA Office	AB	320	Dedicated space for BSBA profesionals to support programs, teachers, students and is centrally located between getween grade levels groupings.
Small Group Room/ Reading	500	Small Group Room	AC	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AD	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 1st-2nd	AE	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	AF	116	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	AG	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	AH	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AJ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Stages 1st-2nd	AK	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
*Unique to District	Select SF	Calming	AL	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Self-Contained Sped - Toilet	60	Toilet Room	AM	86	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
Small Group Room/ Reading	500	Small Group Room	AN	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Resource Room	500	Learning Center	AO	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AP	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Floor 3					
Small Group Room/ Reading	500	Small Group Room	AQ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Language Based 3rd-5th	AR	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Resource Room	500	Learning Center	AS	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AT	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AU	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.

Hatherly Elementary School Proposed Special Education Program
(New Construction)

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Small Group Room/ Reading	500	Small Group Room	AV	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 3rd-5th	AW	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	AX	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	AY	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Self-Contained Sped	Select SF	School Psychologist	AZ	150	Space for clinician to assist with educational and psychological evaluations and provide individual counseling to students on Individualized Education Programs (IEP); located near grade level communitIES.
Small Group Room/ Reading	500	Small Group Room	BA	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	BB	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Stages 3rd-5th	BC	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	BD	86	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	BE	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	BF	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	500	Learning Center	BG	200	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	BH	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	500	Learning Center	BJ	200	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	BK	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	BL	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
Small Group Room/ Reading	500	Small Group Room	BM	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 3rd-5th	BN	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	BO	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.

Hatherly Elementary School Proposed Special Education Program
(New Construction)

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
*Unique to District	Select SF	Calming	BP	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	BQ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	BR	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
Small Group Room/ Reading	500	Small Group Room	BS	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
			Total	19,010	

Square Footage Summary:

The proposed overall gross square footage of the new building is 165,035; Average square feet of General Classrooms is 900.

MSBA guidelines include 9,060 net square feet of dedicated special education space. The proposed program is +9,950 nsf in excess of the guidelines.

***Indicates that space is unique to District's program and does not appear in MSBA space guidelines.**

WILMINGTON WILDWOOD EARLY CHILDHOOD CENTER

01 MAY 2025

MSBA SCHEMATIC DESIGN REPORT

DORE + WHITTIER SMMA FONTAINE

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Acknowledgements

Dore & Whittier Architects, Inc. would like to acknowledge the following individuals from the Town of Wilmington, Wilmington Public Schools administration, and the Wildwood ECC, Woburn Street and North Intermediate Schools for their assistance to the Design Team.

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Judith O'Connell, Assistant Town Manager
Dennis Kelley, Public Buildings Superintendent

Wilmington Public Schools Administration
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Paul Ruggiero, Assistant Superintendent for Administration and Finance
Christine Elliot, Assistant Superintendent for Curriculum and Staff Development
Christine Murray, Interim Director of Student Support Services
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Diane Carreiro, Principal, North Intermediate School
Tracy Ingersoll, Executive Assistant to the Superintendent of Schools
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Nicholas Golden, Vice Chair
Jennifer Bryson, Member
Michael Mercaldi, Member
David Ragsdale, Member
Jay Samaha, Member
Stephen Turner, Member

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Owner's Construction Manager (CM) – Fontaine Brothers

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smma

05/01/2025

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Mr. Michael McGurl
Director of Capital Planning
Massachusetts School Building Authority (MSBA)
40 Broad Street, Suite 500
Boston, Massachusetts 02109

Wilmington Elementary School / SMMA No. 22127
RE: DESE Submission

Dear Mr. McGurl:

The District is pursuing execution of a Project Scope and Budget Agreement for the MSBA approved Schematic Design for the Wilmington Elementary School project in Wilmington, Massachusetts. The District's 2024/2025 enrollment is 2,817. The design enrollment for the proposed school project is 755 students plus PreK. The existing Wildwood Early Childhood Center currently serves grades PreK-K, Woburn Street School serves grades 1-3 and North Intermediate School serves grades 4-5 and is proposed to serve District grades PreK-5 for the North side of Wilmington.

In accordance with M.G.L. c.70B, MSBA staff assembled the documents required for the review of the special education program at Wilmington Elementary School. The following are attached per the "Submittal Requirements":

- A letter from Superintendent Dr. Glenn Brand of the Wilmington Public School District describing its special education program.
- Proposed space summary that includes the existing facility, proposed spaces, and MSBA guidelines based on the agreed upon design enrollment. The first page of this summary indicates a total of 19,010 square feet of space dedicated to the delivery of special education.
- The floor plans for the proposed 165,035 square foot Wilmington Elementary School.
- A complete Special Education Adjacency Table.

I have reviewed the attached documents and confirm that the District's School Building Committee has officially approved the attached submittal on April 15, 2025 and verify that the space summary matches the floor plan and is complete and conform to the MSBA requirements as described in Module 4 – Schematic Design Guidelines.

Sincerely,

Julie Leduc

Julie Leduc
Director of OPM Services / SMMA
jleduc@smma.com / 781.910.2793

CC: Wildwood School Building Committee

Enclosures: see above listed documents

Glenn Brand, Ed.D.
Superintendent of Schools

Christine Elliott
Assistant Superintendent for
Curriculum & Staff Development

Paul Ruggiero
Assistant Superintendent of

WILMINGTON PUBLIC SCHOOLS
161 Church Street | Wilmington, MA 01887
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Andrea Stern Armstrong
Director of Human Resources

Kenneth Lord
Director of Technology & Digital Learning

A school and community partnership that provides an inclusive, respectful, and collaborative learning environment where all stakeholders are engaged in the development of the whole child.

April 16, 2025

Department of Elementary and Secondary Education
Matthew Deninger, Director of Resource Allocation Strategy and Planning
135 Santilli Highway
Everett, MA 02149

Project: Wilmington PK-5 Elementary School
Subject: Schematic Design DESE Submission: Special Education Delivery Methodology

Dear Mr. Deninger,
The following documentation reflects the Special Education Delivery Methodology of the Wilmington Public Schools (WPS) including information regarding the current, proposed, and specialized programs for the proposed new consolidated elementary school in Wilmington. Also included are the following:

- Educational Space Summary
- Space Summary Deviations Narrative
- Proposed Floor Plans
- Special Education Adjacency Table

WPS has made the appropriate provisions for children with disabilities in congruence with Section 1 of Chapter 71B and adheres to the federal and state laws that guarantee the rights of all students' access to the general education curriculum. The WPS philosophy is to embrace the inclusion of students with disabilities in all aspects of school life by including them in the general education environment to the fullest extent possible. This approach has been actualized via significant investment over many years in the development of a broad spectrum of in-district programming.

Wilmington's robust and comprehensive range of Special Education programs and services ensure that 98.1%* of enrolled students can be educated within the district. The very small number (1.9% of the student population) of students who are educated in out-of-district placements is indicative of the success of this approach and reflects our commitment to creating an inclusive educational environment that, to the maximum extent feasible, educates students in their home community. Special education services are provided to eligible students and are designed to remediate deficit areas, support the development of new skills, and allow students to gain the skills to access the general education curriculum in the least restrictive environment possible. The services and staffing available across the District are allocated annually based on

Notice of Non-Discrimination
All educational and non-academic programs, activities and employment opportunities at Wilmington Public Schools are offered without regard to race, color, sex, religion, national origin, ethnicity, sexual orientation, gender identity, homelessness, age and/or disability, and any other class or characteristic protected by law.

the service delivery needs identified on the Individualized Education Plans (IEPs) of the special education population being served at each school. WPS offers programs and services for students ages ranging from 3 to 22.

WPS provides qualifying students with a variety of related services including speech and language, occupational therapy, physical therapy, counseling, and behavior support. These programs and services are designed to increase the opportunity for students to receive robust special education services within the district. The inclusive nature of the programs and services provide a collaboration to augment opportunities and enhance the support disabled children receive to maximize access to the general education setting.

The design of the new building will improve the District's ability to make curriculum accessible to all children, including those with disabilities. A new facility will provide specially designed spaces that are ADA compliant and employ Universal Design architectural features to be accessed by the students who most require these supports. Dedicated Special Education rooms will be positioned throughout the building and either embedded within or in proximity to grade level neighborhoods whenever possible to minimize travel distances and to keep students receiving services among their peers. The intentional placement of rooms and the provisions for universal room features will provide the flexibility needed to meet the ever-changing needs of students and the inclusion priorities of the District.

Thank you for your consideration of this application.

Sincerely,

Glenn Brand
Superintendent of Schools

Christine Murray
Int. Director of Student Support Services

Kathleen Bissell
Principal, Wildwood Early Childhood Center

Stacey Scott
Principal, Woburn Street Elementary School

Diane Carreiro
Principal, North Intermediate School

** Based upon October 1, 2024 enrollment report with DESE.*

SPECIAL EDUCATION DELIVERY METHODOLOGY

Wilmington Public Schools adheres to federal and state laws that guarantee the rights of all students to access the general education curriculum. The philosophy of the Wilmington Public Schools is to embrace the inclusion of students with disabilities in all aspects of the community and school life, including the general education environment, to the fullest extent possible. Special education services are provided to eligible students. They are designed to remediate deficit areas, support the development of new skills, and allow students to gain the skills to access the general education curriculum in the least restrictive environment possible.

CURRENT SPECIAL EDUCATION PROGRAMS

Special Education Programming by School for the 2024-2025 School Year

Boutwell ECC **Pre-K & K**	**Wildwood ECC** **Pre-K & K**	**Shawsheen** **Grades 1-3**	**Woburn** **Grades 1-3**	**West Int.** **Grades 4 & 5**	**North Int.** **Grades 4 & 5**	**Middle School** **Grades 6-8**	**High School** **Grades 9-12**
Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center	Inclusion & Learning Center
		Language-Based	Language-Based	Language-Based	Language-Based	Language-Based (4)	Language-Based (3)
		Stepping stones	STAGES	Stepping Stones	STAGES	Student Support (1) & Transitions (1)	Evolution (2)
	Strides (3)	Strides (2)		Strides		Strides	Strides
Drive in services	Drive In services						
						Lifeskills	Lifeskills
							Postgrad
Integrated Preschool	Integrated Preschool						

Related Services/Therapies:

- Occupational Therapy
- Physical therapy
- Speech and language Therapy
- Clinical Staff (School counselors, school psychologists, social workers, adjustment counselors and Social Emotional Learning and Family Engagement Specialists)
- Applied Behavioral Analyst (ABA) Therapy
- Board Certified Behavior Analysts
- Adaptive Physical Education
- Teacher of Visually Impaired
- Teacher of the Deaf
- Audiologist
- Orientation and Mobility Specialist

Deficiencies:

- All three schools identified in the potential project require significant improvement in the physical space to provide all related services. Currently, many related service providers do not have dedicated workspaces or shared spaces for servicing students, including our school psychologists, occupational therapists, physical therapists, and speech and language providers. While services are being provided in compliance with student IEPs in all settings, significant improvements in the amount and quality of space for staff offices, student services, and staff/parent consultation are needed.
- In all three buildings, there is limited space for facilitating in-person IEP meetings and virtual and phone conferences to meet with parents and caregivers. Currently, service providers at all three schools share one classroom for both their office and service delivery space. Making confidentiality of student services, collaboration, and case management an ongoing challenge.
- As the Wildwood Early Childhood Center is currently split among two schools, the special education teacher that supports these enrolled students is now providing inclusion and pull-out services in two schools.
- Given the age of all three elementary schools, there are no extended learning spaces, no small rooms or spaces to provide services near student classrooms, and in most cases, services are not provided in the same space every time due to demands on open spaces by multiple staff.
- While the Wildwood houses three specialized classrooms for students with Autism, there is no sensory room and no motor space for students who receive such services, causing OT and PT to occur in classrooms and hallways.
- There are currently no dedicated calming spaces for students who may be dysregulated.
- Lack of handicap accessible facilities which limits program placement

Other Program Needs:

- Expand preschool programming
- Safe outdoor spaces = handicap accessible, developmentally appropriate play structures, contained play spaces.

PROPOSED SPECIAL EDUCATION PROGRAMS

Programs that will continue:

- Pre-Kindergarten Early Learning Center (ELC)
- Inclusion
- Partial inclusion
- PLC, ILC (for students with autism and intellectual impairments)
- The therapeutic learning program (previously called "JEMS", currently located in Jenkins Elementary School, but will be incorporated into the project and relocated)

Programs Additions/Enhancement:

- Expand Pre-Kindergarten programming.
- Additional opportunities for therapies, related services, sensory breaks and calming spaces to be in close proximity to classrooms.
- Access to technology.
- Access to hands-on, multi-sensory, project-based learning that allows flexibility, collaboration, and student choice.
- Multiple spaces to allow for various meetings to take place simultaneously.
- Multiple spaces to allow for varied sized learning groups to meet at the same time.
- Opportunities for flexible scheduling.
- Opportunities for increased community engagement and collaboration.
- Opportunities for families to attend school functions
- Assisted listening technology in each classroom for hearing impaired accessibility, as well as general use throughout the educational spaces of the proposed project.

List programs and services that would be moved from within the District (from which school they are being moved) as a result of the proposed project

- Wildwood: Inclusion & Learning Center, Integrated Preschool
- Woburn Street: Inclusion & Learning Center, STAGES
- North: Inclusion & Learning Center, STAGES
- Shawsheen: STRIDES
- West: STRIDES
- Occupational Therapy
- Physical therapy
- Speech and language Therapy

- Clinical Staff (School counselors, school psychologists, social workers, adjustment counselors and Social Emotional Learning and Family Engagement Specialists)
- Applied Behavioral Analyst (ABA) Therapy
- Board Certified Behavior Analysts
- Adaptive Physical Education
- Teacher of Visually Impaired
- Teacher of the Deaf
- Audiologist
- Orientation and Mobility Specialist

Programs to be Discontinued:

The district is not discontinuing programming. Given a new building will have accessibility throughout the school, the STRIDES program at the Shawsheen and West will be consolidated and relocated to the new building. This will allow students to continue with their peers, negating the need to move the cohort across town after kindergarten.

Total Number of Special Education Students to be Served in the New Building:

- 185 projected students

Previous Coordinated Program Review:

Previously, every six (6) years, the District participated in a Coordinated Program Review (CPR) from the Massachusetts Department of Elementary and Secondary Education (MADESE). Currently, this audit process has been split into an every three-year Tiered Focus Monitoring (TFM) process. The last Coordinated Program Review (CPR) that included special education facilities was held in the 2017 - 2018 school year, and the findings under Special Education Indicator #55 “Facilities” were found to be partially implemented.

Deficiencies:

The DESE requires that District buildings meet the following regulatory requirements:

Special Education Facilities and Classrooms

The school district provides facilities and classrooms for eligible students that:

- Maximize the inclusion of such students into the life of the school;
- Provide accessibility in order to implement fully each student’s IEP;

- Are at least equal in all physical respects to the average standards of general education facilities and classrooms;
- Are given the same priority as general education programs in the allocation of instructional and other space in public schools in order to minimize the separation or stigmatization of eligible students and are not identified by signs or other means that stigmatize such students.

Wilmington Special Education CPR findings in 2018 included:

- SE 3 Special requirements for determination of specific learning disability- Partially Implemented
- SE 6 Determination of transition services -Partially Implemented
- SE 7 Transfer of parental rights at age of majority and student participation and consent at the age of majority- Partially Implemented
- SE 47 Procedural requirements applied to students not yet determined to be eligible for special education- Partially Implemented
- SE 54 Professional development- Partially Implemented
- SE 55 Special education facilities and classrooms- Partially Implemented
- SE 56 Special education programs and services are evaluated-Partially Implemented

During this review, SE 55 Special Education facilities and classrooms were identified for corrective action. Noted was that the Middle School STRIDES classroom needed to be relocated to be more in the life of the school environment. Additionally noted was, “At the Boutwell Early Childhood Center, observations indicated that two speech and language therapists, one school adjustment counselor, and one occupational therapist share an office. A review of schedules indicated that four to six students simultaneously receive services from three to four different staff, which creates auditory and visual distractions.” These were remedied during the corrective action stage of the process.

The District participated in the Tiered Focus Monitoring (TFM), and the onsite component of this process was completed on February 6, 2024. The District received the report on April 25, 2024 and the district was in full compliance with the ADA and other requirements of the law.

Remedy:

Ensure that special education students have equitable spaces based on their needs through a planned building design.

All specialized programs will continue. Currently, the district does not accept students through school choice or any type of outside tuition basis.

To accommodate the proposed programs and services, the preferred design alternative should provide:

- Dedicated space for Occupational and Physical Therapies

- Small group rooms and other environments for a range of therapies for individual and small group sessions
- Safe and private areas for counseling, including but not necessarily limited to Adjustment Counselor offices, small group rooms
- Sensory areas to provide opportunities for motor breaks
- Calming areas for de-escalating students
- Small group teaching areas
- Individual teaching and assessment areas
- Areas for teaching life skills including eating, toileting, cleaning, resting and recreation
- Areas to assess students for special education services
- Safe, clutter-free hallways to facilitate student and staff movement throughout the building, taking into consideration potential need for adaptive equipment (i.e. wheelchairs, walkers, etc.)
- Areas for having meetings with parents, teams and consultants
- Natural light
- Easy access to outdoor learning and play spaces
- Contained, safe outdoor learning and play spaces
- Various storage space to reduce visual clutter
- Access to technology to augment communication
- Sound-treated or sound-resistant spaces
- Environmental adaptation for noise reduction
- Range of student seating (therapy balls, “wobble” stools, standing desks, small group tables, individual desks)
- Air quality/air conditioning for students with medical needs.

The proposed substantially separate classrooms will be scheduled the same as the general education classrooms in order to encourage peer interactions arriving at school, eating lunch with peers in the cafeteria, participating in “specials” (like Art, Music, etc.) with their peers and dismissal at the same time. Students in the substantially separate programs will be included with peers in the general education classroom to the greatest extent, per their needs and their IEPs. There will be 5 to 8 students in the substantially separate classroom with a lead teacher who is certified in moderate or intensive special needs, along with multiple paraprofessionals. The student to staff ratio will be less than 2:1, with some programs having closer to a 1:1 ratio. If the group size exceeds 8, the district will ensure sufficient staffing to comply with DESE regulations. In addition to the special education teacher and paraprofessionals, related service providers such as OT, PT and SLP will provide students services either within the substantially separate classroom, general education setting, or the therapist’s office.

Local Review Process:

- The District met with the design team several times and in several different settings to review and discuss decisions related to the number, type, and location of special education spaces. Descriptions of those times and settings are provided below.

- Visioning – Visioning session #3 included an activity where special educators documented the type and features associated with self-contained classrooms, break-out spaces, therapy environments, and support service spaces. Participants included Special Education Teachers, Therapists, Student Support Service professionals, and the Director of Special Education.
- Programming Meetings – Departmental meetings to discuss room sizes, counts, features, and geographic locations occurred in both the PDP and PSR phases primarily at the Working Group, whose members included the Director of Special Education, the Assistant Superintendent of Curriculum and Instruction, three building principals, and the Superintendent. These meetings continued into the Schematic Design phase with updates on the location and features of special education spaces.
- Schematic Design – The Design Team facilitated several days of end user group meetings with the special educators and other professionals who will be occupying individual spaces or suites of spaces to discuss the final location of rooms and their detailed interior features (casework, furniture, technology, markerboards, tackboards, acoustics, connections to adjacent spaces, etc.).
- Presentations were made throughout the PDP, PSR, and Schematic Design phases to the Working Group, the School Building Committee, School Committee, and the general public communicating the location and features of spaces serving special education students.

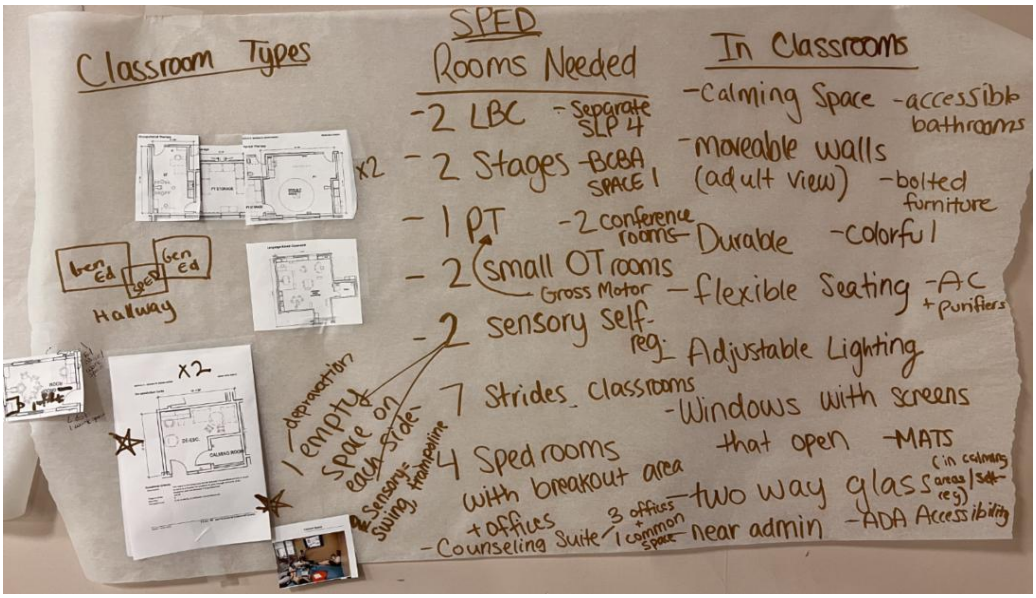


Figure 1 – Sample Work Product, Visioning

Rationale for Location of Special Education Facilities within the Proposed Building:

Several factors led to decisions about where to locate specific programs and specific spaces. All of these factors align with the District's overall goal of creating an inclusive facility that serves the needs of all students.

- Position self-contained classrooms with their grade level peers in their grade level learning community to the greatest extent possible.
- Position small group rooms between each pair of classrooms to reduce travel time and stigma associated with academic and social / emotional supports.
- Position extended learning areas adjacent to general education and special education classrooms to the greatest extent possible

Lower Elementary Wings:

- The Learning Centers are centrally located in the Kindergarten, 1st and 2nd grade level groupings adjacent to the Reading Specialists and with direct access to the extended learning area.
- Small Group Rooms are typically shared between two classrooms, with doorways directly off the classrooms, which will help them to function as an extension of the learning environment. Children receiving services will essentially not have to leave the learning environment to meet with a specialist or provider.
- The only differentiating factor in the design of the small group rooms are those located on the south end of the south academic wing. They are the only ones that are not shared between two classrooms, due to their position and given the odd number of classrooms within each wing. As a result, these small group rooms are designed with a door connecting directly to the corridor for shared use.
- Two of the four Speech and Language Rooms are located on the first level as they will be shared between the PreK and Kindergarten grade level groupings. Typically younger students receive more Speech and Language services than the older students.
- School Psychologist is centrally located in the PreK wing and adjacent to the Strides classrooms.
- Three Self-Contained SPED Rooms will house the Strides Program on the first level and are integrated within the PreK and Kindergarten grade level groupings, with children of a comparable age range to those in the program. Each has an ensuite Calming space and Toilet, with direct adjacency and access to an extended learning area directly outside its door.
- Three Self-Contained SPED Rooms will house the Strides, Stages and Language-based programs on the second level and are integrated within the 1st and 2nd grade level groupings, with children of a comparable age range to those in the program. Each has direct adjacency and access to an extended learning area directly outside its door. Strides and Stages classrooms also have ensuite Calming spaces and Toilets.
- BCBA (Board certified Behavioral Analysts) shared office #245 is centrally located between the three levels, as it will be shared between all grades over the three levels.
- The Occupational/Physical Therapy (OT/PT) Suite is centrally located to the whole school as it serves the entire age range population. It is located to favor the lower elementary side of the building, as typically younger students receive more OT/PT services than the older students. It is directly adjacent to the Gymnasium, as sometimes PT requires a larger movement space, or PT will collaborate closely with the PE teachers to coordinate service delivery. OT/PT is also adjacent to, to the courtyard, to take advantage of outdoor space and accessible play equipment in good weather.

Upper Elementary Wing:

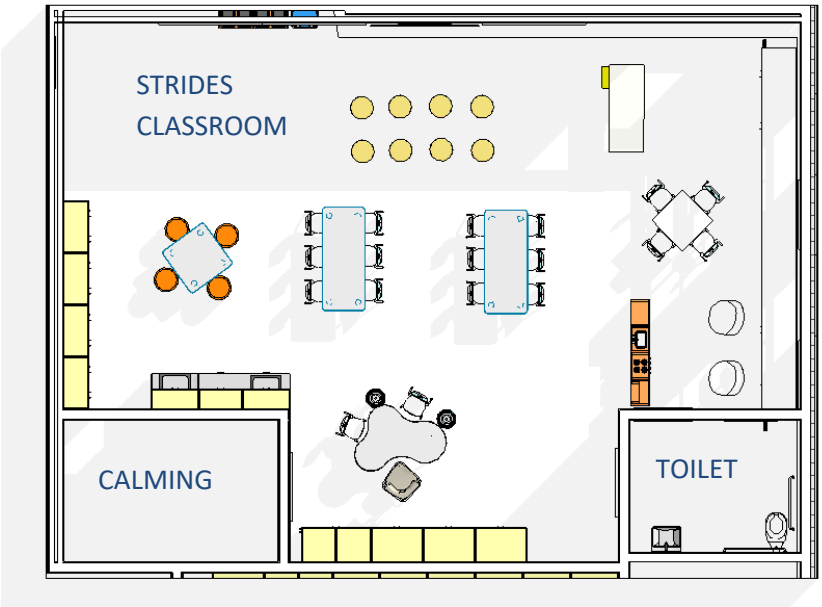
- Two Self-Contained SPED Rooms will house the Strides program on the third level and are integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. Each has direct adjacency and access to an extended learning area directly outside its door. Strides classroom also has ensuite Calming space and Toilet.
- A Self-Contained SPED Room will house the Stages program on the third level and is integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. It has direct adjacency and access to an extended learning area directly outside its door. Stages classroom also has ensuite Calming space and Toilet.
- A Self-Contained SPED Room will house the Language-based program on the third level and is integrated within the 3rd, 4th, and 5th grade level groupings, with children of a comparable age range to those in the program. It has direct adjacency and access to an extended learning area directly outside its door.
- Small Group Rooms are typically shared between two classrooms, with doorways directly off the classrooms, which will help them to function as an extension of the learning environment. Children receiving services will essentially not have to leave the learning environment to meet with a specialist or provider.
- The Learning Centers are centrally located with the grade level groupings with direct access to an extended learning area.
- Speech and Language Rooms are centrally located between grade level groupings and in close proximity to stairwells as they will be shared between the grade levels.

Design Response Overview

The current design responds to all the desires and educational intent described in the narrative above, many of which are relevant not only for students with special needs but for all students.

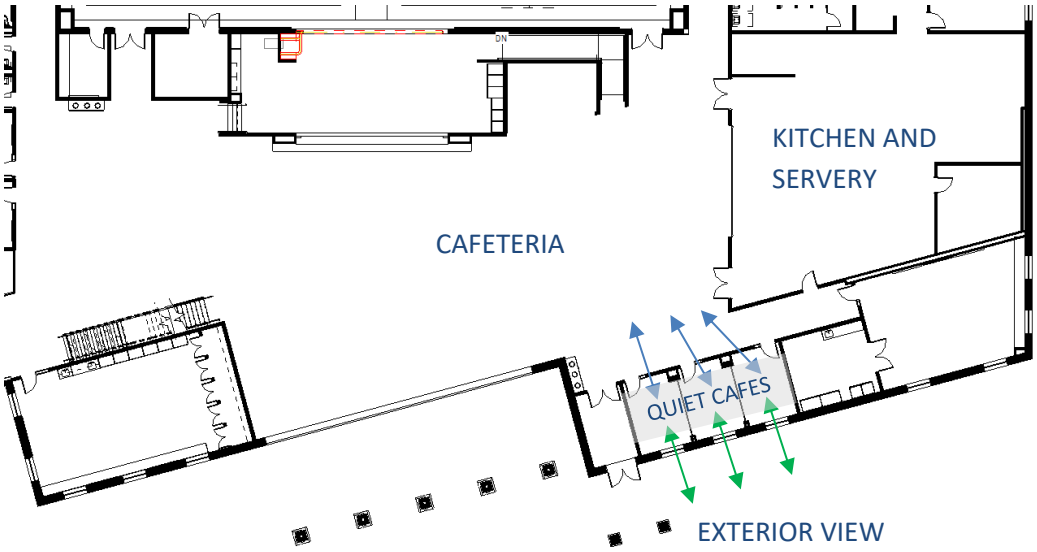
- Purpose-designed spaces for the Strides, Stages and Language-based programs are included in the project.
- These spaces are positioned within the academic areas and embedded with the general classrooms serving their grade level peers. Each of the self-contained classrooms are sized to be identical to general classrooms, will have the same views, access to extended learning spaces, and technology resources as general classrooms. These spaces will also have access to a small group room accessed from within the classroom just like their general classroom peer spaces. Strides and Stages classrooms also include a calming space. The illustration

below is a sample self-contained special education classroom and depicts some of the features that are possible in this suite.



Sample Self-contained Classroom – Conceptual Features and Layout

- In addition to classroom environments, the design includes dedicated OT/PT space.
- A wide variety of learning environments are included in design to reduce stigma for students needing supports. Small group rooms are located between each pair of classrooms to allow students to receive supports in an acoustically separate space and without the need to remove them from their classroom to travel to a distant office. Similarly, and depending on students' needs, extended learning spaces allow students visual and acoustical breaks from the general classroom environment.
- Extended learning areas in the design are positioned immediately outside general and special education classrooms but are intentionally not all identical. Some are larger and more suited to movement activities, large group instruction, and sensory stimulation. Others are smaller and expect to be outfitted for small group activities, student choices, counseling activities, and sensory deprivation.
- A key feature of the preferred alternative is the courtyard space. For all students, but particularly for students with special needs, access to a protected outdoor learning environment ensures a safe and fully accessible opportunity to interact with nature.
- Another key feature is the quiet cafes in the cafeteria. For all students, but particularly for students with special needs, opportunity to participate in the mid-day lunch experience within a quieter, calming space.



Partial Floor Plan, Quiet Cafes –Access to Cafeteria, Kitchen and Exterior Views

Grade and School Configuration Policies:

- As noted above, the school is divided into Lower Elementary Wings, Shared Core Spaces zone, and an Upper Elementary Wing.
- The Lower Elementary Wing houses PreK and K on level 1; and Grades 1 and 2 on Level 2
- The Upper Elementary wing houses Grade 3, 4 and 5 on Level 3
- This grade configuration is unlike the other elementary schools in the District as it consolidates six grade groupings under one roof intentionally to eliminate transitions at the elementary ages and allow students with special support needs to remain with their peers.

Grade Range Zoning Diagram of the Building

SPECIALIZED PROGRAM

List of Specialized Programs:

- Integrates Preschool classrooms
- STRIDES Classrooms
- Stages Classrooms
- Language-Based Classrooms

List of Collaboratives:

- Wilmington is a member of the SEEM Collaborative and also participates in other collaboratives as a non-member, including Valley and CREST. While the district is a member and participates in collaboratives, the District does not plan to house any collaborative programs nor provide dedicated space to collaboratives as part of the project for any of the agreed-upon enrollments.
- Wilmington does accept non-resident students from other districts on a tuition basis.

List of Alternative Education Programs:

- N/A

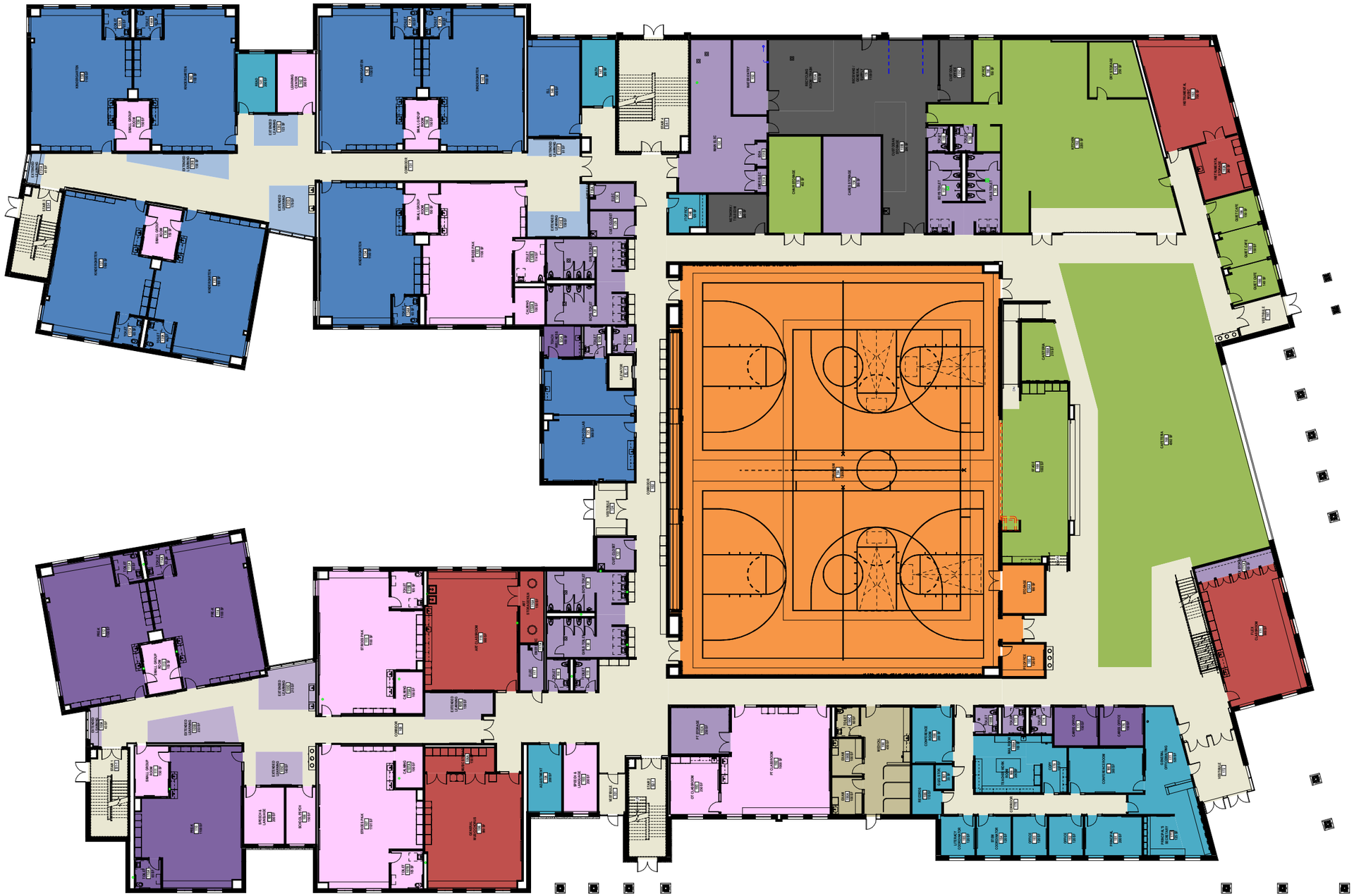
Narrative on Early Childhood Education Programs:

- The district provides an Early Childhood program for students who receive special education services at no cost to parents, as well as non- special education eligible students on a tuition basis if selected through a lottery system. The district currently has two Early Childhood Centers, Boutwell and Wildwood. Currently there are two integrated Pre-Kindergarten classrooms and three substantially separate Pre-Kindergartens at each location.
- The district has up to 8 students within each substantially separate classroom, and up to 90 preschool students within the integrated program. Each integrated classroom has a morning and an afternoon session with each session having a maximum of 15 students. The proposed plan is to relocate and expand the Pre-Kindergarten program within the new school by adding a third full-day integrated preschool classroom. This would increase the capacity by 15 students and reduce our wait list to enter the program.

Relationships with Other Private or Public Entities:

- CARES is a before and after school extended day program for students enrolled in the Wilmington Public Schools. The program does accept students formally identified as special education students.

The floor plans that follow are intended to illustrate the spatial relationships within the proposed building.



PROGRAM FLOOR PLAN

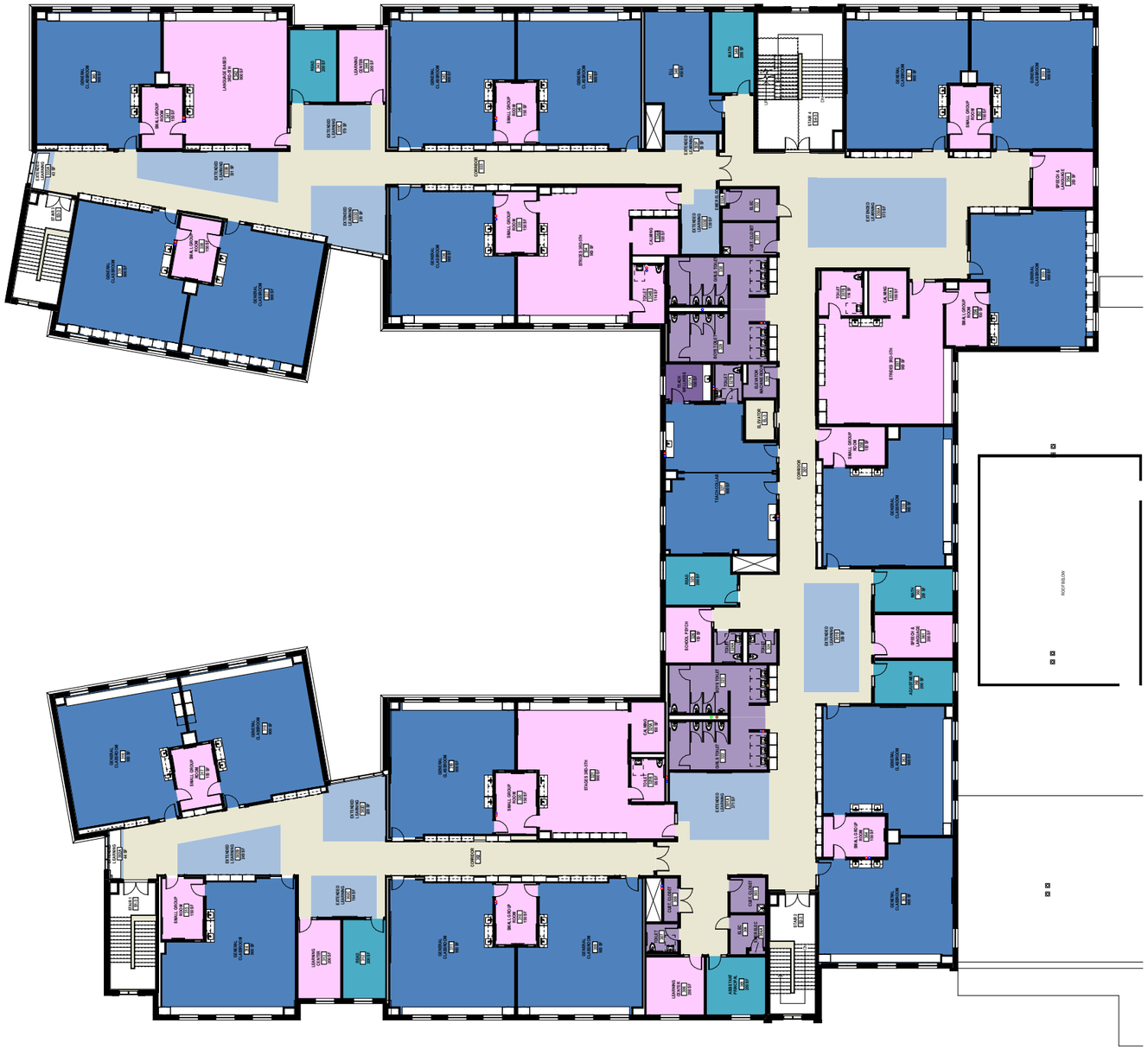
LEVEL 1

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

ROOF BELOW
ROOF BELOW
ROOF BELOW



N

0 16' 32' 64'

SCALE: 1/32"=1'-0"

PROGRAM FLOOR PLAN

LEVEL 3

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

Educational Space Summary

The space summary on the following pages contains an itemization of the proposed spaces needed to deliver the District's educational program for grades PreK-5th using the MSBA's latest edition elementary school space summary template.

Room labels unique to the District and/or that vary from MSBA room names are identified with a yellow highlight. Total gross floor area, or gross square feet (GSF), are shown at the bottom of the table for the proposed conditions.

The District and the Design Team worked together to align proposed spaces with MSBA square footage guidelines for individual program areas and the total gross square footage to the greatest extent possible. However, some deviations do exist. All deviations were deemed necessary by the District to serve the educational program and are explained in detail on the pages following the space summary.

Some changes to the design have occurred since the submission of the Preferred Schematic Report. With further input from the District, some new spaces have been added to the project that subdivided larger program areas, and other program spaces have moved location within the plans to meet design and functional goals and requirements. The essence of the overall building planning and individual spatial relationships have remained intact.

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Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
CORE ACADEMIC	**44,259**			**0**			**45,700**			**45,700**			**10,450**			**35,250**	STE Guidelines Policy
(List rooms of different sizes separately)																	
Kindergarten Classroom with Toilet				0	varies	7	8,156	varies	7	8,156	varies	0	-244	1,200	7	8,400	1,100 NSF (minimum size) - 1,300 NSF (maximum size); Minimum of (2) sinks required per Kindergarten Classroom
Rm. 134					1165												
Rm. 135					1165												
Rm. 137					1165												
Rm. 138					1165												
Rm. 140					1165												
Rm. 143					1165												
Rm. 145					1166												
General Classroom (Grades 1-6)				0	900	30	27,000	varies	30	27,000	varies	3	1,350	950	27	25,650	900 NSF (minimum size) - 1,000 NSF (maximum size); Minimum of (2) sinks required per General Classroom
Rm. 206																	
Rm. 208																	
Rm. 211																	
Rm. 213																	
Rm. 215																	
Rm. 216																	
Rm. 233																	
Rm. 234																	
Rm. 236																	
Rm. 237																	
Rm. 242																	
Rm. 244																	
Rm. 309																	
Rm. 311																	
Rm. 314																	
Rm. 316																	
Rm. 318																	
Rm. 319																	
Rm. 336																	
Rm. 337																	
Rm. 339																	
Rm. 340																	
Rm. 345																	
Rm. 347																	
Rm. 351																	

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	**Existing Totals**	**PROPOSED PROGRAM**															
		EXISTING TO REMAIN / RENOVATED			**NEW CONSTRUCTION**			**TOTAL**			**VARIATION TO MSBA GUIDELINES**			**MSBA GUIDELINES (DO NOT MODIFY)** **(Refer to Educational Facility Planning for additional information)**			
ROOM TYPE		**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**COMMENTS**
Rm. 353																	
Rm. 355																	
Rm. 359																	
Rm. 363																	
Rm. 365																	
Science, Technology, Engineering (STE) Room (Grades 3-6) Rm. 256				0	1,080	1	1,080	1,080	1	1,080	0	0	0	1,080	1	1,080	1,080 NSF (minimum size); Refer to the 2018 STE Guidelines for additional information.
STE Storage Room - Rm. 256A				0	120	1	120	120	1	120	0	0	0	120	1	120	Minimum of (1) 120 NSF STE Storage Room required per STE Room; Refer to the 2018 STE Guidelines for additional information.
ELL Classroom - Rm 146, Rm 348				0	450	2	900	varies	2	900	varies	2	900				
Teacher Collaboration - Rm 125, Rm 224, Rm 327				0	900	3	2,700	varies	3	2,700	varies	3	2,700				
Extended Learning K																	
Rm. 131A					41	1	41	41	1	41	41	1	41				
Rm. 131B					158	1	158	158	1	158	158	1	158				
Rm. 131C					123	1	123	123	1	123	123	1	123				
Rm. 131D					179	1	179	179	1	179	179	1	179				
Rm. 131E					162	1	162	162	1	162	162	1	162				
Rm. 131F					81	1	81	81	1	81	81	1	81				
Extended Learning 1st-5th				0													
Rm. 205A					58	1	58	58	1	58	58	1	58				
Rm. 205B					243	1	243	243	1	243	243	1	243				
Rm. 205C					163	1	163	163	1	163	163	1	163				
Rm. 205D					292	1	292	292	1	292	292	1	292				
Rm. 205E					212	1	212	212	1	212	212	1	212				
Rm. 230A					43	1	43	43	1	43	43	1	43				
Rm. 230B					261	1	261	261	1	261	261	1	261				
Rm. 230C					140	1	140	140	1	140	140	1	140				
Rm. 230D					262	1	262	262	1	262	262	1	262				
Rm. 230E					154	1	154	154	1	154	154	1	154				
Rm. 230F					172	1	172	172	1	172	172	1	172				
Rm. 301A					371	1	371	371	1	371	371	1	371				
Rm. 301B					359	1	359	359	1	359	359	1	359				
Rm. 302A					44	1	44	44	1	44	44	1	44				
Rm. 302B					249	1	249	249	1	249	249	1	249				
Rm. 302C					164	1	164	164	1	164	164	1	164				
Rm. 302D					228	1	228	228	1	228	228	1	228				
Rm. 333A					43	1	43	43	1	43	43	1	43				
Rm. 333B					331	1	331	331	1	331	331	1	331				
Rm. 333C					179	1	179	179	1	179	179	1	179				
Rm. 333D					270	1	270	270	1	270	270	1	270				
Rm. 333E					139	1	139	139	1	139	139	1	139				
Rm. 333F					50	1	50	50	1	50	50	1	50				
Rm. 350A					573	1	573	573	1	573	573	1	573				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
SPECIAL EDUCATION	9,553			0			19,010			19,010			9,950			9,060	Special Education spaces require DESE review and approval.
(List rooms of different sizes separately)																	
Self-Contained Special Education Classroom				0	Varies	10	9,600	Varies	10	9,600	Varies	4	3,900	950	6	5,700	900 NSF (minimum size) - 1,300 NSF; equal to the size of the proposed General Classrooms that serve the same student population.
Strides Program PK-K - Rm 107, Rm 115. Rm 132				0	1100	3		1,100	3								
Strides Program 1st-2nd - Rm 231				0	900	1		900	1								
Strides Program 3rd-5th - Rm 334, Rm 357				0	900	2		900	2								
Stages Program 1st-2nd - Rm 218				0	900	1		900	1								
Stages Program 3rd-5th - Rm 321				0	900	1		900	1								
Language-Based Program 1st-2nd - Rm 239				0	900	1		900	1								
Language-Based Program 3rd-5th - Rm 342				0	900	1		900	1								
Self-Contained Special Education Toilet Room				0	varies	8	840	varies	8	840	varies	26	480	60	6	360	
Strides Program PK-K Toilet - Rm 107B				0	105	1											
Rm 115B					105	1											
Rm 132B					114	1											
Strides Program 1st-2nd Toilet - Rm 231B				0	116	1											
Strides Program 3rd-5th Toilet - Rm 334B				0	114	1											
Rm 357B					114	1											
Stages Program 1st-2nd Toilet - Rm 218B				0	86	1											
Stages Program 3rd-5th Toilet - Rm 321B				0	86	1											
Learning Center				0	200	6	1,200	200	6	1,200	-300	2	-800	500	4	2,000	1/2 size of a General Classroom
Rm 142																	
Rm 210																	
Rm 241																	
Rm 306																	
Rm 313																	
Rm 344																	
Small Group Room				0	150	26	3,900	varies	26	3,900	varies	24	2,900	500	2	1,000	1/2 size of a General Classroom
Rm 111				0													
Rm 113				0													
Rm 133				0													
Rm 136				0													
Rm 139				0													
Rm 144				0													
Rm 207				0													
Rm 212				0													
Rm 214				0													
Rm 217				0													
Rm 232				0													
Rm 235				0													
Rm 238				0													
Rm 243				0													
Rm 310				0													
Rm 315				0													
Rm 317				0													
Rm 320				0													
Rm 335				0													
Rm 338				0													
Rm 341				0													
Rm 346				0													
Rm 352				0													
Rm 356				0													
Rm 358				0													
Rm 364				0													
Calming				0	100	8	800	100	8	800	varies	8	800				
Rm 107A																	
Rm 115A																	
Rm 132A																	
Rm 218A																	
Rm 231A																	
Rm 321A																	
Rm 334A																	
Rm 357A																	
OT Classroom/Office - Rm 193				0	250	1	250	250	1	250	250	1	250				
PT Classroom Rm 192				0	1,000	1	1,000	1,000	1	1,000	1,000	1	1,000				
School Psychologists - Rm 108, Rm 326				0	150	2	300	varies	2	300	varies	2	300				
BCBA Office/Team Chairs - Rm 245				0	320	1	320	320	1	320	320	1	320				
Speech & Language - Rm 103, Rm 109, Rm 354, Rm 361				0	200	4	800	varies	4	800	varies	4	800				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	Existing Totals	PROPOSED PROGRAM										MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL			VARIATION TO MSBA GUIDELINES					
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
Public Day Education Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
Collaborative Program Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
ART & MUSIC	5,655			0			5,075			5,075			0			5,075	
Art Classroom (25 seats) - Rm 116				0	980	1	980	980	1	980	-20	-1	-1,020	1,000	2	2,000	Assumed schedule: 2 times per week per student
Art Workroom with Storage and Kiln - Rm 116A				0	150	1	150	150	1	150	0	-1	-150	150	2	300	
General Music / Chorus (25-50 seats) - Rm 106				0	980	1	980	980	1	980	-220	-1	-1,420	1,200	2	2,400	Assumed schedule: 2 times per week per student
General Music Storage - Rm 106A				0	150	1	150	150	1	150	75	-4	-225	75	5	375	
Music Practice / Ensemble				0	0	0	0	0	0	0	0	0	0				
Instrumental Music - Rm 163				0	700	1	700	700	1	700	700	1	700				
Instrumental Storage - Rm 163A				0	240	1	240	240	1	240	240	1	240				
Flex Classrom - Music - Rm 171				0	900	1	900	900	1	900	900	1	900				
Flex Classrom - Art - Rm 257				0	975	1	975	975	1	975	975	1	975				
HEALTH & PHYSICAL EDUCATION	8,913			0			12,300			12,300			6,000			6,300	Excess Physical Education Spaces Policy
Gymnasium - Rm 194				0	12000	1	12,000	12,000	1	12,000	6,000	0	6,000	6,000	1	6,000	
Gym Storeroom - Rm 194A				0	180	1	180	180	1	180	30	0	30	150	1	150	
PE Office ~~with Shower and Toilet~~ - Rm 195				0	120	1	120	120	1	120	-30	0	-30	150	1	150	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
MEDIA CENTER	2,265			0			4,068			4,068			0			4,068	
Media Center / Reading Room - Rm 252				0	3,859	1	3,859	3,859	1	3,859	-208	0	-208	4,068	1	4,068	
Librarian Workroom - Rm 252A				0	209	1	209	209	1	209	209	1	209				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
DINING & FOOD SERVICE	13,620			0			9,458			9,458			0			9,458	
Cafeteria / Dining - Rm 168 and Rm 168A				0	4,611	1	4,611	4,611	1	4,611	-1,052	0	-1,052	5,663	1	5,663	Based on 2 lunch seatings - 15 NSF per seat
Stage - Rm 169				0	1,002	1	1,002	1,002	1	1,002	2	0	2	1,000	1	1,000	
Chair / Table / Equipment Storage Rm 153				0	452	1	452	452	1	452	0	0	0	452	1	452	
Kitchen - Rm 162				0	2,255	1	2,255	2,255	1	2,255	200	0	200	2,055	1	2,055	1,600 NSF for first 300 students + 1 NSF per additional student
Dry Storage - Rm 162E					250	1	250	250	1	250	250	1	250				
Kitchen Office - Rm 161				0	150	1	150	150	1	150	150	1	150				
Staff Lunch Room - Rm 251				0	289	1	289	289	1	289	0	0	0	289	1	289	20 NSF per student
Quiet Café Area				0	varies	3	449	varies	3	449	varies	3	449				
Rm 164				0	150		0	150	0	0	150	0	150				
Rm 165				0	150		0	150	0	0	150	0	150				
Rm 166				0	149		0	149	0	0	149	0	149				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM											VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL											
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS			ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
MEDICAL	603			0	710		710			710					0			710	
Medical Suite Toilet - Rm 190C				0	60	1	60	60	1	60			0	0	0	60	1	60	
Nurses' Office / ~~Waiting Room~~ Exam - Rm 190A				0	100	1	100	100	1	100			-150	0	-150	250	1	250	
Examination Room / ~~Resting~~ Office - Rm 190B				0	100	1	100	100	1	100			0	-3	-300	100	4	400	
Medical / Waiting Area / Resting Area - Rm 190				0	450	1	450	450	1	450			450	1	450				
~~Resting Area~~				0	0	1	0	0	1	0			0	1	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
ADMINISTRATION & GUIDANCE	5,113			0			5,548			5,548					2,658			2,890	
General Office / Waiting Room with Toilet - Rm 177				0	528	1	528	528	1	528			0	0	0	528	1	528	
Teachers' Mail and Time Room - Rm 189A				0	100	1	100	100	1	100			0	0	0	100	1	100	
Copy Room - Rm 179				0	150	1	150	150	1	150			0	0	0	150	1	150	
Records Room - Rm 186				0	110	1	110	110	1	110			0	0	0	110	1	110	
Principal's Office with Conference Area - Rm 181				0	200	1	200	200	1	200			-175	0	-175	375	1	375	
Principal's Secretary / Waiting - Rm 177A				0	125	1	125	125	1	125			0	0	0	125	1	125	
Assistant Principal's Office - Rm 223, Rm 305				0	200	2	400	varies	2	400			varies	1	280	120	1	120	
Supervisory / Spare Office - Rm 182, Rm 183				0	120	2	240	120	2	240			0	1	120	120	1	120	
Conference Room				0	varies	2	500	varies	2	500			250	1	250	250	1	250	
Conference Room - Rm 180					300	1													
Conference Room - Rm 188					200	1													
School / Adjustment Counselors -Rm 104, Rm 246, Rm 362				0	200	3	600	200	3	600			50	0	150	150	3	450	
Guidance Storeroom - Rm 187				0	35	1	35	35	1	35			0	0	0	35	1	35	
Teachers' Work Room - Rm 189				0	200	1	200	200	1	200			-328	0	-328	528	1	528	
Reading Specialists - rm 141, 209, 240, 312, 325, 343				0	200	6	1,200	200	6	1,200			200	6	1,200				
Math Tutors				0	200	4	800	varies	4	800			varies	4	800				
Rm 147																			
Rm 222																			
Rm349																			
Rm 360																			
IT Technician Office - Rm 148				0	120	1	120	120	1	120			120	1	120				
Literacy Coordinator - Rm 185				0	120	1	120	120	1	120			120	1	120				
STEM Coordinator - Rm 184				0	120	1	120	120	1	120			120	1	120				
[Enter room type here]				0			0	0	0	0			0	0	0				
CUSTODIAL & MAINTENANCE	486			0			2,355			2,355					0			2,355	
Custodian's Office - Rm 155C				0	175	1	175	175	1	175			25	0	25	150	1	150	
Custodian's Workshop				0	0	0	0	0	0	0			-375	-1	-375	375	1	375	
Custodian's Storage - Rm 155B				0	206	1	206	206	1	206			-169	0	-169	375	1	375	
Recycling Room / Trash - Rm 155A				0	413	1	413	413	1	413			13	0	13	400	1	400	
Receiving and General Supply Rm 155				0	1,159	1	1,159	1,159	1	1,159			807	0	807	352	1	352	
Storeroom				0	0	0	0	0	0	0			-503	-1	-503	503	1	503	
Network / Telecom Room -Rm 149				0	200	1	200	200	1	200			0	0	0	200	1	200	
Custodian Storage - Rm 248					202	1	202	202	1	202			202	1	202				
[insert room type here]				0			0	0	0	0			0	0	0				
OTHER	2,765			0			5,800			5,800					5,800			0	
(List rooms separately below)							5,800												
Pre-Kindergarten Classroom with Toilet (if applicable)				0	varies	3	3,510	varies	3	3,510			varies	3	3,510	1,200	0	-	1,100 NSF (minimum size) - 1,300 NSF (maximum size)
Rm 110					1165														
Rm 112					1173														
Rm 114					1172														
Extended Learning PK				0	varies	5	790	varies	5	790			varies	5	790				
Rm 105A					43														
Rm 105B					233														
Rm 105C					140														
Rm 105D					215														
Rm 105E					159														
Teacher Wellness Room - Rm 125A, 224A, 327A				0	100	3	300	100	3	300			100	3	300				
CARES program Coorinator Office - Rm 175				0	150	1	150	150	1	150			150	1	150				
CARES Site Coorinator Office - Rm 176					150	1	150	150	1	150			150	1	150				
Health Classroom - Rm 204				0	900	1	900	900	1	900			900	1	900				
[Enter room type here]				0			0	0	0	0			0	0	0				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 4/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	ROOM NFA[1]	# OF ROOMS	NFA TOTALS	COMMENTS
Total Building Net Floor Area (NFA)	93,310			0			130,004			130,004			54,809			71,165	Total Building Net Floor Area (NFA)
Proposed Student Capacity / Enrollment														# of Grades	6	725	Total Enrollment (Enter Design Enrollment)
														K	1	109	Kindergarten Enrollment
														Grade 1	1	253	Lower Elementary School Enrollment (Grades 1-2)
														Grade 2	1	330	Lower Elementary School Enrollment (Grades 1-2)
														Grade 3	1		
														Grade 4	1		
														Grade 5	1		
														Grade 6	0		
NON-PROGRAMMED SPACES		% of GFA		0	% of GFA		93,081	% of GFA		93,081							Complete this Category with Schematic Design Submittal
Office / Occupied Rooms (List rooms separately below)																	
PT Storage Rm (ESEA		0	0		0	0.2%	150	0	0.2%	150							
CARES Storage - Rm 150		0	0		0	0.1%	100	0	0.1%	100							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
[Enter room type here]		0	0		0	0.0%		0	0.0%	0							
Unassigned BISP / SP Spaces		0	0		0	0.0%		0	0.0%	0							
Unassigned Closets, Supply Rooms, and Storage Rooms		0	0		0	0.0%		0	0.0%	0							
Toilet Rooms		0	0		0	0.0%		0	0.0%	0							
Circulation (corridors, stairs, ramps and elevators)		0	0		0	0.0%		0	0.0%	0							
Remaining[3]		0	0	0	0	32.9%	54,350	0	32.9%	54,350							
Total Building Gross Floor Area (GFA)[2]	168,634			0			183,085			183,085			93,360			108,475	Total Building Gross Floor Area (GFA)[2]
Grossing Factor (GFA / NFA)				#DIV/0!			1.41			1.41			0.84			1.41	Grossing Factor (GFA / NFA)

		PDP	PDS	SD	Difference
1	Individual Room Net Floor Area (NFA)	107,900	103,870	103,035	1,017
2	Total Building Gross Floor Area (GFA)				
3	Remaining				

Architect Certification

I hereby certify that all of the information provided in the "Proposed Space Summary" is true, complete and accurate and, except as approved in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.

Name of Architecture Firm: Dore + Whittier

Name of Principal Architect: Donald M Walter

Signature of Principal Architect: Donald M Walter

Digitally signed by Donald M Walter
DN: C=US, E=dwalter@doreandwhittier.com, O="Dore & Whittier", CN=Donald M Walter
Date: 2025.04.18 19:08:59-04'00'

Date: 4/18/25

Deviations From MSBA Guidelines – 755 Students + 100 PreK

The proposed space summary identifies a need of 165,035 GSF at a net to gross multiplier of 1.5 to serve the educational program, a deviation of 55,560* GSF from the MSBA guidelines for K-5th grade population of 755 students + approximately 100 PreK students. The narrative that follows offers evidence and support for these deviations.

Below is a summary of the initial proposed Space Summary as it has progressed through the MSBA process:

	Existing Wildwood, Woburn St and North Int. Schools Combined	PDP	Preferred Schematic Report	Schematic Design Report
Program Area	TOTAL NSF	TOTAL NSF	TOTAL NSF	TOTAL NSF
Core Academic	36,096	45,700	45,700	45,700
Special Education	11,300	19,010	19,010	19,010
Art & Music	6,315	4,040	4,040	5,082
Health & Physical Education	9,772	12,300	12,300	12,300
Media Center	2,265	4,068	4,068	4,068
Dining & Food Service	13,620	9,458	9,458	9,458
Medical	603	710	710	710
Administration & Guidance	5,582	5,308	5,308	5,548
Custodial & Maintenance	2,654	2,355	2,355	2,355
Other	2,764	6,100	6,100	5,800
TOTAL NSF	90,972	110,240	110,240	110,024
TOTAL GSF	138,614	163,573	163,573	165,035

* It is important to note that the MSBA Space Summary Template for this enrollment is based on a net to gross multiplier of only 1.46.

CORE ACADEMIC

The core academic program category totals 45,700 NSF, a deviation of +10,450 NSF from the MSBA guideline. The proposed space summary deviates from MSBA guidelines in four key ways: general classrooms, ELL classrooms, teacher collaboration spaces, and extended learning areas.

The first deviating factor relates to additional classrooms. Under a consolidated student population, the District requests thirty general classrooms for grades 1st – 5th, a deviation of three classrooms from the MSBA guidelines of twenty-seven general classrooms for grades 1st – 5th. The need for additional classrooms is a direct result of the District's local class size guidelines and current class models which are presented in detail in the educational program narrative.

The second factor leading to the deviation in Core Academic square footage is a demographic shift in Wilmington that has resulted in more students who qualify for English Language Learner services and programs. The proposed space summary deviates from MSBA guidelines by providing two half-sized classroom spaces to accommodate these services totaling 900 NSF.

The third factor leading to the deviation in Core Academic square footage is the additional space requested to support professional collaboration among faculty and staff. The district requests three 900 NSF Teacher Collaboration Spaces, one centrally located on each level. These spaces are to serve for common planning time, data meetings, and professional development spaces. They may also house a few hoteling desks for volunteers and itinerant staff if they don't have a professional home base elsewhere in the project. It is important to note that the district has tuned the space allocation since PSR to better meet its specific needs. After further review, the district realized the number of educators are more evenly distributed over three levels than originally anticipated. The number of Teacher Collaboration spaces was reduced from six to three while maintaining the same overall square footage of 2,700 NSF and evenly distributing on each level. The three teacher collaboration spaces are now centrally located between academic wings on each floor for greater access and flexibility of use.

The final factor in the deviation between the proposed space for Core Academics and the MSBA guidelines for this category is the additional space requested for Extended Learning. The needs and intent for this space are explained in the educational program narrative. The proposed Core Academic area includes thirty Extended Learning areas of varying sizes and locations totaling 5,744 NSF. This is a 456 SF decrease from PSR as some area from Kindergarten extended learning was allocated back to the Kindergarten classrooms and does not change the net square footage of the Core academic category.

The District is proposing three Pre-Kindergarten classrooms to support the current program and expand the program's offering with a full day class. At the PSR submittal, all of the net square footage associated with Pre-Kindergarten classrooms were recategorized into the "Other" category and remains there in the Schematic Design submittal.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

SPECIAL EDUCATION

The Special Education program category totals 19,010 NSF, a deviation of +9,950 NSF from the MSBA guidelines. Several District-specific programs and services contribute to much of this deviation, including dedicated space to support programs like the substantially separate, self-contained Strides program and services such as Occupational Therapy and Physical Therapy all outlined in the Special Education sub-section of the Educational Program Narrative. PT Storage was removed based on MSBA PDP comments to "Non-programmed Spaces" category.

The remaining deviation in square footage is a result of the district's request for twenty-six (26) small group rooms and a request for a series of spaces associated with support service professionals: School Psychologists, Speech and Language Pathologists, and Board-Certified Behavioral Analysists all of which exclusively serve students with special needs. Small group rooms are located between pairs of classrooms to serve as supplemental instructional environments that are physically and visually connected directly to, but acoustically separate from, the general classroom. These spaces would primarily serve students who receive supports from professionals beyond the general classroom teacher but would also be a critical resource to general education teachers for small group activities and differentiated instruction consistent with Universal Design for Learning.

It should be noted that the toilet room for the Stages Program serving 3rd – 5th grades was not accounted for in the PSR submittal and has since been added to the program. However design progress has reallocated square foot area between individual toilet rooms within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal to accommodate the additional toilet room.

The overall NSF of this category remains unchanged since the PSR submittal.

ART & MUSIC

The art and music program category totals 5,075 NSF, indicating an increase of 1,035 NSF in this category from PSR, and alignment with the MSBA guidelines.

The increase in the category total since PSR is the result of on-going programming meetings with end users and further analysis of scheduling and operational use for a PK-5 configuration. The functional needs for art and music spaces vary significantly, warranting a second flex space and assigning a primary function to each flex space in the program, one for art on the second level and the other for

music on the first level. When not in use by these programs, flex rooms can serve as a multi-purpose space for other programs and a resource for the CARES program and community after-school.

It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

HEALTH & PHYSICAL EDUCATION

The health & physical education program category totals 12,300 NSF, a deviation of +6,000 NSF from the MSBA guidelines. The overall NSF of this category remains unchanged since the PSR submittal.

MEDIA CENTER

The media center program category totals 4,068 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area within this category as the design was further developed to account for a workroom.

DINING & FOOD SERVICE

The dining and food services program category totals 9,458 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as the design was further developed. As articulated in PDP and PSR, the District directed the Design Team to size the dining room to accommodate all kindergarten through 5th grade students in three seatings. Given the plan to operate three seatings rather than two, the reduced square footage in the dining room will still be able to accommodate enrollment growth in the future.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

MEDICAL

The medical program category totals 710 NSF, which aligns with MSBA guidelines. The overall NSF of this category remains unchanged since the PSR submittal.

ADMINISTRATION & GUIDANCE

The administration & guidance program category totals 5,548 NSF, a deviation of +2,658 NSF from the MSBA Guidelines and increase of +240 NSF since PSR. It is important to note that the district has increased the proposed NSF to tune this category for its specific local needs. The deviation is related to providing office and instructional spaces for student support service providers who serve both general and special education students. Since PSR, an audit of spaces recognized two professionals originally identified in the District's Educational Plan, a Literacy Coordinator and STEM Coordinator, and allocated space within administration, increasing this category by +240 NSF.

CUSTODIAL AND MAINTENANCE

The custodial and maintenance program category totals 2,355 NSF, which is equal to the MSBA Guidelines.

This category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category.

OTHER

Items in the "other" category total 5,800 NSF, a decrease of -300 NSF since PSR. Much of this deviation from results from providing (3) Prekindergarten general education classrooms, PreK extended learning areas, CARES spaces associated with the after-school program including (1) 150 NSF program coordinator office and (1) 150 NSF site coordinator office and a dedicated Health classroom at 900 NSF. The final deviation is the result of providing (3) 100 NSF teacher wellness spaces which are meant to accompany teacher collaboration spaces and serve as places to conduct a private/confidential phone call and double as a lactation space. The reduction from six to three wellness rooms since PSR correlates directly to the reduction in teacher collaboration spaces discussed in the Core Academic category.

It is important to note, however, that design progress has reallocated square foot area between the PreK extended learning areas and the PreK classrooms as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal. The reallocation results in a decrease of 210 NSF in the PreK extended learning area.

NON-PROGRAMMED SPACES

Items in the "Non-programmed Spaces" category were added based on previous comments from MSBA:

PT Storage 250 NSF

Cares Storage 500 NSF

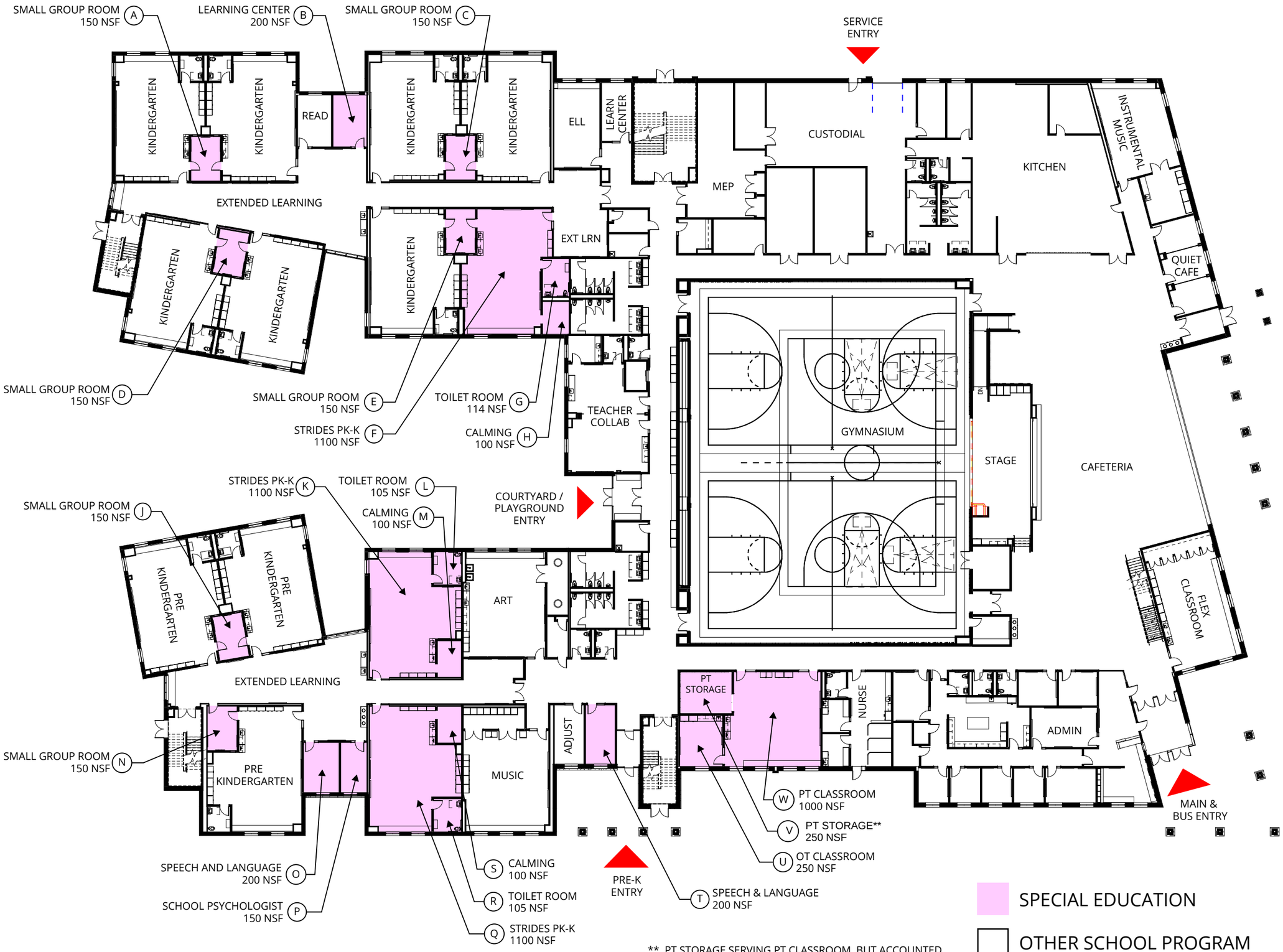
This category remains unchanged since the PSR submittal.

SUMMARY

In summary, the District and the Design team are proposing 110,024 NSF and 165,035 GSF to satisfy the educational program. These square footages deviate from the MSBA guidelines by 34,859 NSF and 55,560 GSF.

Floor Plans

The following pages provide colored floor plans identifying the locations of all Special Education Spaces.



DESE FLOOR PLAN

LEVEL 1

DORE + WHITTIER

DESE FLOOR PLAN

LEVEL 2

N

LANGUAGE BASED 1ST-2ND 900 NSF (Y)
LEARNING CENTER 200 NSF (Z)
SMALL GROUP ROOM 150 NSF (AA)
BCBA OFFICE 320 NSF (AB)
SMALL GROUP ROOM 150 NSF (X)
SMALL GROUP ROOM 150 NSF (AC)
SMALL GROUP ROOM 150 NSF (AD)
STRIDES 1ST-2ND 900 NSF (AE)
CALMING 100 NSF (AG)
TOILET ROOM 116 NSF (AF)
STAGES 1ST-2ND 900 NSF (AK)
CALMING 100 NSF (AL)
SMALL GROUP ROOM 150 NSF (AJ)
TOILET ROOM 86 NSF (AM)
SMALL GROUP ROOM 150 NSF (AH)
SMALL GROUP ROOM 150 NSF (AN)
LEARNING CENTER 200 NSF (AO)
SMALL GROUP ROOM 150 NSF (AP)

GENERAL CLASSROOM
READ
ADJUST
EXTENDED LEARNING
EXT LRN
TEACHER COLLAB
ASSIST
MATH
HEALTH
CUSTODIAL BELOW
MEP
ROOF
GYMNASIUM BELOW
CAFETERIA BELOW
STAFF LUNCH
FLEX CLASSROOM
STE CLASSROOM
LIBRARY

SPECIAL EDUCATION

OTHER SCHOOL PROGRAM

DORE + WHITTIER

N

DESE FLOOR PLAN

LEVEL 3

SPECIAL EDUCATION

OTHER SCHOOL PROGRAM

DORE + WHITTIER

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Floor 1					
Small Group Room/ Reading	500	Small Group Room	A	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Resource Room	500	Learning Center	B	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	C	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	D	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	E	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides PK-K	F	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	G	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	H	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	J	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides PK-K	K	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	L	105	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	M	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	N	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	O	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
*Unique to District	Select SF	School Psychologist	P	150	Space for clinician to assist with educational and psychological evaluations and provide individual counseling to students on Individualized Education Programs (IEP); located near grade level communitIES.
Self-Contained Sped	950	Strides PK-K	Q	1100	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	R	105	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	S	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
*Unique to District	Select SF	Speech and Language	T	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
*Unique to District	Select SF	OT Classroom	U	250	A space capable of supporting a wide range of occupational therapy activities. Space is positioned centrally to the entire building but slightly biased towards lowest grade grouping in order to reduce travel distance for earliest learners.
Unique to District	*Select SF*	*PT Storage***	*V*	*250*	*Dedicated storage closet for PT equipment and supplies.* ***Because it serves the PT Classroom it has been included in the DESE plan illustration and Special Education Space Adjacency Table, but has been accounted for under "non-programmed spaces" on the MSBA Space Summary Template. As such, this space is not included in the total category sqaure footage calculation below.*
*Unique to District	Select SF	PT Classroom	W	1000	A space capable of supporting a wide range of physical therapy activities. Space is positioned centrally to the entire building but slightly biased towards lowest grade grouping in order to reduce travel distance for earliest learners.
Floor 2					
Small Group Room/ Reading	500	Small Group Room	X	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	Select SF	Language Based 1st-2nd	Y	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Resource Room	500	Learning Center	Z	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AA	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	BCBA Office	AB	320	Dedicated space for BSBA profesionals to support programs, teachers, students and is centrally located between getween grade levels groupings.
Small Group Room/ Reading	500	Small Group Room	AC	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AD	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 1st-2nd	AE	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	AF	116	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	AG	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	AH	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AJ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Stages 1st-2nd	AK	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
*Unique to District	Select SF	Calming	AL	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Self-Contained Sped - Toilet	60	Toilet Room	AM	86	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
Small Group Room/ Reading	500	Small Group Room	AN	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Resource Room	500	Learning Center	AO	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AP	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Floor 3					
Small Group Room/ Reading	500	Small Group Room	AQ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Language Based 3rd-5th	AR	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Resource Room	500	Learning Center	AS	200	Learning environment for supports delivered by Learning Center professionals located within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	AT	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	AU	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.

Hatherly Elementary School Proposed Special Education Program
(New Construction)

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
Small Group Room/ Reading	500	Small Group Room	AV	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 3rd-5th	AW	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	AX	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	AY	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Self-Contained Sped	Select SF	School Psychologist	AZ	150	Space for clinician to assist with educational and psychological evaluations and provide individual counseling to students on Individualized Education Programs (IEP); located near grade level communitIES.
Small Group Room/ Reading	500	Small Group Room	BA	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Small Group Room/ Reading	500	Small Group Room	BB	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Stages 3rd-5th	BC	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	BD	86	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.
*Unique to District	Select SF	Calming	BE	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	BF	150	Located adjacent to a general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	500	Learning Center	BG	200	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	BH	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	500	Learning Center	BJ	200	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Small Group Room/ Reading	500	Small Group Room	BK	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	BL	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
Small Group Room/ Reading	500	Small Group Room	BM	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
Self-Contained Sped	950	Strides 3rd-5th	BN	900	Self-contained classroom serving a substantially-separate program located to be within the grade level community of its grade level peers.
Self-Contained Sped - Toilet	60	Toilet Room	BO	114	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. These toilet rooms should be outfitted with a water closet, lavatory, changing table, and potentially a shower.

Hatherly Elementary School Proposed Special Education Program
(New Construction)

MSBA Guidelines Space	MSBA Guidelines SF	Proposed Room Name	Floor Plan Designation (A-Z)	Proposed SF	Proposed Space Description and Reasoning for Adjacencies
*Unique to District	Select SF	Calming	BP	100	Located as part of suite of rooms serving self-contained classrooms and substantially-separate programs. Space will serve as both a small group room similar to those located between pairs of general education classrooms, but these will also serve as self-regulation calming spaces.
Small Group Room/ Reading	500	Small Group Room	BQ	150	Located between a self-contained and general education classroom to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
*Unique to District	Select SF	Speech and Language	BR	200	Learning environment for support delivered by Speech and Language Pathologists located near grade level communities.
Small Group Room/ Reading	500	Small Group Room	BS	150	Located between pairs of general education classrooms to serve as a learning environment for inclusionary supports delivered by special educators and student support service professionals.
			Total	19,010	

Square Footage Summary:

The proposed overall gross square footage of the new building is 165,035; Average square feet of General Classrooms is 900.

MSBA guidelines include 9,060 net square feet of dedicated special education space. The proposed program is +9,950 nsf in excess of the guidelines.

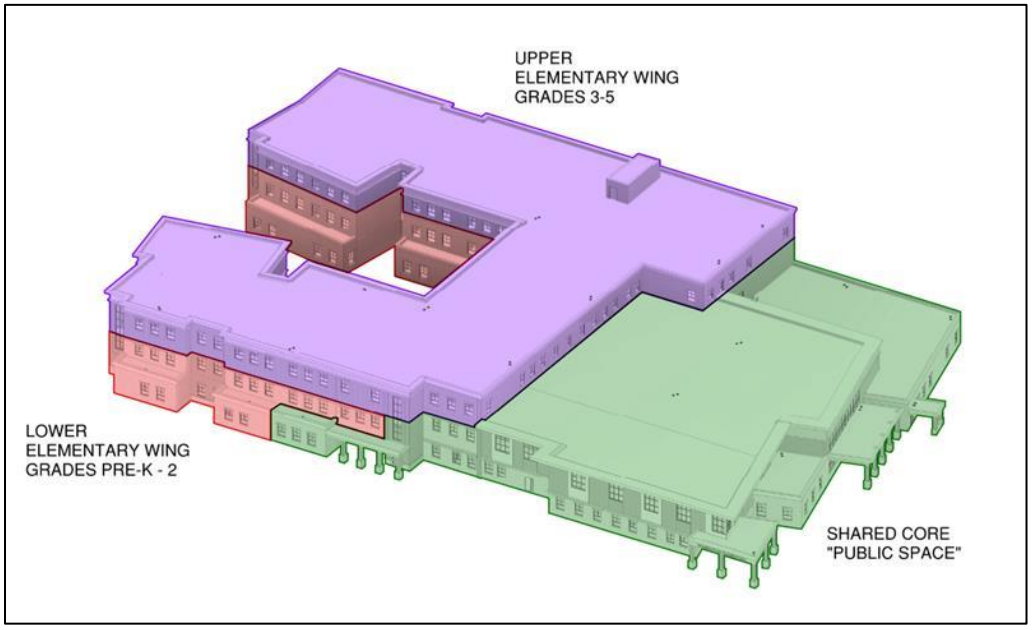
***Indicates that space is unique to District's program and does not appear in MSBA space guidelines.**

INTRODUCTION

Summary of Preferred Solution

On December 13, 2024 the Massachusetts School Board Authority (MSBA) voted to approve the Town of Wilmington Preferred Schematic Report (PSR) for the Wildwood Elementary School project. This approval was based on the preferred option for a new school with a Design Enrollment of 755 students in grades K-5, plus 100 Pre-K students. The preferred solution presented in the PSR located the new school on the existing playfield northwest of the existing North Intermediate School and proposed the demolition of the existing school and creation of new parking and drives to improve site circulation, increase on-site parking, and establish new outdoor areas for student gathering and play. The existing site plan is included in Section 4.1.4, Attached Drawings, as part of this report.

The approved building plan is configured with a three-story academic wing to the west and a shared core to the east. The shared core is designed as the “public” area of the building, with security/fire barriers sectioning off the “private” classroom wings.



The main entry Lobby serves as a welcoming gateway that sets the tone for a positive and inclusive environment. A separate Pre-K entry creates a safe, organized and accessible transition between home and school for the youngest learners. The main lobby opens to the communal hub, the cafeteria, with programs like Administration, Flex Music, Nurse, OT/PT and Physical Education spaces nearby. The Library is located on the second level just above the main entry and administration with a connecting stair nearby. The Gymnasium and Cafeteria are linked by a raised stage platform with openings to both sides, giving the public space a great level of flexibility for multiple uses.

The classroom wings are arranged on either side of an open courtyard. Each level of each wing includes:

- Classrooms
- Small Group Learning rooms
- Extended Learning Areas and Support spaces
- Circulation
- Views to building exterior spaces and Courtyard

One grade level team occupies one level in each wing, with shared spaces arranged more-or-less equidistant between the two sides. The lower elementary students (PreK-Grade 2) occupy the first two levels. Grades 3-5 occupy the third level. Generally, classroom spaces are located along the exterior walls with views to exterior spaces. Playgrounds for lower elementary grades PK-2 are located closer to the academic wings to allow its use throughout the day for exercise, movement, play and outdoor learning. Upper elementary playground and basketball courts are located closer to the cafeteria and main entry.

Administrative offices are generally located adjacent to and monitoring the main entrance, with offices for assistant principals, adjustment counselors, reading specialists and math tutors decentralized in the classroom wings close to the students.

Overview of the Process and Community Outreach

After the completion and delivery of the PSR to the MSBA on October 24, 2024, the project team held several User Group Meetings and Working Group meetings that included teachers, administrators, special educators, and staff, as well as department heads including special education and the Director of Facilities. The results of each of the meetings were presented to the School Building Committee (SBC) and incorporated into the Schematic Design documents.

The District is maintaining a project website where members of the community can access updated project information, presentations, FAQs, and view recordings of SBC meetings: (**https://www.wpsk12.com/our_district/facilities/school_building_projects/wildwood_building_project**)

The following is a list of major meetings between the Design Team and the Owner since the delivery of the PSR in October 20024. Items marked in **Bold** print indicate meetings that were open to the public:

DATE	MEETING	MAIN AGENDA ITEM(S)
10/29/2024	User Group Meetings	Nursing, Admin, Guid., PK-K, Kitchen, Bldg Ops
10/29/2024	Leadership Working Group Meeting	
11/1/2024	PR Working Group	
11/4/2024	User Group Meetings	SPED, OT/PT/SLP, Admin Assists, Gr. 1-2, 3-5
11/5/2024	Leadership Working Group Meeting	
11/6/2024	User Group Meetings	Reading, Math, Specials, Library/STEM, ELL

11/8/2024	PR Working Group	
11/12/2024	Leadership Working Group Meeting	
11/13/2024	Facilities Assessment Subcommittee Meeting	
11/19/2024	Site/Landscape Working Group	
11/19/2024	Leadership Working Group Meeting	
11/19/2024	**School Building Committee**	**FAS, SD schedule, CM vs DBB, Gym location study**
11/20/2024	User Group Meetings	Music/Theater
11/26/2024	Leadership Working Group Meeting	
12/3/2024	Leadership Working Group Meeting	
12/3/2024	**School Building Committee**	**PSR comments, SF status, Ext. visioning, CM/DBB**
12/10/2024	Leadership Working Group Meeting	
12/11/2024	Sustainability Working Group	
12/13/2024	MSBA Board Meeting	
12/17/2024	Leadership Working Group Meeting	
12/17/2024	**School Building Committee**	**Ext. visioning results, Interior visioning, Site investigation outcomes, Bldg. systems overview**
1/7/2025	User Group Meeting	
1/7/2025	Leadership Working Group Meeting	
1/8/2025	Site/Landscape Working Group	
1/8/2025	PR Working Group	
1/14/2025	Leadership Working Group Meeting	
1/14/2025	**School Building Committee**	**Plan updates, Interior visioning results, Project inspiration, Exterior Aesthetics**
1/15/2025	Sustainability Working Group	
1/15/2025	PR Working Group	
1/17/2025	User Group Meeting	District Leadership Team
1/21/2025	Leadership Working Group Meeting	
1/22/2025	Site/Landscape Working Group	
1/22/2025	PR Working Group	
1/23/2025	Sustainability Working Group	
1/28/2025	Leadership Working Group Meeting	
1/29/2025	Sustainability Working Group	
1/29/2025	PR Working Group	
1/29/2025	Wilmington Abutters Meeting	
1/29/2025	**School Building Committee**	**Plan updates, Aesthetics, Bldg. systems, CM@R**
1/30/2025	User Group Meeting	Food Service
2/4/2025	User Group Meeting	Athletic Department and Recreation Department
2/4/2025	Leadership Working Group Meeting	
2/5/2025	PR Working Group	
2/5/2025	Sustainability Working Group	
2/5/2025	**School Building Committee**	**Plan updates, Aesthetics, Selection of Building System, CM@R**
2/7/2025	Site/Landscape Working Group	
2/11/2025	Public Safety Meeting	
2/12/2025	PR Working Group	

2/13/2025	User Group Meeting	Music/Stage/Library
2/13/2025	**School Building Committee**	**Approval of Construction manager**
2/14/2025	Building Security Meeting	
2/19/2025	PR Working Group	
2/20/2025	Meeting with DPW/Town Engineer	Traffic Study Review
2/26/2025	PR Working Group	
3/5/2025	**School Building Committee**	
3/6/2025	Meeting with CISA	Review building security with District's Homeland security consultant
3/11/2025	Leadership Working Group Meeting	
3/12/2025	PR Working Group	
3/18/2025	Cost Estimate Reconciliation	
3/19/2025	Sustainability Working Group	
3/19/2025	PR Working Group	
3/25/2025	Leadership Working Group Meeting	
3/25/2025	**School Building Committee**	**Review Construction Cost Estimate**
3/26/2025	PR Working Group	
3/31/2025	**Community Forum #6**	
3/31/2025	**School Building Committee**	**Approve Project Scope and Budget**
4/1/2025	PR Working Group	
4/8/2025	Leadership Working Group Meeting	
4/15/2025	Leadership Working Group Meeting	
4/15/2025	**School Building Committee**	**Vote to submit SD Package**

The Design Team met with administration and facility operations as well as Public Safety first responders and the DPW, to review safety and security. Access to the site and building were reviewed, security protocol was discussed as well as the location and preferred options for security glazing, roof access, cameras, mass notification and other building safety features.

District's Total Project Budget & Steps to Secure Local Funding

The project funding was reviewed with the Town of Wilmington. The Town anticipates a total project budget of **$173.3 million** (rounded). The Town's current intent is to authorize bonds to fund this amount outside the Town's budget through debt exclusion; bonds garnered by debt exclusion require a two-thirds vote in favor by the Town's registered Voters.

In addition to the school building project, the Town has projects ongoing and capital improvements projects on the horizon. The Town has recently finished a new Senior Center, which opened it's doors in February, and is in the middle of a new Town Hall/School Administration building construction project. That project is on schedule to be finished by the end of 2025 or early 2026. Additionally, the Town is in the feasibility stage of a Fire Substation in North Wilmington. All of these projects are being financed within the levy without the need for an override or debt exclusion.

The current vote schedule is for a Special Town Meeting Election to vote the approval of the project on Saturday September 13, 2025, followed by a Debt Exclusion Vote on Tuesday September 16, 2025.

Total Project Budget Narrative

The estimated Building Construction and Site Cost is **$137.7 million** (rounded) which includes Base Construction, General Conditions and General Requirements, Bonds and Insurance, Overhead of the Contractor Manager, Fee Escalation and Design and Pricing Contingency. The estimated Total Project Cost is **$173.3 Million** (rounded) and includes the Building Construction, Site Costs, abatement and demolition of the existing North Intermediate School building, as well as: Architecture and Engineering Fees, Owner's Project Management Costs, Reimbursable Services, Miscellaneous Project Costs, Owner's Costs and Contingencies, and budgeted Furniture, Fixtures and Equipment, and Technology Costs. The overall MSBA project budget is shown in the MSBA Form 3011 format and is included in Section 4.1.2.Q.

This cost estimate and budget is based on the delivery method of Mass General Law (MGL) chapter 149A; Construction Manager at Risk (CMR). The decision to pursue the project delivery method of MGL chapter 149A over MGL chapter 149, Design-Bid-Build (DBB), was made by the School Building Committee based on prior favorable experience with this delivery method in the District and the Town as a whole, and the belief that this project delivery method provides financial advantages over Chapter 149. The delivery method advantages and disadvantages were discussed at School Building Committee meetings from the end of PSR phase up to a vote of 20-1 in favor of Ch 149A at the 11/19/24 SBC meeting.

Two independent cost estimates were prepared for the project, one by the Architect's cost estimator, PM&C, and one by the Construction Manager, Fontaine Brothers Inc. The cost estimates have been reconciled, and both include necessary Value Engineering items for consideration in future phases. They are provided in Section 4.1.2R & 4.1.2S respectively.

List of Add-Alternates:

A list of add-alternates or deduct-alternates was not included in the cost estimates. Alternates will be considered at a later time, prior to bidding if required.

Updated Project Description

The proposed new consolidated elementary school will serve 755 students in grades K- 5, plus 100 Pre-K students, for a total of 855 students. The proposed 165,035 GSF school will be located on the North Intermediate School site, a 12.145-acre parcel, at the playfield to the northwest of the existing school building. The new school design along with the demolition of the existing North Intermediate School building will:

- allow completely revised and greatly improved site circulation and parking
- provide direct access from the school to play and outdoor learning areas without crossing site drives
- include greatly improved site stormwater management

The new building is set back on the site, which will minimize its apparent scale from the public roads. Parking is located closer to the roadways at the existing building location. The building will be screened from neighboring abutters by added screening with berms and vegetation.

The proposed site design (see attached) provides separated onsite bus, parent, and Pre-K drop off zones and parking for 193+ cars. One hundred forty (140) parking spaces will be dedicated to the school staff with 20 spaces for the dual-use Pre-K park-and-drop off/ minibus spaces. Remaining spaces are for visitor parking. Overflow parking for events at the school can be accomplished using parallel-parking spaces on the outer lane of service drives for the potential of an additional 30+ spaces if required. The section of driveway west of Pre-K parking spaces and the vehicle turnaround would be marked and signed as a fire lane for emergency access only and reinforced with gates to prevent vehicles from accessing. An additional gate is proposed just west of the delivery loading zone on the north access road to prevent vehicles from traveling beyond that point during school hours.

One of the main neighborhood concerns is the increased traffic and traffic backing up onto Ballardvale and Salem Streets during peak morning and afternoon drop-off/pickup times, leading to delays and unsafe situations on the roads. The proposed site plan offers flexibility for buses and vehicles to utilize either of the driveways. Operationally the district indicated a preference for greater onsite queue of vehicles with the Ballardvale driveway. The site will have space for 80+ vehicles to queue on-site and off the streets. Although this does not account for the total vehicles estimated for queue, the peak load is only realized three days when the afterschool CARES program is not offered. It may also be mitigated by slightly offsetting dismissal times by grade (current practice by the district) to spread out the peak over a period of time, greatly reducing congestion. Offsite mitigation at nearby intersections with existing issues was discussed in the traffic study and under review by the Town Engineer and DPW.

The project's outdoor spaces consist of an open exterior courtyard with outdoor learning, and recreation spaces adjacent to the building. The Courtyard has been designed to allow protected access for play, outdoor learning and gardening. Exterior spaces consist of a large playground south of the building with poured-in-place rubber surfaces, play equipment, basketball court and U-8 soccer field for grades 3-5. There are two additional playgrounds west of the building with hardscape surface for foursquare and pavement games and a rubber play surface with Pre-K and grades K-2 age-appropriate equipment. Additional outdoor learning and open areas are located northeast of the building adjacent to the turnaround which can double as a hardscape play area during school hours, a sensory garden to the south at the Pre-K entry, an informal gathering space at the plaza to the east, an additional basketball court to the east and youth-sized soccer-sized fields running along the west side of the access road from Salem Street. As noted above, all primary exterior spaces are directly accessed from the building without crossing any traffic lanes.

The building and site are designed to provide spaces that can be shared with the community when not in use by the school. These spaces include the outdoor basketball courts, playgrounds and fields, as well as the indoor gymnasium, cafeteria, performance space, media center, and potentially flex art and flex music rooms.

As part of the design of a building and site with intended shared use, the security requirements of "public" access areas in the school as well as "private" areas where access needs to be limited or controlled were considered and discussed. Supervision of the exterior both during and after school hours was also considered and incorporated into the design. During school hours the main parking lot and drives are visible from the main office area and cameras are located at all doors and allow for multiple views of the adjacent building area. All exterior doors will be connected to the alarm system which will notify the main office when doors are left in the hold open position. Entry into the building during school hours will be limited to the main entrance and require a two or three-step check-in system through a vestibule: communication to the front office from outside the vestibule; communication and visual identification once inside the vestibule; and final credential verification at the transaction window withing the vestibule or once admitted inside the main office.

The security system will include lockdown technology for the lower and upper elementary classroom wings at two basic double-door points on Level 1 with "stacking" locations on Level 2 for ease of wayfinding. Level 3 is private in its entirety as it houses three grade groupings with no public spaces. Access to public spaces after school hours will be controlled by locking down the academic wings.

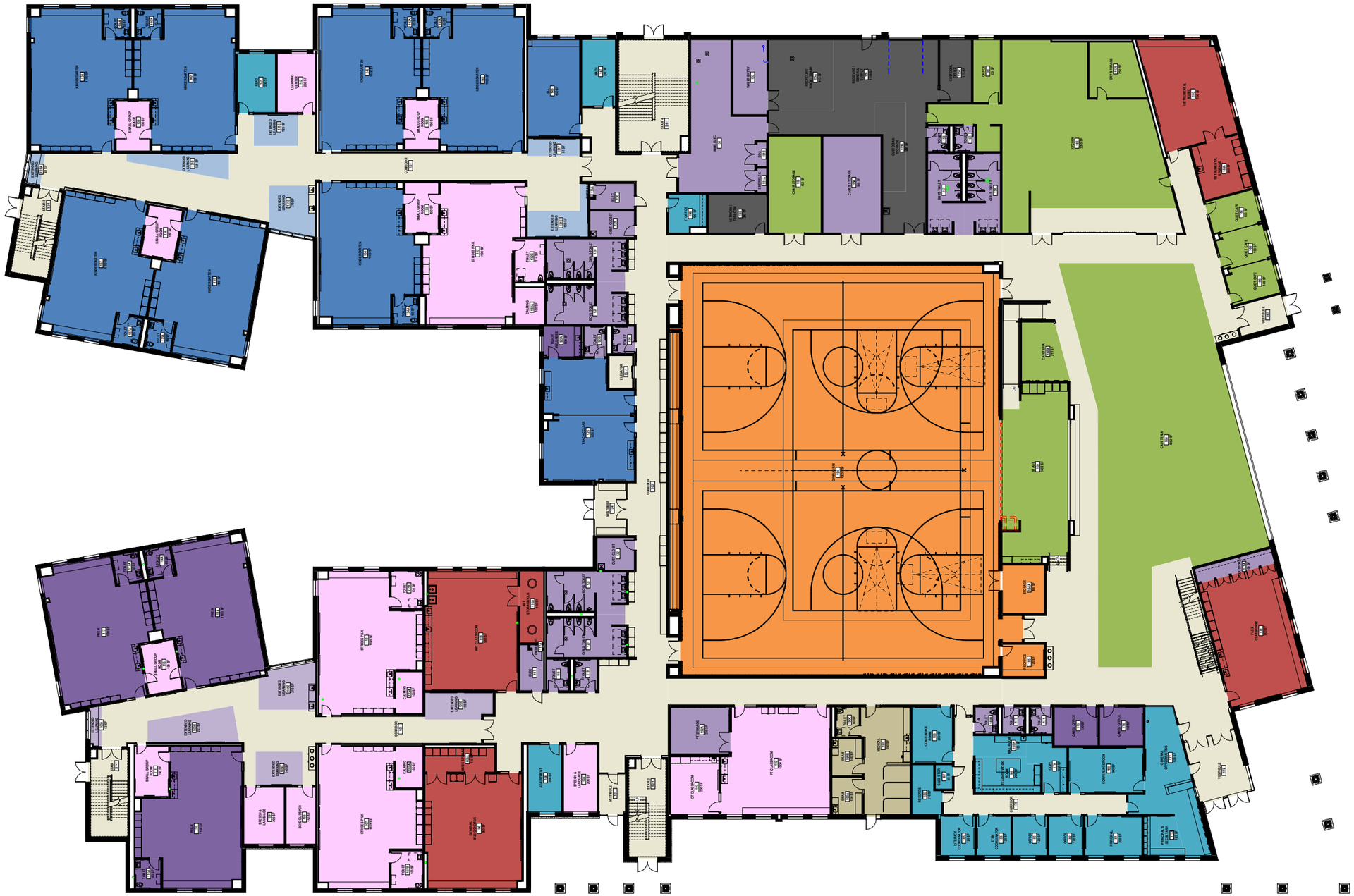
The new school has been designed to provide learning spaces and to meet the educational program documented in the Educational Program Narrative and MSBA Space Summary. As a general planning concept, all classrooms and regularly occupied support spaces have exterior views to the open-site areas, green-space areas, play spaces or the courtyard and elementary wings. These spaces are generally flooded with natural light from sizable windows and glazed curtain wall elements. The building materials have been chosen for their durability, feasibility and economy.

The placement of major educational and support spaces near the front entrance: the Cafeteria, Stage, Gymnasium, Library, Flex Music Room, support the idea of a school building as a community to create a sense of belonging for all students. The dining area greets students and visitors as they progress further into the public core of the building and serves as the central hub, small performance space, gathering area for students, and a connection point to the second floor.

The following illustrations have been included to assist in communicating design concepts and intent.

- Colored Presentation Site Plan
- Colored Floor Plans
- Exterior Elevation Perspectives
- Interior Perspectives

Proposed Site Plan



PROGRAM FLOOR PLAN

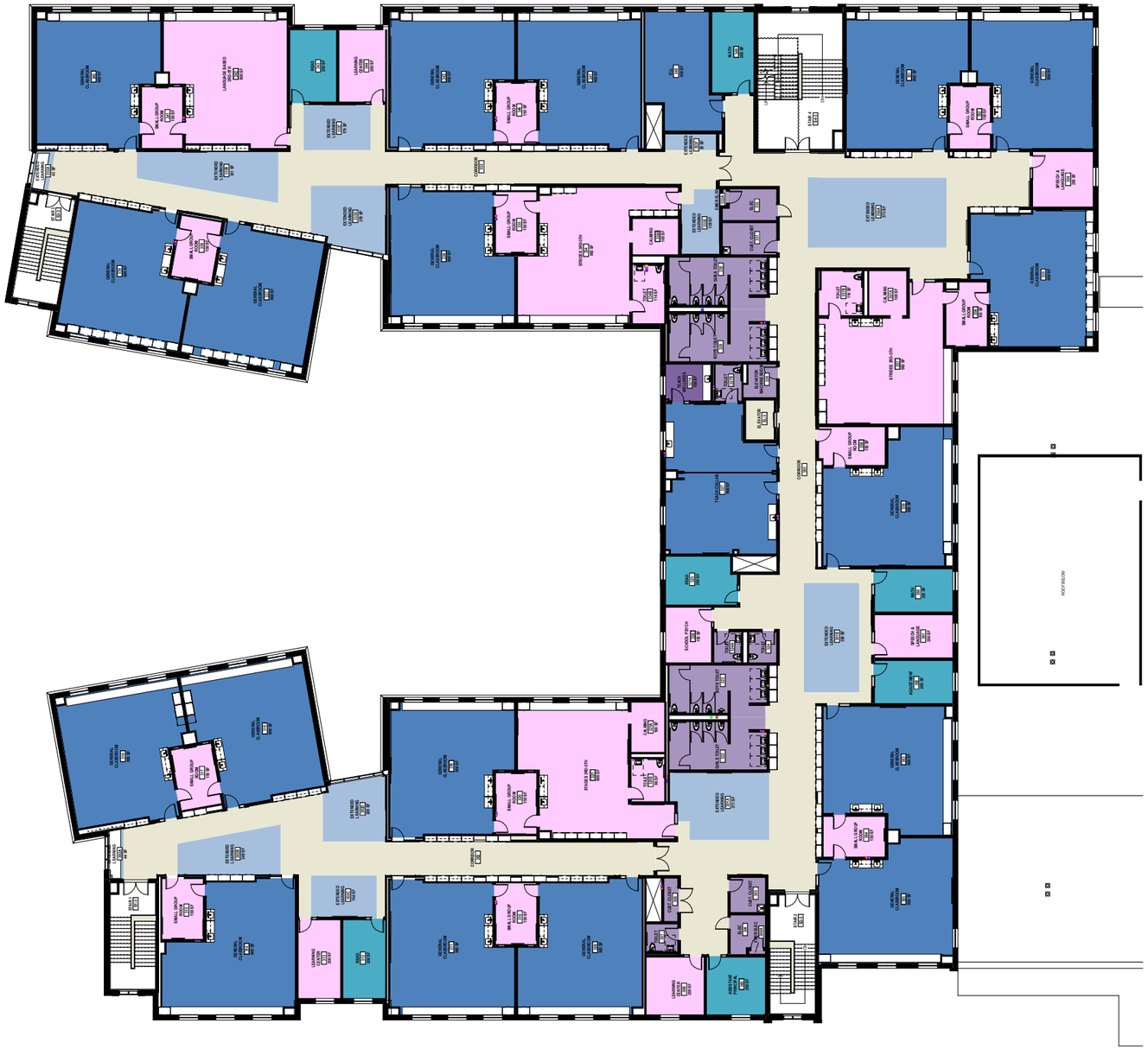
LEVEL 1

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

ROOF BELOW
ROOF BELOW
ROOF BELOW



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SCALE: 1/32"=1'-0"

PROGRAM FLOOR PLAN

LEVEL 3

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

Exterior Perspective Drawings

Aerial view from Southeast

Proposed Main Building Entrance view from Upper Elementary Playground

South Building Elevation of Academic Wing and Main Building Entrance view from Drop-Off Loop

East Elevation View of Main Entry and Cafeteria Entry

Courtyard View from the West

Interior Perspective view of the Main Lobby and Stair to Library

Interior Perspective view of the Cafeteria towards Main Lobby and Stage

Interior Perspective view of the Cafeteria and Stage

Interior Perspective view of the Cafeteria

Interior Perspective view of the Gymnasium towards the Cafeteria

Interior Perspective view of the Library

Interior Perspective view of a Typical Classroom

Interior Perspective view of an Extended Learning Area in Pre-K and Kindergarten

Interior Perspective view of an Extended Learning Area - Grades 1-2

Interior Perspective view of a typical Extended Learning Area – Grades 1-5

Interior Perspective view of an Extended Learning Area – Grades 3-5

FINAL DESIGN PROGRAM

Architectural Characteristics Narrative

The architecture of the elementary school building draws its inspiration from the character of the Town and the architectural language of the School Building Committee members and community input, creating a thoughtful balance between tradition and youthful energy.

The design approach includes a timeless palette of materials - warm red brick and soft-toned masonry - anchors the design in the rich historical context of the community with the use of durable, cost-effective materials. An energy-efficient design with compact, functional layout results in traditional forms that blend with the local community.

The building's massing was carefully designed to minimize the visual impact of the three-story academic wing by positioning it behind the two-story public core. This approach strategically reduces the perceived height of the structure, creating a more approachable and human-scaled presence for those arriving from either Salem or Ballardvale Streets. By layering the volumes in this way, the building maintains a civic identity while remaining sensitive to its surrounding context and the scale of its users.

At the same time, the design embraces the joyful spirit of an elementary school. Playful elements woven throughout the building provide bursts of color and at entryways and gathering spaces. Natural wood elements bring nature in as daylight pours through windows, activating vibrant learning environments that feel open, safe, and inspiring. The result is a school that honors its place in the town's fabric while inviting curiosity, imagination, and a love for learning.

Signed Copies of the Educational Space Summary

The space summary on the following pages contains an itemization of the proposed spaces needed to deliver the District's educational program for grades PreK-5th using the MSBA's latest edition elementary school space summary template.

Room labels unique to the District and/or that vary from MSBA room names are identified with a yellow highlight. Total gross floor area, or gross square feet (GSF), are shown at the bottom of the table for the proposed conditions.

The District and the Design Team worked together to align proposed spaces with MSBA square footage guidelines for individual program areas and the total gross square footage to the greatest extent possible. However, some deviations do exist. All deviations were deemed necessary by the District to serve the educational program and are explained in detail on the pages following the space summary.

Some changes to the design have occurred since the submission of the Preferred Schematic Report. With further input from the District, some new spaces have been added to the project that subdivided larger program areas, and other program spaces have moved location within the plans to meet design and functional goals and requirements. The essence of the overall building planning and individual spatial relationships have remained intact.

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
CORE ACADEMIC	**44,259**			**0**			**45,700**			**45,700**			**10,450**			**35,250**	STE Guidelines Policy
(List rooms of different sizes separately)																	
Kindergarten Classroom with Toilet				0	varies	7	8,156	varies	7	8,156	varies	0	-244	1,200	7	8,400	1,100 NSF (minimum size) - 1,300 NSF (maximum size); Minimum of (2) sinks required per Kindergarten Classroom
Rm. 134					1165												
Rm. 135					1165												
Rm. 137					1165												
Rm. 138					1165												
Rm. 140					1165												
Rm. 143					1165												
Rm. 145					1166												
General Classroom (Grades 1-6)				0	900	30	27,000	varies	30	27,000	varies	3	1,350	950	27	25,650	900 NSF (minimum size) - 1,000 NSF (maximum size); Minimum of (2) sinks required per General Classroom
Rm. 206																	
Rm. 208																	
Rm. 211																	
Rm. 213																	
Rm. 215																	
Rm. 216																	
Rm. 233																	
Rm. 234																	
Rm. 236																	
Rm. 237																	
Rm. 242																	
Rm. 244																	
Rm. 309																	
Rm. 311																	
Rm. 314																	
Rm. 316																	
Rm. 318																	
Rm. 319																	
Rm. 336																	
Rm. 337																	
Rm. 339																	
Rm. 340																	
Rm. 345																	
Rm. 347																	
Rm. 351																	

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	**Existing Totals**	**PROPOSED PROGRAM**															
		EXISTING TO REMAIN / RENOVATED			**NEW CONSTRUCTION**			**TOTAL**			**VARIATION TO MSBA GUIDELINES**			**MSBA GUIDELINES (DO NOT MODIFY)** **(Refer to Educational Facility Planning for additional information)**			
ROOM TYPE		**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**ROOM NFA[1]**	**# OF ROOMS**	**AREA TOTALS**	**COMMENTS**
Rm. 353																	
Rm. 355																	
Rm. 359																	
Rm. 363																	
Rm. 365																	
Science, Technology, Engineering (STE) Room (Grades 3-6) Rm. 256				0	1,080	1	1,080	1,080	1	1,080	0	0	0	1,080	1	1,080	1,080 NSF (minimum size); Refer to the 2018 STE Guidelines for additional information.
STE Storage Room - Rm. 256A				0	120	1	120	120	1	120	0	0	0	120	1	120	Minimum of (1) 120 NSF STE Storage Room required per STE Room; Refer to the 2018 STE Guidelines for additional information.
ELL Classroom - Rm 146, Rm 348				0	450	2	900	varies	2	900	varies	2	900				
Teacher Collaboration - Rm 125, Rm 224, Rm 327				0	900	3	2,700	varies	3	2,700	varies	3	2,700				
Extended Learning K																	
Rm. 131A					41	1	41	41	1	41	41	1	41				
Rm. 131B					158	1	158	158	1	158	158	1	158				
Rm. 131C					123	1	123	123	1	123	123	1	123				
Rm. 131D					179	1	179	179	1	179	179	1	179				
Rm. 131E					162	1	162	162	1	162	162	1	162				
Rm. 131F					81	1	81	81	1	81	81	1	81				
Extended Learning 1st-5th				0													
Rm. 205A					58	1	58	58	1	58	58	1	58				
Rm. 205B					243	1	243	243	1	243	243	1	243				
Rm. 205C					163	1	163	163	1	163	163	1	163				
Rm. 205D					292	1	292	292	1	292	292	1	292				
Rm. 205E					212	1	212	212	1	212	212	1	212				
Rm. 230A					43	1	43	43	1	43	43	1	43				
Rm. 230B					261	1	261	261	1	261	261	1	261				
Rm. 230C					140	1	140	140	1	140	140	1	140				
Rm. 230D					262	1	262	262	1	262	262	1	262				
Rm. 230E					154	1	154	154	1	154	154	1	154				
Rm. 230F					172	1	172	172	1	172	172	1	172				
Rm. 301A					371	1	371	371	1	371	371	1	371				
Rm. 301B					359	1	359	359	1	359	359	1	359				
Rm. 302A					44	1	44	44	1	44	44	1	44				
Rm. 302B					249	1	249	249	1	249	249	1	249				
Rm. 302C					164	1	164	164	1	164	164	1	164				
Rm. 302D					228	1	228	228	1	228	228	1	228				
Rm. 333A					43	1	43	43	1	43	43	1	43				
Rm. 333B					331	1	331	331	1	331	331	1	331				
Rm. 333C					179	1	179	179	1	179	179	1	179				
Rm. 333D					270	1	270	270	1	270	270	1	270				
Rm. 333E					139	1	139	139	1	139	139	1	139				
Rm. 333F					50	1	50	50	1	50	50	1	50				
Rm. 350A					573	1	573	573	1	573	573	1	573				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
SPECIAL EDUCATION	9,553			0			19,010			19,010			9,950			9,060	Special Education spaces require DESE review and approval.
(List rooms of different sizes separately)																	
Self-Contained Special Education Classroom				0	Varies	10	9,600	Varies	10	9,600	Varies	4	3,900	950	6	5,700	900 NSF (minimum size) - 1,300 NSF; equal to the size of the proposed General Classrooms that serve the same student population.
Strides Program PK-K - Rm 107, Rm 115. Rm 132				0	1100	3		1,100	3								
Strides Program 1st-2nd - Rm 231				0	900	1		900	1								
Strides Program 3rd-5th - Rm 334, Rm 357				0	900	2		900	2								
Stages Program 1st-2nd - Rm 218				0	900	1		900	1								
Stages Program 3rd-5th - Rm 321				0	900	1		900	1								
Language-Based Program 1st-2nd - Rm 239				0	900	1		900	1								
Language-Based Program 3rd-5th - Rm 342				0	900	1		900	1								
Self-Contained Special Education Toilet Room				0	varies	8	840	varies	8	840	varies	26	480	60	6	360	
Strides Program PK-K Toilet - Rm 107B				0	105	1											
Rm 115B					105	1											
Rm 132B					114	1											
Strides Program 1st-2nd Toilet - Rm 231B				0	116	1											
Strides Program 3rd-5th Toilet - Rm 334B				0	114	1											
Rm 357B					114	1											
Stages Program 1st-2nd Toilet - Rm 218B				0	86	1											
Stages Program 3rd-5th Toilet - Rm 321B				0	86	1											
Learning Center				0	200	6	1,200	200	6	1,200	-300	2	-800	500	4	2,000	1/2 size of a General Classroom
Rm 142																	
Rm 210																	
Rm 241																	
Rm 306																	
Rm 313																	
Rm 344																	
Small Group Room				0	150	26	3,900	varies	26	3,900	varies	24	2,900	500	2	1,000	1/2 size of a General Classroom
Rm 111				0													
Rm 113				0													
Rm 133				0													
Rm 136				0													
Rm 139				0													
Rm 144				0													
Rm 207				0													
Rm 212				0													
Rm 214				0													
Rm 217				0													
Rm 232				0													
Rm 235				0													
Rm 238				0													
Rm 243				0													
Rm 310				0													
Rm 315				0													
Rm 317				0													
Rm 320				0													
Rm 335				0													
Rm 338				0													
Rm 341				0													
Rm 346				0													
Rm 352				0													
Rm 356				0													
Rm 358				0													
Rm 364				0													
Calming				0	100	8	800	100	8	800	varies	8	800				
Rm 107A																	
Rm 115A																	
Rm 132A																	
Rm 218A																	
Rm 231A																	
Rm 321A																	
Rm 334A																	
Rm 357A																	
OT Classroom/Office - Rm 193				0	250	1	250	250	1	250	250	1	250				
PT Classroom Rm 192				0	1,000	1	1,000	1,000	1	1,000	1,000	1	1,000				
School Psychologists - Rm 108, Rm 326				0	150	2	300	varies	2	300	varies	2	300				
BCBA Office/Team Chairs - Rm 245				0	320	1	320	320	1	320	320	1	320				
Speech & Language - Rm 103, Rm 109, Rm 354, Rm 361				0	200	4	800	varies	4	800	varies	4	800				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools **Wildwood Early Childhood Center**	Existing Totals	PROPOSED PROGRAM										MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL			VARIATION TO MSBA GUIDELINES					
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
Public Day Education Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
Collaborative Program Spaces (List rooms separately below)																	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
ART & MUSIC	5,655			0			5,075			5,075			0			5,075	
Art Classroom (25 seats) - Rm 116				0	980	1	980	980	1	980	-20	-1	-1,020	1,000	2	2,000	Assumed schedule: 2 times per week per student
Art Workroom with Storage and Kiln - Rm 116A				0	150	1	150	150	1	150	0	-1	-150	150	2	300	
General Music / Chorus (25-50 seats) - Rm 106				0	980	1	980	980	1	980	-220	-1	-1,420	1,200	2	2,400	Assumed schedule: 2 times per week per student
General Music Storage - Rm 106A				0	150	1	150	150	1	150	75	-4	-225	75	5	375	
Music Practice / Ensemble				0	0	0	0	0	0	0	0	0	0				
Instrumental Music - Rm 163				0	700	1	700	700	1	700	700	1	700				
Instrumental Storage - Rm 163A				0	240	1	240	240	1	240	240	1	240				
Flex Classrom - Music - Rm 171				0	900	1	900	900	1	900	900	1	900				
Flex Classrom - Art - Rm 257				0	975	1	975	975	1	975	975	1	975				
HEALTH & PHYSICAL EDUCATION	8,913			0			12,300			12,300			6,000			6,300	Excess Physical Education Spaces Policy
Gymnasium - Rm 194				0	12000	1	12,000	12,000	1	12,000	6,000	0	6,000	6,000	1	6,000	
Gym Storeroom - Rm 194A				0	180	1	180	180	1	180	30	0	30	150	1	150	
PE Office ~~with Shower and Toilet~~ - Rm 195				0	120	1	120	120	1	120	-30	0	-30	150	1	150	
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
MEDIA CENTER	2,265			0			4,068			4,068			0			4,068	
Media Center / Reading Room - Rm 252				0	3,859	1	3,859	3,859	1	3,859	-208	0	-208	4,068	1	4,068	
Librarian Workroom - Rm 252A				0	209	1	209	209	1	209	209	1	209				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
[Enter room type here]				0			0	0	0	0	0	0	0				
DINING & FOOD SERVICE	13,620			0			9,458			9,458			0			9,458	
Cafeteria / Dining - Rm 168 and Rm 168A				0	4,611	1	4,611	4,611	1	4,611	-1,052	0	-1,052	5,663	1	5,663	Based on 2 lunch seatings - 15 NSF per seat
Stage - Rm 169				0	1,002	1	1,002	1,002	1	1,002	2	0	2	1,000	1	1,000	
Chair / Table / Equipment Storage Rm 153				0	452	1	452	452	1	452	0	0	0	452	1	452	
Kitchen - Rm 162				0	2,255	1	2,255	2,255	1	2,255	200	0	200	2,055	1	2,055	1,600 NSF for first 300 students + 1 NSF per additional student
Dry Storage - Rm 162E					250	1	250	250	1	250	250	1	250				
Kitchen Office - Rm 161				0	150	1	150	150	1	150	150	1	150				
Staff Lunch Room - Rm 251				0	289	1	289	289	1	289	0	0	0	289	1	289	20 NSF per student
Quiet Café Area				0	varies	3	449	varies	3	449	varies	3	449				
Rm 164				0	150		0	150	0	0	150	0	150				
Rm 165				0	150		0	150	0	0	150	0	150				
Rm 166				0	149		0	149	0	0	149	0	149				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM											VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL											
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS			ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
MEDICAL	603			0	710		710			710					0			710	
Medical Suite Toilet - Rm 190C				0	60	1	60	60	1	60			0	0	0	60	1	60	
Nurses' Office / ~~Waiting Room~~ Exam - Rm 190A				0	100	1	100	100	1	100			-150	0	-150	250	1	250	
Examination Room / ~~Resting~~ Office - Rm 190B				0	100	1	100	100	1	100			0	-3	-300	100	4	400	
Medical / Waiting Area / Resting Area - Rm 190				0	450	1	450	450	1	450			450	1	450				
~~Resting Area~~				0	0	1	0	0	1	0			0	1	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
[Enter room type here]				0			0	0	0	0			0	0	0				
ADMINISTRATION & GUIDANCE	5,113			0			5,548			5,548					2,658			2,890	
General Office / Waiting Room with Toilet - Rm 177				0	528	1	528	528	1	528			0	0	0	528	1	528	
Teachers' Mail and Time Room - Rm 189A				0	100	1	100	100	1	100			0	0	0	100	1	100	
Copy Room - Rm 179				0	150	1	150	150	1	150			0	0	0	150	1	150	
Records Room - Rm 186				0	110	1	110	110	1	110			0	0	0	110	1	110	
Principal's Office with Conference Area - Rm 181				0	200	1	200	200	1	200			-175	0	-175	375	1	375	
Principal's Secretary / Waiting - Rm 177A				0	125	1	125	125	1	125			0	0	0	125	1	125	
Assistant Principal's Office - Rm 223, Rm 305				0	200	2	400	varies	2	400			varies	1	280	120	1	120	
Supervisory / Spare Office - Rm 182, Rm 183				0	120	2	240	120	2	240			0	1	120	120	1	120	
Conference Room				0	varies	2	500	varies	2	500			250	1	250	250	1	250	
Conference Room - Rm 180					300	1													
Conference Room - Rm 188					200	1													
School / Adjustment Counselors -Rm 104, Rm 246, Rm 362				0	200	3	600	200	3	600			50	0	150	150	3	450	
Guidance Storeroom - Rm 187				0	35	1	35	35	1	35			0	0	0	35	1	35	
Teachers' Work Room - Rm 189				0	200	1	200	200	1	200			-328	0	-328	528	1	528	
Reading Specialists - rm 141, 209, 240, 312, 325, 343				0	200	6	1,200	200	6	1,200			200	6	1,200				
Math Tutors				0	200	4	800	varies	4	800			varies	4	800				
Rm 147																			
Rm 222																			
Rm349																			
Rm 360																			
IT Technician Office - Rm 148				0	120	1	120	120	1	120			120	1	120				
Literacy Coordinator - Rm 185				0	120	1	120	120	1	120			120	1	120				
STEM Coordinator - Rm 184				0	120	1	120	120	1	120			120	1	120				
[Enter room type here]				0			0	0	0	0			0	0	0				
CUSTODIAL & MAINTENANCE	486			0			2,355			2,355					0			2,355	
Custodian's Office - Rm 155C				0	175	1	175	175	1	175			25	0	25	150	1	150	
Custodian's Workshop				0	0	0	0	0	0	0			-375	-1	-375	375	1	375	
Custodian's Storage - Rm 155B				0	206	1	206	206	1	206			-169	0	-169	375	1	375	
Recycling Room / Trash - Rm 155A				0	413	1	413	413	1	413			13	0	13	400	1	400	
Receiving and General Supply Rm 155				0	1,159	1	1,159	1,159	1	1,159			807	0	807	352	1	352	
Storeroom				0	0	0	0	0	0	0			-503	-1	-503	503	1	503	
Network / Telecom Room -Rm 149				0	200	1	200	200	1	200			0	0	0	200	1	200	
Custodian Storage - Rm 248					202	1	202	202	1	202			202	1	202				
[insert room type here]				0			0	0	0	0			0	0	0				
OTHER	2,765			0			5,800			5,800					5,800			0	
(List rooms separately below)							5,800												
Pre-Kindergarten Classroom with Toilet (if applicable)				0	varies	3	3,510	varies	3	3,510			varies	3	3,510	1,200	0	-	1,100 NSF (minimum size) - 1,300 NSF (maximum size)
Rm 110					1165														
Rm 112					1173														
Rm 114					1172														
Extended Learning PK				0	varies	5	790	varies	5	790			varies	5	790				
Rm 105A					43														
Rm 105B					233														
Rm 105C					140														
Rm 105D					215														
Rm 105E					159														
Teacher Wellness Room - Rm 125A, 224A, 327A				0	100	3	300	100	3	300			100	3	300				
CARES program Coorinator Office - Rm 175				0	150	1	150	150	1	150			150	1	150				
CARES Site Coorinator Office - Rm 176					150	1	150	150	1	150			150	1	150				
Health Classroom - Rm 204				0	900	1	900	900	1	900			900	1	900				
[Enter room type here]				0			0	0	0	0			0	0	0				

Proposed Space Summary - PK-5 Elementary School

PreK-5th Configuration - Revised 4/18/25

Date: 5/1/2025 Schematic Design Submittal

Wilmington Public Schools Wildwood Early Childhood Center	Existing Totals	PROPOSED PROGRAM									VARIATION TO MSBA GUIDELINES			MSBA GUIDELINES (DO NOT MODIFY) (Refer to Educational Facility Planning for additional information)			
		EXISTING TO REMAIN / RENOVATED			NEW CONSTRUCTION			TOTAL									
ROOM TYPE		ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	ROOM NFA[1]	# OF ROOMS	AREA TOTALS	COMMENTS
Total Building Net Floor Area (NFA)	93,232			0			110,024			110,024			34,859			75,165	**Total Building Net Floor Area (NFA)**
Proposed Student Capacity / Enrollment														# of Grades	6	755	**Total Enrollment (Enter Design Enrollment)**
														K	1	126	Kindergarten Enrollment
														Grade 1	1	252	Lower Elementary School Enrollment (Grades 1-2)
														Grade 2	1	378	Upper Elementary School Enrollment (Grades 3-6)
														Grade 3	1		
														Grade 4	1		
														Grade 5	1		
														Grade 6	0		
NON-PROGRAMMED SPACES			% of GFA	0		% of GFA	55,011		% of GFA	55,011							Complete this category with Schematic Design Submittal
Other Occupied Rooms (List rooms separately below)																	
PT Storage Rm 192A		-	#DIV/0!		-	0.2%	250	-	0.2%	250							
CARES Storage - Rm 154		-	#DIV/0!		-	0.3%	500	-	0.3%	500							
[Enter room type here]		-	#DIV/0!		-	0.0%		-	0.0%	0							
[Enter room type here]		-	#DIV/0!		-	0.0%		-	0.0%	0							
[Enter room type here]		-	#DIV/0!		-	0.0%		-	0.0%	0							
Unoccupied MEP / FP Spaces		-	#DIV/0!		-	0.0%		-	0.0%	0							
Unoccupied Closets, Supply Rooms, and Storage Rooms		-	#DIV/0!		-	0.0%		-	0.0%	0							
Toilet Rooms		-	#DIV/0!		-	0.0%		-	0.0%	0							
Circulation (corridors, stairs, ramps and elevators)		-	#DIV/0!		-	0.0%		-	0.0%	0							
Remaining[3]		-	#DIV/0!	0	-	32.9%	54,261	-	32.9%	54,261							
Total Building Gross Floor Area (GFA)[2]	138,614			0			165,035			165,035			55,560			109,475	**Total Building Gross Floor Area (GFA)[2]**
Grossing Factor (GFA / NFA)				#DIV/0!			1.50			1.50			0.04			1.46	**Grossing Factor (GFA / NFA)**

	PDP	PSR	SD	Difference
[1] **Individual Room Net Floor Area (NFA)**	167,900	163,573	165,035	1,462

[2] **Total Building Gross Floor Area (GFA)**

[3] **Remaining**

Architect Certification

I hereby certify that all of the information provided in this "Proposed Space Summary" is true, complete and accurate and, except as agreed to in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.

Name of Architecture Firm: Dore + Whittier

Name of Principal Architect: Donald M Walter

Signature of Principal Architect: Donald M Walter

Digitally signed by Donald M Walter
DN: C=US, E=dwalter@doreandwhittier.com, O="Dore + Whittier", CN=Donald M Walter
Date: 2025.04.18 19:08:59-04'00'

Date: 4/18/25

Deviations From MSBA Guidelines – 755 Students + 100 PreK

The proposed space summary identifies a need of 165,035 GSF at a net to gross multiplier of 1.5 to serve the educational program, a deviation of 55,560* GSF from the MSBA guidelines for K-5th grade population of 755 students + approximately 100 PreK students. The narrative that follows offers evidence and support for these deviations.

Below is a summary of the initial proposed Space Summary as it has progressed through the MSBA process:

	Existing Wildwood, Woburn St and North Int. Schools Combined	PDP	Preferred Schematic Report	Schematic Design Report
Program Area	TOTAL NSF	TOTAL NSF	TOTAL NSF	TOTAL NSF
Core Academic	36,096	45,700	45,700	45,700
Special Education	11,300	19,010	19,010	19,010
Art & Music	6,315	4,040	4,040	5,082
Health & Physical Education	9,772	12,300	12,300	12,300
Media Center	2,265	4,068	4,068	4,068
Dining & Food Service	13,620	9,458	9,458	9,458
Medical	603	710	710	710
Administration & Guidance	5,582	5,308	5,308	5,548
Custodial & Maintenance	2,654	2,355	2,355	2,355
Other	2,764	6,100	6,100	5,800
TOTAL NSF	90,972	110,240	110,240	110,024
TOTAL GSF	138,614	163,573	163,573	165,035

* It is important to note that the MSBA Space Summary Template for this enrollment is based on a net to gross multiplier of only 1.46.

CORE ACADEMIC

The core academic program category totals 45,700 NSF, a deviation of +10,450 NSF from the MSBA guideline. The proposed space summary deviates from MSBA guidelines in four key ways: general classrooms, ELL classrooms, teacher collaboration spaces, and extended learning areas.

The first deviating factor relates to additional classrooms. Under a consolidated student population, the District requests thirty general classrooms for grades 1st – 5th, a deviation of three classrooms from the MSBA guidelines of twenty-seven general classrooms for grades 1st – 5th. The need for additional classrooms is a direct result of the District's local class size guidelines and current class models which are presented in detail in the educational program narrative.

The second factor leading to the deviation in Core Academic square footage is a demographic shift in Wilmington that has resulted in more students who qualify for English Language Learner services and programs. The proposed space summary deviates from MSBA guidelines by providing two half-sized classroom spaces to accommodate these services totaling 900 NSF.

The third factor leading to the deviation in Core Academic square footage is the additional space requested to support professional collaboration among faculty and staff. The district requests three 900 NSF Teacher Collaboration Spaces, one centrally located on each level. These spaces are to serve for common planning time, data meetings, and professional development spaces. They may also house a few hoteling desks for volunteers and itinerant staff if they don't have a professional home base elsewhere in the project. It is important to note that the district has tuned the space allocation since PSR to better meet its specific needs. After further review, the district realized the number of educators are more evenly distributed over three levels than originally anticipated. The number of Teacher Collaboration spaces was reduced from six to three while maintaining the same overall square footage of 2,700 NSF and evenly distributing on each level. The three teacher collaboration spaces are now centrally located between academic wings on each floor for greater access and flexibility of use.

The final factor in the deviation between the proposed space for Core Academics and the MSBA guidelines for this category is the additional space requested for Extended Learning. The needs and intent for this space are explained in the educational program narrative. The proposed Core Academic area includes thirty Extended Learning areas of varying sizes and locations totaling 5,744 NSF. This is a 456 SF decrease from PSR as some area from Kindergarten extended learning was allocated back to the Kindergarten classrooms and does not change the net square footage of the Core academic category.

The District is proposing three Pre-Kindergarten classrooms to support the current program and expand the program's offering with a full day class. At the PSR submittal, all of the net square footage associated with Pre-Kindergarten classrooms were recategorized into the "Other" category and remains there in the Schematic Design submittal.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

SPECIAL EDUCATION

The Special Education program category totals 19,010 NSF, a deviation of +9,950 NSF from the MSBA guidelines. Several District-specific programs and services contribute to much of this deviation, including dedicated space to support programs like the substantially separate, self-contained Strides program and services such as Occupational Therapy and Physical Therapy all outlined in the Special Education sub-section of the Educational Program Narrative. PT Storage was removed based on MSBA PDP comments to "Non-programmed Spaces" category.

The remaining deviation in square footage is a result of the district's request for twenty-six (26) small group rooms and a request for a series of spaces associated with support service professionals: School Psychologists, Speech and Language Pathologists, and Board-Certified Behavioral Analysists all of which exclusively serve students with special needs. Small group rooms are located between pairs of classrooms to serve as supplemental instructional environments that are physically and visually connected directly to, but acoustically separate from, the general classroom. These spaces would primarily serve students who receive supports from professionals beyond the general classroom teacher but would also be a critical resource to general education teachers for small group activities and differentiated instruction consistent with Universal Design for Learning.

It should be noted that the toilet room for the Stages Program serving 3rd – 5th grades was not accounted for in the PSR submittal and has since been added to the program. However design progress has reallocated square foot area between individual toilet rooms within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal to accommodate the additional toilet room.

The overall NSF of this category remains unchanged since the PSR submittal.

ART & MUSIC

The art and music program category totals 5,075 NSF, indicating an increase of 1,035 NSF in this category from PSR, and alignment with the MSBA guidelines.

The increase in the category total since PSR is the result of on-going programming meetings with end users and further analysis of scheduling and operational use for a PK-5 configuration. The functional needs for art and music spaces vary significantly, warranting a second flex space and assigning a primary function to each flex space in the program, one for art on the second level and the other for

music on the first level. When not in use by these programs, flex rooms can serve as a multi-purpose space for other programs and a resource for the CARES program and community after-school.

It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

HEALTH & PHYSICAL EDUCATION

The health & physical education program category totals 12,300 NSF, a deviation of +6,000 NSF from the MSBA guidelines.

The overall NSF of this category remains unchanged since the PSR submittal.

MEDIA CENTER

The media center program category totals 4,068 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area within this category as the design was further developed to account for a workroom.

DINING & FOOD SERVICE

The dining and food services program category totals 9,458 NSF, which aligns with MSBA guidelines for this category. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as the design was further developed. As articulated in PDP and PSR, the District directed the Design Team to size the dining room to accommodate all kindergarten through 5th grade students in three seatings. Given the plan to operate three seatings rather than two, the reduced square footage in the dining room will still be able to accommodate enrollment growth in the future.

The overall NSF of this category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal.

MEDICAL

The medical program category totals 710 NSF, which aligns with MSBA guidelines. The overall NSF of this category remains unchanged since the PSR submittal.

ADMINISTRATION & GUIDANCE

The administration & guidance program category totals 5,548 NSF, a deviation of +2,658 NSF from the MSBA Guidelines and increase of +240 NSF since PSR. It is important to note that the district has increased the proposed NSF to tune this category for its specific local needs. The deviation is related to providing office and instructional spaces for student support service providers who serve both general and special education students. Since PSR, an audit of spaces recognized two professionals originally identified in the District's Educational Plan, a Literacy Coordinator and STEM Coordinator, and allocated space within administration, increasing this category by +240 NSF.

CUSTODIAL AND MAINTENANCE

The custodial and maintenance program category totals 2,355 NSF, which is equal to the MSBA Guidelines.

This category remains unchanged since the PSR submittal. It is important to note, however, that design progress has reallocated square foot area between individual spaces within this category.

OTHER

Items in the "other" category total 5,800 NSF, a decrease of -300 NSF since PSR. Much of this deviation from results from providing (3) Prekindergarten general education classrooms, PreK extended learning areas, CARES spaces associated with the after-school program including (1) 150 NSF program coordinator office and (1) 150 NSF site coordinator office and a dedicated Health classroom at 900 NSF. The final deviation is the result of providing (3) 100 NSF teacher wellness spaces which are meant to accompany teacher collaboration spaces and serve as places to conduct a private/confidential phone call and double as a lactation space. The reduction from six to three wellness rooms since PSR correlates directly to the reduction in teacher collaboration spaces discussed in the Core Academic category.

It is important to note, however, that design progress has reallocated square foot area between the PreK extended learning areas and the PreK classrooms as individual space geometries, and therefore their sizes, have shifted slightly since the PSR submittal. The reallocation results in a decrease of 210 NSF in the PreK extended learning area.

NON-PROGRAMMED SPACES

Items in the "Non-programmed Spaces" category were added based on previous comments from MSBA:

PT Storage 250 NSF

Cares Storage 500 NSF

This category remains unchanged since the PSR submittal.

SUMMARY

In summary, the District and the Design team are proposing 110,024 NSF and 165,035 GSF to satisfy the educational program. These square footages deviate from the MSBA guidelines by 34,859 NSF and 55,560 GSF.

Space Measurement Analysis

Dore & Whittier uses Building Information Modelling (BIM) technology beginning with the feasibility study phase. This technology measures net square feet to the inside face of interior walls, to the exterior face of exterior walls for gross square feet and rounded to the nearest square foot. This data is then exported and translated into the Space Summary Template.

Our in-house methodology measures exterior square feet according to instructions provided by the MSBA. Everything from the exterior face of exterior walls is included in the calculation for gross square feet including all wall thicknesses, mechanical and plumbing chases, the elevator shaft on every floor, boiler rooms, and all MEP closets. Our methodology includes the entire stair on the first floor but only to the edge of floor level landings at any other levels. Additionally, areas open to below of occupied spaces are excluded from the GSF calculation.

What follows are colored confirmation drawings similar to those provided in the DESE submission. These drawings communicate room usage and current square foot area. These square foot measurements align with the MSBA space summary provided above.

Dore & Whittier certifies that all programmed areas plus all other areas as described in the preceding methodology equals the total gross square foot area of the project.

Donald M Walter

Digitally signed by Donald M Walter
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Date: 2025.04.18 14:22:36-04'00'

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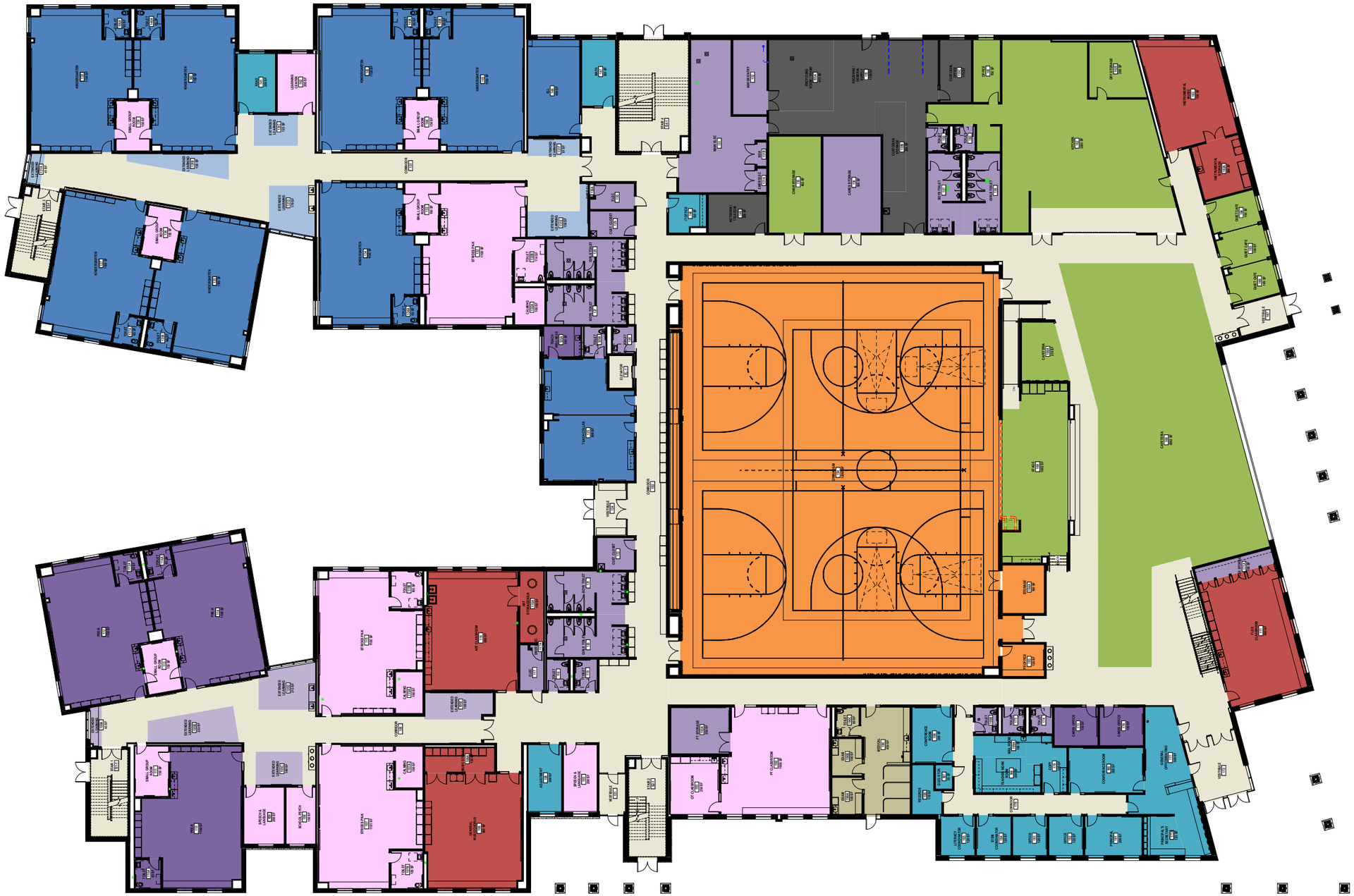
Donald M. Walter, AIA, Principal



PROGRAM FLOOR PLAN

LEVEL 1

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

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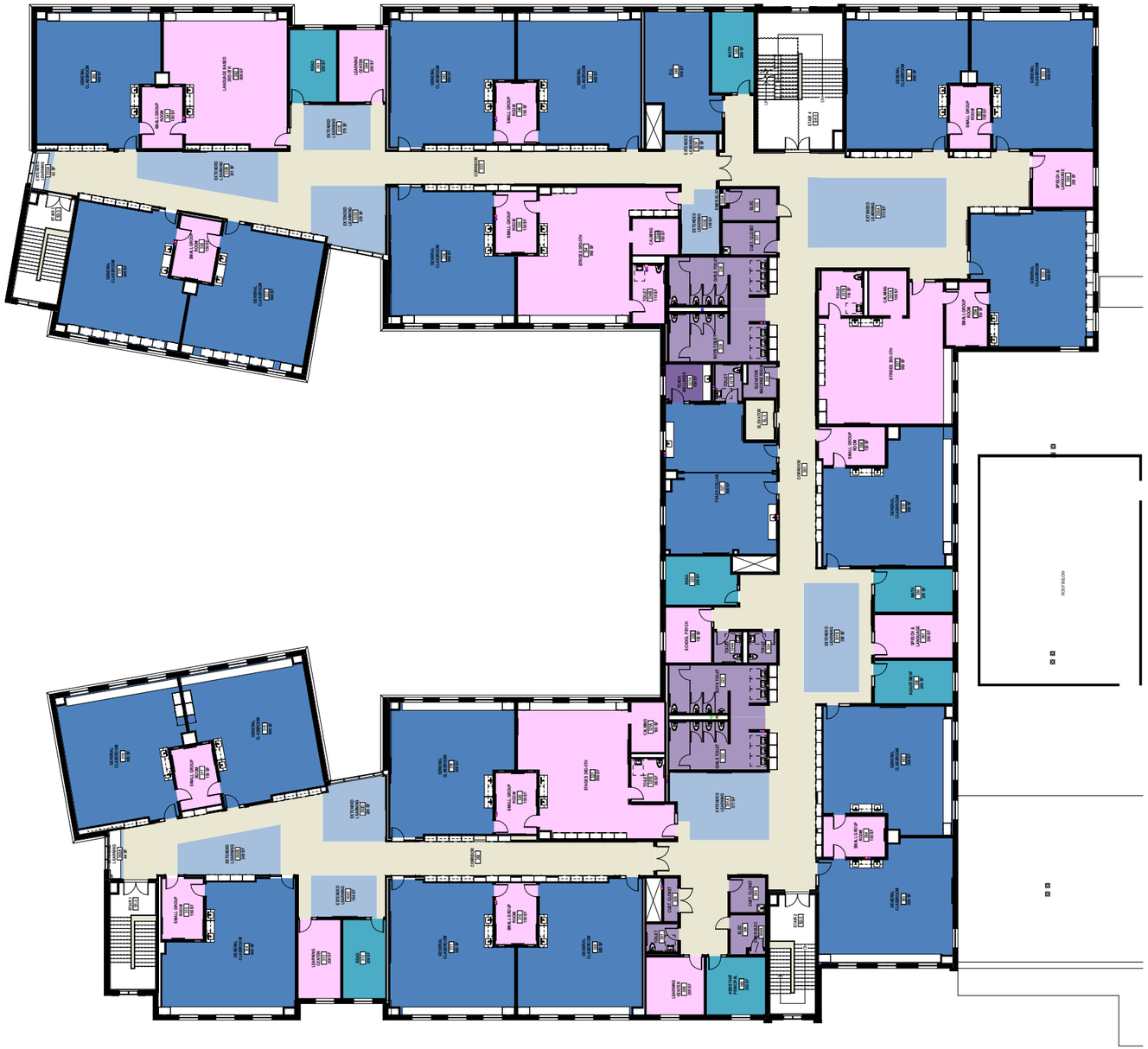

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0 16' 32' 64'

SCALE: 1/32"=1'-0"

PROGRAM FLOOR PLAN

LEVEL 3

Programming Legend

- Core Academic
- Special Education
- Art & Music
- Health & Physical Education
- Dining & Food Service
- Medical
- Administration & Guidance
- Media Center
- Custodial & Maintenance
- Dining & Food Service
- Other | Pre-Kindergarten
- Storage
- MEP
- Toilets
- Circulation

DORE + WHITTIER

Summary of Key Components of the Educational Program

The following narrative describes how the proposed project supports each component of the District's educational program. While the number and size of individual spaces in a few locations has evolved since the PSR submission as a result of continued design efforts, the proposed project continues to satisfy all the guiding principles identified by the District. The bulleted list below represents the Guiding Principles for Design established during the visioning sessions and documented both in the Preliminary Design Program and the Preferred Schematic Report.

The design patterns and responses delineated in the PSR for educational design features have not changed significantly in this SD submission, because the design did not significantly change. Descriptions below were lightly edited to bring them up to date with design refinements.

Guiding Principles	Design Patterns
Flexibility ***"As a result of the fact that education methodologies will change over the life span of the new school, we believe that the facility should be flexible to accommodate the evolution of programming that is necessary to meet student needs."***	Flexible and Varied Environments for Different Activities • The project includes general and special education classrooms, small group rooms, extended learning spaces, outdoor learning areas, and specialized instructional spaces. Extended Learning Spaces • The project includes extended learning spaces directly adjacent to classrooms in direct response to the Universal Design for Learning philosophy. These spaces are intentionally not all the same to support a wide variety of age-appropriate instructional and support activities as well as student choice in their learning environment. Media Center • The Media Center is centrally located for students and positioned in a highly visible and easily accessible location near to the main entry. With a high degree of visibility from within and from the outside of the school, it will serve to connect students and the wider community to learning. Maximize Storage to Extent Possible • The project includes specialized and dedicated storage for Art, Music, PE, the main administrative suite, student dining and food services, OT/PT, and custodial/maintenance. The design has also maximized storage in the form of furnishings and casework within program spaces.

Grade Level Communities ***"We intentionally seek to create grade-level learning communities for students and staff."***	Organize the academic/private zone into smaller communities • Each grade level can occupy a full level of an academic wing with its own identity and a shared connection with grade groupings. The first level houses the youngest PreK and Kindergarten students. The second level connects Grades 1 and 2. The upper elementary students in Grades 3, 4 and 5 occupy the top floor. • Each wing includes general and special education classrooms, small group rooms, extended learning spaces, outdoor learning areas, and specialized instructional spaces. • Wings are connected by a central corridor with additional support functions serving grades on that level, including teacher collaboration areas. Building zoned into public and private sections • Allow for public use of the building outside school hours without the need to provide access to the entire building interior. The design positions public elements of the project in the two-story, eastern half of the building. Academic elements are positioned in the three-story academic part of the building. Carefully planned egress paths and security doors allow different areas of the project to be secured from one another for after-hours events or in an emergency. Sufficient professional space for adult planning, collaboration, and professional development • The project includes three separate teacher collaboration spaces, one at each level, capable of supporting these functions. The rooms can be subdivided for multiple functions simultaneously. Each of these spaces also includes a small, acoustically separate wellness space for lactation/medical needs or private phone calls. Age-Appropriate, Engaging, Varied Experiences for Outdoor Play & Exploration • The playgrounds in the design are positioned to serve a specific grade grouping. The western playgrounds are specific for PreK-2nd grade groupings. The playground southwest of the courtyard is specialized for Prekindergarten and located adjacent to the PreK wing. Kindergarten to 2nd grade share the playground northwest of the courtyard and in close proximity to the academic wings. A third playground is located centrally on the site, close to the cafeteria and main entry for the oldest students in 3rd – 5th grades. These locations allow the exterior environments to be tuned for the developmental needs of those ages.

	• A variety of hardscape and outdoor learning areas are shared.

Universal Design for Learning
"We want to shape the educational program that intentionally integrates special education services throughout the school to ensure that we can support the integration of all children into the learning environment."
	Visible Learning that Includes and Serves all Learners
	• The building design creates a series of opportunities to put learning on display through the use of interior and exterior glazing and other design moves. Extended learning spaces, for example, are positioned outside classrooms with strong visual and physical connections between them to ensure their effectiveness and ease of use.
	
	Quiet Spaces
	• The project includes acoustically separate small group rooms, smaller extended learning spaces, and areas in the Cafeteria that can provide quieter environments.
	
	Learning Places to Allow for Whole-Body Learning
	• The project includes several multi-purpose spaces that allow for whole-body learning, including the Gymnasium, Cafeteria, OT/PT space, larger extended learning spaces, and outdoor learning and play areas.
	
	Shared Spaces between Classrooms
	• Each pair of classrooms share a small group room with access directly from the classrooms.
	• General and special education classrooms share access to extended learning areas and outdoor learning areas, particularly in the courtyard.
	
	Breakout and Collaborative Spaces
	• See narratives above regarding small group rooms and extended learning spaces. In addition to these, there are:
	  ○ teacher collaboration spaces designed for common planning and professional development
	  ○ administrative suite conference rooms
	All of these spaces can serve as collaborative environments.
	
	Inclusive Learning Spaces
	• The wide variety of spaces above and beyond the general and special education classrooms support the concept of integration – locating Special Educators and other professionals to where students are rather than send children to a remote classroom or office for supports. These environments are also effective at reducing stigma because they can and should be used by all students.
	• All learning spaces possess a wide variety of features to support the philosophy of Universal Learning for Design

	including access to technology, varied and mobile furnishings, direct access to daylight and views to nature, and opportunities for students to choose a learning environment to meet their specific needs. Dedicated collaboration space for adults • The project includes three shared Teacher Collaboration spaces meant to support common planning, data review, and professional development.

Additional Guiding Principles for Design

- Safety and Security – Design elements to provide safety and security of building and site.
  Site features protect pedestrians, the building and adjacent properties from vehicles. Site features limit access points, unwanted entry, and passive and active surveillance technologies. The site plan effectively separates parent vehicles and busses with dedicated areas for load/unloading and provides extensive queuing space for parent vehicles—80+ active vehicles in a wait queue. It features a dedicated parking area and entry for Pre-Kindergarten parent vehicles and specialized transportation, and protected, accessible walking paths to and from the building.

- Cost - Minimize both the overall project cost and the Town's share of the cost to the greatest extent feasible.
  The District and the Design Team have made revisions to the design since the project's inception to maximize the use of space and reduce the project's overall size without compromising the educational intent. Some spaces that may be considered ineligible have been removed from the project. The design also employs stacked program elements to simplify the project's geometries, massing, and structural system. Choices about materials, site features, and construction sequencing have been made to minimize project cost without sacrificing durability or maintenance.

- Construction Logistics - Minimize the complexity, construction duration, and impact to the use of the site for educational and community uses during construction.
  The proposed project is sited on the existing play fields northwest of the existing building. This location allows the entire proposed building to be constructed in one phase while the existing building remains in operation. This location also limits the disruption to the existing parking lot and site circulation patterns during construction.
  The decision to pursue Construction Manager at Risk supports this principle as well. Advantages with this methodology include early release packages to limit construction duration and the ability to procure long lead items or materials expected to increase in cost earlier in the project.

- Student, Faculty, and Staff Impact During Construction - Minimize the duration and scale of disruption to the learning experience.
  No construction will occur within the existing building which will limit the disruption to the learning experience during construction.

- Enrollment - Maximize the number of students positively impacted by the project within the financial objectives of the Town
  The proposed project supports the 755+ 100 PK student enrollment which will maximize the number of students positively impacted.

- Materials & Systems Selection - Prioritize durability, cleanability, simplicity of operation, and ease of maintenance.
  The Schematic Design estimate includes material choices that align with these goals. In some instances, more expensive materials were discussed and included in the design because they better aligned with these goals than less expensive options.

- Energy Efficiency - Maximize the energy efficiency of the building, site, and systems to the greatest extent feasible within the financial constraints of the project.
  The building and site have been designed to be LEED Gold, with Platinum as a stretch goal.

Instructional Technology Narrative

Vision

Wilmington Public Schools is committed to providing access to a digital learning environment so all students can achieve their full potential. To that end, WPS has following vision of technology and digital learning:

- Curriculum, Instruction, and Assessment: leverage technology in order to provide the most engaging, effective, and personalized learning environment.
- Technology, Networks, and Hardware: WPS will provide technology, network, and hardware to enable safe, but open access to digital resources throughout the building.
- Data and Privacy: WPS will provide a digital environment that ensures privacy, security of data, as well as the protection of students' identities while encouraging staff to use data to inform instruction, curriculum, and assessment.
- Professional Learning: WPS educators will engage in professional learning that builds competencies necessary to support 21st Century learning.
- Leadership: Administration and staff will support 21st Century learning initiatives that utilize technology to communicate, collaborate, engage, problem-solve, and create.

Establish a new 5-year Technology Plan to ensure that infrastructure, hardware, and software meet the needs of students and staff.

Practice

The four fundamental areas a new building needs to address are:

- Adequacy of Devices; Quality and Availability
    - Chromebooks supplied to each elementary classroom.
    - Additional access to PC's, Chromebooks, and other technologies that serve specific purposes, i.e. STEM labs, Library/Media Center, and non-classroom environments.
- 21st century classrooms
    - Both wired and wireless high-speed access to the internet
    - Digital displays, integrated sound systems, hearing impaired systems and separate notification and alert systems.
    - Spaces to collaborate, build and share with technology. These spaces should have wired and wireless access, power for charging devices and peripherals, and screens for projection of shared content.
- Staffing
    - Dedicated Instructional Technology Specialist to support the six elementary schools and collaborate with teachers to support technology integration through co-teaching, model teaching, and lesson planning support.
    - Instructional Technology Specialist to bring coding, robotics, STEM, and Internet safety lessons into the classroom through the classroom teacher.

    - Technical support handled by shared district staff with Desktop Technicians (3), a System Administrator, a Network Administrator, and a Director of Technology & Digital Learning managing the needs.
- Robust Network Infrastructure
    - Modern networking protocols
    - Fiber linking the building to the Town Fiber Optic network
    - Systems that are future-proofed to allow for addition to and upgrades over time
    - Appropriate facilities to maintain the network and building equipment

The design of the new building should provide for the following additional features:

- One cart of Chromebooks per classroom at all grades K-5 with a designed location for the cart with electrical power
- Additional Chromebooks and iPads for special education classrooms and programs with dedicated charging/storage stations
- Built-in classroom amplification systems and sound field systems with wireless teacher microphones
- Each classroom and learning space should have an interactive display panel like ClearTouch Panels. The district would like to explore mobile display options and maximize vertical display options to allow for flexible learning environments
- Sufficient space and equipment for STEM learning
- Large spaces such as the extended learning areas, cafe, and gymnasium should have built-in sound systems with support for hearing impairment and available connection to technology and projectors
- The district would like to explore emerging technologies to incorporate into the classroom environment such as interactive/immersive learning experiences
- The district is currently in the process of creating a new 5-year technology plan. We have surveyed staff, students, and families and will use this information and the new technology plan to help guide us in technology planning for a new building

Functional Relationships and Adjacencies

Functional and spatial relationships, adjacencies, and the relationship of interior and exterior program elements all impact the overall educational experience. During predesign, successfully defining these relationships ensured the efficiency and effectiveness of spaces and fully vetted the overall impact and/or support one space provides another in terms of how it benefits curriculum, instruction, the student/staff experience, safety, security, and community use.

Overall, the District desires to organize the building into two major zones. One zone is the “public” zone, which accommodates spaces that may be accessed by students, staff, and/or the community during and/or after school hours. These spaces include the cafeteria, gymnasium, music rooms, art rooms, library, nurse, and administrative offices. The second "private" zone includes all the remaining spaces.

Within the public zone, any design alternative should express the following:

- Administrative suite immediately adjacent to the main entry of the facility with direct visual access to the building approach and the main entry
- Medical Suite in proximity to the main office administrative suite
- Cafeteria/ stage near music such that the equipment from the music room can be easily moved into the cafeteria for performances
- Kitchen located immediately adjacent to the cafeteria and in close proximity to site service entry
- Programmed custodial/maintenance spaces located near kitchen and service entry
- Possess the ability to be secured from the remainder of the building during off-school hours, special events, or lockdown.

Within the private zone, any design alternatives should express the following:

- Academic areas organized into seven grade-level neighborhoods, each with:
    - Extended learning space
    - Small Group Rooms located between pairs of classrooms
    - Special education-related rooms as required by District Program
    - Pre-Kindergarten and Kindergarten located on the ground floor in proximity to outdoor learning environments
- Special education spaces distributed throughout all grade level teams to maximize inclusive practices, allow for effective delivery of related services
- Possess the ability to be secured from the remainder of the building during off-school hours, special events, or lockdown.
- Provide a wide variety of instructional spaces, including traditional classrooms, small group rooms, and extended learning spaces (XLAs) with strong visual and physical connections between these experiences to facilitate a wide variety of instructional practices, varying group sizes, and opportunities for inclusionary practices for student support services.
- Provide lower grades with access to calming areas with sensory options; upper grades access XLAs/outside classroom areas

- Create teacher collaboration spaces capable of supporting day-to-day planning activities, diagnostic student data meetings, and professional development experiences
- Create an environment that positions office and service-delivery spaces for student support services near and distributed amongst grade level classrooms
- Organize building into lower elementary and upper elementary grade level groupings with shared core spaces in between
- Organize building into grade level learning communities, but in such a way that limits isolation of any one grade-level and allows grade-level learning communities to expand in bubble years
- Reduce travel distances between classrooms and shared core space to the greatest extent possible

Site Features and Adjacencies

Dedicated site circulation for each of the following:

  - Parent vehicles
  - Buses/Vans
  - Pedestrians
  - Specialized transportation (requires a dedicated and separate loading/unloading zone, but may not require complete separation from bus circulation)
- Any proposed project should include the installation of age-appropriate fully accessible playgrounds located near the cafeteria to best facilitate the daily recess/lunch sequence. Additionally, the district would like to provide the following types of outdoor educational-based activities in either enrollment option:
  - Collection, examination, and analysis of soil, water, and plant samples
  - Offering of artistic and/or informational presentations in an amphitheater setting
  - Planting, maintenance, and harvesting of vegetable gardens

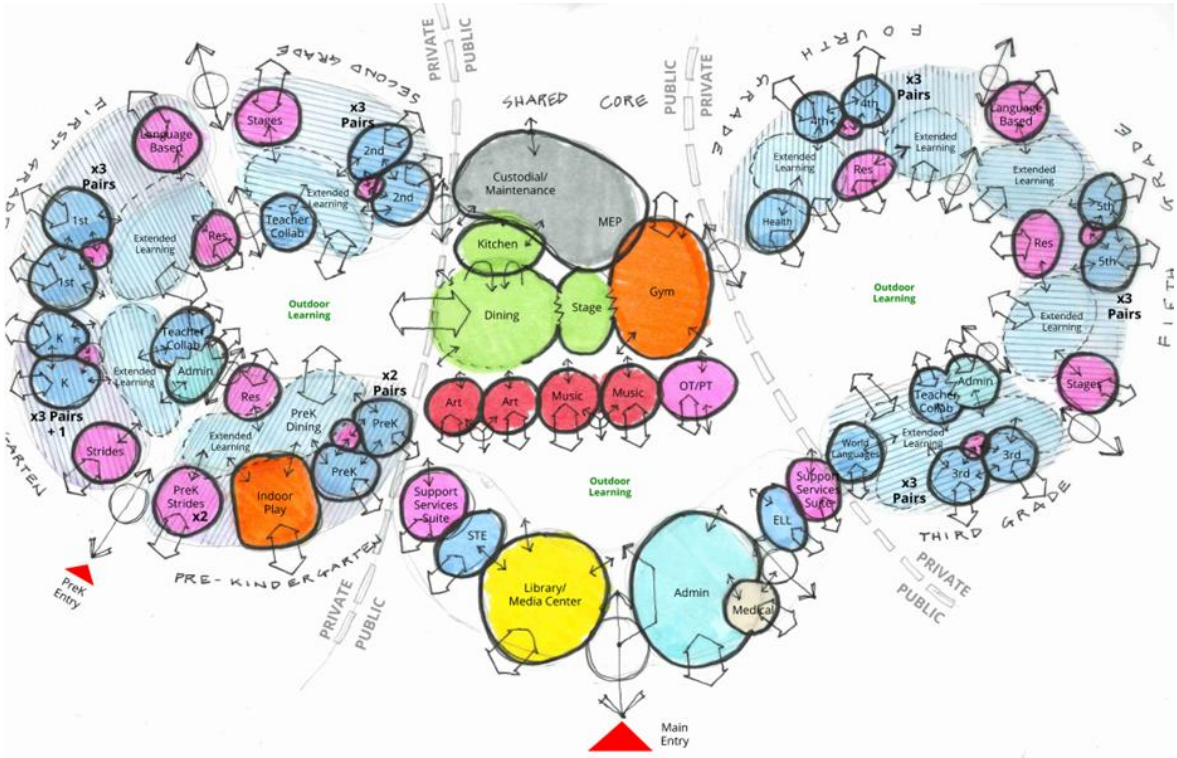
Design alternatives should express the following:

- All playgrounds in proximity to grade level classrooms and the cafeteria. This close geographic relationship will help to easily manage the transition from classroom to recess, from recess to the cafeteria, and from the cafeteria back to the classroom. Additionally, this relationship will support the capability of outdoor learning opportunities.
- A hardscape play area adjacent to playgrounds
- Emergency vehicle access to be coordinated with public safety requirements and positioned at the outermost edge of site planning to allow access to playgrounds and outdoor learning areas without the need to crossover the emergency vehicle pavement
- A paved service yard capable of supporting deliveries in a wide variety of vehicles
- Appropriate number of faculty and staff parking near the academic areas of the building and capable of doubling as event parking near public areas of the building (gym & cafeteria).
  - 140 spaces minimum (180 spaces preferred) for PreK-5th enrollment
  - 120 spaces minimum (150 spaces preferred) for PreK-3rd enrollment
  - 60 spaces minimum (100 spaces preferred) for PreK-K enrollment
- Physical education exercise, games, dance, and general movement activities

- Exploration of the wetlands on the property via paths and boardwalks

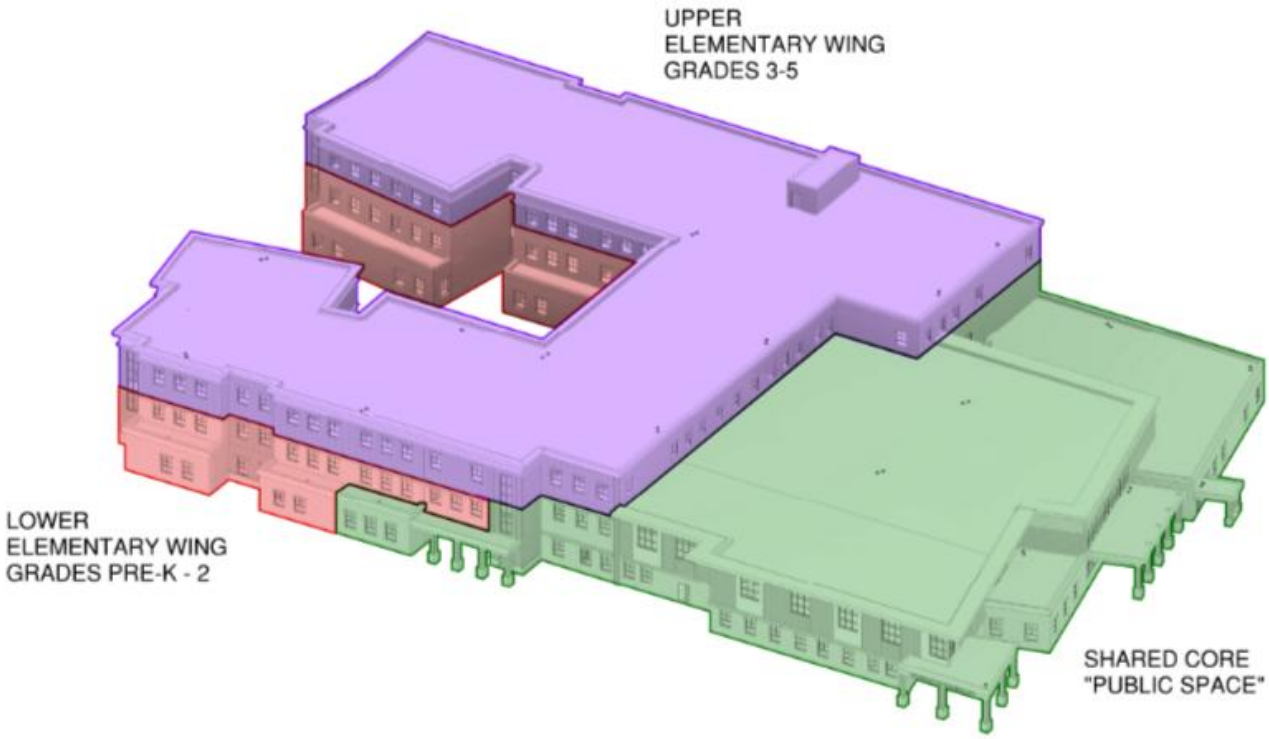
Conceptual Building Diagram

The overall building diagrams below express the District's idealized building layout and programmatic adjacencies. Although expressed as a single story in the diagram, an understanding exists that site characteristics and constraints may dictate a multi-story building design. Also expressed in the diagram is a need to separate parent vehicles and buses in the site circulation pattern, to allow access to playing fields and playgrounds without the need to cross parking or roadways, and an overall orientation of the building along a general East/West axis to maximize opportunities for natural daylight and other sustainability strategies.



Conceptual Planning Diagram

As noted above, the building as designed is divided between a "Public" core, and "private" academic wings—Lower and Upper Elementary. This design resolution is in keeping with the initial planning diagram as initially conceived. This building organization is important academically, organizationally for administration, as well as for safety and security and building code-driven features of the design.



Conceptual Building Organization Diagram

Security And Visual Access Requirements

The design of the new PK-5 elementary school project aims to Students who feel safe and secure in their environment will be better prepared and more successful within their education. For students to excel in school, they must feel safe, secure, and confident.

Access Control System

All exterior doors will be electronically monitored and be unlocked by a card-based access control system or by a push button intercom/camera system. The exterior doors that provide access to playgrounds and the fields will remain secured at all times with staff access via swipe/proximity card entry. The inner set of doors in the main entry vestibule will be locked at all times, except as specifically designated by school administration. Panic buttons that send a silent signal communication directly to 911 dispatch will be located in Administration. Doors at the security threshold between the “public” core and the “private” academic wings will be controlled by magnetic holders and programmed locked by access control, securing those wing areas during after-hours events. Interior doors will be equipped with locking systems that allow doors to be secured from the inside of the room. Any communicating doors will lock from both sides.

Security

The Design team has met with and will continue to be advised by the District and public safety officials. These initial meetings have reviewed topics such as:

- a detailed site-specific assessment identifying specific vulnerabilities including physical security review, human factors and emerging technologies which can be implemented in the design/build
- access to the site, and vehicular site circulation
- entry points to the building
- the security concept of dividing the building into two compartments with security thresholds between
- glazing: "bullet resistant", intrusion resistant, safety glazing, tempered, high strength vs the need for entry by emergency personnel
- card readers at exterior entrances
    - Master key control and access control

The District has outlined emergency procedures for each school, which will be re-written and customized for the opening of the new school.

Security and visual access for the new school facility will require a multi-layered systems approach. Technology such as cameras, intercoms, and automatic locking devices will be incorporated into the design as well as passive design elements where the building design is a tool for improved security. These design features include:

- Site design elements and signage that reinforce territoriality of the school property, and the reminder of heightened surveillance on campus.
- Visual access from the main administrative area to the main entry drive, parking area and building entrance.
- A secured main entry sequence consisting of a controlled vestibule with check-in window and intercom for visitor verification prior to entry into the building.
- Exterior doors with automatic locking hardware and card reader access.
- Separation of the public-use spaces such as gymnasium and cafeteria from the more private academic classroom spaces.
- Spatial relationship strategies that allow portions of the building to be secured independently and automatically in a lock-down or crisis situation and provides communication and administrators on both sides of the lock-down areas.
- Egress planning that both meets the building code requirements and permits effective evacuation protocols including connected rooms and dedicated stairwells on the academic side of the building.
- Classroom lockset hardware that allows doors to be locked from the inside quickly.
- Strategically placed interior glazing to foster a welcoming educational experience while still permitting effective shelter-in-place protocols. Such a strategy will include shading devices to limit visual intrusion in a crisis events.

- Vehicular access to the perimeter of the facility that provides multiple locations for safety or first responders to access the building.
- Landscaping strategies to prevent vehicular access to the building and pedestrians.
- Site circulation strategies and strategically located vehicular gates to prevent unwanted vehicles from entering certain areas of the site at certain times.
- Intrusion resistant glazing in strategic locations.
- Knox boxes located in strategic locations.
- Fire alarm control panel located in the vestibule of the main entrance.
- Security cameras throughout the facility and exterior with web-based monitoring capabilities for remote access. Security Cameras will be placed cameras to maintain operational views of the building, playgrounds, interior hallways, bathroom entrances, and public spaces such as the library, gymnasium, and cafeteria.

The proposed facility will be a secure building, while at the same time have a welcoming, community-oriented feel that is not compromised but rather enhanced by the additional security features.

Site Development Requirements

Parking

The proposed site design provides separate onsite bus, parent, and Pre-K drop off zones and parking for 193 cars. One hundred forty (140) parking spaces will be dedicated to the school staff with 20 spaces for the dual-use Pre-K park-and-drop off/ mini-buses. Additional spaces are for event parking. Overflow parking for events at the school can be accomplished using marked parallel-parking spaces on the outer lane of service drives for an additional 30+ spaces minimum, making a site total of 223+ spaces. Overflow parking will continue to be explored with the Town based on requirements in the By-laws as events would not be held on site when school is in operation.

Parking numbers were developed based upon expected teacher staffing, transient parking needs for professionals who travel between school buildings, and support staff counts. Parking is concentrated closer to Salem and Ballardvale Streets and in proximity to the main entry. The PreK parking is near the PreK entrance.

Bus Access

Buses will enter the site from Salem Street at the south entrance, travel towards the south side of the school for student pick-up and drop-off. Buses will exit the site at the south entrance to Salem Street.

Facility Service and Delivery

Service access to the site is from the entrance on Ballardvale Street. Delivery vehicles will follow the same entrance path as the Vehicle loop but will terminate at the delivery area and exit the site at the same location as they entered. The delivery and service area is located at the north end of the building.

Further discussion of Parking and Site Circulation, including illustrative existing and proposed circulation diagrams, is included in Section 4.1.2C – Traffic Analysis.

Aesthetic Focal Points

The building is designed to fit within the context of the overall Town aesthetic. The design team also took specific measures to try and help what will be one of the larger educational buildings in the town fit into a residential neighborhood by nestling the building into the site and away from the street.

Aerial view of the site

Once the viewer has arrived on the site, the two-story portion of the building is visible, before its totality is revealed as one approaches closer to the building. At that moment, the canopies marking the main entries become the focal point of the design, set against the more plain backdrop of the façade.

Main entries viewed from the east

The focal point in the school is the multi-functional dining area which greets students and visitors upon entering the school and serves as the central hub of the school connecting students to the media center and second floor connector via an open stair. This space is accented by large windows which provide a visual connection to the welcoming outdoor plaza. The dining area also serves as the smaller performance viewing area. The double-sided performance stage opens to the gymnasium for larger performance/event viewing.

Cafeteria

TRAFFIC ANALYSIS

Summary

Dore + Whittier, with the consultation of CDW Engineering and Nitsch Engineering Traffic division, conducted an existing conditions assessment in PDP and Traffic Impact Study of the site circulation as part of the proposed site design at the North Intermediate Site in SD. The traffic Analysis is located in Appendix X.04.

The design attempts to separate the streams of traffic from one another as quickly as possible once on-site. Other design improvements include:

- increased dedicated parking for faculty and staff
- addition of a Pre-K drop off parking area adjacent to a separate entrance into the building
- Separated, improved bus load/unload zone
- Safer, clearly defined sidewalks and crosswalks for bike and pedestrian users
- Greatly increased parent vehicle queue off Ballardvale Street, approximately 80+ vehicles
- Separation between the student outdoor activity area and the access roads
- Clear, adequately sized routes and setup locations for first responder emergency vehicles

The following narrative and plans outline the existing conditions and the proposed solution. Although some initial desktop study has been done, final turning radius and patterns for all vehicle types (delivery, bus, and emergency) will be further studied and included in the Design Development phase of this project.

Evaluation of Existing Traffic Patterns

Nitsch Engineering conducted a site visit to the proposed site on October 23, 2024, to observe adjacent roadway conditions and vehicle flow and operations. The North Intermediate site currently holds the North Intermediate School and a playground, baseball fields, soccer fields, tennis courts, and a basketball court. The existing school is one of two intermediate schools in the Wilmington Public School system and serves the north region of the Town. The existing North Intermediate School consists of a building with two stories for a total of 52,569 square feet. A paved play area and a parking lot are also present on the site. The North Intermediate School serves approximately 250 students in grades four and five.

Primary access to the North Intermediate School is provided by a loop on Salem Street, providing access to the main entrance at the south of the building. The loop accommodates one-way traffic, with an ingress driveway at the southeast corner of the building and an egress driveway at the southwest corner of the building. Bus drop-off and pick-up occurs at this loop. Additional access is located to the east of the building and is served by another pair of one-way driveways off Ballardvale Street. Parent drop-off and pick-up occurs in this area, which also provides approximately 52 parking spaces for school staff. Evening and weekend events are often a difficult situation for the school, as

some events require teachers' attendance as well as parents. With utilization already at full capacity, parents are left to park on neighboring streets.

Another major concern of the existing condition is the car queues and additional traffic extending onto Salem Street and Ballardvale Street with a proposed PK-5 population. The design team heard this feedback from neighbors at an abutters meeting held in January.

Buses

Buses are shared in the district and pick-up and drop off times are staggered based on the route.

North Intermediate School: Aerial Site Photos with Existing Conditions Circulation Diagrams

Proposed Traffic and Site Circulation

The proposed PreK-5 Elementary School will serve 755 students in grades K- 5, plus up to 100 Pre-K students, for a total of 855 students. The school will be located on the playfield to the northwest of the existing Norh Intermediate School. The new site design along with the demolition of the existing school building will allow a re-envisioning of the site circulation.

Vehicle Circulation On-Site

The design separates the streams of traffic from one another with separate entry/exit points. The design team heard feedback from neighbors at an abutters meeting held in January regarding traffic back up on Salem and Ballardvale Street. After further review with School administration and Municipal Departments, the design team is shifting the original intent for circulation.

The proposed site plan will have space for approximately 80 vehicles to queue on-site and off Ballardvale Street, with the first 10+ vehicles in that queue being in the active load/unload zone of the vehicle loop. The post-loading space on the exit roadway is an additional 8+ vehicles, making the total onsite stacking space at any one moment approximately 88 cars. The peak load factoring in household with multiple students, but without consideration of afterschool programs, is estimated conservatively at 165 vehicles by the district. This may be mitigated by slightly offsetting dismissal times by grade to spread out the peak time and greatly reduce congestion.

The project includes vehicle gates to control access during and after the school day. When closed, the gates will prevent vehicles from driving around the school building.

CARES Impact

Based on data provided by the school, over 200 families participate in the CARES before and after school program. The CARES program is offered all but 3 days of the school year. The design team in conjunction with the traffic consultant and district will review available data to understand the impact of this program and its likely significant reduction to the pick-up and drop-off needs for the proposed project in Design Development.

Buses

The number of buses under a consolidated school is anticipated at 12, depending on ridership and final routing.

Pedestrians and Bike Riders

Bike riders and pedestrians will use the brand-new bituminous sidewalks along the south edge at Salem Street and east edge at Ballardvale Street, that connect to existing sidewalk networks in nearby neighborhoods. Once on-site they will follow sidewalks to the main entry plaza with limited crossing points of vehicular lanes. Cyclists can lock their bikes at the bike parking area on the entry plaza.

Service access to the site is from the entrance on Ballardvale Street. Delivery vehicles will follow the same entrance path as the vehicle loop, stopping to deliver goods at the service area on the north

side of the building and exit the site at the same location as they entered. Small package deliveries such as USPS, FedEx or UPS can occur at the main entrance during the day without interfering with operations or safety.

Parking

The proposed site design provides separated onsite bus, parent, and Pre-K drop off zones and parking for 193 cars. One hundred five (140) parking spaces will be dedicated to the school staff with 20 spaces for the dual-use Pre-K park-and-drop off/ visitors lot. Remaining spaces are intended for event parking.

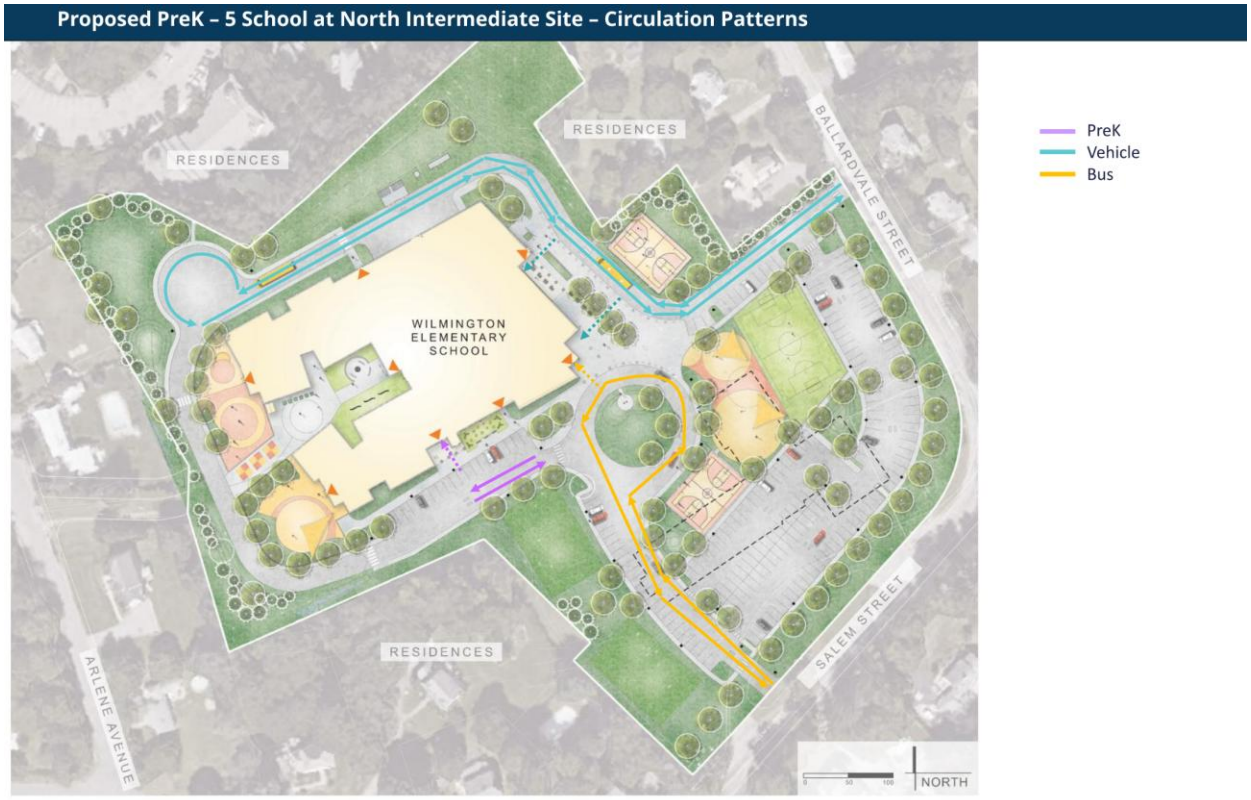
Wilmington Zoning has a requirement for "Educational" parking spaces: 1 space for each staff position, plus 1 space for each five persons of rated capacity of the largest auditorium, and 1 space for each student vehicle which can be expected at only one time on the premises.

The proposed gym is sized for 1,115 people, which equates to 223 parking spaces. An additional 140 staff parking spaces totals 363. Ideally the gymnasium would be used after hours for events. That may reduce the requirements for event parking to just the 223 spaces. Currently the site design includes 193 proposed spaces.

Additional overflow parking for events at the school can be accomplished using marked parallel-parking spaces on the outer lane of straight sections of vehicle drives behind the school for an additional 30+ spaces, making a site total of 223 spaces. The inner lane and curved corner sections of driveways would be marked and signed as a fire lane for emergency access all around the building, with no parking allowed. Overflow parking will be further reviewed during design development.

The number of 363 parking spaces would be burdensome and the design team will aim to seek relief from the zoning requirement recognizing several points of view:

- Building that much parking would preclude the inclusion of play areas on the site
- This amount of impervious area would be very difficult to permit on this site
- It would be a burdensome cost just to build these spaces, only to have more than half of them empty most of the time.



Effects on Off-Site Traffic

After adding the expected new traffic to the existing traffic on the adjacent intersections, the proposed school is expected to worsen operations at the intersection of Salem Street at Middlesex Avenue and Route 62 at Middlesex Avenue/High Street. Our analysis shows that the expected operational issues can be mitigated through signal retiming at the intersection of Route 62 at Middlesex Avenue/High Street. It is recommended that further study be conducted by the Town of Wilmington to address the existing operational deficiencies at the intersection of Salem Street and Middlesex Avenue in a manner that also provides excess capacity for the projected new trips from the proposed school. No significant impact is expected at the other study intersections.

The design team has met with the Town Engineer and DPW to review the results of the traffic study. The town intends to explore potential off-site improvements at the intersections noted in the traffic study in conjunction with the proposed project.

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Use this MEPA guideline checklist to check any aspects that apply to the project, to understand if an ENF/EIR, or any additional review from MEPA may be required.

MEPA Trigger	**(a) ENF and Mandatory EIR.** (Triggered by any of the items in this column)		**(b) ENF and Other MEPA Review if the Secretary So Requires.** (Triggered by any of the items in this column)	
DGA/ ENVIRONMENTAL JUSTICE PROTOCOLS	1. If your site has an Environmental Justice population within a 1-mile DGA (Designated Geographical Area) while the project DOES NOT (a) exceed any Air threshold at 301 CMR 11.03(8) OR; (b) generate 150 or more New ADT(Average Daily Traffic) of diesel vehicle traffic over a duration of 1 year (excluding public transit trips) 2. If your site has an Environmental Justice population within a 5-mile DGA (Designated Geographical Area) while the project (a) exceeds any Air threshold at 301 CMR 11.03(8) OR; (b) generates 150 or more New ADT(Average Daily Traffic) of diesel vehicle traffic over a duration of 1 year (excluding public transit trips)	☐ ☐ ☐ ☐	None	
LAND	1. Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices. 2. Creation of ten or more acres of impervious area.	☐ ☐	1. Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices. 2. Creation of five or more acres of impervious area. 3. Disposition or change in use of land or an interest in land subject to Article 97 of the Amendments to the Constitution of the Commonwealth, unless the Secretary waives or 4. Conversion of land in active agricultural use to nonagricultural use, provided the land includes soils classified as prime, state-important or unique by the United States 5. Release of an interest in land held for conservation, preservation or agricultural or watershed preservation purposes, unless the Secretary waives or modifies the replacement 6. Approval in accordance with M.G.L. c. 121A of a New urban redevelopment project or a fundamental change in an approved urban redevelopment project, provided that the 7. Approval in accordance with M.G.L. c. 121B of a New urban renewal plan or a major modification of an existing urban renewal plan.	☐ ☐ ☐ ☐ ☐ ☐ ☐
STATE-LISTED SPECIES UNDER M.G.L. c. 131A (Massachusetts Endangered Species Act).	None		1. Alteration of designated significant habitat. 2. Greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern.	☐ ☐
WETLANDS, WATERWAYS AND TIDELANDS.	1. Provided that a Permit is required: (a) alteration of one or more acres of salt marsh or bordering vegetating wetlands; or (b) alteration of ten or more acres of any other wetlands. 2. Alteration requiring a variance in accordance with the Wetlands Protection Act. 3. Construction of a New dam. 4. Structural alteration of an existing dam that causes an Expansion of 20% or any decrease in impoundment Capacity. 5. Provided that a Chapter 91 License is required, New non-water dependent use or Expansion of an existing non-water dependent structure, provided the use or structure occupies one or more acres of waterways or tidelands.	☐ ☐ ☐ ☐ ☐ ☐	1. Provided that a Permit is required: (a) alteration of coastal dune, barrier beach or coastal bank; (b) alteration of 500 or more linear feet of bank along a fish run or inland bank; (c) alteration of 1,000 or more sf of salt marsh or outstanding resource waters; (d) alteration of 5,000 or more sf of bordering or isolated vegetated wetlands; (e) New fill or structure or Expansion of existing fill or structure, except a pile- supported structure, in a velocity zone or regulatory floodway; or (f) alteration of ½ or more acres of any other wetlands. 2. Construction of a New roadway or bridge providing access to a barrier beach or a New utility line providing service to a structure on a barrier beach. 3. Dredging of 10,000 or more cy of material. 4. Disposal of 10,000 or more cy of dredged material, unless at a designated in-water disposal site. 5. Provided that a Chapter 91 License is required, New or existing unlicensed non-water dependent use of waterways or tidelands, unless the Project is an overhead utility line, a	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

			6. Construction, reconstruction or Expansion of an existing solid fill structure of 1,000 or more sf base area or of a pile-supported or bottom-anchored structure of 2,000 or more sf base area, except a seasonal, pile-held or bottom-anchored float, provided the structure occupies flowed tidelands or other waterways.	☐
WATER	1. New withdrawal or Expansion in withdrawal of: (a) 2,500,000 or more gpd from a surface water source; or (b) 1,500,000 or more gpd from a groundwater source. 2. New interbasin transfer of water of 1,000,000 or more gpd or any amount determined significant by the Water Resources Commission. 3. Construction of one or more New water mains ten or more miles in length. 4. Provided that the Project is undertaken by an Agency, New water service to a municipality or water district across a municipal boundary through New or existing	☐ ☐ ☐ ☐ ☐	1. New withdrawal or Expansion in withdrawal of 100,000 or more gpd from a water source that requires New construction for the withdrawal. 2. New withdrawal or Expansion in withdrawal of 500,000 or more gpd from a water supply system above the lesser of current system-wide authorized withdrawal volume or three- 3. Construction of one or more New water mains five or more miles in length. 4. Construction of a New drinking water treatment plant with a Capacity of 1,000,000 or more gpd. 5. Expansion of an existing drinking water treatment plant by the greater of 1,000,000 gpd or 10% of existing Capacity. 6. Alteration requiring a variance in accordance with the Watershed Protection Act, unless the Project consists solely of one single family dwelling. 7. Non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities.	☐ ☐ ☐ ☐ ☐ ☐ ☐
WASTEWATER	1. Construction of a New wastewater treatment and/or disposal facility with a Capacity of 2,500,000 or more gpd. 2. New interbasin transfer of wastewater of 1,000,000 or more gpd or any amount determined significant by the Water Resource Commission. 3. Construction of one or more New sewer mains ten or more miles in length. 4. Provided that the Project is undertaken by an Agency, New sewer service to a municipality or sewer district across a municipal boundary through New or existing 5. New discharge or Expansion in discharge of any amount of sewage, industrial waste water or untreated stormwater directly to an outstanding resource water. 6. New Capacity or Expansion in Capacity for storage, treatment, processing, combustion or disposal of 150 or more wet tpd of sewage sludge, sludge ash, grit, screenings, or other	☐ ☐ ☐ ☐ ☐ ☐	1. Construction of a New wastewater treatment and/or disposal facility with a Capacity of 100,000 or more gpd. 2. Expansion of an existing wastewater treatment and/or disposal facility by the greater of 100,000 gpd or 10% of existing Capacity. 3. Construction of one or more New sewer mains: (a) that will result in an Expansion in the flow to a wastewater treatment and/or disposal facility by 10% of existing Capacity; or (b) five or more miles in length. 4. New discharge or Expansion in discharge: (a) to a sewer system of 100,000 or more gpd of sewage, industrial waste water or untreated stormwater; (b) to a surface water of: i. 100,000 or more gpd of sewage; ii. 20,000 or more gpd of industrial waste water; or iii. any amount of sewage, industrial waste water or untreated stormwater requiring a variance from applicable water quality regulations; or (c) to groundwater of: i. 10,000 or more gpd of sewage within an area, zone or district established, delineated or identified as necessary or appropriate to protect a public drinking water supply, an ii. 50,000 or more gpd of sewage within any other area; iii. 20,000 or more gpd of industrial waste water; or iv. any amount of sewage, industrial waste water or untreated stormwater requiring approval by the Department of Environmental Protection of a variance from Title 5 of 5. New Capacity or Expansion in Capacity for: (a) combustion or disposal of any amount of sewage sludge, sludge ash, grit, screenings, or other sewage sludge residual materials; or (b) storage, treatment, or processing of 50 or more wet tpd of sewage sludge or sewage	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
TRANSPORTATION.	1. Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: (a) construction of a New roadway two or more miles in length; or (b) widening of an existing roadway by one or more travel lanes for two or more miles. 2. New interchange on a completed limited access highway. 3. Construction of a New airport. 4. Construction of a New runway or terminal at an existing airport. 5. Construction of a New rail or rapid transit line along a New, unused or abandoned right-of-way for transportation of passengers or freight (not including sidings, spurs or other lines	☐ ☐ ☐ ☐ ☐	1. Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: (a) construction of a New roadway one-quarter or more miles in length; or (b) widening of an existing roadway by four or more feet for one-half or more miles, excluding widening to add bicycle or pedestrian accomodations. 2. Construction, widening or maintenance of a roadway or its right-of-way that will: (a) alter the bank or terrain located ten more feet from the existing roadway for one- half or more miles, unless necessary to install a structure or equipment; (b) cut five or more living public shade trees of 14 or more inches in diameter at breast height; or (c) eliminate 300 or more feet of stone wall.	☐ ☐ ☐ ☐ ☐

	6. Generation of 3,000 or more New adt on roadways providing access to a single location. 7. Construction of 1,000 or more New parking spaces at a single location.	☐ ☐	3. Expansion of an existing runway at an airport. 4. Construction of a New taxiway at an airport. 5. Expansion of an existing taxiway at Logan Airport. 6. Expansion of an existing terminal at Logan Airport by 100,000 or more sf. 7. Expansion of an existing terminal at any other airport by 25,000 or more sf. 8. Construction of New or Expansion of existing air cargo buildings at an airport by 100,000 or more sf. 9. Conversion of a military airport to a non-military airport. 10. Construction of a New rail or rapid transit line for transportation of passengers or freight. 11. Discontinuation of passenger or freight service along a rail or rapid transit line. 12. Abandonment of a substantially intact rail or rapid transit right-of-way. 13. Generation of 2,000 or more New adt on roadways providing access to a single location. 14. Generation of 1,000 or more New adt on roadways providing access to a single location and construction of 150 or more New parking spaces at a single location. 15. Construction of 300 or more New parking spaces at a single location.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
ENERGY.	1. Construction of a New electric generating facility with a Capacity of 100 or more MW. 2. Expansion of an existing electric generating facility by 100 or more MW. 3. Construction of a New fuel pipeline ten or more miles in length. 4. Construction of electric transmission lines with a Capacity of 230 or more kv, provided the transmission lines are five or more miles in length along New, unused or abandoned right of way.	☐ ☐ ☐ ☐	1. Construction of a New electric generating facility with a Capacity of 25 or more MW. 2. Expansion of an existing electric generating facility by 25 or more MW. 3. Construction of a New fuel pipeline five or more miles in length. 4. Construction of electric transmission lines with a Capacity of 69 or more kv, provided the transmission lines are one or more miles in length along New, unused or abandoned right of way.	☐ ☐ ☐ ☐
AIR.	1. Construction of a New Stationary Source with federal potential emissions, after construction and the imposition of required controls, of: 250 tpy of any criteria air pollutant; 40 tpy of any HAP; 100 tpy of any combination of HAPs; or 100,000 tpy of GHGs based on CO2 Equivalent. 2. Modification of an existing Stationary Source with federal potential emissions that collectively will result, after construction and the imposition of required controls, of 75,000 tpy of GHGs based on CO2 Equivalent.	☐ ☐	1. Construction of a New Stationary Source with federal potential emissions, after construction and the imposition of required controls, of: 100 tpy of PM10, PM 2.5, CO, lead or SO2; 50 tpy of VOC or NOx; 10 tpy of any HAP; or 25 tpy of any combination of HAPs. 2. Modification of an existing Stationary Source resulting in a "significant net increase" in actual emissions, provided that the stationary source or facility is major for the pollutant. For purposes of this threshold, a "significant net increase" in actual emissions shall mean an increase in emissions of: 15 tpy of PM10; 10 tpy of PM 2.5; 100 tpy of CO; 40 tpy of SO2; 25 tpy of VOC or NOx; 0.6 tpy of lead.	☐ ☐
SOLID AND HAZARDOUS WASTE.	1. New Capacity or Expansion in Capacity of 150 or more tpd for storage, treatment, processing, combustion or disposal of solid waste, unless the Project is a transfer station, is an Expansion of an existing facility within a validly site assigned area for the proposed use, or is exempt from site assignment requirements.	☐	1. New Capacity or Expansion in Capacity for combustion or disposal of any quantity of solid waste, or storage, treatment or processing of 50 or more tpd of solid waste, unless the Project is exempt from site assignment requirements. 2. Provided that a Permit is required in accordance with M.G.L. c. 21D, New Capacity or Expansion in Capacity for the storage, recycling, treatment or disposal of hazardous waste.	☐ ☐
HISTORICAL AND ARCHAEOLOGICAL RESOURCES.	None		1. demolition of all or any exterior part of any Historic Structure listed in or located in any Historic District listed in the State Register of Historic Places or the Inventory of Historic and 2. destruction of all or any part of any Archaeological Site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the	☐ ☐
AREAS OF CRITICAL ENVIRONMENTAL CONCERN.	None		1. Any Project of ½ or more acres within a designated ACEC, unless the Project consists solely of one single family dwelling.	☐
REGULATIONS.	None		Promulgation of New or revised regulations, of which a primary purpose is protecting against Damage to the Environment, that significantly reduce: 1. standards for environmental protection; .	☐

			2.opportunities for public participation in permitting or other review processes; or 3. public access to information generated or provided in accordance with the regulations.	☐ ☐

Architect and Engineer Certification

By signing this certification, I hereby certify that all of the information provided in this "MEPA Trigger Checklist" is true, complete and accurate to the best of my knowledge and belief.

Dore & Whittier Architects, Inc.

Name of Architecture Firm

Lee Dore

Name of Architect

Signature of Architect

April 18, 2025

Date

By signing this certification, I hereby certify that all of the information provided in this "MEPA Trigger Checklist" is true, complete and accurate to the best of my knowledge and belief.

CDW Consultants

Name of Engineering Firm

Eric Wilhelmsen

Name of Engineer

Eric Wilhelmsen

Digitally signed by Eric Wilhelmsen
DN: C=US, E=ewilhelmsen@cdwconsultants.com, O=CDW Consultants Inc., CN=Eric Wilhelmsen
Date: 2025.04.18 11:43:58-04'00'

Signature of Engineer

April 18, 2025

Date

Date:	4/9/2025
District:	Wilmington School District
Project Name:	Wildwood Early Childhood Center
MSBA Project ID:	

SITE PERMIT	REQUIREMENTS	FILING DATE	EXPECTED RESPONSE DATE	TRIGGER - YES/NO	AGENCY COMMENTS/SUGGESTED ACTIONS	DESIGNER RESPONSES
CONCOM	NOI	MM/DD/YYYY	MM/DD/YYYY			On-site wetlands were flagged and identified as non-jurisdictional. A meeting with the local Conservation agent to confrim the non-juristional status should be held during the permitting process.
MHC	PNF	MM/DD/YYYY	MM/DD/YYYY			The exisitng building does not fall on any historic register and therefore does not require any MHC permitting.
MA-DOT	PNF with MHC	MM/DD/YYYY	MM/DD/YYYY			This project will provide work on local Town managed roadways.
MA-DEP	NOI	MM/DD/YYYY	MM/DD/YYYY			On-site wetlands were flagged identified as non-jurisdictional. A meeting with the local Conservation agent to confrim the non-juristional status should be held during the permitting process.
NHESP	NOI	MM/DD/YYYY	MM/DD/YYYY			This project does not require a NHESP permit.
MEPA	PNF with MHC	MM/DD/YYYY	MM/DD/YYYY			This project does not trigger any MEPA thresholds and does not require a MEPA permit.

Instructions to complete the permit tracking table:

1. Enter the date the PNF/NOI was filed.
2. Enter the date when the response is expected.
3. If a response is received from CONCOM/MHC/MA-DOT/MA-DEP/NHESP/MEPA, mention 'YES' in the 'trigger' column. Summarize the proposed/requested/mandated action by the agencies in a few words and corresponding Designer responses in the appropriate column. Please include the full response as an attachment with this submittal for MSBA's reference.
4. If there is no response by the expected response date, mention 'NO' in the 'trigger' column.
5. Indicate “Not Applicable” (where appropriate) in the "trigger" column and describe why each item is not applicable.
6. Describe the status of the following approvals. Any status updates/concerns/notes can be mentioned in the 'Designer Responses' column.
7. Make sure to attach the sheet with every submittal for the project to track any changes.
8. Provide the status of any other state or federal approval not listed above (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some items listed below may not be applicable to this project).
9. Provide a copy of the PNF, NOI, appropriate application forms and/or approval letters where applicable.

Architect and Engineer Certification

By signing this certification, I hereby certify that all of the information provided in this "Permit Tracking Table" is true, complete and accurate to the best of my knowledge and belief.

Name of Architecture Firm: Dore & Whittier Architects, Inc.

Name of Architect: Lee Dore

Signature of Architect:

Date: April 18, 2025

By signing this certification, I hereby certify that all of the information provided in this "Permit Tracking Table" is true, complete and accurate to the best of my knowledge and belief.

Name of Engineering Firm: CDW Consultants, Inc.

Name of Engineer: Eric Wilhelmsen

Signature of Engineer:

Date: 4/10/2025

SITE RISK ASSESSMENT & EVALUATION FOR ENVIRONMENTAL HAZARDS

Summary of Site Risk Assessment & Evaluation of Environmental Hazards

A Site Risk Assessment & Evaluation of Environmental Hazards was completed for the proposed site as part of the Preferred Schematic Report (see attachments). The Assessment relied on various sources to evaluate the potential for environmental events that could cause damage, degradation and/or occupant injury.

The selected site is at high risk from Extreme Precipitation – Urban Flooding due an increase in impervious surfaces and the potential for tree removal. However, the relatively large site offers ample opportunity for on-site treatment and management of stormwater. The site was determined to be at *low risk* from Extreme Precipitation – Riverine Flooding. The site is generally well suited to development.

Early in PSR, the design team met with Wilmington Public Safety officials to introduce the project and review alternatives. The group will not identify the potential school project as a designated emergency shelter.

SITE RISK ASSESSMENT & EVALUATION OF ENVIRONMENTAL HAZARDS

DORE + WHITTIER

Project: Wilmington Elementary School

Subject Site: North Intermediate School
320 Salem St. Wilmington, MA 01887

Preferred Option: PreK-5 N.1

Summary

This Site Risk Assessment & Evaluation of Environmental Hazards (the Assessment) was performed on the Project site to provide the District with information related to specific risks and/or hazards that may influence the suitability of the site or developmental considerations should the subject site be selected. This Assessment is specific to the selected project site and selected option (New Pre-K – 5). A summary of Assessments for all sites under consideration was incorporated into the MSBA Preferred Schematic Report.

Vulnerabilities Assessments

Flooding & Storm Surges

Floodplain Information was obtained from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), see Appendix X.10. All proposed sites are within a Zone X, which is identified as an area outside of the 0.2% chance (500-year) annual floodplain. Therefore, any redevelopment or new construction would not trigger a permit with respect to floodplain. Wilmington's annual average rainfall is 44.4 inches per year.

Using the Resilient Mass Action Team (RMAT) Climate Resilience Design Standards Tool (refer to attached report), the site is at *low risk* from flooding due to Sea Level Rise/Storm Surge and Extreme Precipitation – Riverine Flooding as it is not in an exposed location. The site was found to be at *high risk* for Extreme Precipitation – Urban Flooding if the selected option increases the site impervious area.

High Winds

The basic wind speed (*V*) for Risk Category III Buildings (Educational Group with more than 250 occupants) is 126 mph in accordance with Table 1604.11 of the 10th Edition of the Massachusetts State Building Code 780 CMR. A Surface Roughness Category B prevails in all directions surrounding the site for more than 2600 feet establishing the site as Exposure B. The building is not situated in a Hurricane Prone Region or a Wind-Borne Debris Region as defined by the Code.

The FEMA National Risk Index tool (refer to attached report) assesses risks associated with three types of wind events: hurricanes, tornadoes, and strong winds. These risks are aggregated for all of

Middlesex County and are not specific to the Town of Wilmington or the subject site. The Risk Index tool is focused primarily on assessing the potential for financial loss across a region and has limited use for a site-specific risk assessment. Still, some useful contextual data can be gleaned from the Risk Index report.

Middlesex county has experienced 30 hurricane events over the 171-year record-keeping period, resulting in an average annual frequency of 0.175 hurricanes per year, or about one hurricane event every 5.7 years. Because of Wilmington's relative inland location, it is at lower risk of the most severe hurricane impacts, which is reflected in the Building Code wind speed determination above. The County has also experienced 10 tornados since 1950 for an average of one tornado every 7.4 years. Most of the tornadoes have been relatively mild (EF2 or lower) and none of these tornadoes passed through Wilmington. However, the most severe tornado on record, a category EF3 event, crossed Tewksbury in 1974. The FEMA tool also documents 32 Strong Wind Events (classified as wind speeds over 58 mph) since 1986, or approximately one per year. While this data is not predictive, it is useful to the extent that it indicates the potential for experiencing high-wind storms or events with some regularity during the building's functional life span.

Extreme Temperatures

A cold wave is defined as a rapid drop in temperature over 24 hours and extreme cold temperatures for an extended period, typically affecting a large area. To determine the potential for cold waves, we can rely on the FEMA Risk Tool report for Middlesex County which indicates that the region experiences a cold wave approximately every 4 years and assigned a Risk Index Rating of Relatively Moderate for the region. The RMAT tool did not indicate any site-specific risk associated with extreme cold conditions.

Similarly, heat waves are periods of abnormally and uncomfortably hot and humid weather for a region. The FEMA Risk Tool reports a frequency of one heat wave every 1.33 years – or three times the frequency of cold waves noted above. The resulting Risk Index Rating associated with heat waves for the county is also Relatively Moderate. However, the RMAT tool determined that the subject site was at High Risk for extreme heat related events. The RMAT results cite increased impervious area and the removal of trees resulting in potentially less than 10% of the site under canopy cover as site-specific factors associated with this determination.

Winter Weather

The winter weather annualized frequency as determined by the FEMA Risk Tool represents the average number of Winter Weather Hazard events for the region. Winter Weather Hazards are storms where the main types of precipitation are freezing rain, sleet, and/or snow. The Risk Tool reports an average of 6.7 winter storm events per year, making it one of the most frequent climate events affecting the site. Because the events are relatively common and the community is well positioned to manage such events, the FEMA Risk Tool reported a Risk Index Rating associated with Winter Storms as Relatively Low.

Wilmington's annual average snow fall is 53.9 inches per year. The North School provides ample potential for effective on-site snow storage and management in the event of high snow accumulation storm events.

Ice storms are freezing rain events (rain that freezes on contact) with significant ice accumulations of 0.25 inches or greater. The FEMA Risk Tool reports an average of 2.7 freezing rain events per year, resulting in a Risk Index Rating of Relatively High. Ice storms often have increased potential to damage buildings, property, and agriculture as well as regional power distribution.

Power Outages

80% of power outages are attributable to weather events. In particular, high wind events, ice storms, heavy snow, and combination events such as blizzards all contribute to the majority of outages. Given the regional risk factors for winter storm events noted above, the subject site will experience power outages from time to time. Massachusetts electrical utility customers experience on average 8.7 hours of power outage per year. However, the Project location in Wilmington will utilize Reading Municipal Lighting & Power as the regional utility company. RMLP has an excellent record of system reliability throughout the year with an annual average interruption duration of just over 3 minutes and a peak monthly average outage duration of only 14 minutes (average for December, 2023). Similarly, the annual system interruption frequency is just over 0.03 interruptions per year, with a peak monthly average interruption frequency of 0.12 interruptions in July of 2023. RMLDs system reliability offers significant protection from power interruptions in general and in particular long-duration interruptions over the anticipated project life span.

Developmental Considerations

General Site Suitability

With respect to climate hazards and site resiliency assets, the site is generally well suited for development. Within the context of sites available for development in the Town of Wilmington, the subject site does not assume additional risk or vulnerability due to its specific location, exposure, or any immediate adjacencies.

Building Massing & Orientation

The building mass should leverage a relatively compact form with a low surface area to volume ratio in order to reduce shedding heat through the thermal envelope during cold weather events when power outages are more likely. In particular, minimizing roof exposure with multi-story configurations where possible will maximize the building volume for a given surface area exposure. A more compact building mass will also reduce the site impervious area, which is an important consideration for a site at elevated risk due to Extreme Precipitation – Urban Flooding.

Building orientation will have relatively little impact on resiliency strategies for the site. While specific fenestration orientation will have advantages with respect to day lighting, glare control, and passive heat gain, these considerations are not specific to site resiliency.

Floor Elevations of Occupied Areas and Critical Equipment

The subject site is not at risk for coastal flooding, storm surges, or riverine flooding. Therefore, there is no critical elevation to maintain for occupied floors or critical equipment. Given the sites risk associated with urban flooding, the lowest floor elevation should be situated above finish grade with the surrounding grade sloping away from the building as a passive flood mitigation strategy.

Stormwater Management

As was noted in the Vulnerability Assessment section, the subject site was found to be at *high risk* for Extreme Precipitation – Urban Flooding, particularly since the options proposed for this site will likely increase the impervious area. The ResilientMass Map & Data center project a 10.8% increase in total precipitation and a 14.8% increase in the 99th percentile storm rainfall for the target year 2070. Site-specific stormwater management design should consider both current and projected increases in rainfall event volume.

Building Materials

Site-specific consideration of building materials can generally be addressed in three categories.

- Superstructure: Because of the site's inland location well away from coastal brackish waters or salt spray, protection from corrosion is not a particular concern for the site. Exterior exposed structural steel members can be protected with conventional hot-dipped galvanized finish. Building foundations should be designed assuming freeze-thaw exposure category F2.
- Exterior Materials: High resilience to freeze-thaw cycling and UV degradation are the primary considerations for the selection of exterior building materials. Materials close to the ground should be highly durable with few or no open ventilation joints that would allow snow or ice to accumulate within wall cavities. Exterior concrete paving of pedestrian walks and near building entries should assume freeze-thaw exposure category F-3.
- Interior Materials: Finish floor surfaces in building entries, adjacent primary corridors, and high-traffic assembly areas should be selected to be highly durable when exposed to water, ice, snow, and de-icing chemicals.

Building Systems Selection

Mechanical (HVAC) systems that are all-electric will eliminate dependence on fossil fuel burning equipment for facility. However, all-electric systems are also dependent on a reliable and durable power grid for long-term viability. The resiliency and continued development of the regional power grid is outside of the control of the building owners. However, the FEMA Risk Tool indicates that Middlesex County has a Social Vulnerability rating of *Relatively Low* and a Community Resilience rating of *Relatively High*. These social categorizations suggest that the region is well suited to

continue to prioritize and invest in socially beneficial environmental improvements, such as maintenance and improvement of the regional power grid. It would be reasonable to expect that, in this region all-electric building systems will be highly resilient over the anticipated building life span. Where feasible, simplicity of operations and maintenance of the mechanical and electrical systems will improve the overall resilience of the system design.

Emergency Back-Up Systems

The building will be required to be designed with a generator to power emergency back-up systems. Diesel generators functional time is limited by the fuel tank size. However, given that the average electrical customer experiences less than one hour of power outage per year, conventional fuel tank sizes that anticipate 48 to 72 hours of operation should be more than adequate to deal with occasional intermittent outages. Natural gas generators are connected to the local gas utility and will not be subject to the same fuel tank size time limitations; in this regard, a natural gas generator is better suited for extreme long-term power outages (more than 48 hours).

The school building will be rooftop PV ready as required by Code. However, the installation of a PV array is not currently contemplated as part of the Project. If the Owner eventually intends to incorporate on-site renewable energy systems (electrical PV array – either roof-top or on-site), then energy storage systems should be considered to provide alternative back-up power. Alternative power sources will improve the overall facility resilience.

Emergency Event Design Considerations

The facility will not be designed or designated as an emergency shelter. Emergency event planning will be developed by the Owner considering primarily maintaining operations as a school facility.

North Site

Climate Resilience Design Standards Tool Project Report

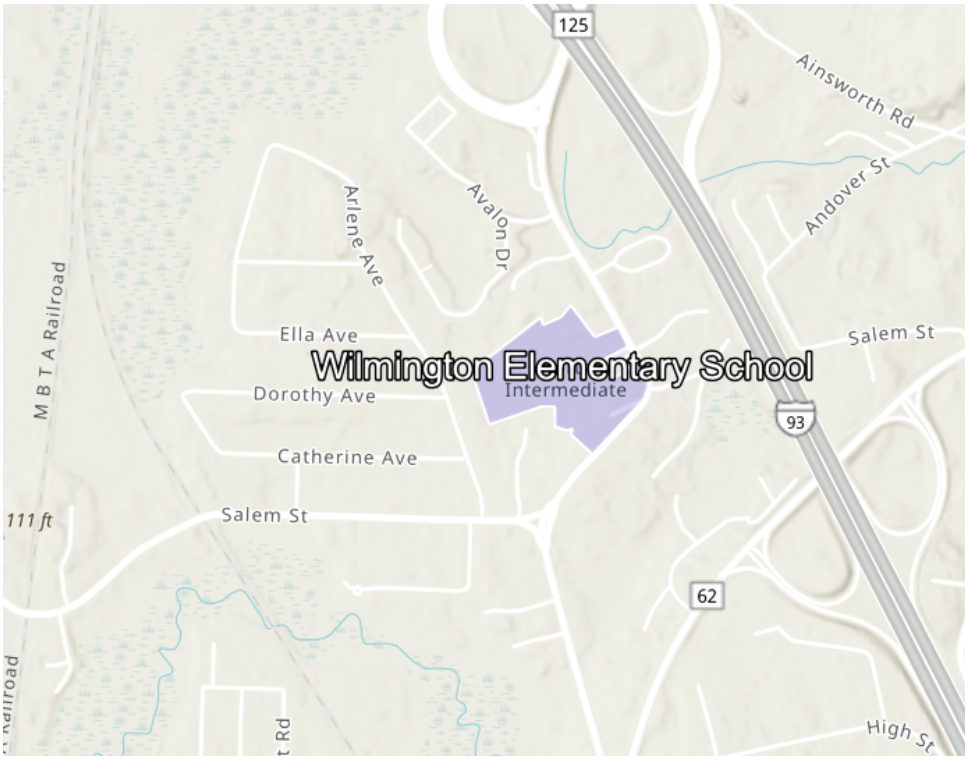
Wilmington Elementary School
Date Created: 11/23/2024 8:40:46 AM
Created By: dmentzer@doreandwhittier.com
Date Report Generated: 11/23/2024 2:04:14 PM
Tool Version: Version 1.2
Project Contact Information: David Mentzer (dmentzer@doreandwhittier.com)

Project Summary

Link to Project

Estimated Capital Cost: $183999998.00
End of Useful Life Year: 2076
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Moderate
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Urban Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	Not Exposed
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Elementary School	Low Risk	High Risk	Low Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Elementary School					
Extreme Precipitation					
Elementary School	2070			50-yr (2%)	Tier 3
Extreme Heat					
Elementary School	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Urban Flooding

This project received a "High Exposure" because of the following:

- Increased impervious area
- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- Existing impervious area of the project site is between 10% and 50%

Extreme Precipitation - Riverine Flooding

This project received a "Not Exposed" because of the following:

- No historic riverine flooding at project site
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Increased impervious area
- Existing trees are being removed as part of the proposed project
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Elementary School
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable for more than a day but less than a week after natural hazard event
- Less than 10,000 people would be directly affected by the loss/inoperability of the asset
- Few alternative programs and/or services are available to support the community
- Cost to replace is greater than $100 million
- There are no hazardous materials in the asset

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Elementary School — Building/Facility

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Elementary School	2070	50-Year (2%)	9.8	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat — High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Project Inputs

Core Project Information

Name:	Wilmington Elementary School
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2076
Location of Project:	Wilmington
Estimated Capital Cost:	$183,999,998
Who is the Submitting Entity?	Private Other Dore + Whittier Archtiects David Mentzer (dmentzer@doreandwhittier.com)
Is this project being submitted as part of a state grant application?	Yes
What stage are you in your project lifecycle?	Design
Is climate resiliency a core objective of this project?	Yes
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	Construction of new PK-5 school.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project protects public water supply
- ✓ Project promotes decarbonization
- ✓ Project recharges groundwater
- ✓ Project filters stormwater using green infrastructure
- ✓ Project remediates existing sources of pollution
- ✓ Project provides recreation
- ✓ Project improves air quality
- ✓ Project prevents pollution
- ✓ Project provides cultural resources/education

Factors to Improve Output

- ✓ Incorporate nature-based solutions that may provide flood protection
- ✓ Incorporate nature-based solutions that may reduce storm damage
- ✓ Incorporate nature-based solutions that improve water quality
- ✓ Incorporate nature-based solutions that sequester carbon carbon
- ✓ Increase biodiversity, protect critical habitat for species, manage invasive populations, and/or provide connectivity to other habitats
- ✓ Preserve, enhance, and/or restore coastal shellfish habitats
- ✓ Incorporate vegetation that provides pollinator habitat
- ✓ Increase plants, trees, and/or other vegetation to provide oxygen production

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	No
Recharges groundwater	Yes
Protects public water supply	Yes
Filters stormwater using green infrastructure	Yes
Improves water quality	No
Promotes decarbonization	Yes
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	Yes
Prevents pollution	Yes
Remediates existing sources of pollution	Yes
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	No
Provides recreation	Yes
Provides cultural resources/education	Yes

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	No
Does the project site have a history of riverine flooding?	No

Does the project result in a net increase in impervious area of the site?	Yes
Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Elementary School
Asset Type: Typically Occupied
Asset Sub-Type: School (primary, secondary, high, vocational, etc.)
Construction Type: New Construction
Construction Year: 2026
Useful Life: 50

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Building may be inaccessible/inoperable for more than a day, but less than a week after natural hazards events without consequences

Identify the geographic area directly affected by permanent loss or significant inoperability of the building/facility.
Impacts would be limited to local area and/or municipality

Identify the population directly served that would be affected by the permanent loss of use or inoperability of the building/facility.
Less than 10,000 people

Identify if the building/facility provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The building/facility does not provide services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

If the building/facility became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the building/facility would not be expected to result in injuries

If there are hazardous materials in your building/facility, what are the extent of impacts related to spills/releases of these materials?
There are no hazardous materials in the building/facility

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Moderate – Inoperability may impact other facilities, assets, or buildings, but is not expected to affect their ability to operate

If this building/facility was damaged beyond repair, how much would it approximately cost to replace?
Greater than or equal to $100 million

Is this a recreational facility which can be vacated during a natural hazard event?
No

If the building/facility became inoperable for longer than acceptable in Question 1, what are the public and/or social services impacts?
Few alternative programs and/or services are available to support the community

If the building/facility became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the building is not able to serve or operate its intended users or function)?
Loss of building is not expected to reduce the ability to maintain government services.

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts to loss of confidence in government (i.e. the building is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

ENVIRONMENTAL AND EXISTING BUILDING ASSSESSMENT

There has been no new site or building assessments quantifying the presence of hazardous materials, other than the original Hazardous Materials Survey included in Section 3.1.4 G 12 of the Preliminary Design Report for this project.

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GEOTECHNICAL AND GEO-ENVIRONMENTAL ANALYSIS

Summary

The existing North Intermediate site survey is included in Appendix Section X.05. The Schematic Design documents have been developed within the context of this survey and the current cost estimates reflect coordination with the existing site conditions.

Lahlaf Geotechnical Consulting, Inc. has performed a preliminary geotechnical investigation of the North Intermediate site which incorporated test borings, test pits, and laboratory testing of soil samples determine the general characteristics of the on-site soils, season water groundwater depth(s) and make recommendations with respect to the building foundation systems and site development considerations. More in depth analysis will occur on the site to confirm or modify preliminary findings, and to test soils permeability for stormwater management design. The complete geotechnical report and test borings maps are included in Appendix Section X.06. The current cost estimates reflect the findings and incorporate the recommendations of this investigation.

In addition to the Geotechnical investigation, PEER Consultants performed limited subsurface soil investigations; the resulting memorandum of their findings is included in Appendix X.07. Nine soil samples were visually characterized and screened. No VOCs, SVOCs, MCPs, PCBs, TPH, pesticides, or herbicides were reported at concentrations exceeding reportable levels that would require notification to the MassDEP. Elevated presumed “natural arsenic” levels were noted in the soil encountered within excavation limits of the proposed building footprint. PEER subsequently completed a Soil Quantity Estimates Memorandum, included in Appendix Section X.08 which sought to quantify the soil volume characterized as exhibiting elevated levels of presumed “natural arsenic” that may need to be removed and disposed of off-site. The cost estimates reflect the findings of these memorandums.

Next Steps

Early in Design Development phase, the project will undertake additional geotechnical exploration of the site as recommended in Section 3.1.3 of the Lahlaf report. This investigation will confirm soil conditions, foundation design, and water table elevations in an effort to further refine developmental costs for the project. Similarly, PEER Consultants will be engaged as the project LSP to continue exploration of the site geo-environmental considerations. Consideration of site cut & fill analysis as well as the anticipated quantity of presumed “natural arsenic” containing soil will be evaluated to determine if and how such soils can be re-used on site and how much can be removed and disposed of off-site.

The current cost estimates have taken a conservative approach to anticipating the costs for remediation and development of the site.

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CODE ANALYSIS

Project Summary & Applicable Codes

The Wilmington Elementary School (the Project) includes construction of a new elementary school serving grades Pre-Kindergarten through grade 5. This summary is intended to convey compliance of the completed school building project with the 10th Edition of the Massachusetts State Building Code (CMR 780) which is anticipated to be effective when the project is eligible for construction permitting.

Applicable Codes:

1. Massachusetts State Building Code (780 CMR), 10th Edition (2021 IBC with amendments)
2. Uniform Sate Plumbing Code (248 CMR 10.00)
3. Massachusetts Architectural Access Board (MAAB) Regulations (521 CMR)
4. 2010 Americans with Disabilities Act Standards for Accessible Design (where more stringent than MAAB)
5. Massachusetts Base Energy Code (780 CMR, Chapter 13), 10th Edition (2021 IECC with amendments)
6. Massachusetts Fire Code (537 CMR 1.00) 2021 NFPA 1 with MA Amendments
7. Massachusetts Electrical Code (527 CMR 12.00) 2023 NFPA 70 with MA Amendments
8. Massachusetts Board of Elevator Regulations (524 CMR)

Occupancy Characteristics

The completed project will contain classrooms for grades Pre-K through 5, administrative offices, a cafeteria (including a performance platform) and associated kitchen, a gymnasium, and associated support spaces (mechanical, electrical, and storage spaces).

The occupancy of the complex will be generally classified as Use Group E (Educational) as defined in Section 305 with specific functions and occupancies defined as follows:

Level	Function	Use Group
1	Classrooms	E
	Offices	B (2)

	Gymnasium	E (1)
	Media Center (Library)	E (1)
	Cafeteria & Kitchen	E (1)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)(3)
2	Classrooms	E
	Offices	B(2)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)
3	Classrooms	E
	Offices	B(2)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)

Note 1: Assembly areas that are accessory to Group E occupancies are not considered separate occupancies (§303.1.3).

Note 2: Accessory occupancies are not required to be separated from the main occupancy (§508.2.4).

Note 3: Incidental Accessory Occupancies shall be separated from the main occupancy as described in Table 509.

Physical Characteristics

The project is organized into a three-story classroom wing to the west and a one and two-story public spaces building to the east. The classroom wing contains primarily educational spaces while the public wing incorporates large volume assembly spaces, additional educational spaces, and administrative areas.

The total facility area of the project identified in the Code Plan Diagrams is described as follows:

Level	**Building Area (SF)**
1	76,560
2	42,479
3	41,692
Total:	**160,731**

The building heights from the average grade plane to highest portion of the flat roof can be characterized as follows:

Stories	Building Height (Area)
Three-Story	44 feet (Classrooms)
Two-Story	29 feet (Media Center, Gymnasium

Construction Type, Allowable Height, Allowable Area

Occupancy Separations & Mixed Use

The building is classified as **Type IIA** construction.

Allowable Height

The allowable tabular building height in feet as described in table 504.3 for Type II A, Group E in a building equipped with an automatic sprinkler system is **85 feet.** The maximum roof height, above the average grade is **44 feet,** at the three-story classroom wing.

The allowable tabular building height in stories as described in table 504.4 for Type II A, Group E in a building equipped with an automatic sprinkler system is **4 stories.** The maximum number of stories at the classroom wings is **3 stories.**

Allowable Area

The allowable tabular area in square feet as described in Table 506.2 for Type II B, Group E in a multistory building equipped with an automatic sprinkler system is **79,500 square feet**.

The project includes a fire access road providing 30-plus foot wide access to 100% of the perimeter of the building. The amount of Area Increase determined in accordance with Table 506.3.3 is **0.75.**

The Project is considered Mixed-Occupancy, Multistory building, and the allowable area for each story is determined in accordance with Section 506.2.2. Because the building is less than four stories, each story will comply individually with Section 508.1 for Mixed Use and Occupancy.

Allowable Area (Aa) = $[A_t + (NS \times I_f)]$

Aa = [79,500 + (26,500 x 0.75)] = **99,375 SF**

Levels 2, 3 includes unseparated accessory occupancies that do not occupy more than 10 percent of the floor area of the story and complies with Section 508.2 for Accessory Occupancies.

Level 1 includes accessory occupancies that do occupy more than 10 percent of the floor area of the story and will comply with with Section 508.4 for Separated Occupancies.

In order to comply with Section 508.4, portions of the B group occupancy (at the Administration Area), U group occupancies, and S-2 occupancies will be separated from the other occupancies in accordance with Table 508.4 as follows:

- Group B occupancies require a 1-hour fire-resistance rated separation with an automatic sprinkler system.
- Group U and S occupancies have no fire-resistance rated separation requirement with automatic sprinkler system.

Allowable areas for each occupancy group have been calculated assuming Single-Occupancy, Multistory Buildings for a three-story Construction Type IIA building in accordance with section 506.2.2. The allowable areas for each occupancy group are as follows:

Allowable Area-Educational (Aae) = [79,500 + (26,500 x 0.75)] = **99,375 SF**

Allowable Area-Business (Aab) = [112,500 + (37,500 x 0.75)] = **140,625 SF**

Allowable Area-Utility (Aau) = [57,000 + (19,000 x 0.75)] = **71,250 SF**

Allowable Area-Storage S-2 (Aas) = [237,000 + (79,000 x 0.75)] = **296,250 SF**

Level 1 - Allowable Building Area Sum of the Ratios Calculation

Separated Occupancy	Allowable Building Area	Actual Separated Occupancy Area	Ratio (Actual:Allowable)
E	99,375	67,547	0.680
B	140,625	3,590	0.026
U	71,250	3,802	0.053
S	296,250	1,620	0.005
		Sum of the Ratios:	**0.764**

Level 1 complies with Section 508.4 for separated mixed use.

The following Incidental Uses will be provided with the required separation and/or protection in accordance with Table 509:

Incidental Use per Table 509	Separation and/or Protection
Electrical rooms containing transformers over 112 1/2 Kva	1 hour separation [1]
Emergency Electrical rooms & closets	2 hour separation [1]

Note 1: Separation based on NEC requirement, included for convenience

Fire Resistance Rating of Building Elements:

Fire resistance rating of building elements for **Type IIA** construction are based on the requirements of Table 601 or by other code provisions as described below. Refer to Means of Egress section of this Summary for rating of egress components.

Primary Structural Elements

1 hour fire-resistance rating

- Fire protection of structural member in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.

- Heavy Timber complying with section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less fire-resistance rating is required.

The Project will utilize Heavy Timber framing in accordance with section 2304.11. Heavy Timber portions will support the roof construction over the Cafeteria.

Bearing Walls

Exterior: **1-hour** fire-resistance rating

Interior: **1-hour** fire-resistance rating

Other Exterior Walls

The building is significantly separated from any other building and therefore exterior walls are not subject to the fire resistive rating requirements based on separation distance in Table 602.

Exterior walls may be required to be rated in close proximity to exit enclosures in accordance with Section 1023.7.

Portions of exterior walls within 4 feet of the intersection with the fire wall between Code Buildings AB and C will be rated for 1-hour in accordance with section 706.5.1.2.

Interior Walls & Partitions

No requirement based on construction type per Table 601. Interior walls and partitions shall be rated based on the specific conditions outlined in the Occupancy Separations and Mixed Use, Building Separations, or Special Use & Occupancy Considerations sections of this Code Summary. Additional interior wall & partition ratings may also be required by other sections of the code and are described elsewhere in this Summary.

Floor Construction and Secondary Members:

1-hour fire-resistance rating

No requirement based on construction type per Table 601. Horizontal assemblies in compliance with Section 711.2 will be required to separate occupancies as outlined in the Occupancy Separations and Mixed Use, Building Separations, or Special Use & Occupancy Considerations sections of this Code Summary.

Roof Construction and Secondary Members:

1 hour fire-resistance rating

- Fire protection of structural member in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.

- Heavy Timber complying with section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less fire-resistance rating is required.

The Project will utilize Heavy Timber framing in accordance with section 2304.11. Heavy Timber portions will support the roof construction over the Cafeteria.

Means of Egress

Occupant Loads will be calculated based on Table 1004.1.2 for Assembly Spaces without fixed seating, by actual seat count for spaces with fixed seating (1004.4), or by the design occupant load where this value exceeds the tabular values in accordance with Section 1004.2. Occupant loads for individual spaces can be found on the Code Plan Diagrams.

For the sake of these calculations, General Classrooms and other instructional spaces intended to contain only loose furniture are calculated as “Classroom area” (20 net square feet per occupant). Art Studios, Music Classrooms, and other vocational or specialty instruction spaces intended to contain large amounts of fixed casework and/or equipment are calculated as “Shops and other vocational areas” (50 net square feet per occupant).

The number of required exits per story (per section 1006.3) and the total egress capacity required and provided are summarized on the Code Plan Diagrams.

Two exits or exit access doorways shall be provided from all spaces with a maximum occupant load larger than 49 per Table 1006.2.1; this requirement is applicable to all general classrooms with a net square footage over 1000 SF unless an alternative means of calculating the occupant load is reviewed and accepted by the Authority Having Jurisdiction.

Kindergarten and Pre-K classrooms will have a maximum occupancy of 49 posted at the door to the classrooms in lieu of the calculation at 20 SF / occupant. As such, the space is not required to have two means of egress, exit signs, or doors with exit devices.

Three exits shall be provided from spaces with an occupant load of 501 to 1,000 occupants, and four exits shall be provided from spaces with an occupant load greater than 1,000 occupants (1006.2.1.1). Exits shall be arranged in accordance with section 1007.1.1.

The maximum length of exit access travel distance shall not exceed 250 feet in accordance with Table 1017.2.

Corridors are not required to be rated per Table 1020.1.

Corridors with a required Educational occupancy of 100 or more shall not be less than 72" wide in accordance with Table 1020.2, or not less than 44" for all other portions of the building.

Dead end corridors shall not be greater than 50' in length (1020.4 Ex. 2)

Interior exit stairways, which provide a protected path of egress travel to the exit discharge, shall be enclosed with fire barriers and / or horizontal assemblies with a rating of not less than 1 hour (1023.2).

Exit access stairways, which serve only two stories, are not required to be enclosed with a rated shaft enclosure (1019.3.1).

Special Occupancy & Use Considerations

Cafeteria with Performance Platform

Total occupant loads for the Cafeteria where calculated assuming concentrated seating segregated into seating "zones". The total occupant load for the Cafeteria is greater than 50 and less than 500, requiring two means of egress per Section 1006.2.

The area identified on the plans as the Platform specifically meets the code definition of a Platform defined in section 202. Portions of section 410 related to stages, proscenium ratings, roof vents, egress from stairs, and

rated separations are not applicable to the platform. The construction of the platform will comply with section 410.4.

Gymnasium

The occupant load of the gymnasium has been calculated using a conservative approach that assumes an event such as a town meeting where loose chairs are organized on the gymnasium floor. Refer to the Code Plan for total occupant load. Using this assumption, the total occupancy of the gymnasium and platform exceeds 500 occupants, and three exits are required. All three of these exits pass into corridors.

Media Center

The occupant load for the Media Center has assumed portions of the space containing shelving will be classified as Stacks and the other portions will be classified as Reading Areas in accordance with table 1004.1.2.

Special Egress Considerations

Stairways:

Exit access stairways connecting only two stories not open to other stories are not required to be enclosed (1019.3, Ex. 1). The exit access stairway from the upper level adjacent to the Media Center that descends to the Cafeteria will not be enclosed.

Where the exterior stair enclosure walls are not rated, the exterior walls that are less than 180 degrees from the unrated exterior wall of a stairway enclosure shall have a fire resistance rating of not less than 1 hour for a distance of 10 feet from the stair enclosure per section 1023.7. Openings within these walls will have a fire protection rating of ¾ hour.

Fire Protection Systems

Sprinkler systems will be provided in accordance with 903.3.2(1)(a). Such systems will be NFPA 13 systems as required by Section 903.3.1.1

Sprinklers will not be provided in the elevator machine room per Section 903.2 Exception 2. Specific areas exempted from fire protection under section 903.3.1.1.1 require the approval of the fire code official.

Alternative fire-extinguishing systems shall be provided for all Type I hoods in commercial kitchens per section 904.2.2.

Because no floor level is more than 30 feet above the lowest level of fire department vehicle access, no Class III standpipes are required due to building height per section 905.3.1. However, a standpipe will be provided in the enclosed stair as directed by the local Fire Department.

Per section 905.4, Class I standpipe hose connections will be provided to improve the firefighting operations in the following locations:

- At floor level landings of enclosed egress stairs.

The new school will be provided with portable fire extinguishers in accordance with Section 906.1. In addition to general portable fire distribution, additional portable fire extinguishers will be provided in the following locations:

- Within 30 feet of commercial cooking equipment.
- In the elevator machine room.
- On each floor of structure *while under construction* (to be provided by the General Contractor).
- Where required by the International Fire Code sections on Table 906.1. (No such areas have been identified in the project).
- Special hazard areas such as Science Classrooms, Tech classrooms, or other locations required by the fire code official. (No such areas have been identified in the project).

Fire alarm and detection systems will be installed in accordance with Section 907. Refer to Fire Alarm drawings for additional information and requirements.

Emergency Power & Lighting

Emergency Power shall be provided by an on-site generator and in accordance with Chapter 27 to provide the illumination levels set forth in Section 1008. Refer to Electrical drawings for additional information related to generator and egress lighting.

Plumbing Fixtures

The required plumbing fixture types and counts have been calculated based on 248 CMR 10.00: Uniform State Plumbing Code, Table 1.

Toilet fixtures, including toilets and lavatories, are provided for Kindergarten and Pre-kindergarten students in dedicated classrooms, as permitted by 248 CMR section 10.10 (15)(c)12.d

Pre-Kindergarten
Classrooms with Unisex / Gender-neutral toilet rooms pet 10.10 (15)(c)12.d

	Students Only	Toilets	Lavs				Jan. Sink	DF
Required Student Fixtures[9]:	**90**	**5**	**9**				**1 per Flr**	
Provided:							YES	
Gen Neut Allocation[9]	1 Tlt Rm per Classroom	5	5					
Lavs Provide in Classrooms[10]	2 per Classroom		10					
Total Fixtures Provided:		**5**	**15**				**0**	**0**

Kindergarten
Classrooms with Unisex / Gender-neutral toilet rooms pet 10.10 (15)(c)12.d

	Students Only	Toilets	Lavs				Jan. Sink	DF
Required Student Fixtures[9]:	**144**	**6**	**6**				**1 per Flr**	
Provided:							YES	
Gen Neut Allocation[9]	1 Tlt Rm per Classroom	8	8					
Lavs Provide in Classrooms[10]	2 per Classroom		16					
Total Fixtures Provided:		**8**	**24**				**0**	**0**

Educational Occupancy Scenario - Whole Building (Excluding Pre-Kindergarten & Kindergarten)

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav	M Urinal	Jan. Sink	DF
Required Student Fixtures[1]:	**890**	**11**	**18**	**11**	**18**	**up to 50%**	**1 per Flr**	**7**
Provided:							4	7
Group Toilet Rooms		28	20	21	21	7		
Gen Neut Allocation[4]	0 GN	0	0	0	0			
Total Fixtures Provided:		**28**	**20**	**21**	**21**	**7**	**4**	**7**

Required Faculty Fixtures:

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav
Required Faculty Fixtures[2]:	**140**	**4**	**4**	**3**	**4**
Provided:					
Gen Neut Allocation[4]	13 GN = 7F / 6M	7	7	6	6
Total Fixtures Provided:		**7**	**7**	**6**	**6**

Assembly Occupancy Scenario - Code Building B

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav	M Urinal
Required Fixtures[3]:	**1115**	**16**	**12**	**8**	**12**	**up to 67%**
Provided[5]:						
Group Toilet Rooms		20	14	20	14	6
Gen Neut Allocation[4]	5 GN = 2F / 3M	1	1	1	1	0
Total Fixtures Provided:		**21**	**15**	**21**	**15**	**6**

1. Student Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Schools, Kindergarten, Middle & High School"
2. Faculty Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Schools, Kindergarten, Middle & High School Staff"
3. Student Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Assembly - Indoor Recreational Facilities, Rinks, Swimming Pools, Gymnasiums and Other with Spectator Seating (Patrons & Staff)"
4. Gender Neutral Allocation accounts for how designated single user gender neutral toilet rooms have been allocated to male or female fixture requirements to satisfy minimum fixture requiremetn of Table1.
5. Only "open to public" gang and single user toilet rooms on Level 1 have been included in the provided fixtures for Assembly use tabulation.
6. Gender Neutral toilet rooms are used to satisfy the minimum fixture requirements using one of the two options provided in 10.10(15)(g) for each occupancy group.
7. Where option (r) 2. is utilized, the balance of requried fixutres are provided in gender-designated gang toilet rooms
8. Where option (r) 1. is utilized, all required plumbing fixtures are provided in gender neutural single user toilet rooms
9. Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Pre-Schools and Daycare" one single user rest toom is allowed for up to 20 children and staff combined. The district has committed to a Pre-Kinderegarten target class size of 15 students per classroom.
10. Per 248 CMR 10.10(15)(c)(12)(d)(ii) for Students younger than six years old, lavatories may be installed in classroom areas.
11. Per 248 CMR 10.10(15)(c)(12)(d)(i) for Students younger than six years old, unisex/gender neutral toilet facilities may be installed.

The minimum fixture counts for students in Special Education classrooms and in Kindergarten through 2nd grade classrooms are provided as unisex/gender-neutral toilet rooms as permitted in section 10:10(15)(g)(2) of 248 CMR. Gang toilet rooms are provided to meet the required fixture counts for students in grades 3 through 5.

Energy Efficiency

Although the Town of Wilmington is not a Strech Code or Opt-In Code community, the new school building will be designed in accordance with the Massachusetts Municipal Opt-In Specialized Code (225 CMR 23.00: 2021 International Energy Code with Massachusetts Amendments, including Appendix CC.)

The Project will seek compliance through the Targeted Performance Compliance requirements of Section C401.2.1(2).

The building envelope will demonstrate compliance with the Component Performance Alternative method for Low Glazed Wall System Buildings described in section C402.1.5.1.

A solar ready zone will be indicated on the drawings in accordance with the requirements of section C402.3 and Appendix CB. The required reserved electrical requirements stipulated in Appendix CB will be provided.

Section C402.5 - Air Leakage Thermal Envelope

A continuous air barrier complying with Section C402.5.1 will be provided for the building envelope.

The air leakage of all fenestrations will be specified in accordance with the limitations described in Table C402.5.3.

Building entrances shall be designed with Vestibules in accordance with Section C402.5.5. Exterior doors exempt from this requirement include:

- The Shipping / Receiving door and Mechanical Room door. (Section 402.5.8, Ex. 2).

UTILITY AND PERMITTING ANALYSIS

Executive Summary

Civil Engineering consultant CDW Engineering performed research of the existing site conditions and anticipated site permitting requirements for the proposed PK-5 elementary School located at 320 Salem Street, Wilmington, Massachusetts. CDW Engineering's research included an initial site visit and walk, as well as a review of available record plans. CDW recommends video inspections of the existing storm drainage system that connects Ballardvale and Salem Streets to determine the condition of the drainage pipes.

An existing conditions site survey by Nitsch Engineering with utility research was completed to verify assumptions made from the review of record plans and ground assumptions.

Existing utility routes will need to be maintained during construction since the existing North Intermediate school is anticipated to remain occupied throughout construction phases. Independent utility routes to a new mechanical / electrical / water entry location will be established to permit the installation of new utilities without disrupting school operations.

General Site Description

The North Intermediate School is located off Salem and Ballardvale Streets in a mainly residential area. The existing school building is the primary structure on the 12+ acre site, occupying the south-east portion. It has associated vehicular loop, parking and pedestrian sidewalks to the south, ball fields and sport courts to the north, and a playground just north of a parking area to the east. Subtle grade changes make the site mostly accessible.

Diverse trees serve as a buffer to the north, west, and south sides of the school, creating an inviting environment for students. Within the woodlands that grace the southern perimeter of the school, a small wooded deciduous wetland area is noted. Residential properties abut the project site to the northeast, north, west, and southwest. There are non-jurisdictional wetlands adjacent to the west and southwest property line of the site. The portion of the site west of the existing school building generally slopes downhill from south to north.

Existing vehicular access to the site includes 2 curb cuts along the 385 feet of frontage on Ballardvale Street to access a parking lot, playground, sports courts and fields. An additional 2 curb cuts along the 530 feet of frontage on Salem Street leads to a loop road servicing the main entrance. Situated adjacent to the Ballardvale Street entrance, the primary parking lot offers ample space for approximately 60 vehicles, accommodating both visitors and school personnel. Despite the asphalt surface of this parking lot being well-maintained, it's worth noting the absence of ADA-compliant parking spaces and proper signage.

There is a playground to the north of the parking lot, a large natural recreation area north and west of the existing building.

Existing Site Utilities

Currently, domestic water, electrical, and telecommunications utilities are all routed from the curb cuts under, alongside or overhead and entering the school at various points on the east elevation and into the boiler room.

Water

Water service to the building is provided by a 4-inch copper domestic waterline to the northwest side of the school connected to Wilmington's water system. The building does not have fire protection service. There is an existing fire hydrant on the corner of Salem Street and Ballardvale Street.

A fire hydrant flow test will be provided in the next phase to confirm adequate volume to serve the proposed sprinkler system for the project. A fire pump is included in the SD cost estimate and space for a fire pump room can be accommodated in the current plan if required. Hydrant locations will need to be reviewed by the Fire Chief.

Storm Drainage

There is limited storm drainage infrastructure onsite. The parking lot has two catch basins that, according to the Wilmington's Drainage online map, connect to a drainage system comprised of both asphalt-coated corrugated metal pipe (ACCMP) and reinforced concrete pipe (RCP) that runs in between the grass and the baseball fields and discharges near a wetland to the west of the site. Catch basins were also observed on Ballardvale Street, which connects to a 12" Corrugated Metal Pipe (CMP) system that runs along Ballardvale and Salem Street and seems to discharge near wetlands to the east of the school property.

Sewer

An existing conditions site survey by Nitsch Engineering with utility research was completed to verify assumptions made from the review of record plans and ground assumptions for municipal sewer service.

Based on the existing conditions survey, a 6" sewer pipe connects to the 8" sewer main in the street. It is estimated that the 8" pipe carries approximately 650,000 gallons per day.

> The existing North Intermediate School (grades 4-5) generates approx. 2,900 gallons per day (based on 250 students + 40 staff = 290 persons * 10 gallons/day).
>
> A proposed PK-5 school generates approx. 9750 gallons per day (based on 855 students +120 staff = 975 persons * 10 gallons/day).

The increase in sewage is estimated at 6,850 gallons/day, well under 650,000 gallons per day.

Natural gas

The natural gas service and meter are located on exterior of building adjacent to the Mechanical Room. Gas piping is black steel with threaded and welded joints depending on the pipe size.

Gas service is not required for the proposed project.

Electric/Telecommunications

Electric service to the building is provided via underground lines to a building mounted meter. Telephone, CATV, and fiber run underground from a utility pole to the electric room.

Reading Municipal Light District (RMLD) is the utility provider and participates in the Site/Landscape Working Group meetings to stay abreast on project needs and updates. RMLD was consulted regarding the existing infrastructure and its ability the handle the a new 4,000A service load for the proposed new building. RMLD confirmed they anticipate the ability to feed the proposed building in correspondence received on February 13, 2025.

The Electrical Engineer will continue to coordinate electrical services with RMLD for new services to the site in support of the new school.

Preliminary Permitting Considerations

Wetlands Protection Act (310 CMR 10.00)

The Wetlands Protection Act ensures the protection of Massachusetts' inland and coastal wetlands, tidelands, great ponds, rivers, and floodplains. It regulates activities in coastal and wetlands areas and contributes to the protection of ground and surface water quality, the prevention of flooding and storm damage, and the protection of wildlife and aquatic habitat.

LEC Environmental Consultants. Inc delineated wetlands at the project site which were located on the survey provided by Nitsch Engineering. There are two wetland areas, one along the western side of the site and the other along the southwestern property line. Both areas were identified as non-jurisdictional. A meeting with the local conservation agent will be held during the permitting process to confirm the non-jurisdictional status.

Bylaw and Regulations

The Town of Wilmington Zoning Bylaw indicates site plan application requirements in section 6.5.2 and will consult the Town Engineer, Fire and Police Departments, Building Inspector, Board of Water & Sewer Commissioners, Department of Public Works, Board of Health, and the Conservation Commission in the process.

In addition to the Town Regulations, new work proposed on-site will be required to meet the MassDEP Stormwater Standards. The project expects to meet all these requirements.

Wellhead Protection Area

The North Intermediate is located within the Zone II Groundwater Protection District (entire site). There are additional stormwater water quality requirements for groundwater infiltration that can be accommodated, and are not generally a constraint issue. Main impacts from a Wellhead area would affect an on-site septic system, but the site is connected to sewer, so a non-issue for septic/sewer. Requirements will be reviewed as part of the site plan permitting.

Wellhead Protection Area

The North Intermediate is located within the Zone II Groundwater Protection District (entire site). There are additional stormwater water quality requirements for groundwater infiltration that can be accommodated, and are not generally a constraint issue. Main impacts from a Wellhead area would affect an on-site septic system, but the site is connected to sewer, so a non-issue for septic/sewer. Requirements will be reviewed as part of the site plan permitting.

Natural Heritage & Endangered Species Program

A review of the 15th Edition of the Massachusetts Natural Heritage Atlas prepared by the Natural Heritage and Endangered Species Program (NHESP), updated August 2021, indicates that the North Intermediate School site is NOT located within a Priority Habitat of Rare Species or an Estimated Habitat of Rare Wildlife.

Massachusetts Environmental Protection Act (MEPA)

The proposed development of this site as shown on the current design plans does not appear to trigger any MEPA thresholds associated with CDW Engineering's design elements and will likely not require an ENF or EIR to be filed with MEPA.

Floodplain

Based on the FEMA Flood Insurance Rate Maps for Wilmington (Community Panel No. 25017C0283F), the Site does not fall into a regulated Flood Zone.

USEPA NPDES

Construction activities that disturb one acre or more are regulated under the United States Environmental Protection Agency's (USEPA) National Pollution Discharge Elimination System (NPDES) Program. In Massachusetts, the USEPA issues NPDES permits to operators of regulated construction sites. Regulated projects are required to develop and implement stormwater pollution prevention plans in order to obtain permit coverage.

Because the land disturbance for the Project is anticipated to be greater than one acre, it is anticipated that a Notice of Intent will need to be filed with the EPA.

Historical Resources

The existing North Intermediate School was built in 1962 and is of no special historical, architectural, or aesthetic value. The PNF is not expected to raise any issues of historical preservation for the existing building. It is understood that MHC approval is required prior to tendering bids for the project.

Zoning Analysis

The lot is located within the Residential-20 (R-20) zoning district. The Town of Wilmington dimensional requirements for R-20 district are as follows:

Minimum Lot Area: 20,000 square feet
Minimum Lot Frontage: 120 feet
Minimum Front setback: 40 feet
Minimum Side Setback: 20 feet
Minimum Rear Setback: 20 feet
Minimum Lot Width: 125 feet
Maximum Height: 35 feet or 2-1/2 stories

The academic wings of the proposed building are 3 stories and will require approval from zoning.

Wilmington Zoning also has a requirement for "Educational" parking spaces: 1 space for each staff position, plus 1 space for each five persons of rated capacity of the largest auditorium, and 1 space for each student vehicle which can be expected at only one time on the premises.

The proposed gym is sized for 1,115 people, which equates to 223 parking spaces. An additional 140 staff parking spaces totals 363. Ideally the gymnasium would be used after hours for events. That may reduce the requirements for event parking to just the 223 spaces. Currently the site design includes 193 proposed spaces.

The actual number of parking spaces needed is a minimum of 140, based upon a staffing analysis of teachers, staff, volunteers and visitors. The number of 363 parking spaces would be burdensome from several points of view:

- Building that much parking would preclude the inclusion of play areas on the site
- This amount of impervious area would be very difficult to permit on this site
- It would be a burdensome cost just to build these spaces, only to have more than half of them empty most of the time.

The design team will present this evidence at the site planning process with the aim of seeking relief from this zoning requirement for height and parking.

Municipal Open Space Status

The existing North Intermediate School site has a Municipal Open Space designation with "Limited Protection". The Town of Wilmington's Open Space and Recreation Plan (2021) explains the following regarding Open Space protected through Town Ownership (Page 51, Page 54):

"The next level of open space protection is through ownership by the Town of Wilmington… Land under the general control of the Town provides some level of protection. Development by the Town of parcels under its control will, in most instances, require the expenditure of Town funds and be subject to a majority vote of Town Meeting."

The site use will not change with the project and continue as a town property used for educational purposes. Town votes planned in September 2025 related to this project are for the expenditure of Town funds and for a majority vote by the Town for the project to move forward.

Permitting table timeline

Permit	Permitting Preparer	Permitting Authority	Filing Date	Hearing Date	Anticipated Review (Approval Date)
Site Plan Review	CDW	Town of Wilmington Planning Board	After 75% DD	TBD	8- to 10- weeks after submittal
Notice of Intent	CDW	Town of Wilmington Conservation Commission	After 75% DD	TBD	8- to 10- weeks after submittal
Scituate DPW (Roadway, driveway, and general utility layout)	CDW	Wilmington DPW	After 75% DD until 100% CD	On-going Review after 100% DD	8- to 10- weeks after submittal
National Pollutant Discharge Elimination System (NPDES) with EPA Notice of Intent (NOI)	Contractor	Environmental Protection Agency (EPA)	Two weeks before construction starts	No hearing required	Once Submitted to EPA; Close NOI at end of Construction.

MASSING STUDY

Design Proposal

The new PK-5 elementary school is intentionally designed to provide clear lines of sight to the site's primary vehicular access points, enhancing visibility and safety. Oriented along an east–west axis, the building takes full advantage of passive solar energy and natural daylighting, enriching the learning environment with abundant sunlight. While the new facility stands one story taller than the existing school, careful design and massing techniques mitigate its presence within the context of the site.

Set approximately 410 feet from Ballardvale Street and 440 feet from Salem Street, the school's design transitions gracefully in scale from the two-story public wing to the three-story academic wing. The building's mass is thoughtfully broken down by single-story canopies, vestibules, and program spaces, contributing to a pedestrian-friendly, approachable facade. The academic wing is organized vertically by grade level, with durable, light-toned masonry and cast stone banding at the first two levels offering a robust and visually grounded base. Above, a darker red masonry brick provides a rich material contrast while symbolizing the developmental progression of students through the upper grades. Glazed stair towers, large-format windows, and transparent extended learning areas bring light into the core of the building while adding vertical articulation to the facade. Mirroring the public wing, one-story classroom projections and canopies further soften the building's overall scale and integrate it harmoniously into its context.

Proposed South Elevation Street View from Salem Street approach

Architecturally, the new school is organized into two clearly defined wings to distinguish between "public" and "private" functions. The public wing—designed to welcome students, staff, and community members during and beyond school hours—includes the gymnasium, cafeteria, performance space, art and music rooms, and media center.

In contrast, the private wing houses the academic core of the school and is designed with security in mind, allowing it to be fully secured during after-hours events or in emergency situations.

The academic layout is both age-appropriate and flexible, with two lower wings dedicated to PreK–K and grades 1–2, and a third, upper-level wing accommodating grades 3–5. Each of the seven grade-level “neighborhoods” includes clusters of classrooms anchored by shared extended learning spaces and small group rooms. Special education spaces are seamlessly integrated throughout, promoting inclusion and accessibility across all grade levels.

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BUILDING SYSTEM NARRATIVES

The following sections from our consultant engineers describe the proposed building systems.

Sustainable Design Elements	4.1.2.K-3
Building Structure	4.1.2.K-3
HVAC Life Cycle Cost Analysis	4.1.2.K-5
Electrical	4.1.2.K -11
Plumbing	4.1.2.K -18
Fire Protection	4.1.2.K -20
Information Technology	4.1.2.K -22

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SUSTAINABLE DESIGN ELEMENTS

The new elementary school will feature many sustainable design elements including:

- site stormwater management
- water use reduction through low-flow plumbing fixtures
- many energy-efficient building systems such as mechanical, electrical, and interior lighting and controls
- Sustainable material choices through heightened durability, higher indoor air quality, healthier component materials and regionally sourced products

A full report and LEED scorecard can be found in Section 4.1.2 L Sustainable Building Design Guide.

STRUCTURE

Substructure

Foundations

Based on the foundations of the existing structures at the columns of the proposed structure would bear on reinforced concrete spread footings and the perimeter foundation walls would bear on continuous reinforced concrete strip footings extending at least 4 ft.- 0 in. below grade. With the assumed bearing capacity of the soil of 2 tons/sf, a typical interior footing would be 11 ft.- 0 in. x 11 ft.- 0 in. x 24 in. deep and the typical exterior footings would be 10 ft.- 0 in. x 10 ft.- 0 in. x 24 in. deep in the three-story areas. In the two-story areas a typical interior footing would be 9 ft.- 0 in. x 9 ft.- 0 in. x 24 in. deep and the typical exterior footings would be 8 ft.- 0 in. x 8 ft.- 0 in. x 24 in. deep. In single-story areas a typical interior footing would be 7 ft.- 0 in. x 7 ft.- 0 in. x 24 in. deep and the typical exterior footings would be 6 ft.- 0 in. x ft.- 0 in. x 24 in. deep. Typical interior and exterior footings at the Cafetorium and Gymnasium would be 8 ft.- 0 in. x 8 ft.- 0 in. x 24 in. deep. The exterior foundation walls would be 14 to 16 in. thick, reinforced cast-in-place concrete walls on 24 to 36 in. wide continuous reinforced concrete strip footings around the perimeter of the building extending a minimum of 4 ft.- 0 in. below finished grade.

Slabs-on-Grade

Based on the existing school construction, the lowest level of the proposed structure would be a 5 in. thick concrete slab-on-grade reinforced with welded wire reinforcing over a vapor barrier on 2 in. thick rigid insulation on 8 in. of compacted granular structural fill and a base course of 8 in. of compacted gravel.

Superstructure

Typical Floor Construction

A 5 ¼ in. light weight concrete composite metal deck slab reinforced with welded wire fabric on wide flange steel beams spanning between steel girders and columns. The weight of the structural steel is estimated to be 14 psf for the typical framing. Allow for 25 psf of weight of structural steel for the classrooms above the Gymnasium, the floor may be framed with steel beams or trusses spanning across width of the gymnasium.

Typical Roof Construction

The roof construction would be galvanized, corrugated 3 in. deep, Type 'N' metal roof deck spanning between wide flange steel beams and girders. At locations of roof supported mechanical equipment, a concrete slab will be provided similar to the typical supported slab. The weight of the structural steel is estimated to be 14 psf.

Cafeteria Roof Framing

The roof construction would be acoustic, galvanized, corrugated 3 in. deep, Type 'NA' metal roof deck at the Cafeteria, spanning between structural glue-laminated timber beams and girders, supported by steel and/or glue-laminated wood columns.

Gymnasium Roof Framing

The roof construction adjacent to the classrooms would be acoustic, galvanized, corrugated 3 in. deep, Type 'NA' metal roof deck at the Gymnasium, spanning between long span steel beams or trusses. The weight of the steel joists and structural steel framing is estimated to be 25 psf.

Vertical Framing Elements

Columns

Columns will be hollow structural steel columns. Typical columns would be HSS 8 x 8 columns. Typical columns would be HSS 12 x 12 steel columns at the Gymnasium. Typical columns would be 16 in. x 16 in. glue-laminated wood columns at the Cafeteria.

Lateral Load-Resisting System

The typical lateral load resisting system would be concentric braced frames of structural steel members. The lateral load resisting system of the Gymnasium structure may be reinforced masonry shear walls or ordinary concentric braced frames comprised of HSS structural steel members.

HVAC

LIFE CYCLE COST ASSESSMENT

A lifecycle cost analysis (LCCA) has been performed to quantify anticipated upfront costs, operating costs, and avoided energy costs for several mechanical system options to serve the HVAC needs of the Wilmington Wildwood Elementary School. The Elementary School is a new three-story school with an approximate gross area of 167,000 s.f. The building has been simulated with the school's anticipated hours of operation provided by the owner as follows:

It is anticipated that the typical student hours will occur from 6:30 am – 6:00 pm (Mon-Fri) while the building will be occupied between 6 pm – 9 pm (Mon-Fri) for limited community use, sports, and recreation programs. Limited summer programming shall occur throughout the building from 7:00 am – 3:30 pm (Mon-Fri) for special needs, summer camps, recreation, and sports practices. The Gym will also have limited community use on the weekends from 9:00 am – 9:00 pm.

The goal of the mechanical system lifecycle engineering economic analysis is to assess the performance of various mechanical systems in comparison to a baseline mechanical system.

Each option is compared to the baseline system to determine the greatest combined savings over a 50 year cycle to determine the most advantageous system considering anticipated hours of operation, electrical costs, maintenance costs, initial construction costs, and replacement costs.

By comparison of each option to the baseline system, the option with the greatest total life-cycle savings has been recommended.

The results of the LCCA have been presented to the Town's building committee who subsequently voted to proceed with the option that is outlined in the following the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design. The HVAC systems shall be designed and constructed for LEED for Schools v4 where indicated on this narrative.

DESIGN INTENT

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

The HVAC narrative below provides a summary of new HVAC systems which shall be designated for the building.

BASIS OF DESIGN: (MASS CODE)
Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code. Weather data is based on Laurence G Hanscomb Air Force Base.

Outside: Winter 2.3 degrees F, Summer 91 degrees F DB 74 degrees F WB

Inside: 70 deg. F +/- 2 degrees F for Heating, 75 degrees F +/- 2 degrees F (55 percent RH) for all Air-conditioned areas (Administration, Nurses Office, Guidance, Cafeteria, Classrooms, Teacher Support, Gym).

Unoccupied temperature setback will be provided (60 degrees F heating (adj.), 85 degrees F cooling (adj.).

Outside air shall be provided at the rate in accordance with ASHRAE Standard 62.1 and the International Mechanical Code (latest adopted editions) as a minimum. All occupied areas will be designed to maintain 800 PPM carbon dioxide maximum.

SYSTEM DESCRIPTION – Air Source Heat Pump Chiller/Heater with Classroom Displacement Ventilation

Central Heating and Cooling Plant:

Heating and cooling for building areas shall be provided by a high-efficiency air source heat recovery heat pump chiller/heater plant that include the following quantities of chiller modules:

15 modular air source to water heat pump chillers with simultaneous heating and cooling and a capacity of 30 tons each. An additional heat pump chiller/heater or a supplemental 1000 kw backup electric boiler shall be included to inject heat into the hot water heating loop when ambient conditions limit the output capacity of the air-source heat pump chiller.

One of the modules will be redundant for heating/cooling backup purposes. The air-cooled heat pump chiller units will be mounted on the roof and shall be capable of providing 130 degrees F heating hot water supply at a 5 degrees F ambient temperature condition.

A mechanical room shall be provided for the associated hot water and chilled water pumps and hydronic accessories. The heat pump chiller plant will supply heating hot water and chilled water to heating and cooling equipment and air handling equipment throughout the building via a four-pipe fiberglass insulated schedule 40 black steel and copper piping system.

Primary hot water pumps (Quantity of two in a primary/standby arrangement) with variable frequency drives will be provided and will modulate speed to maintain a minimum flow to the heat pump chiller. Secondary hot water pumps (Quantity of two in a primary/standby arrangement) with variable frequency drives will be provided for meeting the variable flow needs of the hot water system distribution throughout the building. A plate & frame heat exchanger installed within the mechanical room shall be provided to separate the primary and secondary piping loops. In addition to pumps,

new hot water accessories including air separators, expansion tanks, and buffer tanks shall be provided.

Primary chilled water pumps (Quantity of two in a primary/standby arrangement) with variable frequency drives will be provided and will modulate speed to maintain a minimum flow to the heat pump chiller. Secondary chilled water pumps (Quantity of two in a primary/standby arrangement) with variable frequency drives will be provided for meeting the variable flow needs of the chilled water system distribution throughout the building. A plate & frame heat exchanger installed within the mechanical room shall be provided to separate the primary and secondary piping loops. In addition to pumps, new hot water accessories including air separators, expansion tanks, and buffer tanks shall be provided.

1. The heat pump chiller plant will distribute between 45 degrees F and 55 degrees F chilled water to the roof mounted air handling units located throughout the building and will distribute between 58 degrees F and 62 degrees F chilled water to the terminal radiant cooling panels units in the fully-air conditioned building. The chilled water distribution piping will be of the fiberglass insulated schedule 40 type and will be separate from the hot water distribution piping system. Compensated chilled water pumps with variable frequency drives will be provided for variable flow chilled water system distribution.

Ventilation air handling equipment: It is proposed that a new air-conditioning displacement ventilation system be installed to provide air-conditioning and ventilation to the occupied areas of the building.

1. New recirculating rooftop air handling units with supply and return air fans, VFDs, dual core energy recovery sections, hot water heating (and reheat) coils with modulating valve, chilled water cooling coil, economizer capability, and MERV 14 filtration will be provided to serve a new full air conditioning displacement ventilation system. Different building rooms and zones shall be provided with a variable volume (VAV) terminal box with combination temperature, humidity, and CO2 sensor controls. The controls will reduce outside air as allowed maintaining a maximum of 800 PPM while providing sufficient ventilation to meet the required heating or cooling load of the spaces served. As VAV boxes modulate, the supply and return air fans associated Variable Frequency Drives (VFD) of the rooftop units will adjust the fan speed based on system static pressure, reducing the energy consumed by the fans. Each room (or zone) shall be provided with low wall or floor mounted supply air displacement diffusers. Classrooms will typically be provided with two individual wall mounted displacement diffusing units between 250 and 400 CFM each (depending on room size). Return air will be drawn back to the units by ceiling return air registers located within the rooms and will be routed back to the rooftop unit by a galvanized sheet metal return air ductwork distribution system. Supplemental ceiling mounted chilled/hot water radiant panels will be provided along exterior walls that shall be interlocked with space enthalpy sensors that shall modulate the control valve of the terminal cooling coil closed when the space enthalpy is above dewpoint conditions.

2. Preliminary RTU Quantities, zones and airflow capacities are as follows:

RTU-A: (Classroom Wing) – 17,000 CFM Total, 75 Tons cooling, 475 MBH heating
RTU-B: (Classroom Wing) – 20,000 CFM Total, 75 Tons cooling, 475 MBH heating
RTU-C: (Classroom Wing) – 17;000 CFM Total, 75 Tons cooling, 475 MBH heating
RTU-D: (Gym) – 10,000 CFM Total, 40 Ton ASHP Packaged Unit
RTU-E: (Media Ctr) – 3,255 CFM Total, 12 Tons cooling, 88 MBH heating
RTU-F: (Cafetorium) – 10,000 CMF Total, 40 Tons Cooling, 260 MBH heating
RTU-G: (Kitchen/Custodial) – 3,000 CFM Total, 16 Tons cooling, 90 MBH heating
RTU-H: (Admin) – 4,000 CFM Total, 16 Tons cooling, 115 MBH heating
MAU: (Kitchen Hood Makeup) – 4500 CFM Total, 24 Tons cooling, 390 MBH heating

Air Distribution Systems:
The building areas are to be served by a fully air-conditioned variable volume displacement ventilation air distribution system with supplemental chilled water radiant cooling and heating panel system.

New ductwork shall be constructed and installed in accordance with SMACNA and IMC requirements. All new supply and return air ductwork shall be insulated per IMC code requirements (R-8). All new Kitchen exhaust fans shall be provided with new Fire-wrapped carbon steel or insulated stainless steel grease ductwork.

Exhaust Air Fan Systems:
Code required exhaust for the majority of building areas, including toilet rooms, shall be provided through the localized energy recovery ventilation (ERV) systems.

Dedicated exhaust air fan systems shall be provided for Kitchen exhaust air (if provided) and Janitor's closet areas.

Terminal Heating & Cooling Equipment:
Provide new hot and chilled water radiant heating and cooling panels for the perimeter heating and cooling for all fully air conditioned areas (eg. Admin Offices, Guidance, Nurse's suite, cafeteria) of the building. Classrooms shall be provided with hot water radiant heating panels. New hot water radiant heating panels or fin tube radiation shall be provided for perimeter heating of all restrooms with exterior exposure heating loads. Hot water radiation heating equipment shall be provided for all corridors, entryways. Hot water unit heaters shall be provided for all utility rooms.

Split system AC heat pump units:
New ductless split system high efficiency heat pump AC units will be installed to serve Elevator machine rooms, and IT and MDF Server rooms.

Lobby, Corridor, and Entry Way Heating:

New hot water convectors, cabinet unit heaters, and fin tube radiation heating equipment shall be installed to provide heating to building entry way and stairwell areas. Corridors shall be

ventilated from adjacent air handling unit systems. Main Corridor and Lobby areas shall be heated and dehumidified by the displacement ventilation systems.

Utility Areas:
Utility areas will be provided with exhaust air fan systems for ventilation and will typically be heated with horizontal type ceiling suspended hot water or electric unit heaters.

The Main Electric Rooms and IDF rooms will be air conditioned by high efficiency ductless air source heat pumps.

Testing, Adjusting, Balancing & Commissioning:
All new HVAC systems shall be tested, adjusted, balanced and commissioned as art of the project scope.

Automatic Temperature Controls – Building Energy Management System:
A new DDC (direct digital control) Automatic Temperature Control and Building Energy Management System shall be installed to control and monitor building HVAC systems. Energy metering shall be installed to monitor the energy usage of building HVAC systems and utilities (electric, water). The new DDC/ATC system shall be a BACNet open protocol system that is capable of being integrated into the Town Wide Central energy management system.

LEED Energy Savings Summary
To estimate the LEED V4 EAc2 – Optimize Energy Performance savings, energy model simulations have been performed comparing the design building to a baseline ASHRAE Standard 90.1-2010 building.

The ASHRAE Standard 90.1-2010 baseline building is as follows:

- Envelope:
  - Wall: U-0.064
  - Roof: U-0.048
  - Windows: 0.55 U-Value, 0.40 SHGC
  - Curtainwall/Storefront: 0.45 U-Value, 0.40 SHGC
- Mechanical System:
  - System 8 - Electric heating/chilled water cooling air handling units with energy recovery wheels and terminal fan-powered VAV boxes with electric reheat coils (one per floor)
  - System 4 – Packaged electric heat pump cooling/heating constant volume single zone air handling units (serving spaces with loads varying by 10 Btuh/s.f. of the average space load)
  - (2) high-efficiency water-cooled chillers with associated cooling tower
- Domestic Hot Water System:
  - Instantaneous electric domestic hot water system
- Lighting System:
  - 0.99 w/s.f.

The design building is as follows:

- Envelope:
  - Roof: U-0.018
  - Brick Veneer Walls: U-0.028
  - MCM Panel Walls: U-0.025
  - Windows: U-0.25, 0.30 SHGC
  - Curtainwall: U-0.25, 0.30 SHGC
- Mechanical System:
  - (Refer to System description)
- Domestic Hot Water System:
  - Instantaneous electric domestic hot water system
- Lighting System:
  - 0.5 w/s.f.

LEED Energy Savings Summary

A comparison of the Design Building against the ASHRAE Standard 90.1-2010 Baseline Building results in an energy cost savings of 42.8% for 16 total points relating to LEED V4 EAc2 – Optimize Energy Performance.

Note:

The values indicated above are based on energy modelling performed for system comparison purposes only. Our office strongly recommends adding a 30% safety factor to the calculated values of this report for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

ELECTRICAL

The following is the Electrical Systems narrative, which defines the scope of work and capacities of the Power and Lighting System, as well as the Basis of Design. The Electrical Systems shall be designed and constructed for **LEED for Schools** where indicated on this narrative.

Codes

All work installed under Section 260000 shall comply with the Massachusetts State Building Code and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

Design Intent

The work of Section 260000 is as described in this Narrative. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

Sequence of operations and interactions

Classroom and Corridor lighting will be controlled via "addressable relays", which is achieved through programming networked controls. The control of the relays will be by automatic means, such as an occupancy sensor in each classroom. The system will have a BacNet gateway and will be interfaced with the DDC control system for scheduled functions. The controllability shall be in conformance with credit ***LEED credit IEQC 6.1.***

Automatic control of receptacles based on occupancy will be provided for at least 50% of the receptacles installed in private offices, open offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, individual workstations, and classrooms. Controlled receptacles will be marked per NEC 406.3 (E).

Exterior lighting will be controlled by photocell "ON" and "scheduled" for "OFF" operation. The parking area lighting will be controlled by "zones" with dimmable capability. Exterior lights will be addressable and dimmable. Fixtures will be designed and programmed to turn on at dusk utilizing photo sensor input. Fixture shall be turned off based on scheduled preference typically 5AM-6AM. Fixture output shall be scheduled to be reduced by 50% after 12AM. Additional schedule functionality shall be provided based on end user input.

Emergency and Exit lighting will be run through life safety panels and will be "ON" during normal power conditions, as well as power outage conditions. The emergency lighting system will have time control so that lights are "ON" only when the building is occupied.

Description of the Systems

Utilities:

The new building will be supplied with utility power from the utility company Reading Municipal Light

Department (RMLD). The new service will be fed via underground primary duct bank to a pad mounted utility company owned liquid filled transformer.

The service electrical transformer will be furnished, installed, owned and maintained by RMLD, and it will be located adjacent to the building as shown on the civil drawings. The transformer will be of the pad- mounted type with a primary voltage of 13.8 kV and a secondary voltage of 480Y/277 volts. The transformer will be sized by the utility company based on the load data provided by The Design team.

Concrete pad and grounding grid for the pad-mounted transformer is provided by the Contractor per the RMLD standards.

Concrete encased duct bank of the two 4" PVC conduits will be provided by the Electrical Contractor for the primary feeder installation from a utility pole to the pad-mounted transformer. Pre-cast concrete manholes 5' x 5' will be provided by the Contractor to facilitate the primary cables field installation. The duct bank routing is shown on the civil drawings.

Utility company will provide a primary feeder cable from the utility manhole to the pad-mounted transformer via the new manhole and terminate the feeder cable on both ends.

Transformer secondary feeder of the copper conductors will be installed underground in the duct bank of four 4" PVC conduits from the pad-mounted transformer to the main electrical switchboard located in the main electrical room. The secondary feeder and terminations at the switchboard side will be provided by the Electrical Contractor and terminated at the transformer side by RMLD. The new service will be metered at the transformer secondary voltage.

RMLD metering CTs will be installed in a CT section of the switch board, the meter will be located at the direction of the utility company.

Telephone, Cable TV, and City Fiber will be fed underground into the building's Main Distribution Frame/Head End Room.

Copper conductors shall be utilized for all branch circuit and feeder wiring. Aluminum conductors will be allowed for feeders 100 amperes or over.

The building connected electrical load estimate is based on the preliminary building systems design:

Load Type	**KVA**
HVAC Loads (including AHU, Destratification Fans, DCU, Chiller, UH, VRF, Boilers, FCs, Pumps, RTUs, Exhaust Fans, DCU)	1440 KVA
Elevator	31.7 KVA
Exterior Lighting	2.0 KVA
Interior Lighting	90 KVA
General Power	360 KVA
Kitchen	112.5 KVA
EV Charging	144 KVA
Plumbing/Fire Protection (Pumps, etc.)	210 KVA
Total Connected Load	**2,390.2 KVA**

Electrical Distribution System:

Service ratings for the building are designed for a connected load of 15 watts/S.F. The service capacity will be sized for 3,000 Amperes with an 80% rated main breaker. The main bus will be sized at 4,000 Amperes and will have an available breaker space provision at the end of the switchboard to accommodate a future grid connected photovoltaic array. The switchboard will be furnished with a service entrance surge protection device (SPD) rated at 240 kA and a digital metering unit to monitor voltage, current, power factor, demand KW and with a data communication port for interface with BMS. Main switchboard's short circuit rating will be coordinated with the Utility Company but will be rated for 65 KAIC.

New lighting and power panels will be provided to accommodate respective loads. The equipment locations will be in dedicated rooms or closets.

Interior Lighting System:

The intent of the lighting design is to provide a visual environment for the students and faculty that is supportive of the educational activities within the building. The lighting system will be designed in compliance with the applicable Energy Code and be eligible for the Utility company rebate program.

Interior lighting illumination levels will meet the IES recommended values for applicable activity type, be in compliance with the IECC 2021 energy allowances and LEED for Schools control requirements.

PROPOSED Illumination Levels

Location	Average Illumination Levels
Classrooms	30 FC
Offices, Conference Rooms, Library	30 FC
Kitchen	50 FC
Gymnasium	50 FC
Cafeteria	30 FC
Corridors	20 FC
Utility and Storage Rooms	20 FC

Classroom lighting fixtures will consist of recessed/surface mounted direct/indirect luminaries with integral LED source and electronic dimmable drivers. The fixtures will be pre-wired for continuous dimming control where natural daylight is available and also for multi-level switching. Two daylight dimming zones will be provided in each classroom.

Office lighting fixtures will consist of recessed/surface mounted direct only LED luminaries and electronic drivers for dual-level switching. Offices on the perimeter with windows will have daylight dimming where lighting within the daylight zone exceeds 150W.

In general, lighting power density will be 20-40% less than IECC 2021. The power density reduction relates to associated LEED credit in energy and atmosphere.

Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming foot-candle level will be in compliance with associated LEED credit in indoor environment

quality.

Gymnasium lighting will be comprised of direct/indirect fixtures with integral LED source and electronic drivers. The fixtures will be provided with poly carbonate lensing. The light level will be designed for approximately 50 foot candles. Multi-level switching will be provided.

Daylight dimming will be provided within 15 feet of skylights or glazing where lighting within the daylight zone exceeds 150W. Daylight dimming controls will be similar in operation to classrooms.

Corridor lighting will be comprised of recessed mounted linear fixtures with integral LED source and electronic drivers. The Corridor light level will be designed for approximately 20-foot candles. Corridor lighting will be controlled via time schedules during normal business hours and set to occupancy control thereafter.

Cafeteria lighting will be a combination of pendant mounted fixtures with direct only and direct/indirect distribution types. All fixtures shall be provided with integral LED source and electronic drivers. The light levels will be designed for approximately 30 foot candles.

Stage and Auditorium theatrical lights with connector strips and a dimming system will be provided for performances. House lighting in Auditorium will be DMX dimmable to black LED and controlled by a theatrical dimming system.

Kitchen and Servery lighting will consist of recessed 2'x2' and 2'x4' acrylic lensed gasketed troffers with aluminum frame doors, integral LED source, electronic drivers and NSF rated for food preparation areas. Light levels will be approximately 50 foot candles.

Media Center lighting will be a combination of pendant decorative pendant fixtures and recessed fixtures with integral LED source and electronic drivers. The light levels will be designed for approximately 30 foot candles. Daylighting controls will be provided on perimeter light fixtures with 15 feet of glazing

Each area will be locally switched and designed for multi-level controls. Each Classroom, Office space, and Toilet room will have occupancy sensors to turn lights off when unoccupied. Occupancy sensors will be set to vacancy mode where required by Energy Code.

Daylight dimming sensors will be installed in each room where natural light is available for continuous dimming of light fixtures. The control system will be in accordance with associated LEED credit in indoor environmental quality when lighting within the daylight zone exceeds 150W threshold.

The entire school will be controlled with an automatic lighting control system for programming of interior and exterior lights "on and off". Lighting control system will be interfaced with BMS system, and will be demand response capable in accordance with associated LEED credit in Energy and atmosphere.

Emergency Lighting System

An exterior 600KW, 750KVA (diesel fired emergency generator with sound attenuated enclosure and base tank with alarms will be provided. An integral resistive load bank will be provided for generator testing under load. Light fixtures and LED Exit signs will be installed to serve all egress areas such as Corridors, Intervening Spaces, Toilets, Stairs, and Exit discharge exterior doors. The Administration area lighting will be connected to the emergency generator.

The generator power system has been sized to support emergency (life safety), and optional standby

building loads to maintain the building at 50 degrees. The life safety branch of the emergency system will be provided with a manual transfer switch on the emergency line side of the transfer switch in compliance with NEC 700.3(F).

a. Emergency (life safety) Power Loads as required by the Code:
   - Emergency exit and egress lighting (interior and building exterior at the exits)
   - Fire alarm system
b. Standby Power Loads:
   - Heating system with associated heat pumps and controls
   - Telephone/ data closets and associated A/C equipment
   - Communication systems (telephone and public address systems)
   - Building DDC system control panels
   - Kitchen refrigeration equipment
   - Lighting and power in the nurse/medical area
   - Security system equipment

Site Lighting System: ***LEED Credit SSC6: Light Pollution Reduction***

Fixtures for area lighting will be pole mounted cut-off 'LED' luminaries in the parking area and roadways. Pole heights will be 20 feet. The exterior lighting will be connected to the automatic lighting control system for photocell "ON" and timed "OFF" operation. The site lighting fixtures will be dark sky compliant. The illumination level will be 0.5fc for parking areas in accordance with the Illuminating Engineering Society.

Building perimeter will be 'LED' wall mounted cut-off fixtures over exterior doors for Exit discharge.

Wiring Devices:

Each classroom will have a minimum of (2) duplex receptacles per teaching wall and (2) double duplex receptacles on dedicated circuits at classroom computer workstations. The teacher's workstation will have a double duplex receptacle also on a dedicated circuit.

Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

Corridors will have a cleaning receptacle at approximately 25–40 foot intervals.

Exterior weatherproof receptacles with lockable in-use enclosures will be installed at exterior doors.

A system of computer grade panelboards with double neutrals and surge protective devices will be provided for receptacle circuits.

All receptacles will be of the tamper resistant type.

Fire Alarm System:

A fire alarm and detection with mass notification system will be provided with 60 hours battery back-up standby, 15 minutes of alarm. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms. The notification system will be in conformance with NFPA 72 Chapter 24

emergency communications systems.

Smoke detectors will be provided in open areas, corridors, stairwells, and other egress ways.

The sprinkler system will be supervised for water flow and tampering with valves.

Speaker/strobes will be provided in egress ways, classrooms, assembly spaces, open areas, and other large spaces. Strobe only units will be provided in single toilets and conference rooms.

Manual pull stations will be provided at exit discharge doors.

The system will be remotely connected to automatically report alarms to the Fire Department via a Gamewell local energy master box as approved by the Fire Department.

A mass notification system will be provided with separate strobes from the fire alarm system. Audible tone shall be through fire alarm speakers. System activation shall be through panic buttons and card readers with dedicated lockdown key fob.

Metering:

Measurement devices shall be installed to monitor the electrical energy use for each of the following separately:

- Total electrical energy
- Sub-metering in accordance with ASHRAE 90.1 para. 8.4.3.

Recording and Reporting:

- The electrical energy usage for all loads listed above shall be recorded at a minimum of every 15 minutes and reported at least hourly, daily, monthly, and annually. The system shall be capable of maintaining all data collected for a minimum of 36 months.

Uninterruptible Power Supply (UPS):

One (1) 24 kW, three phase centralized UPS system will be provided with seven minutes of battery back-up.

The system will provide conditioned power to sensitive electronic loads, telecommunication systems, bridge over power interruptions of short duration and allow an orderly shutdown of servers and communication systems during a prolonged power outage.

The UPS system will also be connected to the stand-by generator.

Lightning Protection System:

A system of lightning protection devices will be provided.

The lightning protection equipment will include air terminals, roof main conductors and down conductors, conduits, fasteners, connectors, ground rods, etc.

The facility will be issued a UL Master Label Certificate.

Renewable Energy System Provisions:

Electrical provisions will be made for a roof mounted renewable energy system consisting of a grid

(location on Roof of Addition) connected photovoltaic PV system intended to reduce the facilities demand for power.

Two-Way Communications System:

A Two-Way Communications System will be provided at the elevator lobbies that do not have grade access. Area of rescue assistance call boxes will be provided at Elevator Lobbies with no grade access. The call boxes connect to a main panel located adjacent to the Fire Alarm annunciator panel.

Level 2 AC Dual Electric Vehicle Charging Equipment. (EVSE)

Provide provisions for ten (10) dual port EVSE stations fed with 40 ampere feeders back to a EVSE panel. Two protective bollards will be installed at each charging station.

Distribution Antennae System (DAS):

A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners, and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

PLUMBING

GENERAL

The Plumbing System will be designed per the 10th Edition of the Commonwealth of Massachusetts Building Code (780 CMR) and 248 CMR Fuel Gas and Plumbing Code. All plumbing equipment will be electric. No fossil fuels will be used.

PLUMBING SYSTEMS:

Domestic Cold-Water Service:

The building will have a new 4" domestic water supply and will enter the facility through the Water entry room. The cold-water supply system will be extended 10'-0" outside the building and connected to the underground yard main system. Reduced Pressure Backflow Preventer will be provided to the main domestic water supply to protect the service (per the DEP regulation 310 CMR 22). Potable water will meet both the NSF 61 and NSF 372 standards for lead-free safe drinking water Act. Domestic cold water inside the building will be "L" type copper tube with wrought or cast copper fittings. All cold-water piping will be insulated to prevent condensation.

Domestic Hot Water Service:

Domestic hot water supply will be generated through central hot water heaters in mechanical room. Two electric water heaters (80KW), 120-gallon tank storage will be manifolded to supply hot water distribution. The water heater will be a modulating type and will be capable of providing fixture hot water flow throughout the facility. The facility hot water will operate at 130°F and will serve the commercial kitchen sinks, other kitchen hand sinks, lavatories, Class room sinks, and custodian room sinks.

All lavatories qualifying as "public" lavatories will be provided with individual mixing valves below the fixture to reduce hot water discharge temperatures to 120°F maximum per code. Domestic hot water will be distributed in "L" type copper tube with wrought or cast copper fittings. The hot water (HW) and re-circulating (HWR) piping will be insulated per IECC2015.

Roof Storm Drainage:

The surface of the roof deck will be drained with standard roof drain with cast iron domes. The rainwater system will be sized to handle a rainfall rate of 4 inches per hour, with a total runoff from the main roof and the roof deck of just under 1 cubic foot per second. The storm system will be installed in cast iron piping with all horizontal piping insulated to prevent condensation. The storm system will exit at various locations of the building and connect to the municipal storm system. Waste outlets to accept HVAC condensate and sprinkler discharge shall be provided as needed and connect to the storm water piping system.

Sanitary:

The sanitary waste system will drain by gravity and will run to exit the building and connect to the municipal sewer system. A dedicated grease waste line will be installed to collect grease-laden wastewater from the Kitchen appliances and fixtures. The grease line will exit the building adjacent to the Sanitary Sewer and will be connected to an exterior grease trap outside the building. A new minimum 5,000-gallon capacity outdoor grease interceptor will be placed on the site to intercept grease-laden waste prior to connection to site sewer system. Chamber vents from the outdoor grease interceptor will be routed to the roof independent from the rest of the sanitary waste. Enrichment and project classroom sinks will be provided with a solid interceptor. The elevator sump pump will have gas/oil interceptor in the sanitary waste line.

The above-ground sanitary drainage and vent will be piped in cast iron with “no-hub” joints. (3” or larger). Piping smaller than 3 inch will be piped in copper. Piping below the floor shall be weight cast iron hub and spigot.

A floor drain will be provided in all toilet rooms where more than one water closet/urinal is present. Floor drains will be of cast iron body construction, heavy duty grade, PDI approved. Those for use in toilet rooms and other finished spaces will have rough bronze exposed finishes. Floor drains in Toilet rooms will require automatic trap primer systems. Those for use in mechanical rooms and other unfinished spaces will be all cast iron. All trap primers are to be electric, timer type.

Fixtures and Fixture Count

Plumbing fixtures will be added in the facility to accommodate a population of male students and female students and shall be in accordance with 248 CMR Paragraph 10.10, Table 1.

Plumbing fixtures will be equipped with the following water-conserving features.

Water Closet	Urinals	Lavatory
Dual Flush Valve (Sloan WES-111, 1.6 gpf up and 1.1 gpf down)	Manual operation, 0.125 gpf equal to American Standard 6045.013.002.	Manual, Metering Faucet, Deck mounted lead free, 0.35 gpm aerator equal to Chicago Faucets Model 3500-4E39PABCP.

Water closets and urinals will be commercial vitreous china, wall hung (ADA compliant). Lavatories will be wall hung. Each floor will include a janitor’s closet with a corner mop service basin. Toilet cores on each floor will include an alcove-recessed electric water cooler, in a high-low handicapped accessible configuration to meet MAAB requirements. All toilet and mechanical rooms will have floor drains complete with trap primers. Project classrooms and enrichment classroom sinks will have a self-rimming stainless-steel sink with gooseneck type faucets. Drinking fountain will be dual height with bottle filler.

Sinks for administration kitchen spaces shall be stainless steel (ADA compliant) sinks with maximum 1.5 GPM flow rate. Sink shall be provided with lead free faucet. Plumbing roughing connections and faucets will be provided to each kitchen appliances requiring plumbing work. Non-freeze wall hydrants will be provided along the exterior wall of school building. Non-Freeze deck mounted roof hydrant will be installed to serve rooftop mechanical system within 150 feet. Any art room and STE room sinks will be provided with in-line solids interceptor.

FIRE PROTECTION SYSTEMS

General

The fire protection systems will be designed per Massachusetts State Building Code (780 CMR), NFPA 13 Standard for the Installation of Sprinkler System, NFPA 14 Standard for the installation of Standpipe System and NFPA 20 Standard for the installation of Fire Pump Systems (if required).

System Description

A new 8" fire service shall be extended from the site hydrant water loop into the Water Entry room in the new Building. Cross connection control shall be provided by use a supervised double check valve assembly backflow preventer on the fire service as it enters the building. The room will also house the wet alarm check valve. From there, the fire protection pipe will run to each egress stair to feed the standpipe system. Multiple standpipe risers will be provided with floor control valve stations at each floor to feed the sprinkler system. Each floor control station consists of a monitored shut-off valve, flow switch and an Inspector's test valve and sight glass

A new fire hydrant flow test shall be conducted to assess the water flow and pressure in the area. The flow test results shall be analyzed to confirm whether a fire pump is required or not. The fire pump room, if required, shall be 2-hour fire resistance rated and shall be dedicated to fire pump equipment only. The fire pump room shall be minimum 200 sq. ft. The new fire pump, if required, shall be an automatic electric driven horizontal split case fire pump with an automatic transfer switch. Preliminary calculations estimate the fire pump shall be rated for 60 psi at 750 gpm and 50 HP motor. Preliminary calculations estimate the jockey pump to be rated for 2 HP.

The entire building shall be protected throughout with a wet automatic fire suppression system. A fire department Storz pumper connection will be provided at the exterior wall, within 100ft. of a site hydrant. The FDC will either be wall-mount or free-standing, depending on the final details and the preference of the Fire Department AHJ.

Light hazard areas include class rooms, corridors, cafeteria, rest rooms, offices, media & gym etc. Ordinary hazard group-1 areas of the building include kitchen, mechanical rooms, electrical rooms, locker rooms, Science class rooms, etc.

Required Design Densities:

Light Hazard Areas = 0.10 GPM over 1,500 s.f.

Ordinary Hazard Group 1 = 0.15 GPM over 1,500 s.f.

Ordinary Hazard Group 2 = 0.20 GPM over 1,500 s.f.

Sprinkler spacing (max.):

Light Hazard Areas = 225 s.f.

Ordinary Hazard Areas = 130 s.f.

Manual Class I standpipe system will be designed in accordance with NFPA Standard 14, 2019, and

local Fire Department requirements. Standpipes will be located in each required egress stairway, and adjacent to the Stage. Additionally, standpipes will be located so that no part of the building is more than 200 feet from a standpipe valve. Each standpipe will be equipped with a 2 1/2" fire department hose valve with 1 1/2" reducer at the stair floor landing.

Sprinkler heads in areas with finished ceilings will be concealed pendant type and in areas with no suspended ceilings will be upright sprinkler heads. All sprinklers will be quick response heads. Sprinkler heads in mechanical rooms and Gym will be provided with Wire guards. Dry pipe system will be provided in areas subjected to freezing

The fire protection piping will be Schedule 40 piping with threaded or grooved fittings for any piping sized 1½" and less. For sizes over 2", Schedule 10 piping with roll grooved fittings and couplings will be used. All valves controlling the flow of water will be equipped with supervisory devices that report to the Fire Alarm system.

INFORMATION TECHNOLOGY

Voice/Data Structured Cabling System

Voice/data outlets shall be installed in all academic and administrative spaces including but not limited to all classrooms and instructional areas, large group assembly spaces, gym, cafeteria, and Library. Voice/data outlets shall be installed at every desk workstation in all offices.

Pathways between each Intermediate Distribution Frame (IDF) Room and the Main Distribution Frame (MDF) Room will be furnished and installed using conduit between rooms and the above-finished ceiling of main corridors, as well as conduits between floors. 24 strand OM4 multimode and 12 strand Single mode fiber optic cabling, as well as multi-pair voice riser cable, shall be installed between each IDF and the MDF. Fiber patch panels and voice cross-connect blocks shall be installed in Rooms for terminating fiber and multi-pair riser cable.

Data drops shall be furnished and installed including a voice drop for a telephone in each classroom and instructional space.

In new construction areas with new CMU or gypsum walls, furnish and install in-wall two gang outlet boxes, plaster ring, 1" conduit to nearest accessible ceiling, insulating bushings and pull line for all voice/data outlet locations. In repaired and renovated spaces, outlets will be surface mounted utilizing surface mounted boxes and conduit or surface mount raceway, which shall be directly attached to the surface of the walls between the finished ceiling and the outlet. If nearby accessible ceilings are not feasible, conduits may be extended to the nearest accessible ceiling or directly to nearest IDF room.

A structured cabling system shall be provided consisting of Category 6A voice/data cable, modular jacks, patch panels, wiring blocks, racks, fiber optic cable, fiber patch panels, 2-post and 4-post open equipment racks, device plates, outlet boxes, conduit, etc. for a complete and fully functional voice/data/video system.

Provide structured cabling for wireless access points to be located on ceilings and wall enclosures at designated locations throughout the building to ensure 100% coverage. Provide two Category 6A data cables/jacks at the wireless access point outlet for connection of a future Wireless Access Point to the building Local Area Network.

Digital Signage System

Data outlets and power receptacles shall be installed in strategic areas to support the installation of Digital Signage displays. Data outlets shall consist of Category 6A cable, devices plates, outlet boxes, conduit, etc.

The Digital Signage System shall consist of 65", 75", 86", and/or 98" LED flat panel displays with an easy to manage signage player and software.

Gymnasium Local Sound and Projection System

A dedicated local sound system for the Gymnasium shall be furnished and installed and shall include an amplifier, overhead program playback speakers, Bluetooth for mobile device connections, wireless microphone system, dedicated microphone outlets and an assistive listening system mounted in a sound system rack with a lockable door.

A permanently mounted high lumen projector and a built-in tensioned electric projection screen will

be provided in the Gymnasium with user connection plates and a system interface to control the selection of video sources and system volume.

Cafeteria Local Sound and Projection System

A dedicated local sound system for the cafeteria shall be furnished with an installed and shall include an amplifier, program playback as well as voice lift speakers, Bluetooth for mobile device connections, wireless microphone system, dedicated hardwired microphone outlets and an assistive listening system mounted in a sound system rack with a lockable door.

A permanently mounted high lumen projector and a built-in tensioned electric projection screen will be provided in the cafeteria with user connection plates and a system interface to control the selection of video sources and system volume.

Master Clock and Distributed Communication System

A master clock system with connections to the internet for synchronizing time shall be included in the building. Low voltage secondary clocks shall be installed in all academic and administrative spaces, and in all common spaces such as conference rooms, library, gymnasium, and cafeteria. The master clock shall be in the MDF room. A distributed communication system shall be furnished and installed with public address speakers located in all classrooms and instructional spaces, offices, administrative areas, conference rooms, library, gymnasium, cafeteria and main corridors. Talkback speakers with a call in switch shall be furnished and installed in all academic classroom and instructional spaces. The one-way paging speakers shall be flush mounted 16 feet on center in the ceiling of all corridors and large assembly spaces. Multiple one-way paging horn speakers shall be flush mounted to the exterior walls of the school and interior Gymnasium walls. The distributed communication system central equipment shall be located in the MDF room. The system shall be integrated with the telephone system so that public address announcements can be initiated from any telephone handset using an access code. The system shall be interfaced to the Master Clock system for generating scheduled bell tones over the distributed communication system speakers.

Video Intercom and Door Control System

A video intercom system shall be installed at the school's main entry doors to provide administrators with a means of communicating with visitors to the school before allowing entry. The system shall provide a way to interact with visitors while receiving visual verification. The system shall also provide administrators with the ability to unlock doors for visitors remotely. The system shall include door stations with speaker and camera, master stations with display and control buttons, and all low voltage cabling and power supplies. The door vendor shall provide electronic door latch hardware. Video Intercom shall consist of exterior locations located at the main entrance and the receiving entrance doors, and interior management consol stations to be located at the main office, principal's office, kitchen office and custodial/receiving area.

Integrated Security System

Intrusion Detection: A complete intrusion detection system shall be furnished and installed to include but not be limited to magnetic door contacts, motion detectors, sirens, alarm keypads for

arming and disarming the system, conduit and wire. Intrusion detectors shall be installed in corridors, lobbies and all exterior ground level rooms with windows. All exterior doors and all interior access-controlled doors shall be equipped with door contacts to support both the intrusion and access control systems. All ground-floor rooms with windows shall be equipped with motion sensors. All stairwells and main corridors on the first and second floors shall be equipped with motion sensors.

Video Surveillance: A complete video surveillance system shall be furnished and installed to include but not be limited to a server and software, color IP cameras, dedicated network switches, and adequate network storage for archiving video. Interior IP cameras at all egress doors and corridors shall be furnished and installed. Exterior cameras shall be furnished and installed around the exterior of the building. Dedicated Ethernet switches with Power over Ethernet (PoE) ports shall provide power and connectivity to all IP security cameras to the server. A Network Video Recorder (NVR), Video Management System (VMS), and client software shall be included. The NVR shall be large enough to store thirty (30) days of image storage at 15 fps. A cabinet/rack shall be provided in the MDF to house the main equipment including the NVR, rack-mounted monitor, and a UPS system. Conduit and cabling for security camera surveillance system shall be provided under the voice/data structured cabling system. The NVR system, including all VMS software and licensing, shall be a proprietary system so that the system matches the existing surveillance video equipment VMS installed in other buildings. Cameras shall be manufactured by Axis Communications.

A combination of multi-sensor, dual head, fisheye, and single lens dome cameras shall be placed to provide a minimum of 45ppf resolution in all corridors and public spaces. 8mp cameras will be mounted to the exterior of the school, with additional quad 8mp cameras mounted to parking lot light poles. These light pole camera locations will also be equipped with separate 2” conduit and pull boxes from the building for the installation of fiber optic cabling to the security cameras. Additionally, empty 2” conduit and pull boxes from the school to additional light poles will provide future pathways for the Owner to furnish and install cabling to future pole mounted cameras.

Access Control: A complete access control system shall be furnished and installed at designated door locations. The system shall include Card/Proximity Readers, all low voltage cabling, and power supplies, a system server with management software. The door hardware vendor shall provide electronic door latch hardware and Request to Exit devices. The system shall be a proprietary system to match the existing access control system equipment installed in other school buildings.

A complete conduit system including back boxes pull lines, plaster rings, etc. as required to support all security system devices shall be furnished and installed.

Classroom Speech Reinforcement System

A speech reinforcement system shall be provided in all classrooms size instructional spaces. The system shall consist of an amplifier/speaker assembly installed in the finished ceiling utilizing an integrated and dedicated wireless technology, wireless media connector, and two wireless microphones, one lapel microphone for the teacher and another handheld microphone for students. The system shall be proprietary – Lightspeed Topcat.

The system shall amplify the teacher's voice to increase intelligibility, as well as provide a means for providing enhanced program audio playback for multimedia presentations in the classrooms.

School Network Switches and Wireless Access Points

All modern building systems, including but not limited to lighting, HVAC, security, etc., require network connectivity to the internet to function properly.

Therefore, building-wide Network Switches shall be provided, which will deliver network connectivity to voice and data outlets, wireless access points, VoIP telephone handsets, as well as for all building management systems. The Network switch design will also include multiple 10 GbE connections over fiber between IDF Rooms and the MDF room. The network switches and shall be a proprietary system manufactured by Cisco to match the district wide networking standards, which is the basis for all schools in the district. The wireless access points shall be a proprietary item by Meraki to match the district wide wireless standards.

Telephone and Voicemail System

A telephone system including telephone handsets in all classrooms and instructional spaces; at all administrative/staff office workstations, and in all common areas such as conference rooms, library, etc. shall be provided. The telephone system shall be capable of Voice over IP. All headend equipment, including a voice mail system, sized appropriately for the number of users, shall be installed in the MDF. This may involve a proprietary request so that the telephone system matches existing telephone system equipment installed in other buildings.

The system shall be integrated with the Distributed Communication System so that public address announcements can be made from any telephone system handset with the proper access codes pressed at the handset. The Telephone and Voicemail System shall be a proprietary VoIP system manufactured by Yealink to match the district wide Zoom telephone system standards.

Equipment Phase (FF&E phase)

The following technology systems shall be identified and procured by the Owner as part of the Equipment (FF&E) Phase.

Instructional Video Presentation Equipment

Video presentation equipment at all teaching stations including classrooms, SPED rooms, Library, etc. Equipment shall include 75” and 86” interactive flat panels and document cameras. Some ultrashort interactive projectors may also be deployed in specialized areas. Flat panels (and projectors) shall be mounted to the wall with specialized cabling extending between display device and an interface outlet on the teaching wall. Small group meeting spaces and conference rooms may be equipped with smaller 65” interactive flat panel displays.

Computer Network Equipment

Computer network equipment shall include but not be limited to servers, network storage, firewall appliances, teacher and staff computers, teacher tablets, teacher Chromebooks, student Chromebooks, student iPads, and student computers.

Computer Carts and Lockers

Storage and Charging Carts and Lockers will be purchased for securing and charging student tablets, Chromebooks, and computer laptops. Lockers provide a means for securely storing and charging student devices in classrooms, while carts offer portability and flexibility in utilizing the technology within the school.

Network Copier/Printer Equipment

Large Copier/Printers shall be supplied and supplemented with smaller workgroup laser printers and personal laser printers in key administrative areas.

Portable Video Presentation System

Mobile interactive flat panel and/or projectors for use in areas not equipped with display technology.

Cafeteria Point of Sale Equipment

Electronic Cash Register for processing the purchase of school meals shall be provided.

Visitor Management System

A visitor management system for providing the ability to scan visitor's picture identifications (driver's license) and printing visitor credentials while on school premises shall be provided.

SUSTAINABILITY OVERVIEW & DOCUMENTS

Summary

This section includes the following:

- A Sustainable Design narrative
- A completed LEED for Schools V4 Scorecard indicating the necessary points to achieve a minimum "Silver" Certification, including the minimum of five points of the MSBA-designated LEED-Schools v4 Indoor Air Quality Credits/Points (for 1% additional MSBA reimbursement), that also shows a path for the District to achieve "Gold".
- A signed letter indicating the Designer's acknowledgement of the District's goals for participation in the MSBA Green Schools program for an additional 4% reimbursement points.

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Sustainable Design Narrative

The proposed new Wilmington - Wildwood Elementary School is an approximately 167,035 GSF project located in Wilmington, MA.

The project will be participating in the MSBA High Efficiency Green School Program, as follows:

- It will meet the minimum requirements of the MSBA Green Schools program:
    - Using LEED-S v4, for no additional reimbursement, achieve a minimum of "Silver" certification (50 points minimum), including a minimum total of three points (from seven points available) from the following three categories:
        - MR Building Product Disclosure and Optimization - Material Ingredients
        - IEQ - Low Emitting Materials
        - IEQ – Indoor Air Quality Assessment
    - Meet the minimum energy efficiency requirements described in the MA DOER "Stretch Code Green Community" standards. Wilmington is not a Green Community that has adopted the Stretch Energy Code.

Additionally, the project:

- Will meet the MA Specialized Opt-In Stretch Energy Code (for 3% additional MSBA reimbursement)
- Will earn a minimum of five points of the above-listed LEED-Schools v4 Indoor Air Quality Credits/Points (for 1% additional MSBA reimbursement)

The **Owner has selected a Fossil-free mechanical system (see Mechanical Narrative in Section 4.1.2-K, Page 6: An air-source heat pump plant with displacement system with passive radiant cooling/heating panels and high efficiency air-source to hydronic heat pump chiller/heating plant for chilled/heating hot water**. This system will be designed to meet the Opt-In Energy Code, and the project will be designed to be an all-electric mechanical system.

The attached preliminary LEED v4 for Schools scorecard shows a pathway for the new school project to achieve Gold level LEED v4 certification. There are a total of 62 attempted points in the "Yes" column, which if all are successful will surpass the Silver certification minimum goal to Gold certification, plus 29 attempted points in the "Maybe" column.

The score card includes 23 points in the Energy & Atmosphere category, 16 of which are allocated to the Optimize Energy Performance credit, 6 allocated to the Enhanced Commissioning credit, and one point is currently held for Advaned Energy Metering. Nine points are allocated across many of the credits available in the Indoor Environmental Quality category.

In general, credits were selected for this preliminary scorecard based on the location of the project site and assumed LEED boundary, the size of the building, commonly accomplishable credits based on experience with past school building projects in Massachusetts with similar system types, and credits required by MSBA.

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LEEDv4 BD+C: Schools (LEEDv4 SC)
Project Scorecard

Project: Wilmington Wildwood

Date: 4/7/25

The Green Engineer
Sustainable Design Consulting

Y	?	N			
1	0	0	**INTEGRATIVE PROCESS**		1
1			IPc1	Integrative Process	1
4	0	11	**LOCATION & TRANSPORTATION**		15
		N	LTc1	LEED for Neighborhood Development Location	15
1			LTc2	Sensitive Land Protection	1
1		1	LTc3	High Priority Site	1-2
1		4	LTc4	Surrounding Density and Diverse Uses	1-5
		4	LTc5	Access to Quality Transit	1-4
		1	LTc6	Bicycle Facilities	1
		1	LTc7	Reduced Parking Footprint	1
1			LTc8	Green Vehicles	1
6	5	1	**SUSTAINABLE SITES**		12
Y			SSpr1	Construction Activity Pollution Prevention	Required
Y			SSpr2	Environmental Site Assessment	Required
1			SSc1	Site Assessment	1
2			SSc2	Site Development - Protect or Restore Habitat	1-2
1			SSc3	Open Space	1
	3		SSc4	Rainwater Management	2-3
	2		SSc5	Heat Island Reduction	1-2
1			SSc6	Light Pollution Reduction	1
		1	SSc7	Site Master Plan	1
1			SSc8	Joint Use of Facilities	1
8	2	2	**WATER EFFICIENCY**		12
Y			WEpr1	Outdoor Water Use Reduction	Required
Y			WEpr2	Indoor Water Use Reduction	Required
Y			WEpr3	Building-Level Water Metering	Required
2			WEc1	Outdoor Water Use Reduction	1-2
3	2	2	WEc2	Indoor Water Use Reduction	1-7
2			WEc3	Optimize Process Water Use	2
1			WEc4	Water Metering	1
23	8	0	**ENERGY & ATMOSPHERE**		31
Y			EApr1	Fundamental Commissioning and Verification	Required
Y			EApr2	Minimum Energy Performance	Required
Y			EApr3	Building-Level Energy Metering	Required
Y			EApr4	Fundamental Refrigerant Management	Required
6			EAc1	Enhanced Commissioning	2-6
16			EAc2	Optimize Energy Performance	1-16
1			EAc3	Advanced Energy Metering	1
	2		EAc4	Demand Response	1-2
	5		EAc5	Renewable Energy	1-5
	1		EAc6	Enhanced Refrigerant Management	1

Y	?	N			
3	5	5	**MATERIALS & RESOURCES**		13
Y			MRpr1	Storage and Collection of Recyclables	Required
Y			MRpr2	Construction and Demolition Waste Management Planning	Required
	1	4	MRc1	Building Life-Cycle Impact Reduction	2-5
1	1		MRc2	Building Product Disclosure and Optimization - EPD	1-2
	1	1	MRc3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	1-2
1	1		MRc4	Building Product Disclosure and Optimization - Material Ingredients	1-2
1	1		MRc5	Construction and Demolition Waste Management	1-2
9	7	0	**INDOOR ENVIRONMENTAL QUALITY**		16
Y			IEQpr1	Minimum Indoor Air Quality Performance	Required
Y			IEQpr2	Environmental Tobacco Smoke Control	Required
Y			IEQpr3	Minimum Acoustic Performance	Required
2			IEQc1	Enhanced Indoor Air Quality Strategies	2
3			IEQc2	Low-Emitting Materials	3
1			IEQc3	Construction Indoor Air Quality Management Plan	1
1	1		IEQc4	IAQ Assessment	2
1			IEQc5	Thermal Comfort	1
1	1		IEQc6	Interior Lighting	2
	3		IEQc7	Daylight	3
	1		IEQc8	Quality Views	1
	1		IEQc9	Acoustic Performance	1
6	0	0	**INNOVATION**		6
1			INc1.1	Innovation: O+M - Green Cleaning + IPM	1
1			INc1.2	Innovation: Local Food Production	1
1			INc1.3	Innovation: Purchasing - Lamps	1
1			INc1.4	Exemplary Performance Credit: Optimize Process Water Use (100% reduction)	1
1			INc1.5	Pilot Credit: Integrative Analysis of Building Materials	1
1			INc2	LEED Accredited Professional	1
2	2	0	**REGIONAL PRIORITY** (underlined)		4
	1		RPc1	Regional: Renewable Energy (2 pts)	1
	1		RPc2	Regional: Building Lifecycle Impact Reduction (2 pts)	1
1			RPc3	Regional: Protect or Restore Habitat (2 pts)	1
1			RPc4	Regional: Optimize Energy Performance (8 pts)	1

62	29	19	**PROJECT TOTALS (Certification Estimates)**	110

Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

April 16, 2025

Ms. Mary Pichetti
Director of Capital Planning
Massachusetts School Board Authority
40 Broad St. Suite 500
Boston, MA 02109

Project: Wilmington Wildwood ECC – Wilmington, MA
Subject: Green School Program

Dear Ms. Pichetti,

This is an acknowledgement that the Wilmington Public School District has identified a goal of 4% additional reimbursement from the MSBA Green School Program. As their Designer, I have submitted a completed LEED for Schools V4 score card showing all prerequisites and **62 attempted 'yes' points and currently 29 'maybe'** which will:

- Meet the minimum requirements of the MSBA Green Schools program, including achieving LEED-Schools v4 "Silver" certification (50 points minimum), and
- 3% additional reimbursement for meeting the MA Specialized Opt-In Stretch Energy Code, and
- 1% additional reimbursement for earning a minimum of five points of the MSBA-designated LEED-Schools v4 Indoor Air Quality Credits/Points

The scope of work for this project will include the construction elements and performance tasks to achieve these goals, and all subsequent documents, including but not limited to, specifications, drawings, and cost estimates will match the scope of work indicated in the submitted scorecard.

Best regards,
DORE + WHITTIER

Lee P. Dore, Assoc. AIA, CSI, LEED AP
Principal

ADA AND MAAB ACCESSIBILITY COMPLIANCE ANALYSIS

Accessibility Regulation Summary

The Project will comply with the Massachusetts Architectural Access Board (MAAB) 521 CMR, or the 2010 Americans with Disability Act Standards for Accessible Design where it is more stringent than MAAB.

Because the School project is new construction, it shall fully comply with CMR 521 (Section 3.2). Spaces accessed only by ladder, crawlspaces, catwalks, or non-passenger elevators are exempt (Section 3.12).

In educational facilities, only administrative areas, instructional spaces, and areas open to students or the general population are required to comply with 521 CMR (Section 12.1.1). Areas with restricted access intended for use only by staff (such as instructor toilets, toilets for kitchen staff, mechanical and other support spaces) are not required to comply with 521 CMR. Such staff-only toilet rooms or spaces will comply with ADA Standards.

Accessible Routes, General Site and Building Elements

An Accessible Route shall be provided from accessible parking, passenger loading areas, and public streets or sidewalks to the accessible building entrance they serve and shall coincide with the route for the general public (521 CMR - Section 20.2). At least one accessible route shall connect the building with all facilities, elements, and spaces on the site and within the building (Section 20.2.1). The accessible route will comply with the Accessible Route provisions of Section 20.

All spaces required to be accessible will be provided with at least one accessible means of egress in accordance with Section 20.11.1.

Curb cuts complying with Section 21 shall be provided wherever an accessible route crosses a curb (Section 21.2).

Accessible parking spaces shall be provided in accordance with Table 23.2.1. One in every six, but not less than 1 accessible space shall be van accessible in accordance with ADA 208.2.4 (note this requirement is more stringent than MAAB Section 23.2.2). Accessible spaces will be located on the shortest accessible route from the parking lot to an accessible entrance (Section 23.3.1). Where an accessible space cannot be located within 200 feet of an accessible entrance, an accessible passenger drop-off shall be provided within 100 feet of the accessible entrance (23.3.3).

Accessible Parking Spaces, Accessible Van Spaces, and the associated access to the site Accessible Route will comply with Section 23.4

Plumbing Elements and Facilities

Single User Toilet Rooms intended for use by the students or the general public, or located in the Administrative Suite, shall be accessible in accordance with 521 CMR. Toilet rooms with restricted access only by staff members shall be accessible in accordance with the 2010 ADA Standards.

Toilet fixture counts have been calculated based on 248 CMR (Massachusetts Fuel Gas and Plumbing Code) and distributed throughout the project based on the anticipated occupant load in each area.

Toilet rooms intended for use only by elementary school aged children (grades K-6) and by pre-kindergarten children, as defined per 521 CMR Section 30.1-b, shall be designed in accordance with Sections 30.14 through 30.20. This includes the single user toilet rooms within classrooms and the gang toilet rooms.

Drinking fountains shall be provided at each set of restrooms, on each floor, along the accessible route and installed in accordance with Section 36.

Special Occupancy Rooms and Features

The spaces or portions of the building described below require unique description and consideration with respect to accessibility.

Stairways and Elevators

All stairways will be designed as accessible stairways in accordance with Section 27. Stairways intended only for use by service staff, including the roof access ladders, are not required to be accessible (Section 12.1.1).

The elevator will be designed in accordance with Section 28 and to accommodate the required gurney size described in 524 CMR (Massachusetts Board of Elevator Regulations) Section 17.40-(1). As such, it will accommodate the dimensional requirements described in 521 CMR Section 28.

Assembly Spaces in Educational Facilities – Generally

Amphitheaters, lecture halls, and classrooms will comply with 521 CMR Chapter 14 for Places of assembly in accordance with section 12.1.3. The gymnasium and cafeteria will also comply with the requirements of Chapter 14.

Assistive Listening Systems shall be provided for all assembly spaces in accordance with Section 14.5.

Gymnasium

Fixed operable bleacher seating will be provided in the Gymnasium, and the requirements for Number of Accessible Seats (Section 14.2) will be provided for each section of operable bleachers.

Cafeteria

No fixed seating will be provided in the Cafeteria, and the requirements for Number of Accessible Seats (Section 14.2) are not applicable to this space.

Cafeteria tables will be a combination of fixed (attached) and loose seating and will accommodate wheelchairs.

The raised platform (Stage) has an accessible route consisting of a ramp designed in accordance with Section 24 (in accordance with Section 14.6.1-a.).

Media Center

The Media Center will be designed to accommodate the requirements for Libraries described in Section 12.2.

At least 5% of all reading and study areas and computer workstations shall be accessible and designed to accommodate the requirements of Section 12.2.2.

At least one lane of the check-out area will have a counter a minimum of 36” long and a maximum of 36" in height (Section 12.2.3).

Security devices and Card Catalogs will not be provided for the facility.

Aisles between stacks will have a minimum clear width of 42" as the preferred dimension described in Section 12.2.6.

Built In Furnishings and Equipment

Per Section 12.4, a minimum of 1 type of each element in each classroom will comply with the following:

- Countertops and sinks will comply with Section 12.2.2-b, c, and d and consist of a Clear Floor Space with Knee Clearance and a countertop height of 28" to 34".
- At least 50% of shelf space in cabinets with comply with Sections 6.5 Forward Reach and 6.6 Side Reach.
- Controls and operating mechanisms shall comply with Section 39 Controls.

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Room Function Number 01.023

Room Name	KINDERGARTEN
Room Number	140
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	140	Programmed	1,100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for Kindergarten instruction, including a toilet room.
Quantity:	7
Occupant Load:	(18) Students (1) General Education Teacher (1) Para Professional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, ground floor, other Kindergarten classrooms and special education spaces, central location. Paired with another Pre-K classroom
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Wall Board, painted Magnetic writable surface at teaching wall location, 2’ to 7’ for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Set.
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Communicating doors between Classrooms

Furniture

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Room Data Sheet

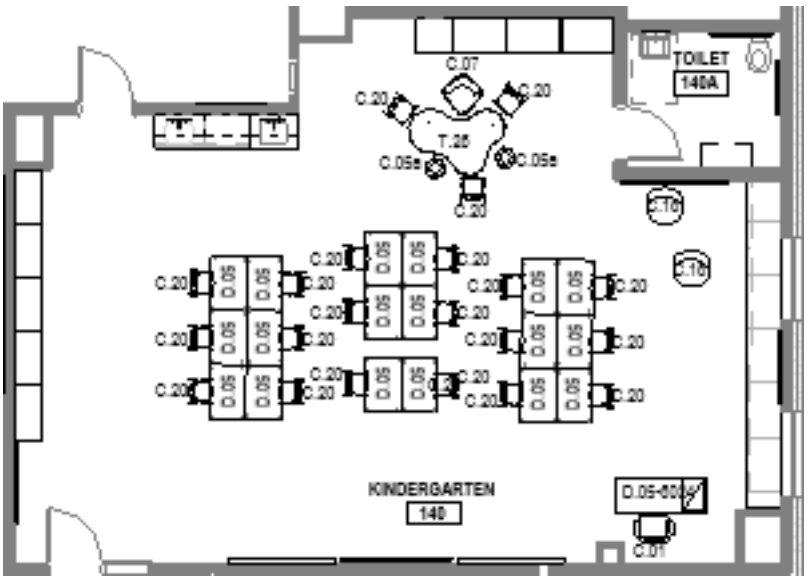
SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.023

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	2
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	22
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	19
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



Room Function Number 01.008

Room Name	GENERAL CLASSROOM
Room Number	216
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	216	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	30
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

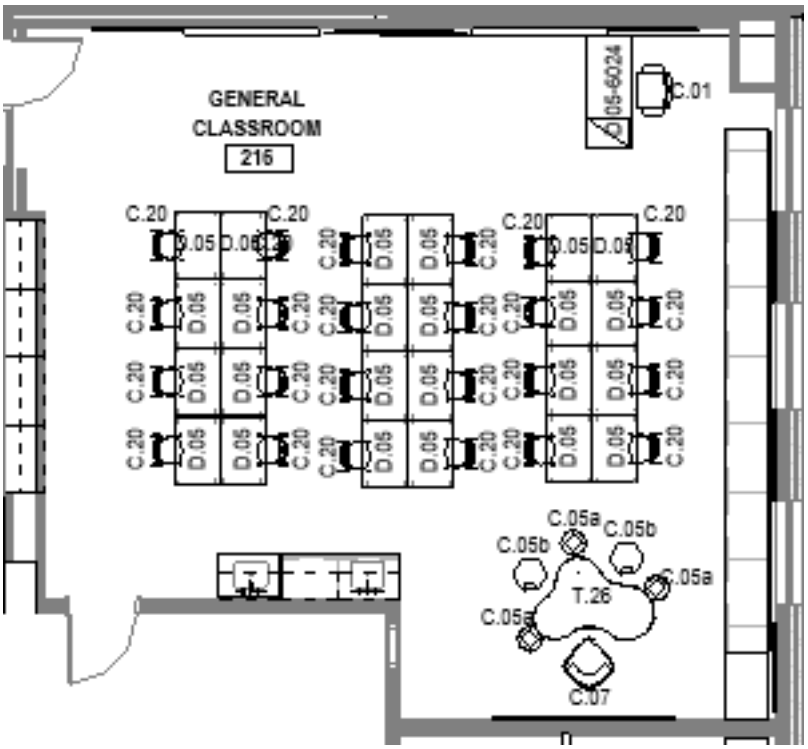
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.008

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	3
C.05b	Steelcase Turnstone - Buoy - Seating - Buoy	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	24
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	24
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 01.028

Room Name	GENERAL CLASSROOM
Room Number	242
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	242	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	30
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

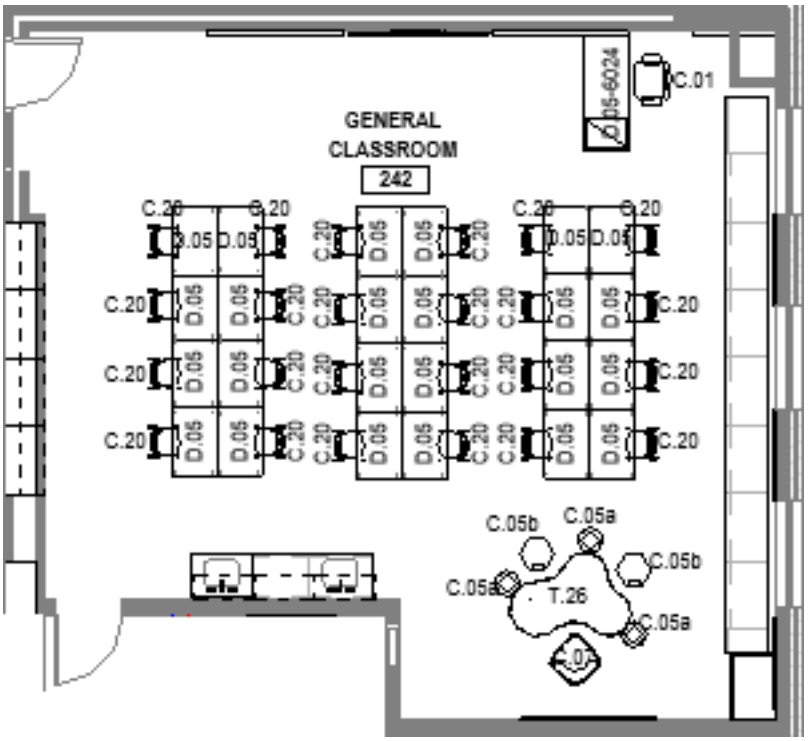
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.028

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	3
C.05b	Steelcase Turnstone - Buoy - Seating - Buoy	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	20
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	20
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



Room Function Number 01.015

Room Name	GENERAL CLASSROOM
Room Number	319
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	319	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	30
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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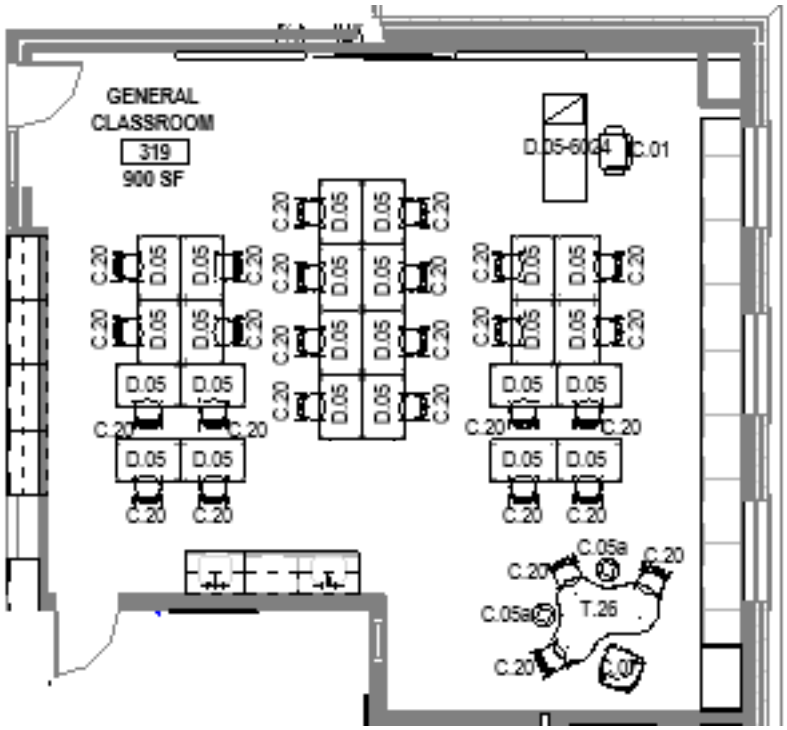
Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	27
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	24
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
S.06	Steelcase Turnstone - Bivi - Storage - Depot - 2 High	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 01.032

Room Name	GENERAL CLASSROOM
Room Number	345
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	345	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	30
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

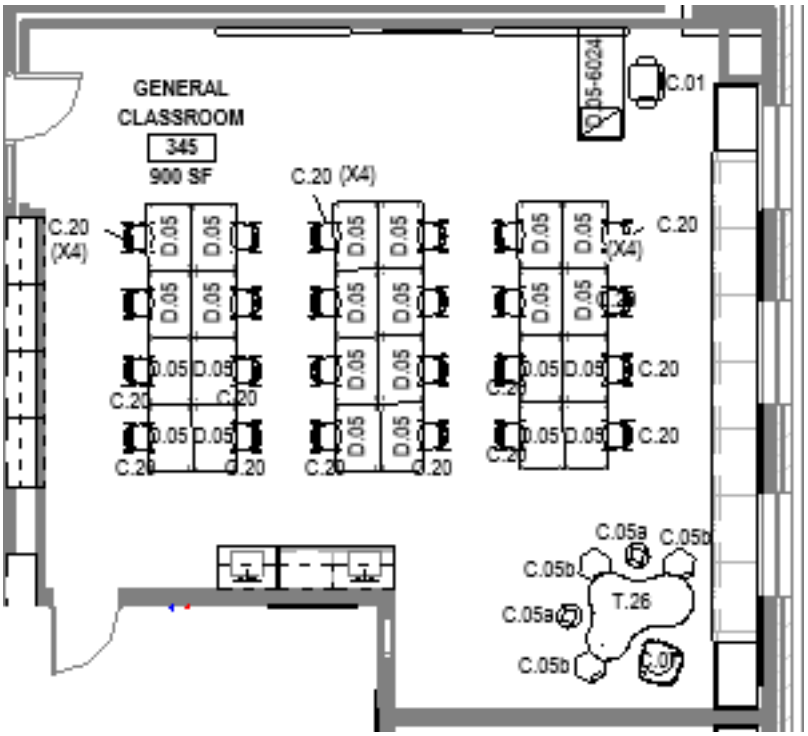
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.032

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.05b	Steelcase Turnstone - Buoy - Seating - Buoy	3
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	25
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	25
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 01.036

Room Name	GENERAL CLASSROOM
Room Number	353
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	353	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	30
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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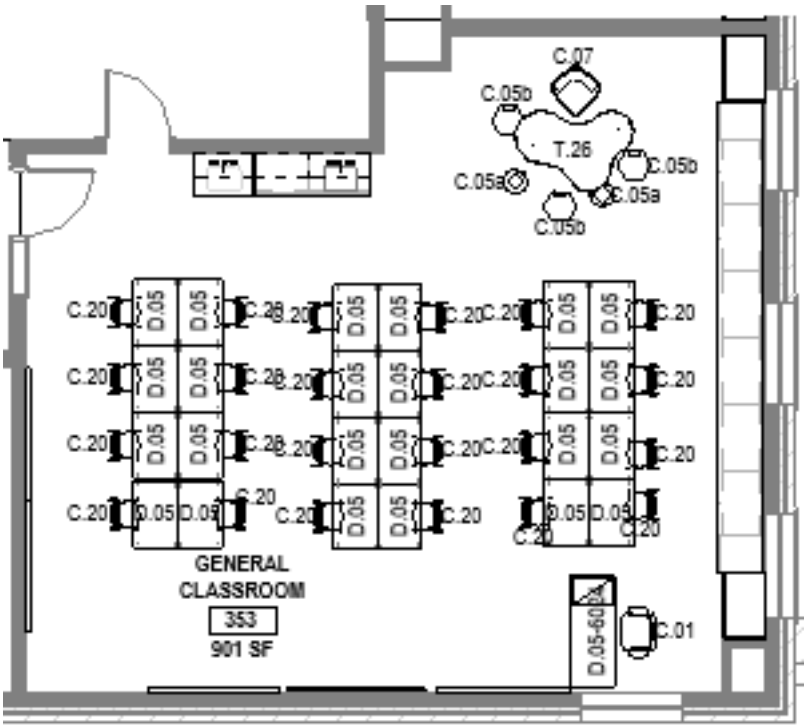
Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.05b	Steelcase Turnstone - Buoy - Seating - Buoy	3
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	20
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	20
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



Room Function Number 01.001

Room Name	STE CLASSROOM
Room Number	256
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	256	Programmed	1,080.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for STE instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	27
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location.
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

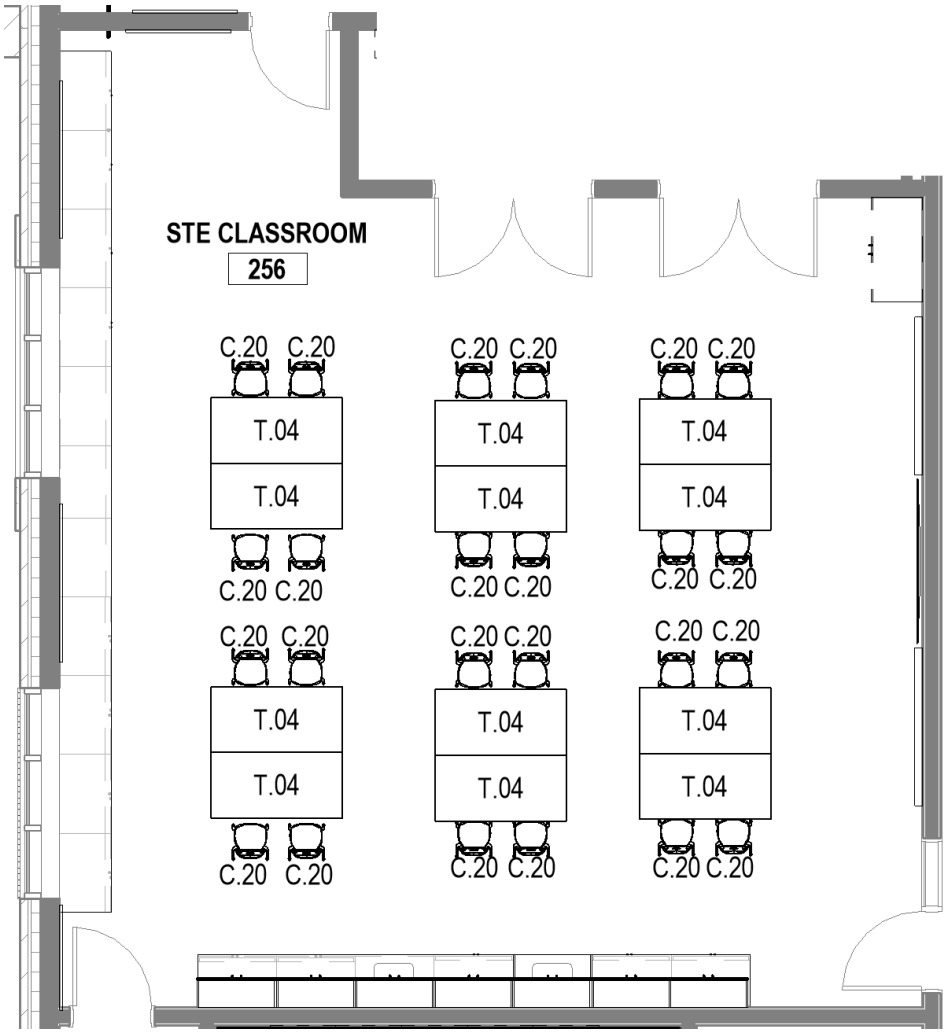
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.001

Furniture

Item: BIM ID	Name	Quantity
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	24
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	12



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Room Function Number 01.002

Room Name	STE STORAGE
Room Number	256A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	256A	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage room
Quantity:	1
Occupant Load:	None

Location Criteria:

Users:	Teachers and students
Adjacency:	Within STE classroom
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	None
Doors:	Flush wood doors. Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment. Wireless network access.

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	None
Furnishings:	None
Equipment:	Typical perimeter power requirements. Additional power required to support specific room equipment
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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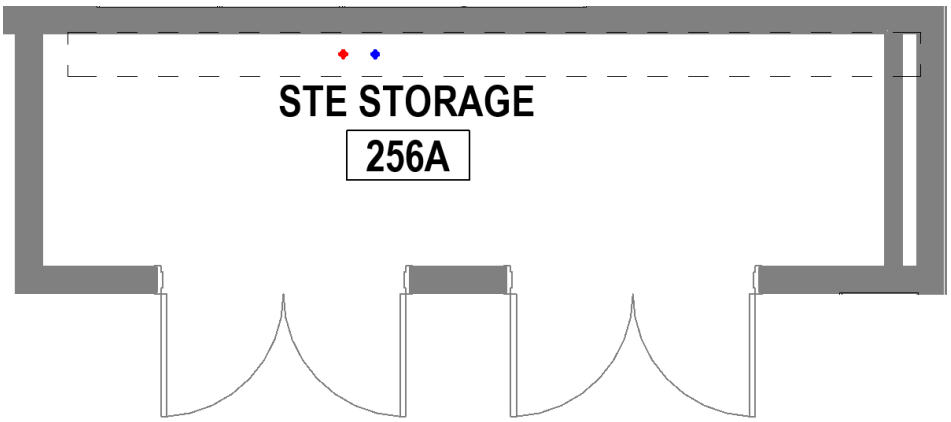
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.002



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Room Function Number 01.006

Room Name	ELL
Room Number	146
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	146	Programmed	450.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for English Language Learner specialists and pull-out instruction in small groups
Quantity:	2
Occupant Load:	(1) Staff (1-15) Students

Location Criteria:

Users:	Accommodates up to 15 students: Peer modeling benefits larger groups. Instruction flexibility: 1-on-1 or full group sessions.
Adjacency:	Central to the grade level teams. Direct access off corridor.
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light and acoustical seals Office hardware set
Plumbing / FP:	Fully Sprinklered Sink installation needed for classroom activities
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Interactive touch panel with wireless access and docking stations. Smart board included for interactive learning. Additional power required to support specific room equipment Public Address system Clock System Wireless network access interactive projector /d

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: Built in Teacher's desk. Teachers storage wardrobe Bookshelves. Secure cabinets for school records and laptops (with charging capabilities). 1-2 file drawers for additional needs. Tall cabinets: one for the wardrobe and another for shelves. Casework for grade-level materials and retail-style book display.
Specialties:	Types & Configurations indicated in the attached room layout sheets including: (2) Marker Board Surfaces
Furnishings:	Types & Configurations indicated in the attached room layout sheets. Flexible space with various furniture configurations: • Tables and desks on casters for mobility. • Kidney-shaped table included. Teacher desk should allow flexibility in arrangement.
Equipment:	Types & Configurations indicated in the attached room layout sheets

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Room Function Number 01.006

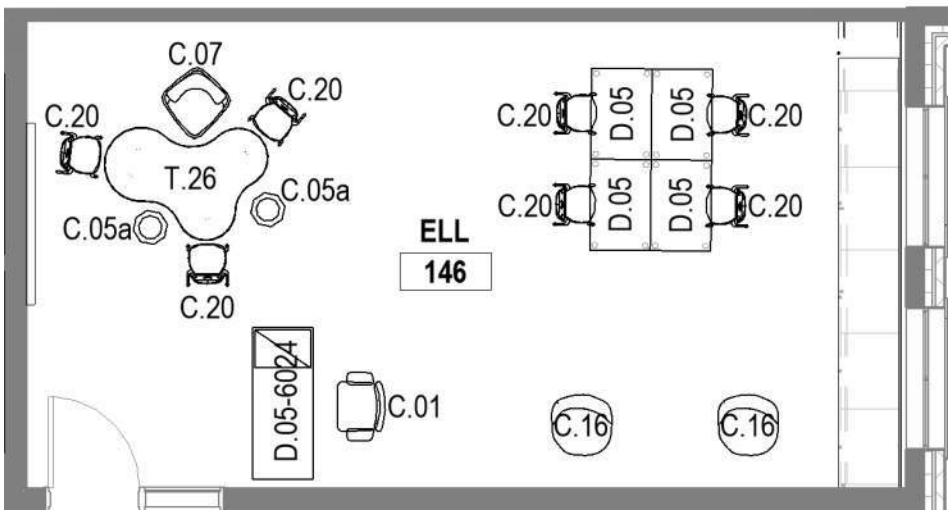
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets. Lockable Storage:• Secure cabinets for school records and laptops (with charging capabilities).• 1-2 file drawers for additional needs.• Tall cabinets: one for the wardrobe and another for shelves.Casework for grade-level materials and retail-style book display.Dedicated headphone storage.

Additional Requirements:

Acoustics can be challenging due to noise:
- Activities like singing and testing occur in the room.
- Testing requires a quieter environment to avoid disruptions.
- Sink installation needed for classroom activities.
- Interactive touch panel with wireless access and docking stations.
- Smart board included for interactive learning.

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	2
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	7
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	4
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 01.037

Room Name	TEACH COLLAB
Room Number	125
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	125	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Collaboration and group planning rooms for teachers
Quantity:	3
Occupant Load:	(20) Teachers/Faculty

Location Criteria:

Users:	Teachers, specialists, paraprofessionals
Adjacency:	Between learning communities
Orientation / Views:	Views to exterior preferred

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum Wall Board, painted Tile backsplash Projectable Magnetic writable surface for collaboration purposes
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom lockset
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Full size refrigerator Microwave,Coffee Maker, copy machine
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	18
C.08b	Chair-Stool-KI-Calida - 30" Stool	4
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	8
T.09	Table-Cafe-KI-Tributaire-Round-X-Base - 30"Dia,36"H,Knife Edge	2

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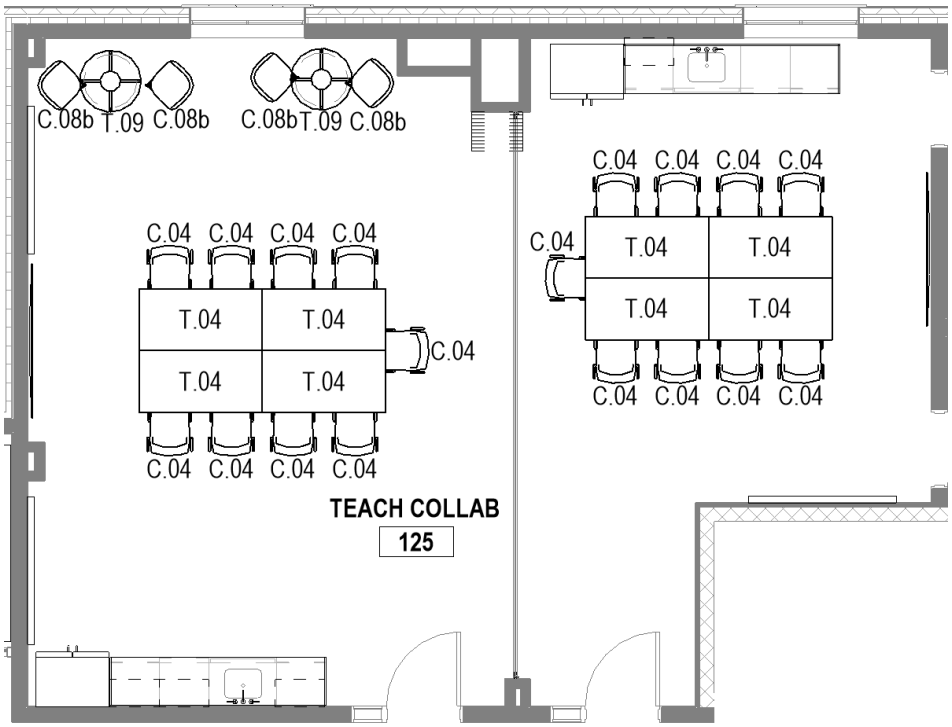
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.037



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Room Function Number 01.057

Room Name	EXTENDED LEARNING
Room Number	131A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	131A	Programmed	0.00
User Room Number			
Additional Number	131B, 131C, 131D		
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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Room Data Sheet

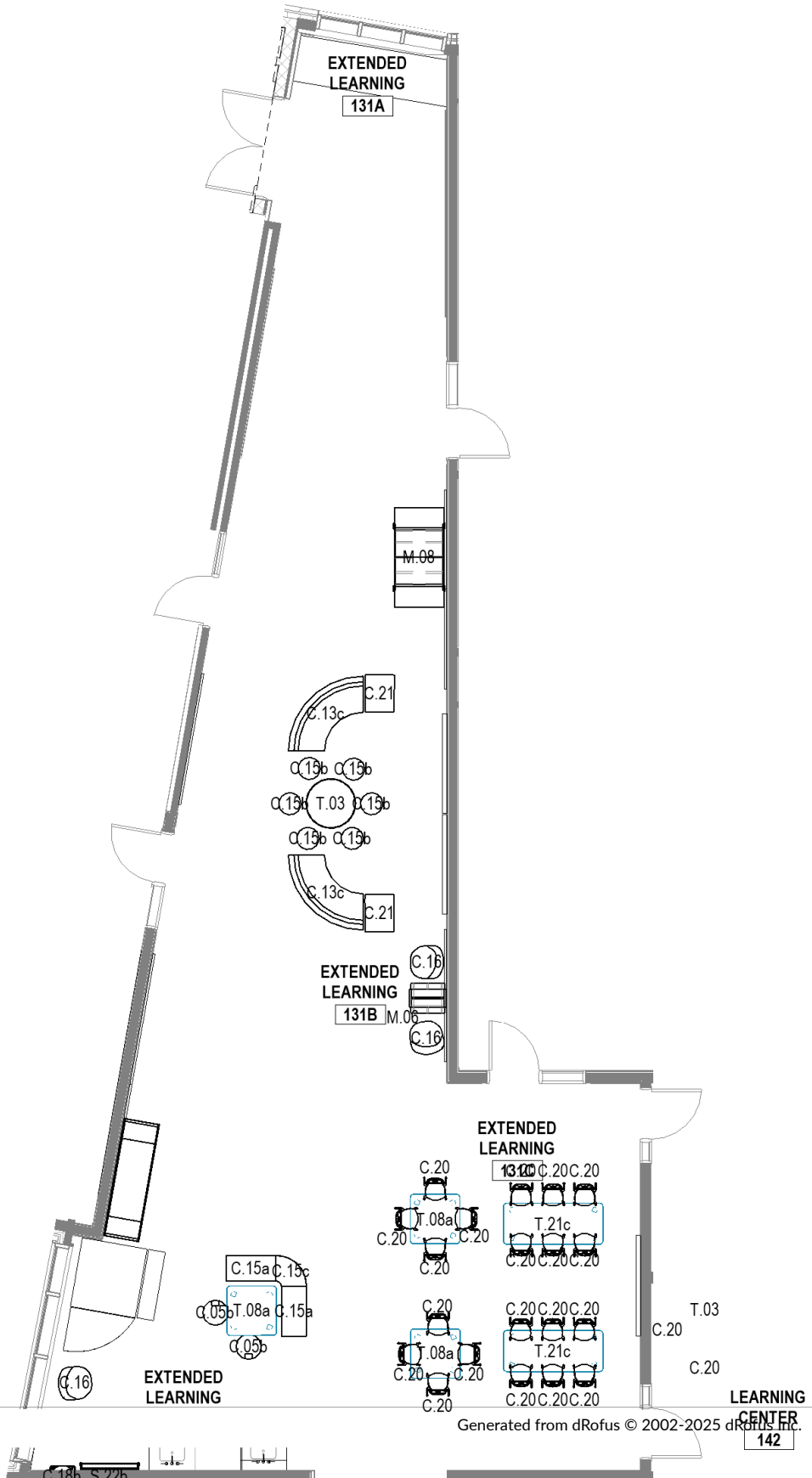
SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.057

(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile



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Room Function Number 01.062

Room Name	EXTENDED LEARNING
Room Number	230A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	230A	Programmed	0.00
User Room Number			
Additional Number	230B, 230C, 230D		
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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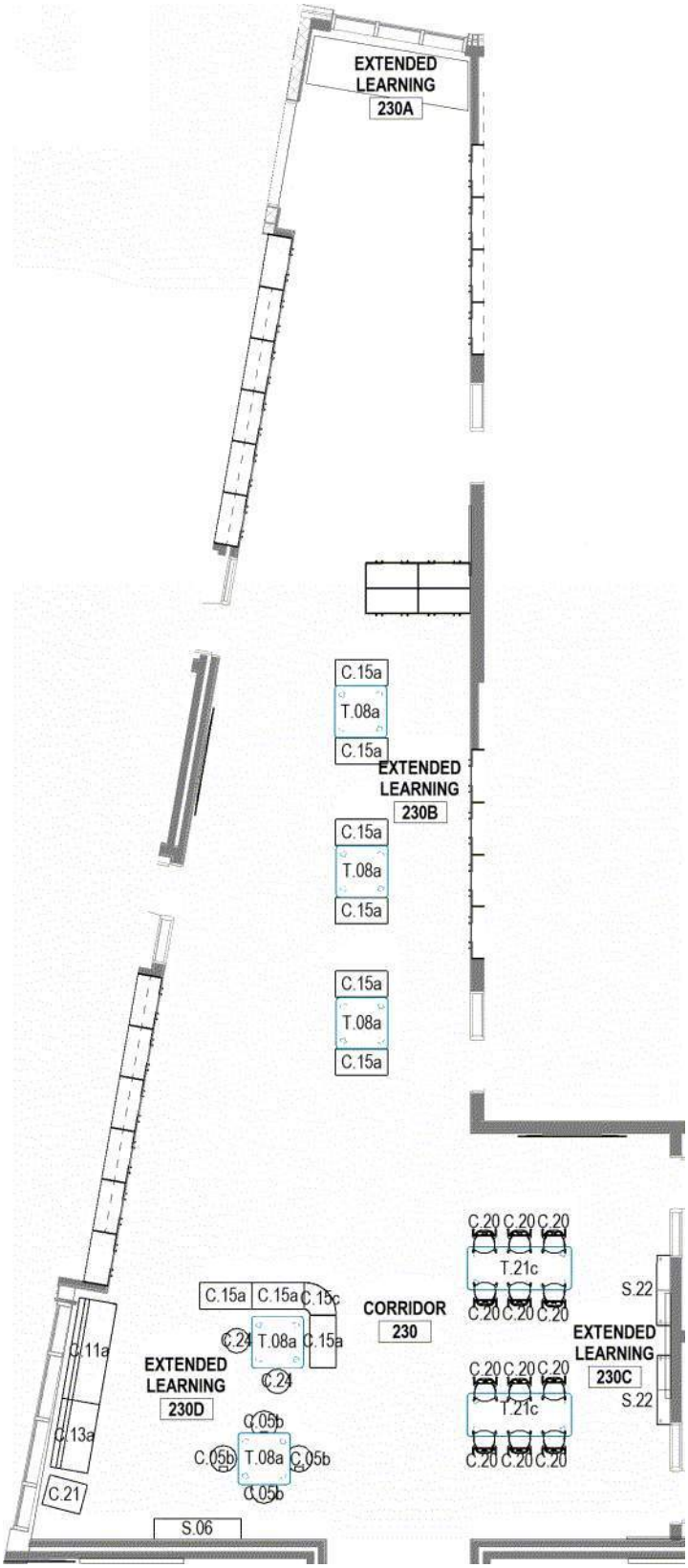
(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile



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Room Function Number 01.021

Room Name	EXTENDED LEARNING
Room Number	301B
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	301B	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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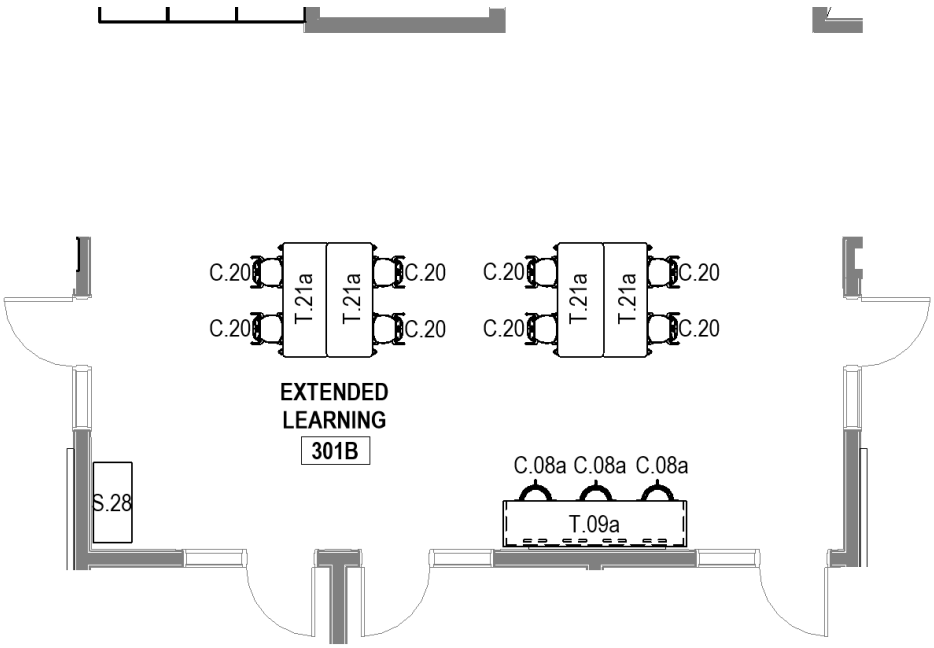
(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile

Furniture

Item: BIM ID	Name	Quantity
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
T.21a	SmithSystem_AM_Table_Education_Elemental_NestAndFold_24D - 24D x 60W	4



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Room Function Number 01.073

Room Name	EXTENDED LEARNING
Room Number	302A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	302A	Programmed	0.00
User Room Number			
Additional Number	302B, 302C, 302D		
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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Room Data Sheet

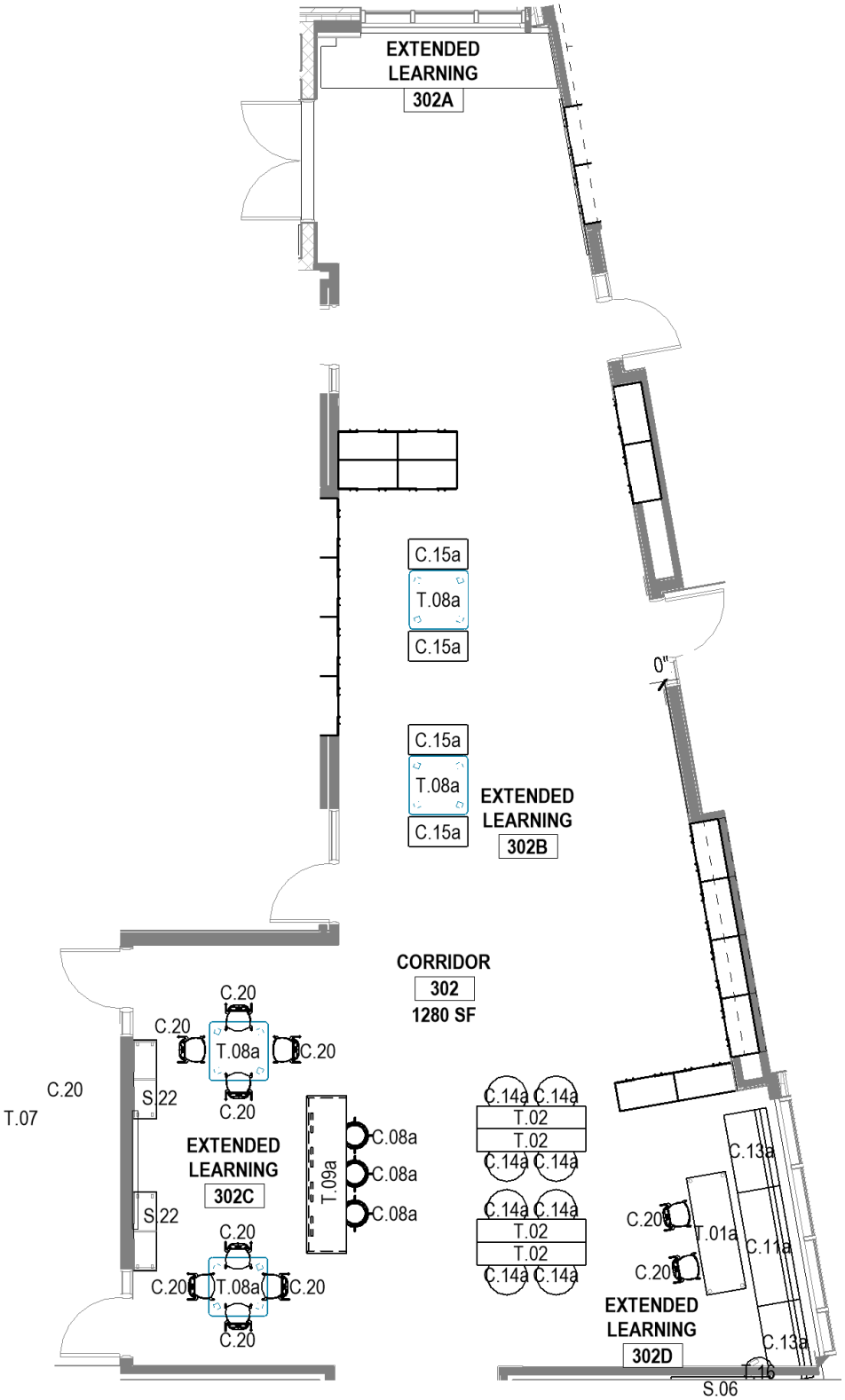
SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.073

(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile



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Room Function Number 01.074

Room Name	EXTENDED LEARNING
Room Number	333A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	333A	Programmed	0.00
User Room Number			
Additional Number	333B, 333C, 333D		
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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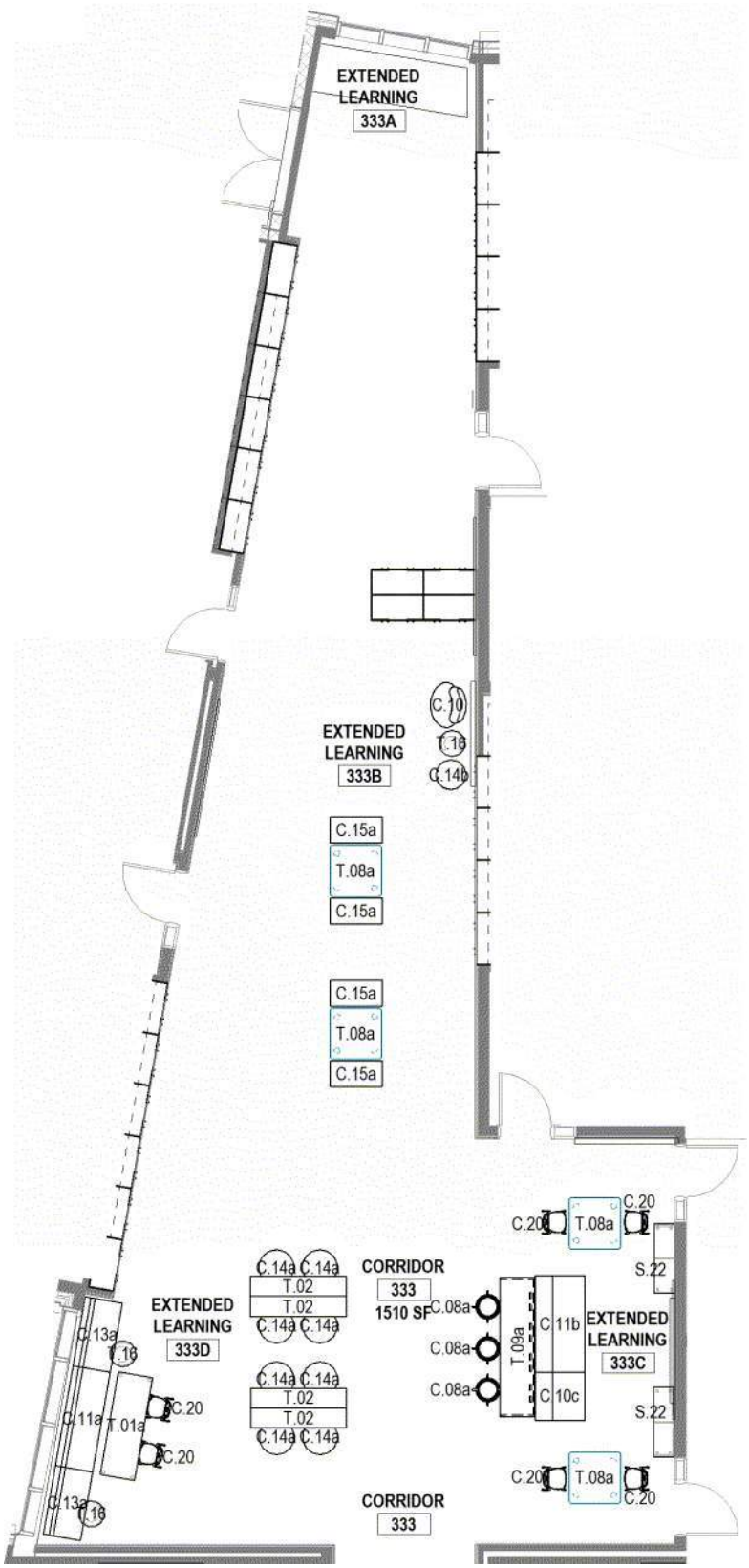
(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile



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Room Function Number 01.020

Room Name	EXTENDED LEARNING
Room Number	350A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	350A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

(1) Interactive projectors, wall mounted

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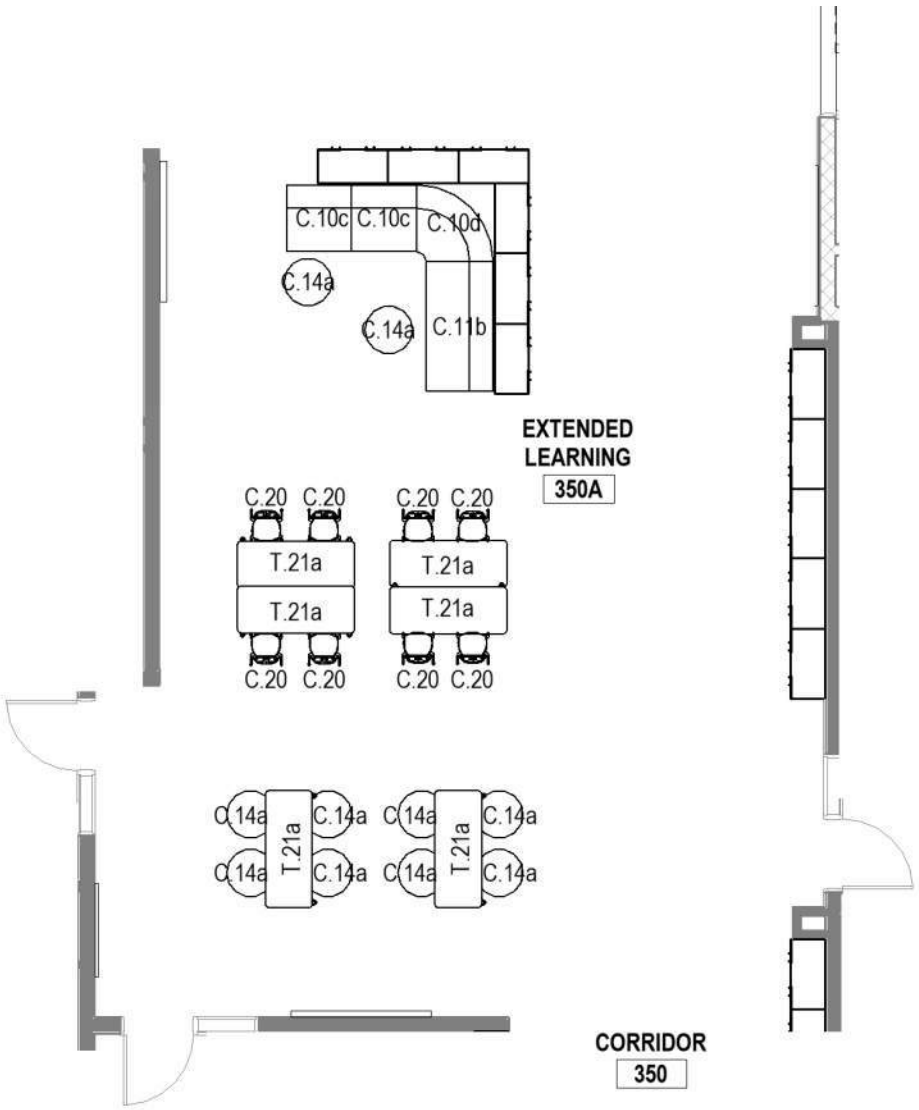
(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile

Furniture

Item: BIM ID	Name	Quantity
C.10c	Steelcase Turnstone - Campfire - Lounge - Half	2
C.10d	Steelcase Turnstone - Campfire - Lounge - Inside Corner - 90deg	1
C.11b	Steelcase Turnstone - Campfire - Lounge - Big	1
C.14a	Steelcase Turnstone - Alight - Seating - Ottoman - Round	10
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
T.21a	SmithSystem_AM_Table_Education_Elemental_NestAndFold_24D - 24D x 60W	6



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Room Function Number 02.004

Room Name	STRIDES PK-K
Room Number	115
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	115	Programmed	1,100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space to serve a substantially separate population of students in grades PREK-K who require intensive, direct, specialized instruction and related services for the majority of the school day.
Quantity:	6
Occupant Load:	(8) Students (1) Special Education Teacher (2-3) Assistants

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within learning communities w/ access to Extended Learning Areas
Orientation / Views:	Views to Exterior & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door, with acoustic seals - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Accessible stainless-steel sink
Lighting:	Linear pendant direct/indirect, dimmable
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: Storage for teachers and paraprofessionals. Storage for 12 students private materials, i.e. lunch boxes, homework folders. Coats, boots etc. will be stored with general classroom in Extended Learning areas. Storage accessed by students Storage not accessible by students
Specialties:	Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Furnishings:	Types & Configurations indicated in the attached room layout sheet
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Mobile Marker boards doubling as room dividers
Shelving / Storage:	n/a

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	3
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2

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Room Data Sheet

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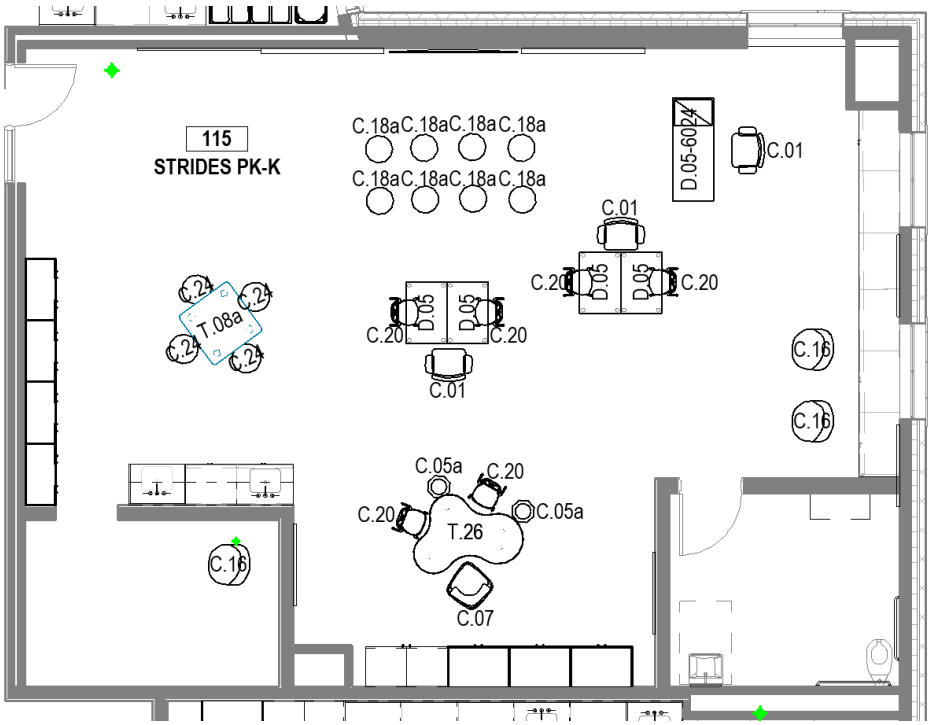
Wilmington Wildwood EC Center

Room Function Number 02.004

Item: BIM ID	Name	Quantity
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	2
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	8
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	6
C.24	SmithSystem_AM_Seating_Education_Oodle_ThreeRockerBaseStool - 3 High	4
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	4
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 02.016

Room Name	STAGES 1ST-2ND
Room Number	218
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	218	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space to serve a substantially separate population of students in grades 1-2 who require intensive, direct, specialized instruction and related services for the majority of the school day.
Quantity:	2
Occupant Load:	(8) Students (1) Special Education Teacher (2-3) Assistants

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within learning communities w/ access to Extended Learning Areas
Orientation / Views:	Views to Exterior & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door, with acoustic seals - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Accessible stainless-steel sink
Lighting:	Linear pendant direct/indirect, dimmable
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	ypes & Configurations indicated in the attached room layout sheets including: Storage for teachers and paraprofessionals. Storage for 8 students private materials, i.e. lunch boxes, homework folders. Coats, boots etc. will be stored with general classroom in Extended Learning areas.Storage accessed by students Storage not accessible by students
Specialties:	Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Furnishings:	Types & Configurations indicated in the attached room layout sheet
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Mobile Marker boards doubling as room dividers
Shelving / Storage:	n/a

Additional Requirements:

Safety at windows - limited opening for security; soft edge sill
limited ledges/cabinets to avoid climbing

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Room Data Sheet

SD - Submission

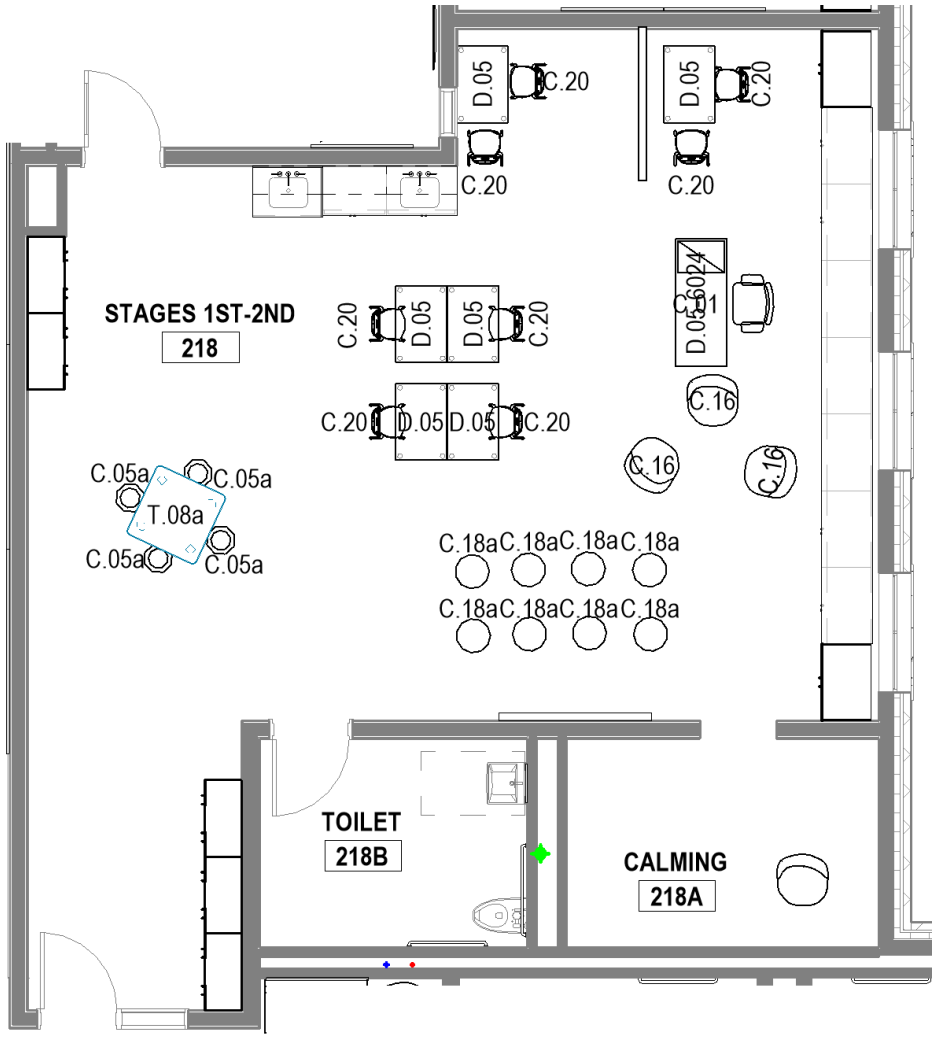
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.016

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	3
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	8
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	6
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1



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Room Function Number 02.020

Room Name	STRIDES 1ST-2ND
Room Number	231
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	231	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space to serve a substantially separate population of students in grades 1-2 who require intensive, direct, specialized instruction and related services for the majority of the school day.
Quantity:	6
Occupant Load:	(8) Students (1) Special Education Teacher (2-3) Assistants

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within learning communities w/ access to Extended Learning Areas
Orientation / Views:	Views to Exterior & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door, with acoustic seals - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Accessible stainless-steel sink
Lighting:	Linear pendant direct/indirect, dimmable
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	ypes & Configurations indicated in the attached room layout sheets including: Storage for teachers and paraprofessionals. Storage for 8 students private materials, i.e. lunch boxes, homework folders. Coats, boots etc. will be stored with general classroom in Extended Learning areas.Storage accessed by students Storage not accessible by students
Specialties:	Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Furnishings:	Types & Configurations indicated in the attached room layout sheet
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Mobile Marker boards doubling as room dividers
Shelving / Storage:	n/a

Additional Requirements:

Closed storage in toilet rooms for toilet training in younger grades (diapers/wipes/gloves) and changing table/pad

Furniture

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Room Data Sheet

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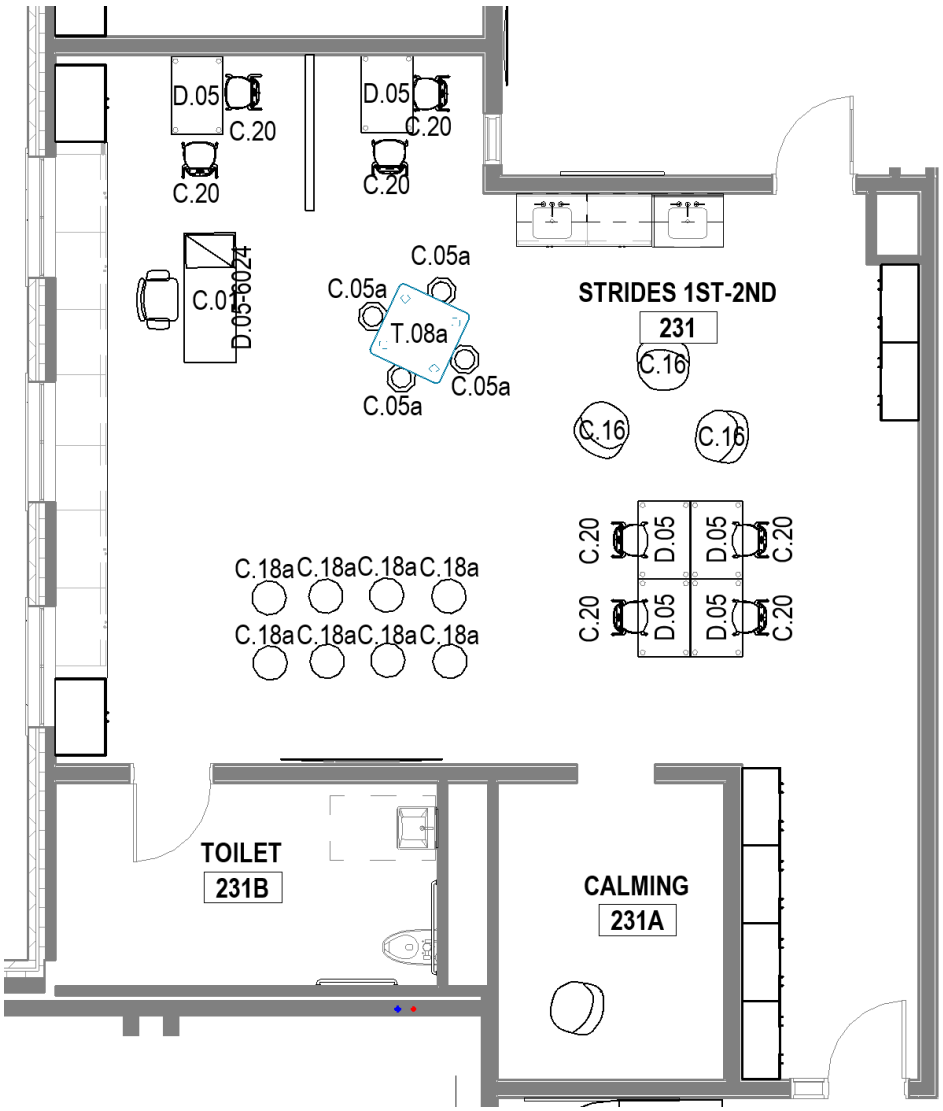
Wilmington Wildwood EC Center

Room Function Number 02.020

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	3
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	8
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	6
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1



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Room Function Number 02.027

Room Name	STAGES 3RD-5TH
Room Number	321
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	321	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space to serve a substantially separate population of students in grades 3-5 who require intensive, direct, specialized instruction and related services for the majority of the school day.
Quantity:	2
Occupant Load:	(8) Students (1) Special Education Teacher (2-3) Assistants

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within learning communities w/ access to Extended Learning Areas
Orientation / Views:	Views to Exterior & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door, with acoustic seals - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Accessible stainless-steel sink
Lighting:	Linear pendant direct/indirect, dimmable
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	ypes & Configurations indicated in the attached room layout sheets including: Storage for teachers and paraprofessionals. Storage for 8 students private materials, i.e. lunch boxes, homework folders. Coats, boots etc. will be stored with general classroom in Extended Learning areas.Storage accessed by students Storage not accessible by students
Specialties:	Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Furnishings:	Types & Configurations indicated in the attached room layout sheet
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Mobile Marker boards doubling as room dividers
Shelving / Storage:	n/a

Additional Requirements:

Safety at windows - limited opening for security; soft edge sill
limited ledges/cabinets to avoid climbing

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Room Data Sheet

SD - Submission

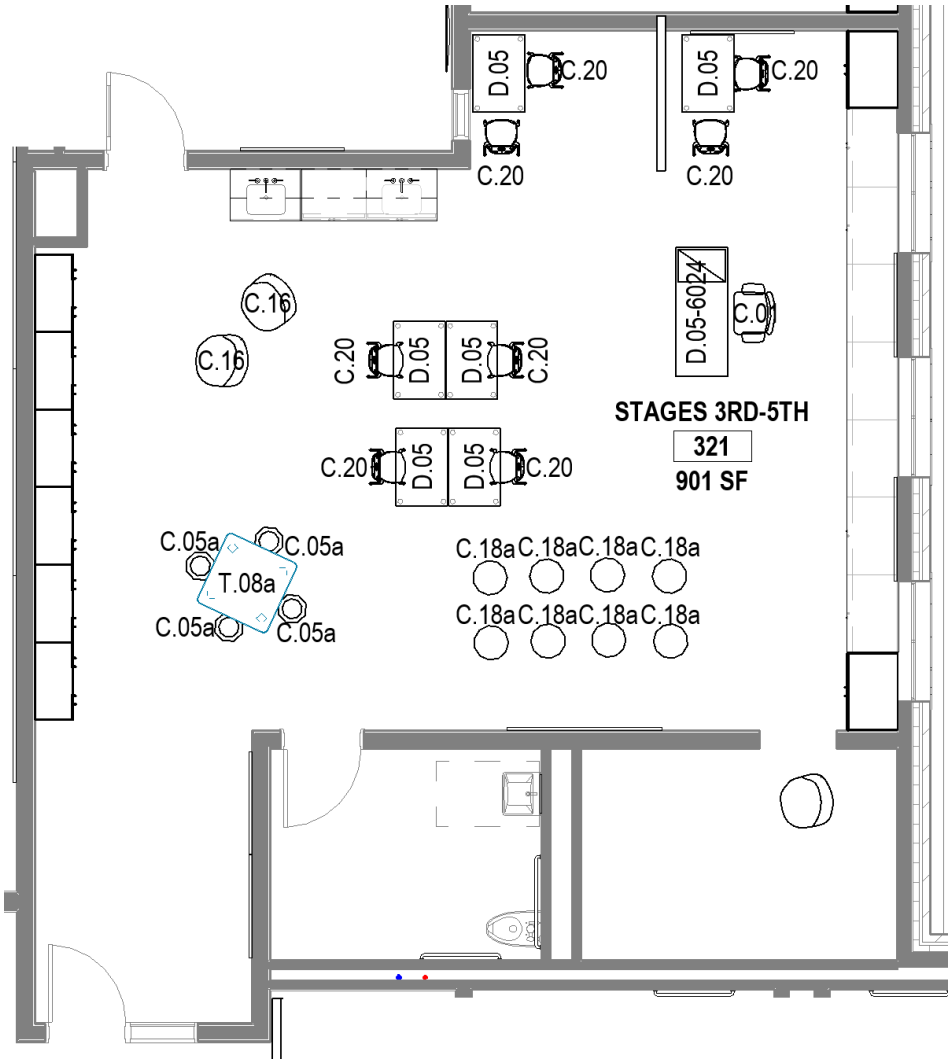
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.027

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	8
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	8
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	6
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1



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Room Function Number 02.031

Room Name	STRIDES 3RD-5TH
Room Number	334
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	334	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space to serve a substantially separate population of students in grades 3-5 who require intensive, direct, specialized instruction and related services for the majority of the school day.
Quantity:	6
Occupant Load:	(8) Students (1) Special Education Teacher (2-3) Assistants

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within learning communities w/ access to Extended Learning Areas
Orientation / Views:	Views to Exterior & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door, with acoustic seals - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Accessible stainless-steel sink
Lighting:	Linear pendant direct/indirect, dimmable
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	ypes & Configurations indicated in the attached room layout sheets including: Storage for teachers and paraprofessionals. Storage for 8 students private materials, i.e. lunch boxes, homework folders. Coats, boots etc. will be stored with general classroom in Extended Learning areas.Storage accessed by students Storage not accessible by students
Specialties:	Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Furnishings:	Types & Configurations indicated in the attached room layout sheet
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Mobile Marker boards doubling as room dividers
Shelving / Storage:	n/a

Additional Requirements:

Closed storage in toilet rooms for toilet training in younger grades (diapers/wipes/gloves) and changing table/pad

Furniture

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Room Data Sheet

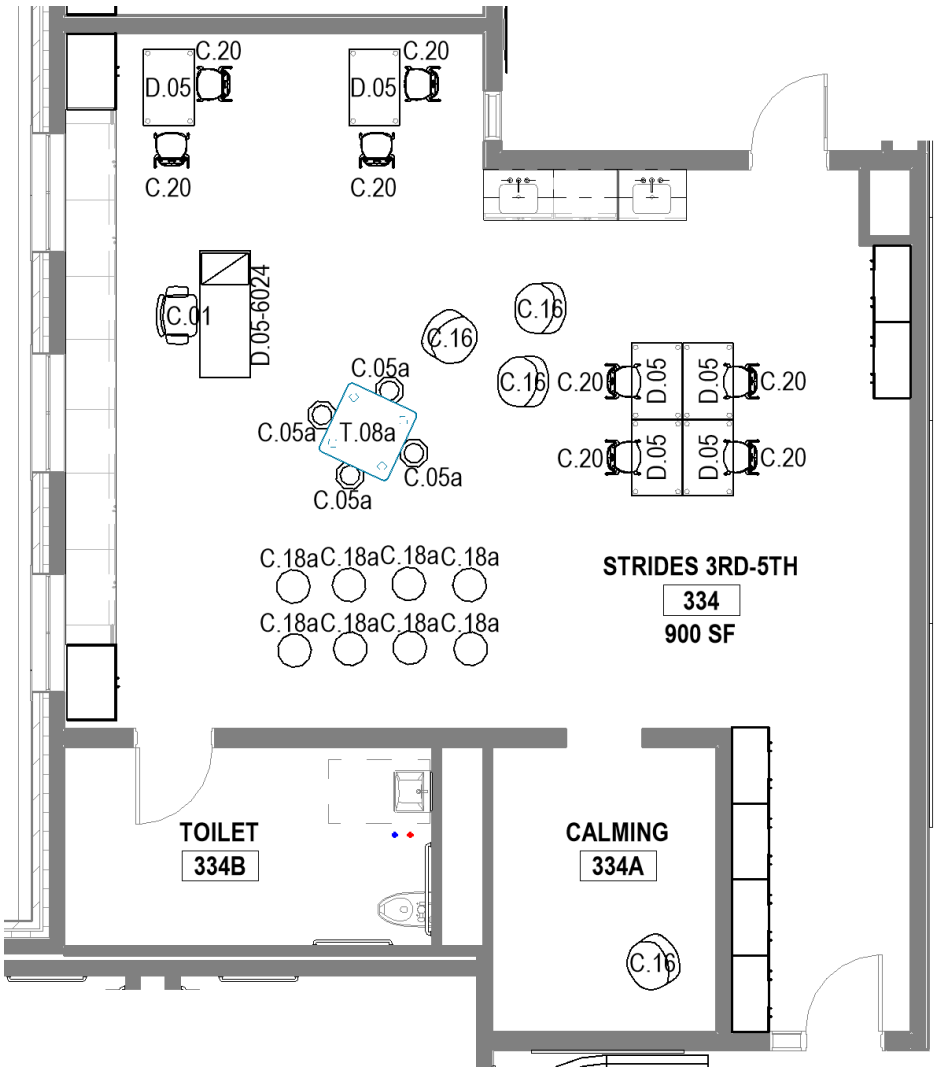
SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.031

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	9
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	8
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	8
D.05	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 36 x 24	6
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1



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Room Function Number 02.008

Room Name	TOILET
Room Number	115B
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	115B	Programmed	105.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Toilet room for self contained SPED classroom
Quantity:	8
Occupant Load:	1

Location Criteria:

Users:	Students
Adjacency:	Within self contained SPED classrooms

Technical Criteria:

Floor Finishes:	Porcelain/Ceramic tile
Wall Finishes:	Tile, Painted Gypsum
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED Standards
Windows:	None
Plumbing / FP:	Accessible plumbing fixtures; height will vary by age range served
Lighting:	Lay in fixtures
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	Soap & paper towel dispensers, mirror, H/C grab bars
Shelving / Storage:	Storage for toileting and cleaning supplies, clean clothing

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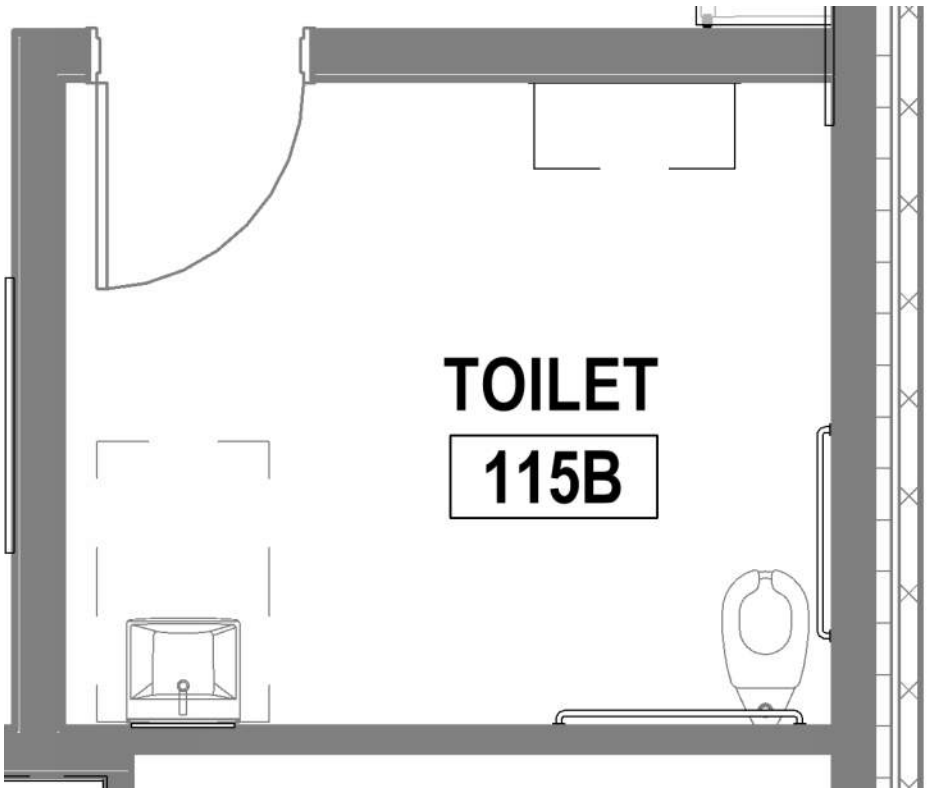
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.008



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Room Function Number 02.062

Room Name	TOILET
Room Number	132B
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	132B	Programmed	114.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Toilet room for self contained SPED classroom
Quantity:	8
Occupant Load:	1

Location Criteria:

Users:	Students
Adjacency:	Within self contained SPED classrooms

Technical Criteria:

Floor Finishes:	Porcelain/Ceramic tile
Wall Finishes:	Tile, Painted Gypsum
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED Standards
Windows:	None
Plumbing / FP:	Accessible plumbing fixtures; height will vary by age range served
Lighting:	Lay in fixtures
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	Soap & paper towel dispensers, mirror, H/C grab bars
Shelving / Storage:	Storage for toileting and cleaning supplies, clean clothing

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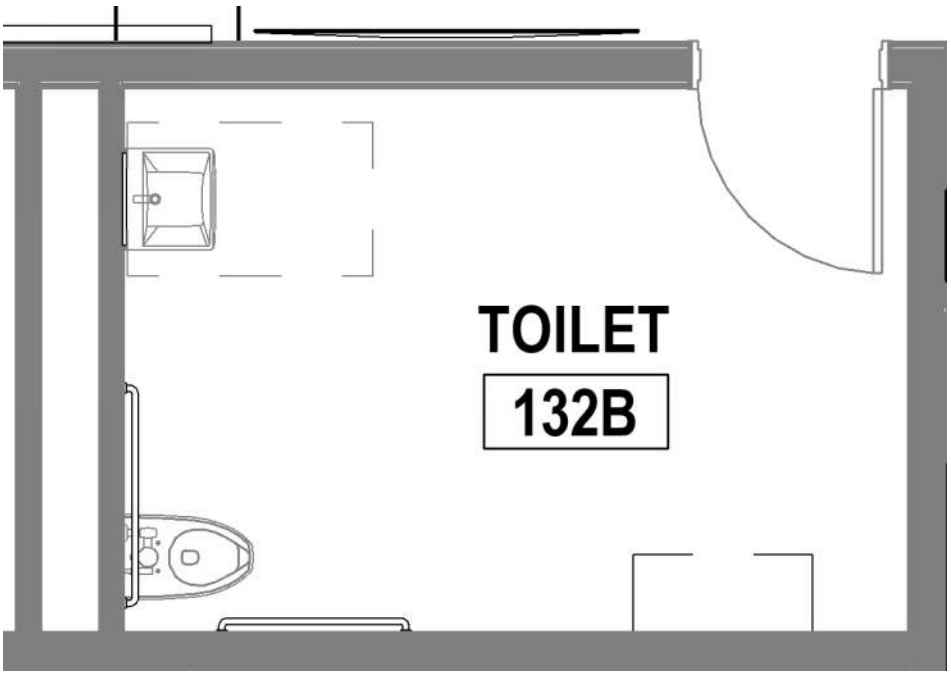
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.062



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Room Function Number 02.022

Room Name	TOILET
Room Number	231B
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	231B	Programmed	116.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Toilet room for self contained SPED classroom
Quantity:	8
Occupant Load:	1

Location Criteria:

Users:	Students
Adjacency:	Within self contained SPED classrooms

Technical Criteria:

Floor Finishes:	Porcelain/Ceramic tile
Wall Finishes:	Tile, Painted Gypsum
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED Standards
Windows:	None
Plumbing / FP:	Accessible plumbing fixtures; height will vary by age range served
Lighting:	Lay in fixtures
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	Soap & paper towel dispensers, mirror, H/C grab bars
Shelving / Storage:	Storage for toileting and cleaning supplies, clean clothing

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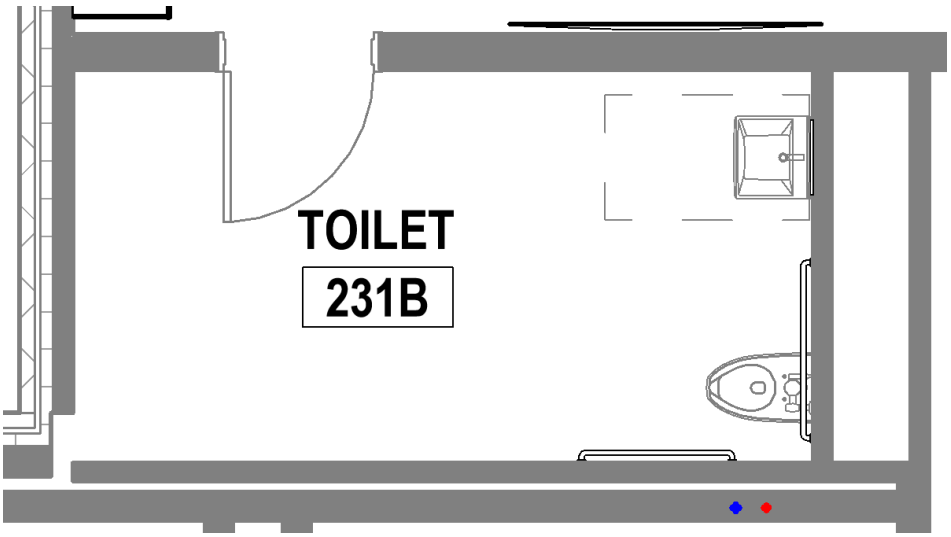
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.022



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Room Function Number 02.035

Room Name	LEARNING CENTER
Room Number	306
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	306	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for English Language Learner specialists and pull-out instruction in small groups
Quantity:	6
Occupant Load:	Max 12 students (1) Special Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Centrally located.
Orientation / Views:	Exterior required & views to Extended Learning Area desired

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood doors with side light and acoustical seals Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	7
T.07	120000-Furniture-Table Round - 36"	1
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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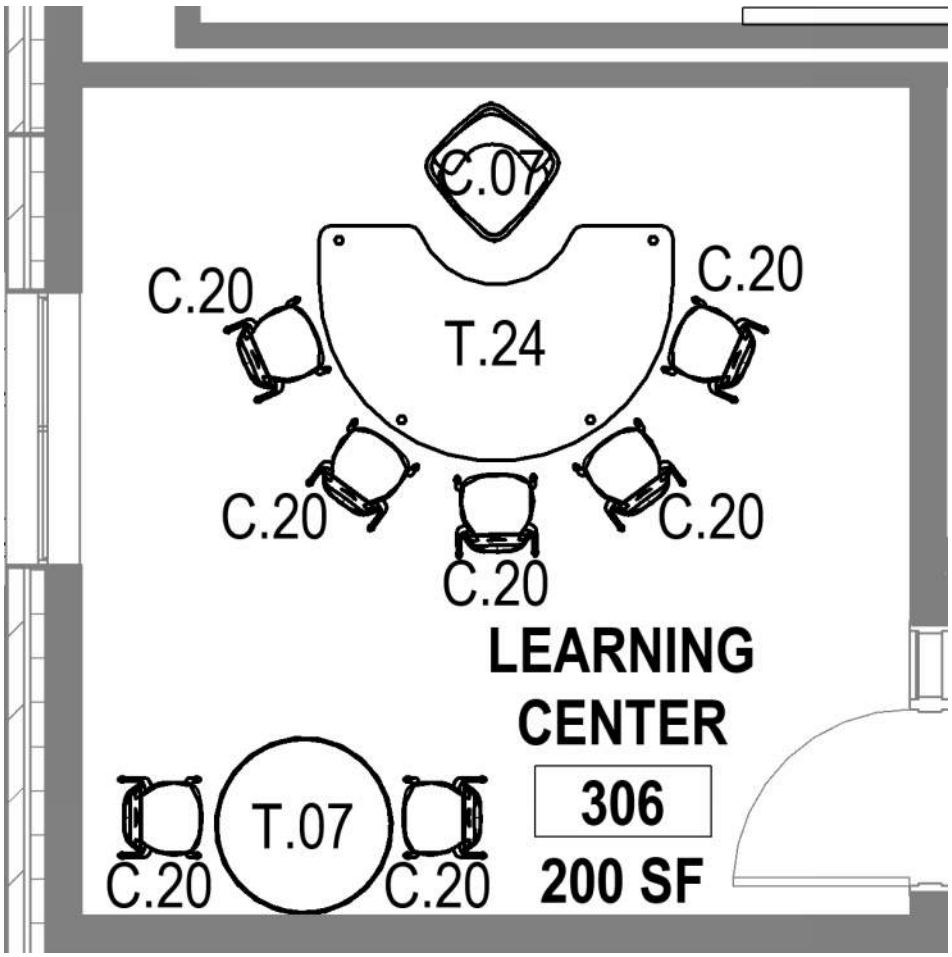

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Room Function Number 02.011

Room Name	LEARNING CENTER
Room Number	210
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	210	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for English Language Learner specialists and pull-out instruction in small groups
Quantity:	6
Occupant Load:	(5-6) Students per group (1) Special Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Centrally located.
Orientation / Views:	Exterior required & views to Extended Learning Area desired

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood doors with side light and acoustical seals Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	6
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.07	120000-Furniture-Table Round - 36"	1
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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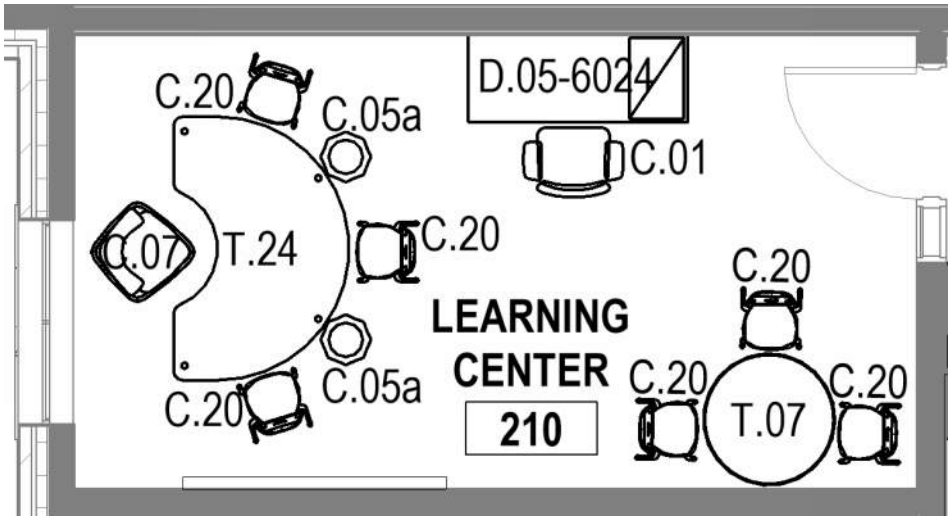
Room Function Number 02.011



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Room Function Number 02.017

Room Name	SMALL GROUP ROOM
Room Number	217
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	217	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	3
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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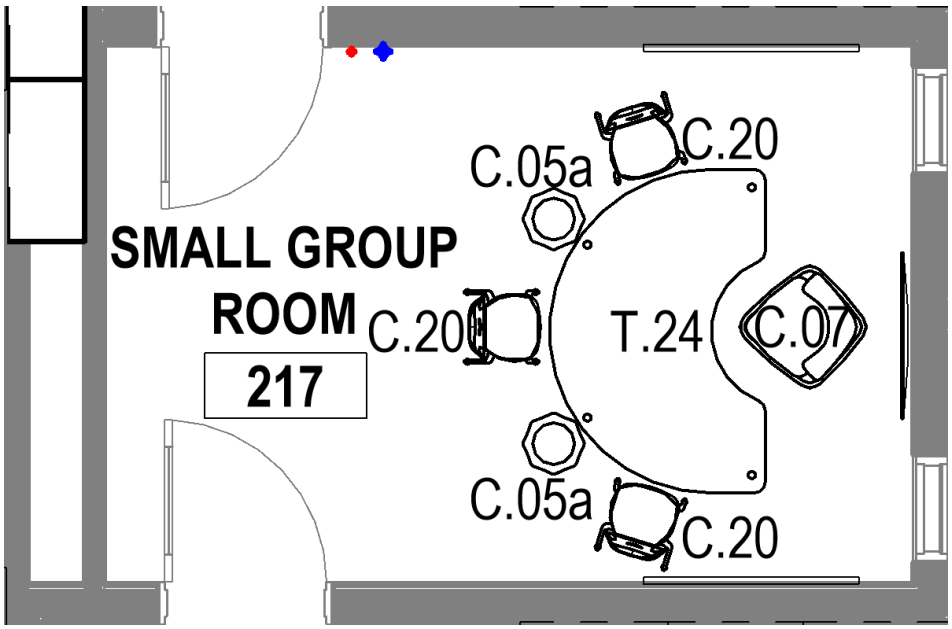
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.017



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Room Function Number 02.028

Room Name	SMALL GROUP ROOM
Room Number	320
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	320	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	5
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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Room Data Sheet

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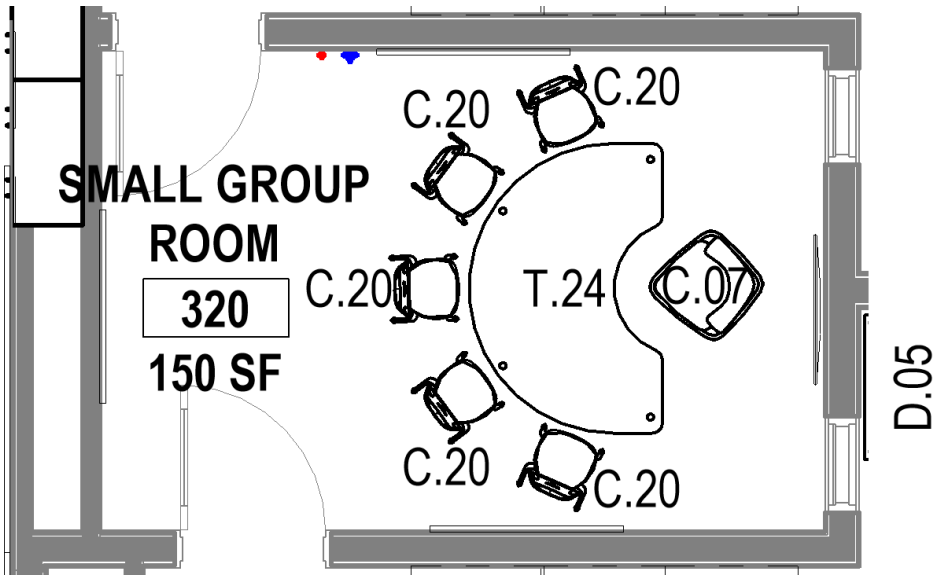
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.028



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Room Function Number 02.047

Room Name	SMALL GROUP ROOM
Room Number	243
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	243	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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Room Data Sheet

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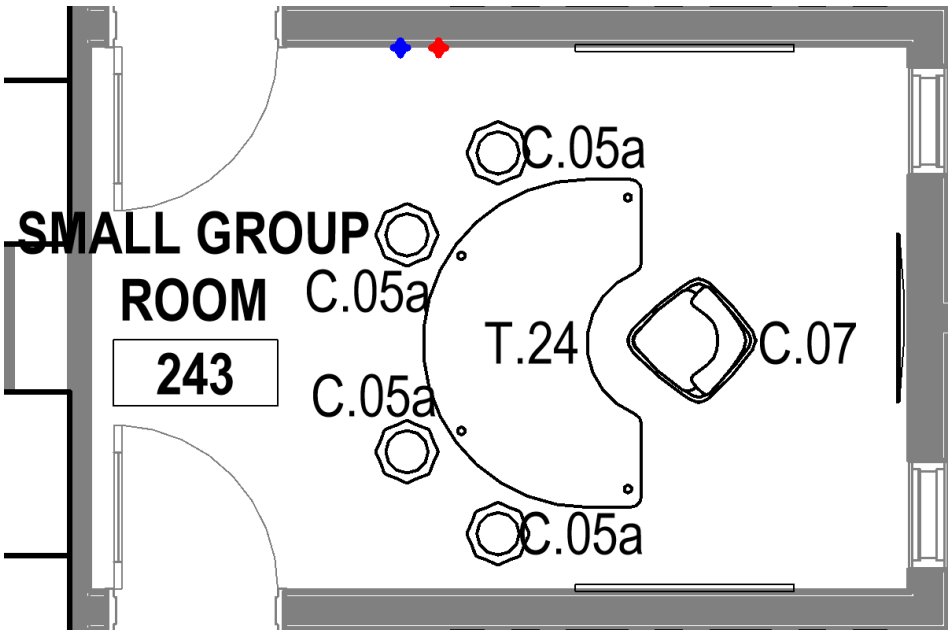
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.047



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Room Function Number 02.051

Room Name	SMALL GROUP ROOM
Room Number	346
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	346	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	3
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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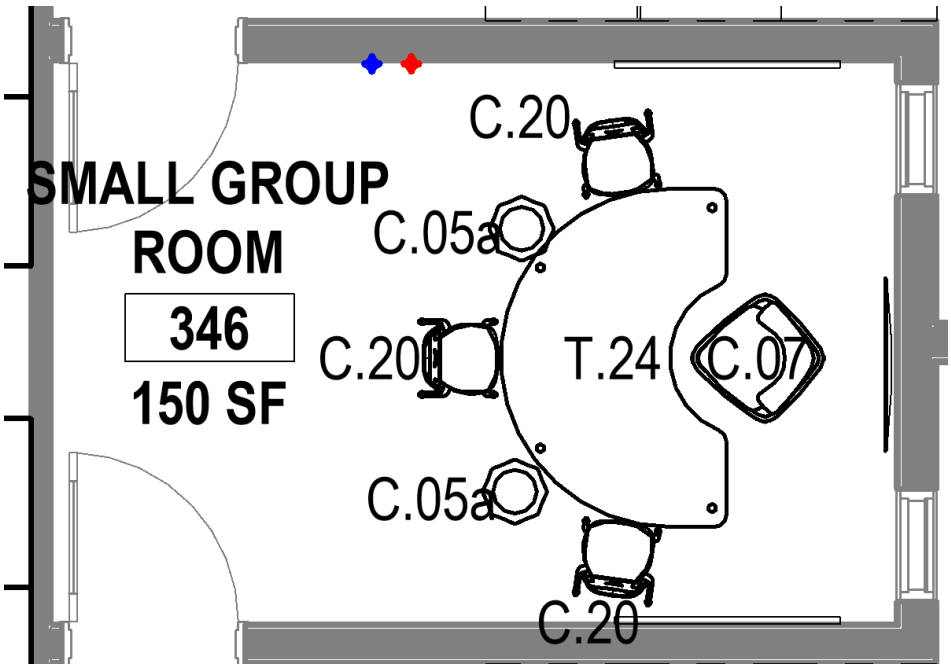
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.051



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Room Function Number 02.065

Room Name	SMALL GROUP ROOM
Room Number	113
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	113	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	3
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	2
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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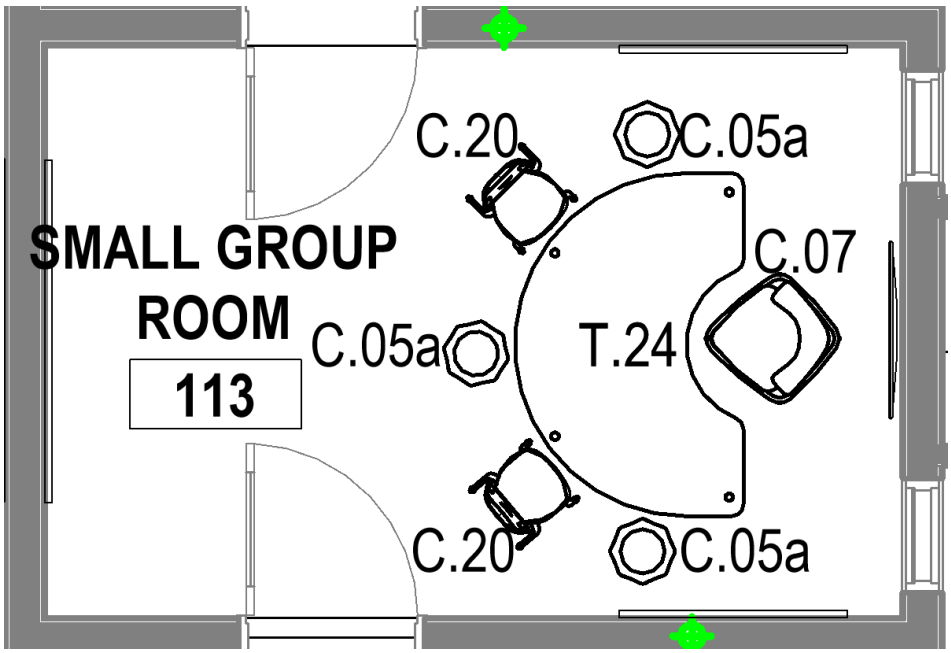
Room Function Number 02.065



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Room Function Number 02.061

Room Name	SMALL GROUP ROOM
Room Number	139
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	139	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Room to delivery small group instruction with specialists
Quantity:	26
Occupant Load:	(1) Teacher (1-6) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Shared between 2 clasrooms
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	4
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
T.24	120000-Furniture-Table Kidney - T.01b Kidney Table - 72"x48"	1

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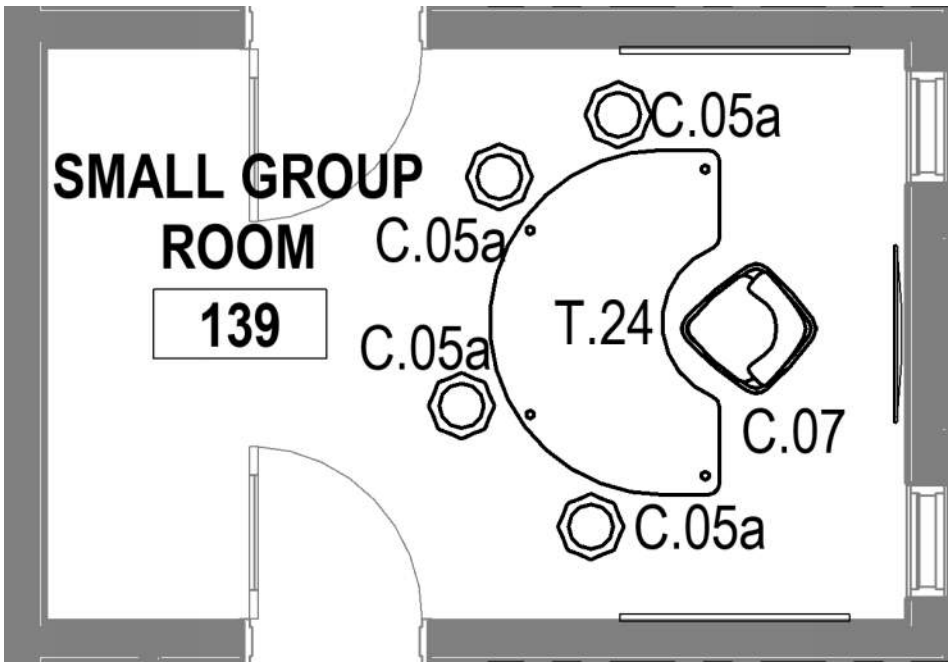
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 02.061



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Room Function Number 02.033

Room Name	TOILET
Room Number	334B
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	334B	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Toilet room for self contained SPED classroom
Quantity:	8
Occupant Load:	1

Location Criteria:

Users:	Students
Adjacency:	Within self contained SPED classrooms

Technical Criteria:

Floor Finishes:	Porcelain/Ceramic tile
Wall Finishes:	Tile, Painted Gypsum
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED Standards
Windows:	None
Plumbing / FP:	Accessible plumbing fixtures; height will vary by age range served
Lighting:	Lay in fixtures
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	Soap & paper towel dispensers, mirror, H/C grab bars
Shelving / Storage:	Storage for toileting and cleaning supplies, clean clothing

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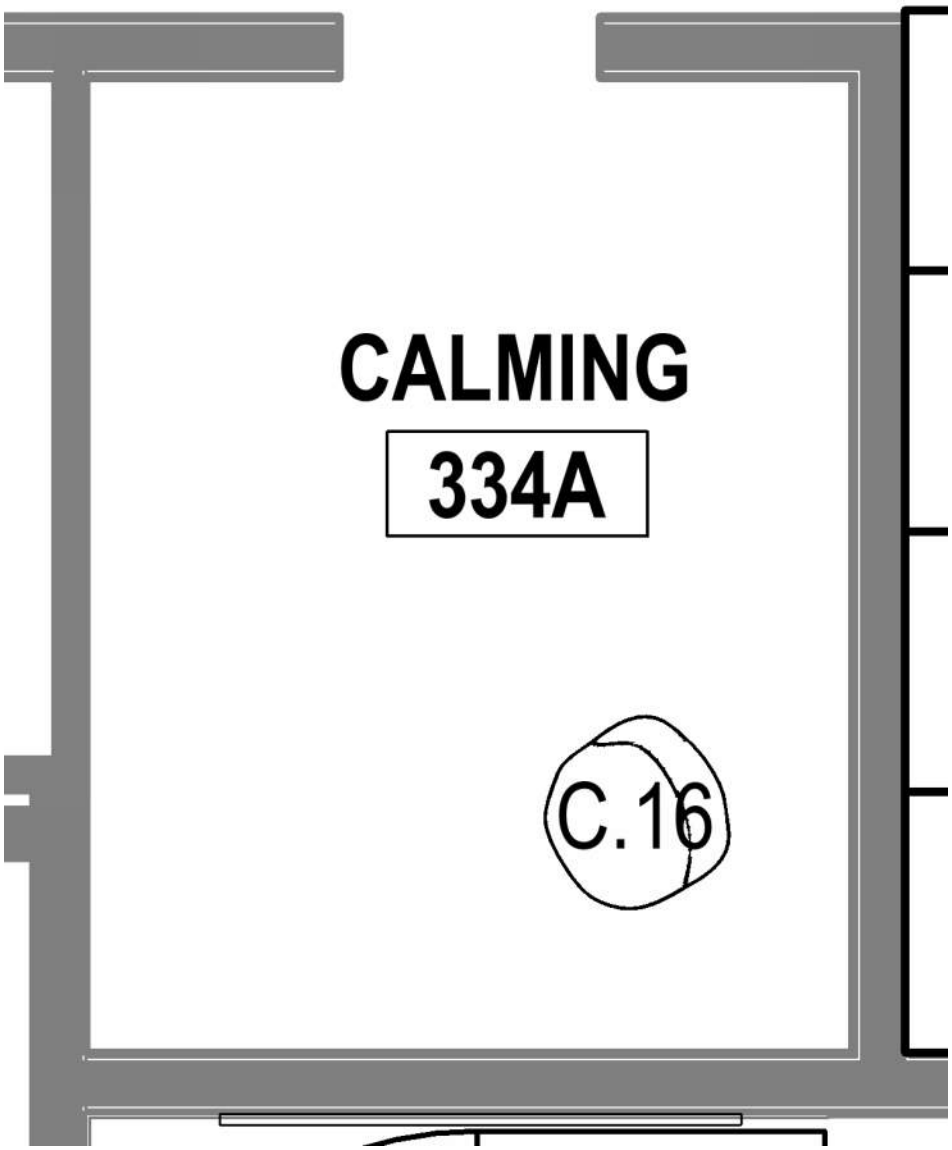
Room Function Number 02.033



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Room Function Number 02.034

Room Name	CALMING
Room Number	334A
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	334A	Programmed	100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space accessible from within the SPED classroom for students in need of de-escalation or a sensory break
Quantity:	8
Occupant Load:	(1-2) Students (1) Special Educator or Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals.
Adjacency:	Within SPED Classrooms.
Orientation / Views:	Exterior views not required. Accessed through classroom.

Technical Criteria:

Floor Finishes:	Resilient athletic flooring
Wall Finishes:	Abuse-Resistant Gypsum Wall Board, painted,
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	None
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	No power outlets or lighting controls located within the room.
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	None

Additional Requirements:

No protruding corners for student safety.

Furniture

Item: BIM ID	Name	Quantity
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	1

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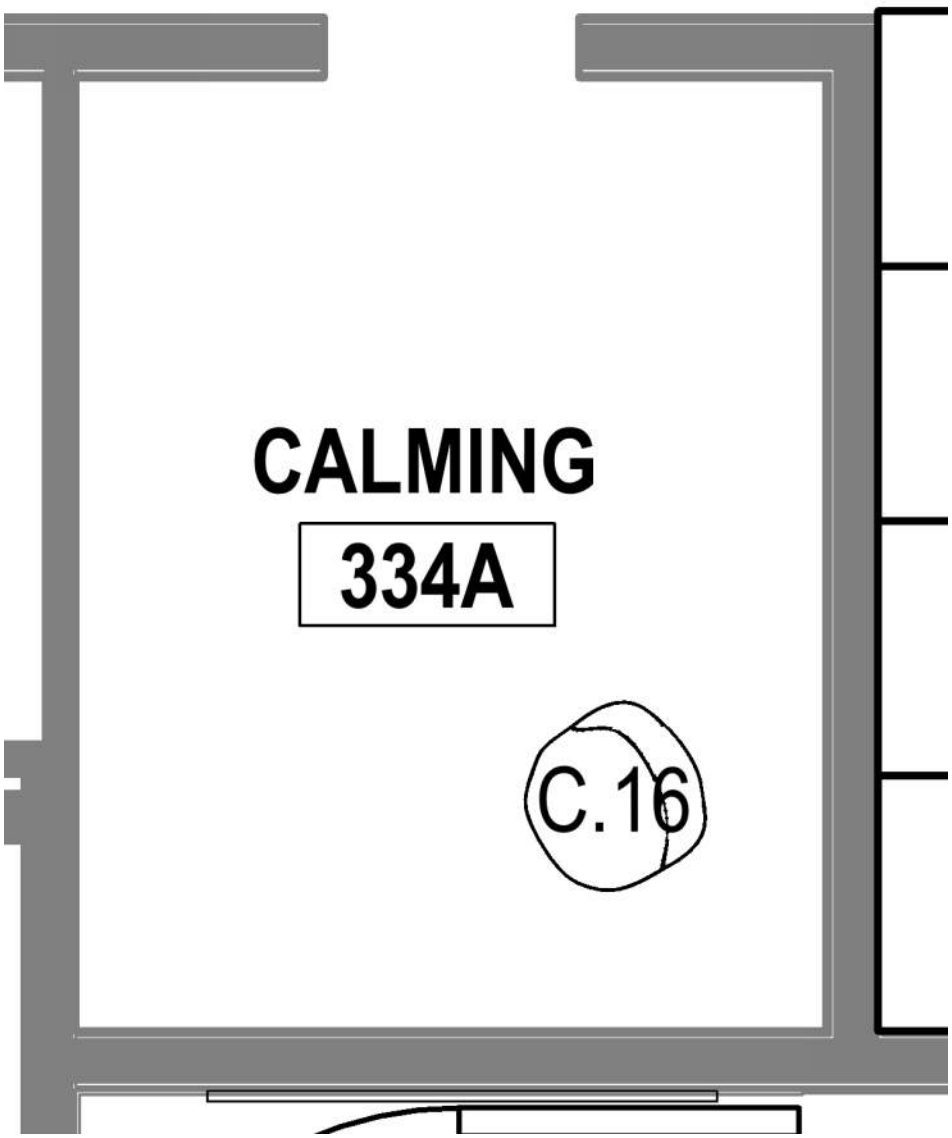
Room Function Number 02.034



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Room Function Number 02.023

Room Name	CALMING
Room Number	231A
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	231A	Programmed	100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space accessible from within the SPED classroom for students in need of de-escalation or a sensory break
Quantity:	8
Occupant Load:	(1-2) Students (1) Special Educator or Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals.
Adjacency:	Within SPED Classrooms.
Orientation / Views:	Exterior views not required. Accessed through classroom.

Technical Criteria:

Floor Finishes:	Resilient athletic flooring
Wall Finishes:	Abuse-Resistant Gypsum Wall Board, painted,
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	None
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	No power outlets or lighting controls located within the room.
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	None

Additional Requirements:

No protruding corners for student safety.

Furniture

Item: BIM ID	Name	Quantity
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	1

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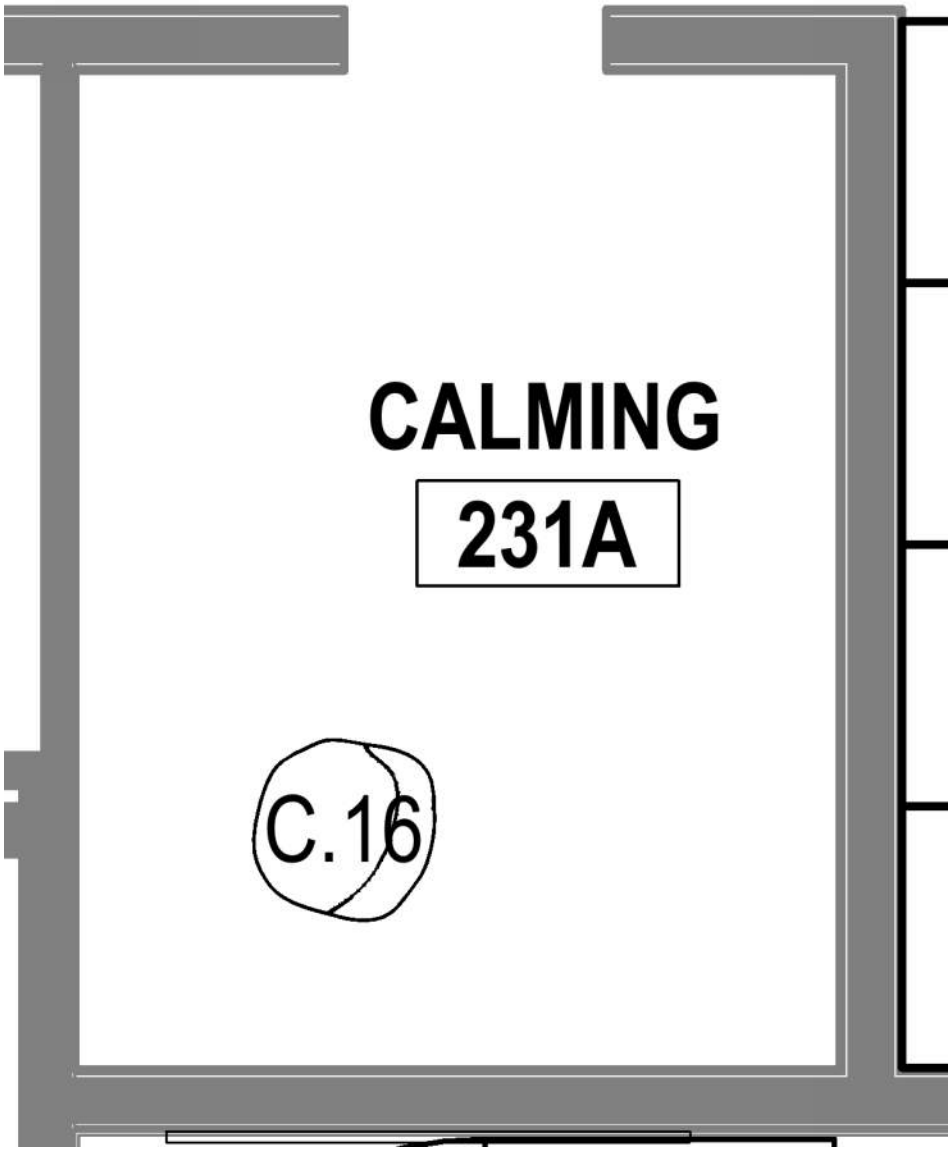
Room Function Number 02.023



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Room Function Number 02.007

Room Name	CALMING
Room Number	115A
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	115A	Programmed	100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	A space accessible from within the SPED classroom for students in need of de-escalation or a sensory break
Quantity:	8
Occupant Load:	(1-2) Students (1) Special Educator or Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals.
Adjacency:	Within SPED Classrooms.
Orientation / Views:	Exterior views not required. Accessed through classroom.

Technical Criteria:

Floor Finishes:	Resilient athletic flooring
Wall Finishes:	Abuse-Resistant Gypsum Wall Board, painted,
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	None
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	No power outlets or lighting controls located within the room.
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	None

Additional Requirements:

No protruding corners for student safety.

Furniture

Item: BIM ID	Name	Quantity
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	1

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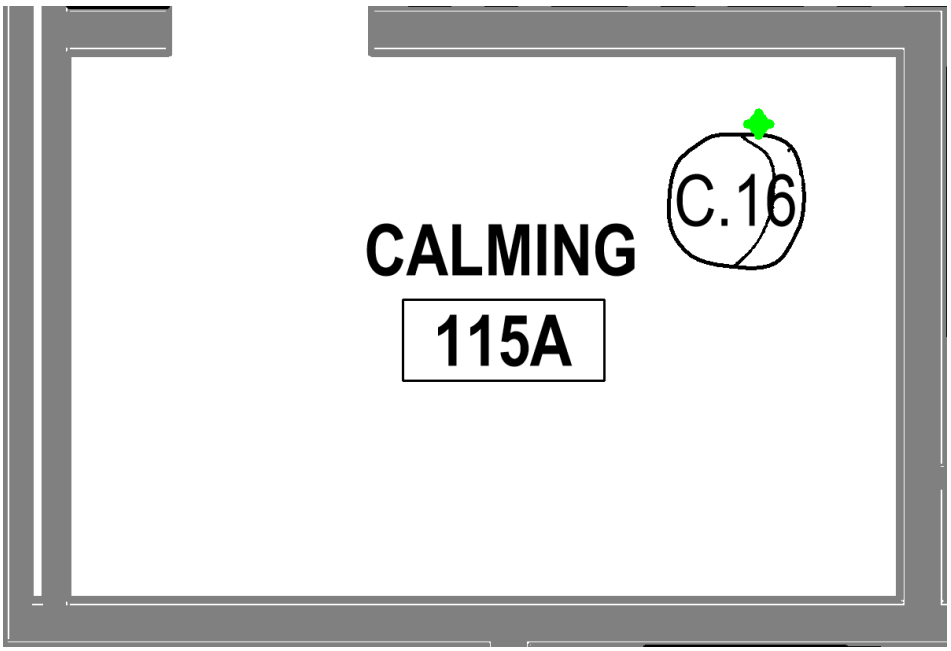
Room Function Number 02.007



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Room Function Number 02.041

Room Name	OT CLASSROOM
Room Number	193
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	193	Programmed	250.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for two professionals, location for drive-in services, other services provided near classrooms
Quantity:	1
Occupant Load:	(4) Students (1) Special Educator (1) Para Professional

Location Criteria:

Users:	This larger room in the suite will serve the grade PK - 5 population. Room will be divided between lower- and upper-age needs and functions will include mats, jumping, floor exercises, balancing, sensory, table for developmental play, plus storage for this equipment.
Adjacency:	Adjacent to the Gymnasium and the PT storage space
Orientation / Views:	Views to Exterior desired

Technical Criteria:

Floor Finishes:	Athletic rubber floor
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Double Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed LED lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets.
Specialties:	Types & Configurations indicated in the attached room layout sheets.
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	storage along perimeter of classroom with open central space (walkers, standers)

Furniture

Item: BIM ID	Name	Quantity
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	2
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1

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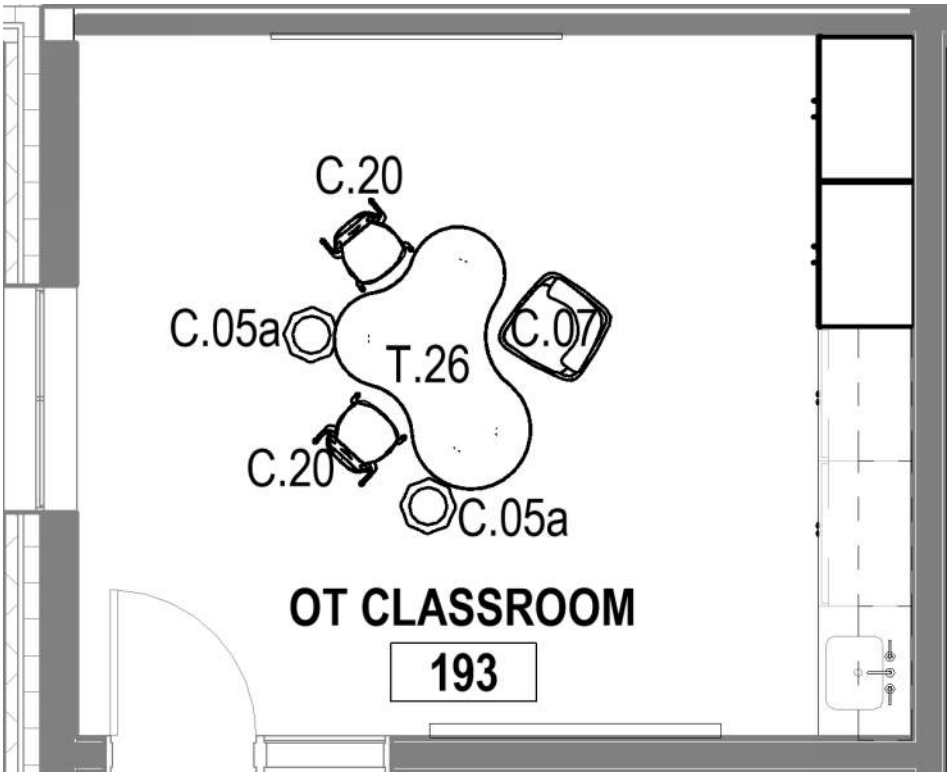
Room Function Number 02.041



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Room Function Number 02.040

Room Name	PT CLASSROOM
Room Number	192
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	192	Programmed	1,000.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Physical Therapy room
Quantity:	1
Occupant Load:	(4) Students (1) Special Educator (1) Para Professional

Location Criteria:

Users:	This larger room in the suite will serve the grade PK - 5 population. Room will be divided between lower- and upper-age needs and functions will include mats, jumping, floor exercises, balancing, sensory, table for developmental play, plus storage for this equipment.
Adjacency:	Adjacent to the Gymnasium and the PT storage space
Orientation / Views:	Views to Exterior desired

Technical Criteria:

Floor Finishes:	Athletic rubber floor
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Double Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed LED lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets.
Specialties:	Types & Configurations indicated in the attached room layout sheets.
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	storage along perimeter of classroom with open central space (walkers, standers)

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	2
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	4
C.24	SmithSystem_AM_Seating_Education_Oodle_ThreeRockerBaseStool - 3 High	4

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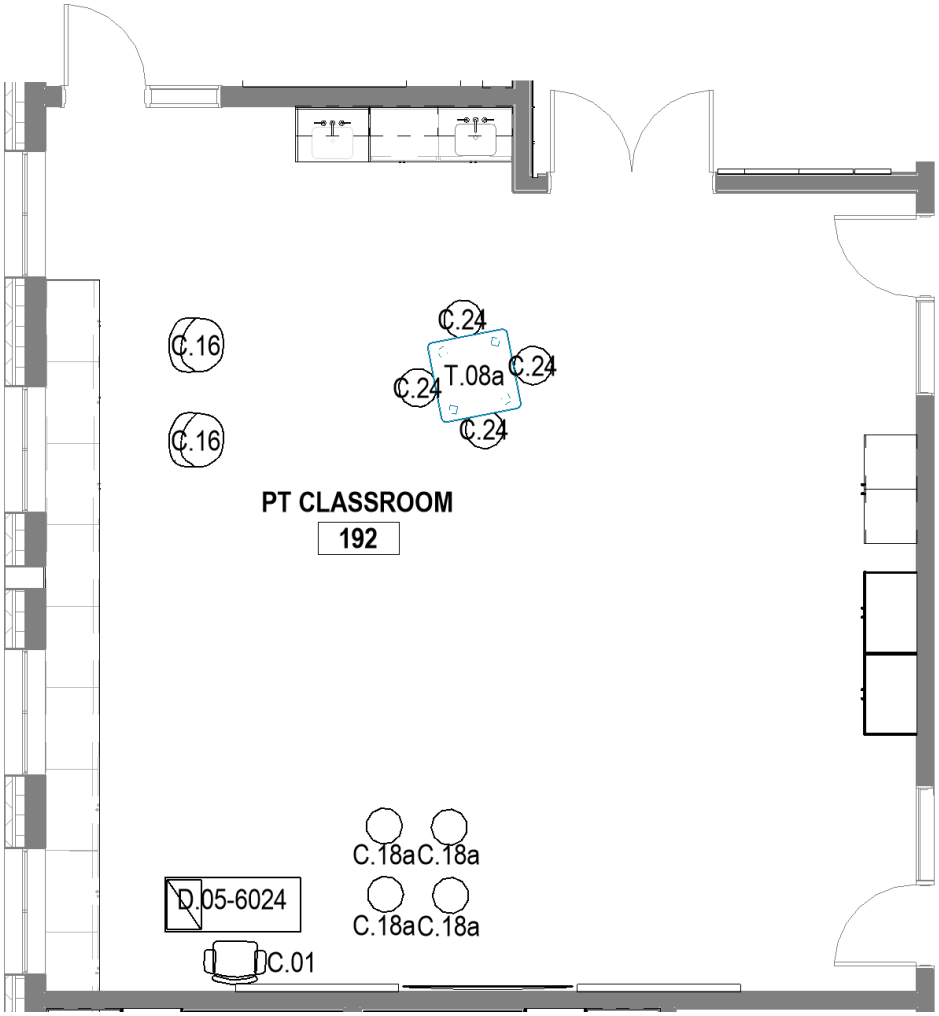
Room Function Number 02.040

Item: BIM ID	Name	Quantity
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.08a	Elemental Activity Table - RectangleSquare1 - 0.914 m x 0.914 m	1



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Room Function Number 02.036

Room Name	SCHOOL PSYCH
Room Number	326
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	326	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for school psychologist capable of supporting typical office tasks, storage of confidential files, confidential phone calls, and in-person meetings with students.
Quantity:	2
Occupant Load:	(1) Staff (1-4) Students / Visitors

Location Criteria:

Users:	School Psychologist & students
Adjacency:	Main office and close to Medical Suite
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Interactive digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets.
Specialties:	Types & Configurations indicated in the attached room layout sheets.
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets.

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	3
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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Room Data Sheet

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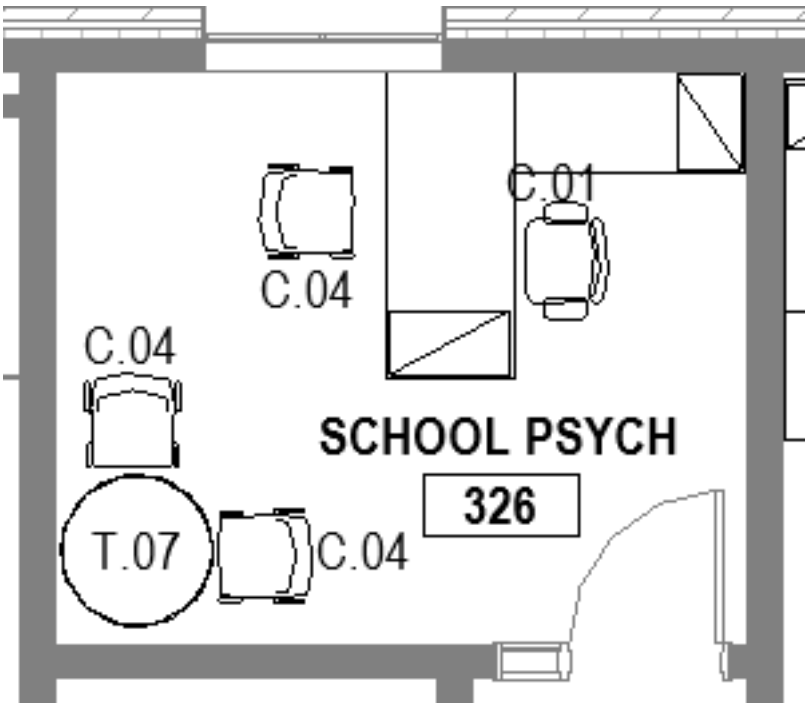
Wilmington Wildwood EC Center

Room Function Number 02.036



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Room Function Number 02.003

Room Name	SCHOOL PSYCH
Room Number	108
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	108	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for school psychologist capable of supporting typical office tasks, storage of confidential files, confidential phone calls, and in-person meetings with students.
Quantity:	2
Occupant Load:	(1) Staff (1-4) Students / Visitors

Location Criteria:

Users:	School Psychologist & students
Adjacency:	Main office and close to Medical Suite
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Interactive digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets.
Specialties:	Types & Configurations indicated in the attached room layout sheets.
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets.

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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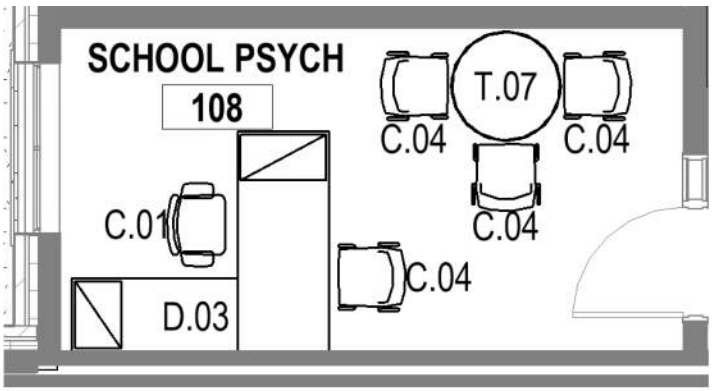

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Room Function Number 02.057

Room Name	BCBA OFFICE
Room Number	245
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	245	Programmed	320.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for service delivery professionals
Quantity:	1
Occupant Load:	(3-4) Staff

Location Criteria:

Users:	Service professionals
Adjacency:	Centrally located in building
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Interactive digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	3
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	3
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	2
T.07	120000-Furniture-Table Round - 36"	1

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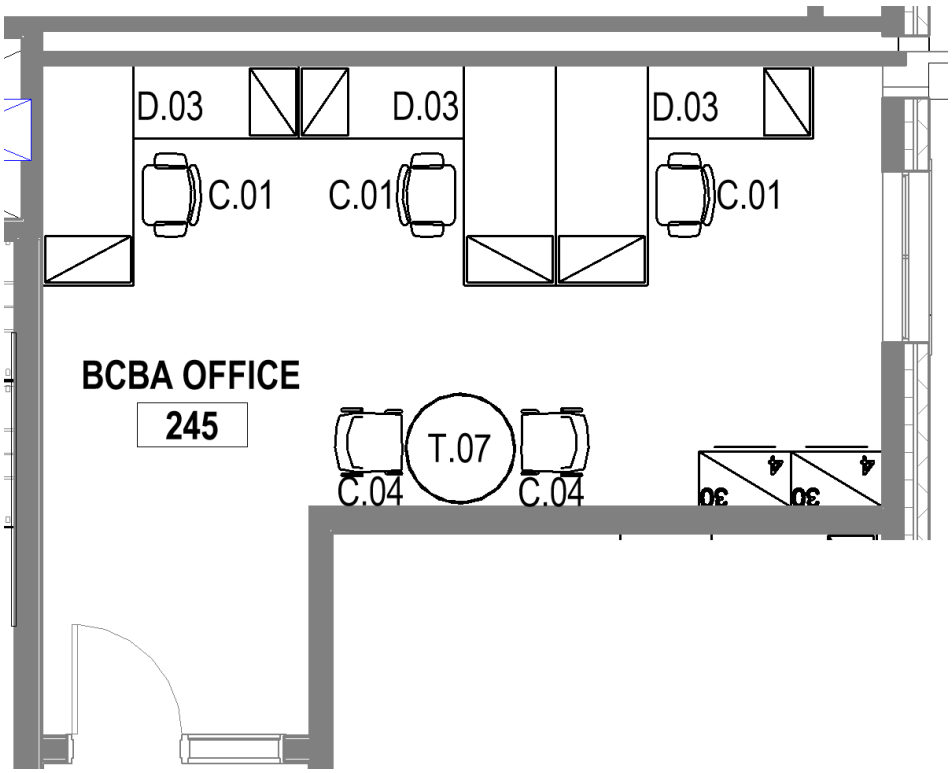
Wilmington Wildwood EC Center

Room Function Number 02.057



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Room Function Number 02.056

Room Name	SPEECH & LANGUAGE
Room Number	103
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	103	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Intended to be both the home base for a Speech & Language Specialist and a venue to provide pull-out services and testing for students in grades K-5.
Quantity:	4
Occupant Load:	(1-4) Students (1) Speech specialist (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Centrally located in Learning Communities. Direct access from main student corridor
Orientation / Views:	Views to Exterior required.

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum Wall Board, painted Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Windows:
Doors:	Flush Wood Door with sidelight- Classroom Hardware Set Shade on sidelight
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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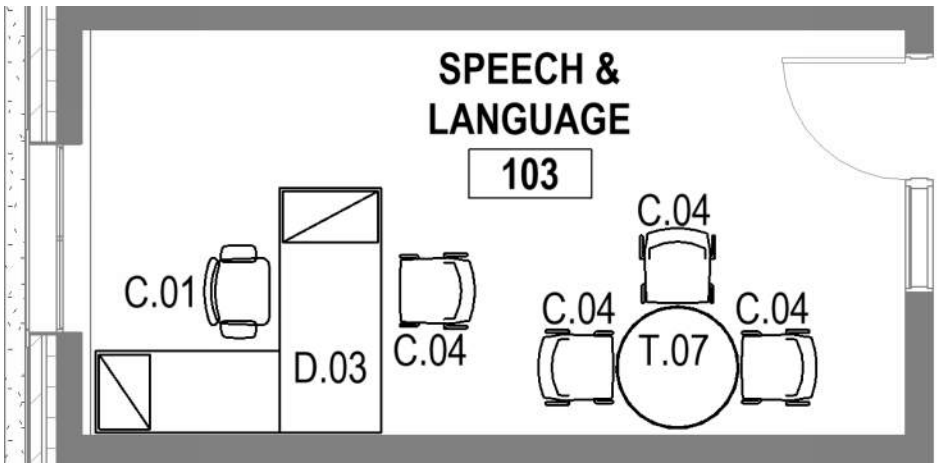
Room Function Number 02.056



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Room Function Number 02.002

Room Name	SPEECH & LANGUAGE
Room Number	109
Department (Name)	SPECIAL EDUCATION

Categorization		Areas	
Room Number	109	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Intended to be both the home base for a Speech & Language Specialist and a venue to provide pull-out services and testing for students in grades K-5.
Quantity:	4
Occupant Load:	(1-4) Students (1) Speech specialist (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Centrally located in Learning Communities. Direct access from main student corridor
Orientation / Views:	Views to Exterior required.

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum Wall Board, painted Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Windows:
Doors:	Flush Wood Door with sidelight- Classroom Hardware Set Shade on sidelight
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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Room Data Sheet

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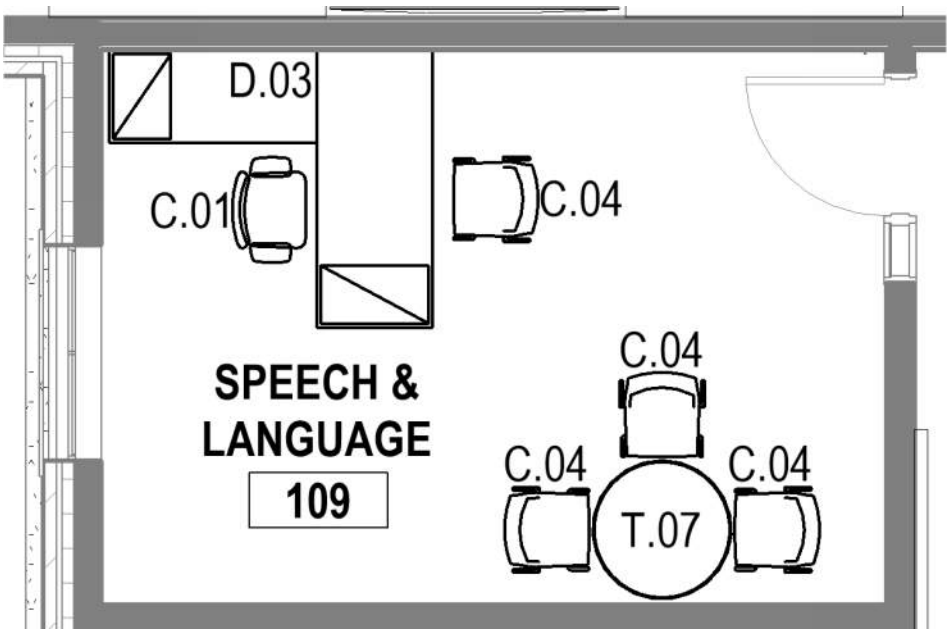
Room Function Number 02.002



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Room Function Number 03.001

Room Name	ART CLASSROOM
Room Number	116
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	116	Programmed	980.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Art Classroom
Quantity:	1
Occupant Load:	(24) Students (1) Art Teacher

Location Criteria:

Users:	Teachers, students
Adjacency:	Located on the ground floor at the corridor's south end to reduce student travel.
Orientation / Views:	Views to exteriors.

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment. Power for (2) pottery wheel stations
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/Sound field system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: Closed and open cabinets for materials and student workCountertop surface
Specialties:	Marker Board Tack Board for student display
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Pottery wheelComputers for digital work Visual display

Furniture

Item: BIM ID	Name	Quantity
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	24

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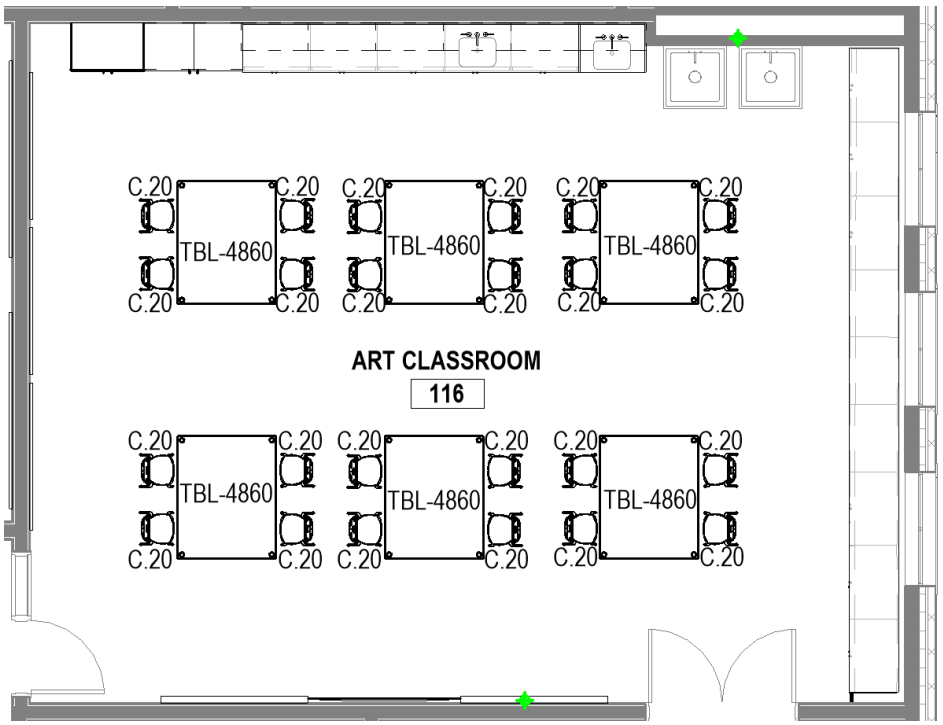
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 03.001



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Room Function Number 03.004

Room Name	ART STORAGE/KILN
Room Number	116A
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	116A	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage room accessible from classroom
Quantity:	1
Occupant Load:	None

Location Criteria:

Users:	Teachers and students
Adjacency:	Accessible within classroom
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Resilient Flooirng
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	None required
Windows:	None
Doors:	Flush Wood Door
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating.
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in Fixture
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	None

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	(2) Kilns
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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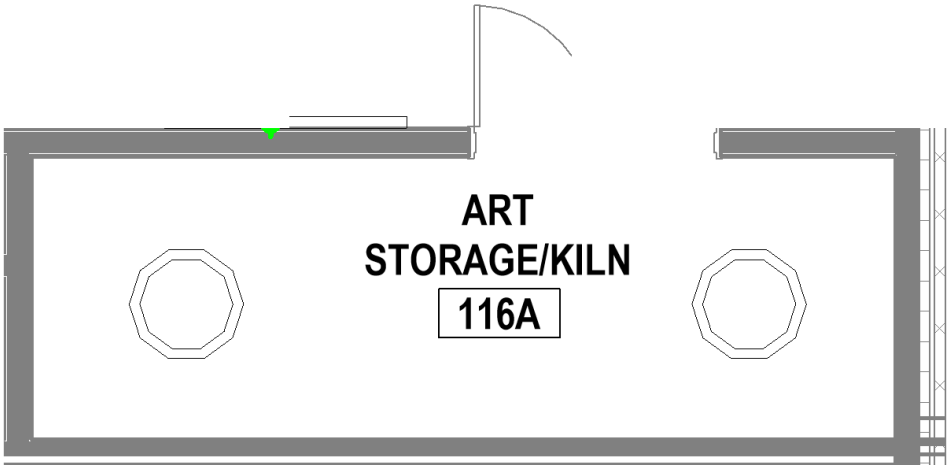
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 03.004



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Room Function Number 03.002

Room Name	GENERAL MUSIC/CHORUS
Room Number	106
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	106	Programmed	980.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Music Classroom to serve as home base for music teacher
Quantity:	2
Occupant Load:	(20-30) students (1) teacher

Location Criteria:

Users:	Teachers, students
Adjacency:	Located on 1st floor for easy access to stage for larger performances.
Orientation / Views:	Views to Exterior.

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Acoustical wall panels (2) Projectable Magnetic writable surface at teaching wall location. 2’ AFF to 7’ AFF for teacher and student use. Tack surface
Ceiling Finishes:	Acoustical ceiling system, 50% barrel Acoustical diffusers, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance. Additional acoustical measures required. Sound absorptive materials based on recommendations from acoustical engineer
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Set Doors to have acoustical seals
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including.
Specialties:	Types & Configurations indicated in the attached room layout sheets. Choral risers to be shared between music room and the stage. To be stored on Stage when not in use.
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Notes from Michael Ferrara - Band Director/Music Teacher

Beginner Band: 48 students
- 5 Flutes
- 9 Clarinets

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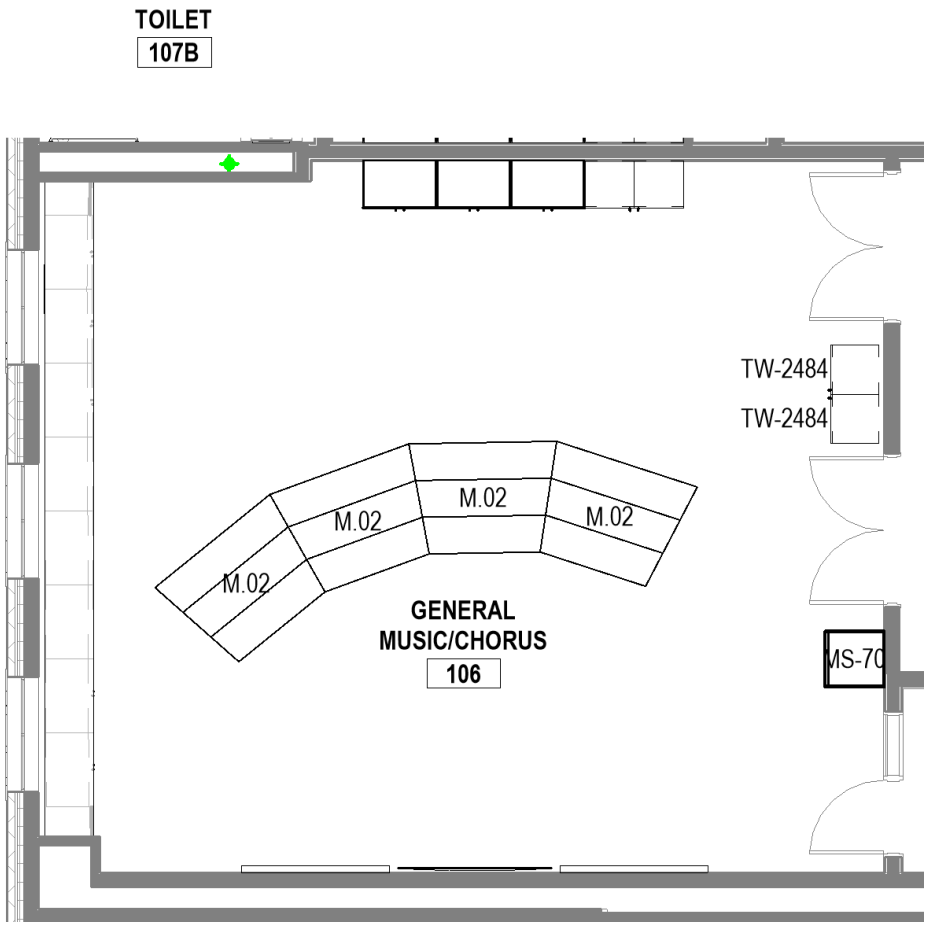
- 4 Saxophones
- 13 Trumpets
- 7 Trombones
- 9 Percussion
- Advanced Band: 28 students
- 4 Flutes
- 5 Clarinets
- 6 Saxophones
- 4 Trumpets
- 1 Trombone
- 8 Percussion
- For percussion:
- Xylophones, glock, cymbals, snare drums, bass drums. a station for auxillary (maracas, tambourine, etc.).
- We do use a drum set for several performances (jazz band).
- While we will utilize an electric keyboard on a stand, there is no need for significant space to accommodate an upright/baby grand piano.

Furniture

Item: BIM ID	Name	Quantity
M.02	Signature - Signature	4



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Room Function Number 03.003

Room Name	MUSIC STORAGE
Room Number	106A
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	106A	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage space for Music Department to store instruments and stage building supplies
Quantity:	1
Occupant Load:	none

Location Criteria:

Users:	Teachers, students
Adjacency:	Adjacent to the Music classroom & Stage
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system
Acoustical:	None
Windows:	None
Doors:	Flush Wood Door - Double
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed lay-in fixtures
Electrical:	Typical perimeter power requirements
Technology:	Public Address system

Fixtures & Furnishings:

Casework:	Tall storage cabinets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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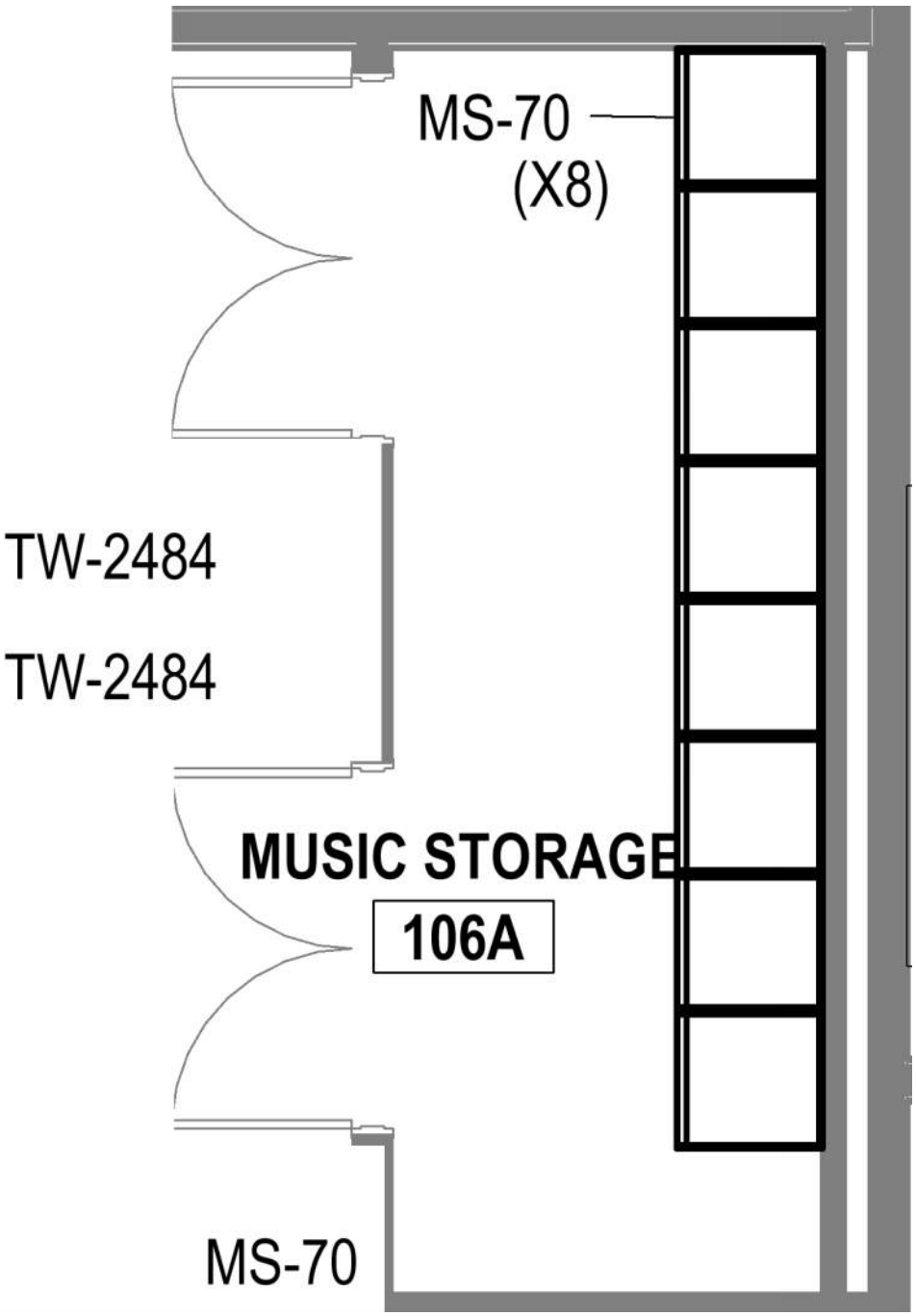

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Room Function Number 03.006

Room Name	INSTRUMENTAL MUSIC
Room Number	163
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	163	Programmed	700.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Music Classroom to serve as home base for music teacher
Quantity:	2
Occupant Load:	(20-30) students (1) teacher

Location Criteria:

Users:	Teachers, students
Adjacency:	Close to stage to allow for more easier access to stage for larger performances. Adjacent to Music storage and the Cafeteria
Orientation / Views:	Views and access to Exterior.

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Acoustical wall panels (2) Projectable Magnetic writable surface at teaching wall location. 2’ AFF to 7’ AFF for teacher and student use. Tack surface
Ceiling Finishes:	Acoustical ceiling system, 50% barrel Acoustical diffusers, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance. Additional acoustical measures required. Sound absorptive materials based on recommendations from acoustical engineer
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Set Doors to have acoustical seals
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station to coordinate with interactive projector (data & power)

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including.
Specialties:	Types & Configurations indicated in the attached room layout sheets. Choral risers to be shared between music room and the stage. To be stored on Stage when not in use.
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Notes from Michael Ferrara - Band Director/Music Teacher

Beginner Band: 48 students
- 5 Flutes

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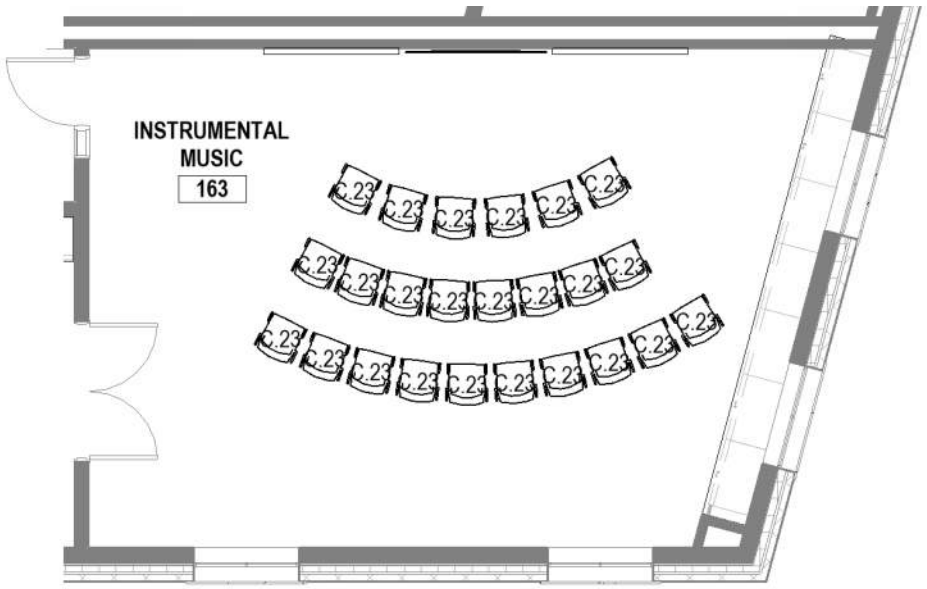
- 9 Clarinets
- 4 Saxophones
- 13 Trumpets
- 7 Trombones
- 9 Percussion
- Advanced Band: 28 students
- 4 Flutes
- 5 Clarinets
- 6 Saxophones
- 4 Trumpets
- 1 Trombone
- 8 Percussion
- For percussion:
- Xylophones, glock, cymbals, snare drums, bass drums. a station for auxiliary (maracas, tambourine, etc.).
- We do use a drum set for several performances (jazz band).
- While we will utilize an electric keyboard on a stand, there is no need for significant space to accommodate an upright/baby grand piano.

Furniture

Item: BIM ID	Name	Quantity
C.23	120000-Furniture-Chair-Haworth-Very1 - Student Chair-Music	24



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Room Function Number 03.007

Room Name	INSTRUMENTAL STORAGE
Room Number	163A
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	163A	Programmed	240.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage space for Music Department to store instruments and stage building supplies
Quantity:	1
Occupant Load:	0

Location Criteria:

Users:	Teachers, students
Adjacency:	Adjacent to the Music classroom & Stage
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system
Acoustical:	None
Windows:	None
Doors:	Flush Wood Doors - Double
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed lay-in fixtures
Electrical:	Typical perimeter power requirements.
Technology:	Public Address system.

Fixtures & Furnishings:

Casework:	Deep Music equipment storage cabinets, sink
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
S.07a	Wenger Cabinet 28 - Narrow Acoustic Cabinet #28	1
S.07b	Wenger Cabinet 42 - Standard Cabinet #42 - Combo	1
S.07c	Wenger Cabinet 42 - Acoustic Cabinet #42 - Guitar	1

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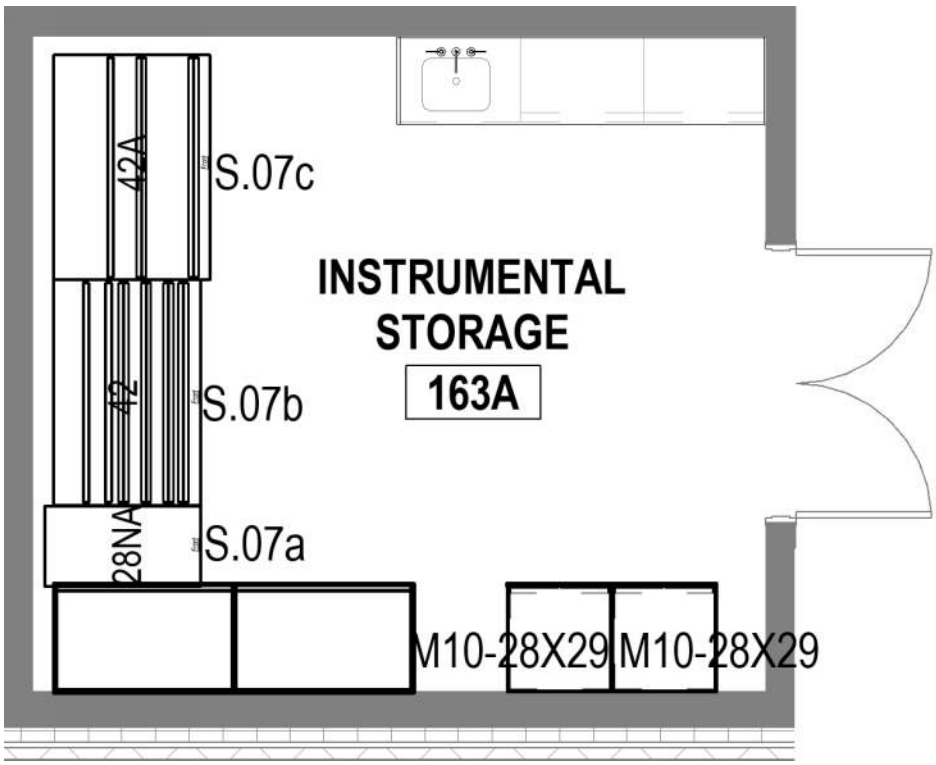

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Room Function Number 03.005

Room Name	FLEX CLASSROOM
Room Number	171
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	171	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	27
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

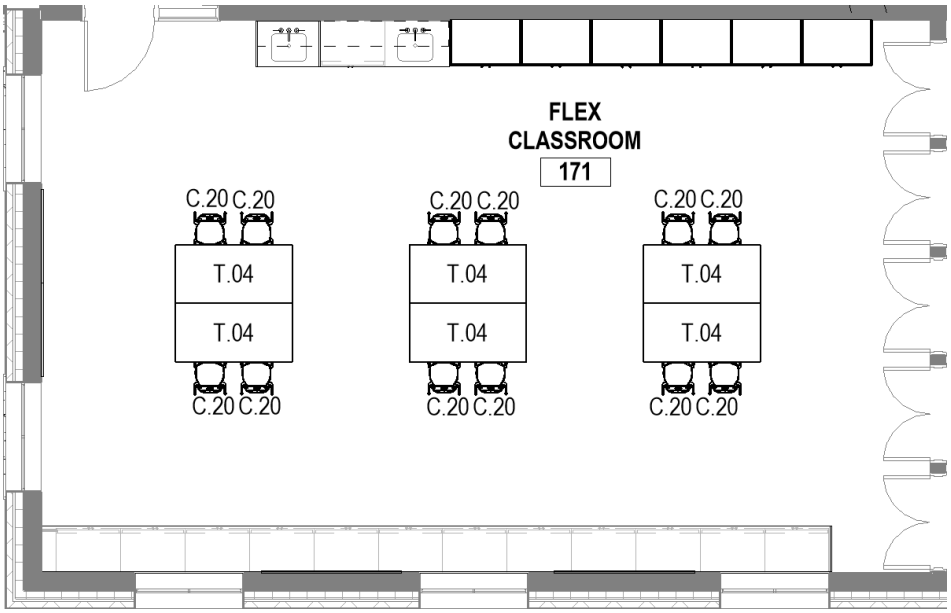
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 03.005

Furniture

Item: BIM ID	Name	Quantity
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	12
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	6



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Room Function Number 12.003

Room Name	FLEX STORAGE
Room Number	171A
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	171A	Programmed	100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage space within FLEX classroom
Quantity:	1
Occupant Load:	0

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and CARES
Adjacency:	Within Flex Classroom
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	Floor to ceiling adjustable shelving. 24"in deep.

Additional Requirements:

None

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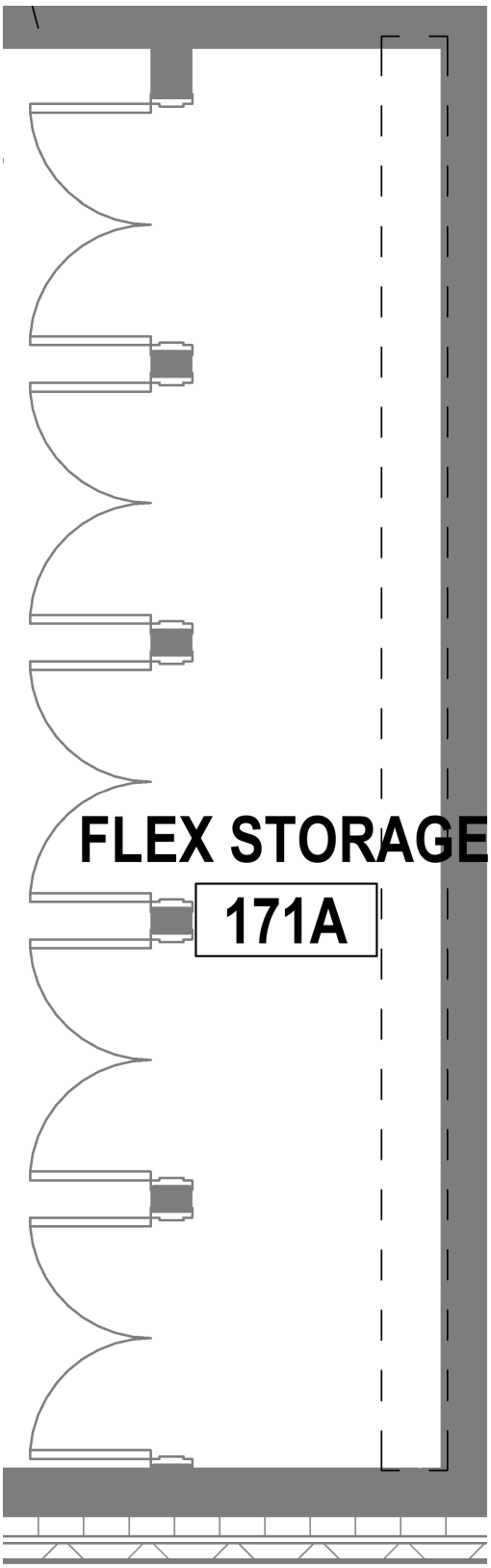
Room Function Number 12.003



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Room Function Number 03.008

Room Name	FLEX CLASSROOM
Room Number	257
Department (Name)	ART & MUSIC

Categorization		Areas	
Room Number	257	Programmed	975.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	27
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

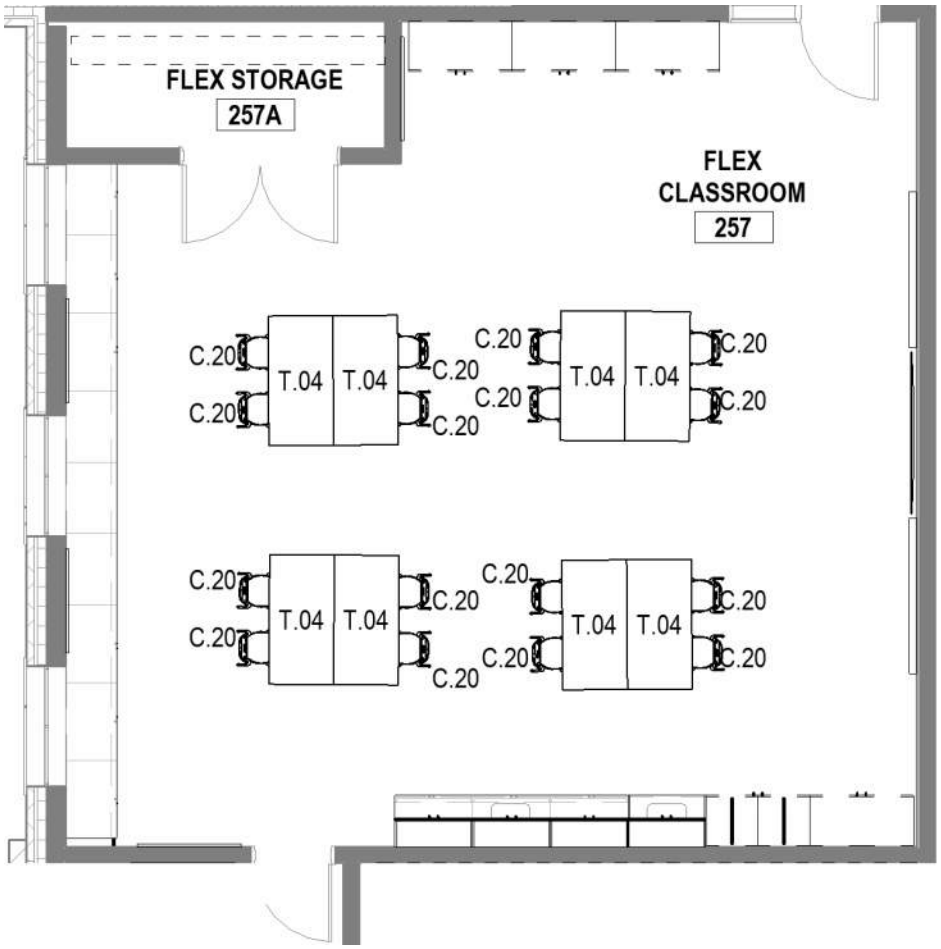
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 03.008

Furniture

Item: BIM ID	Name	Quantity
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	16
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	8



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Room Function Number 12.010

Room Name	FLEX STORAGE
Room Number	257A
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	257A	Programmed	60.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage space within FLEX classroom
Quantity:	1
Occupant Load:	0

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and CARES
Adjacency:	Within Flex Classroom
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	None

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	Floor to ceiling adjustable shelving. 24"in deep.

Additional Requirements:

None

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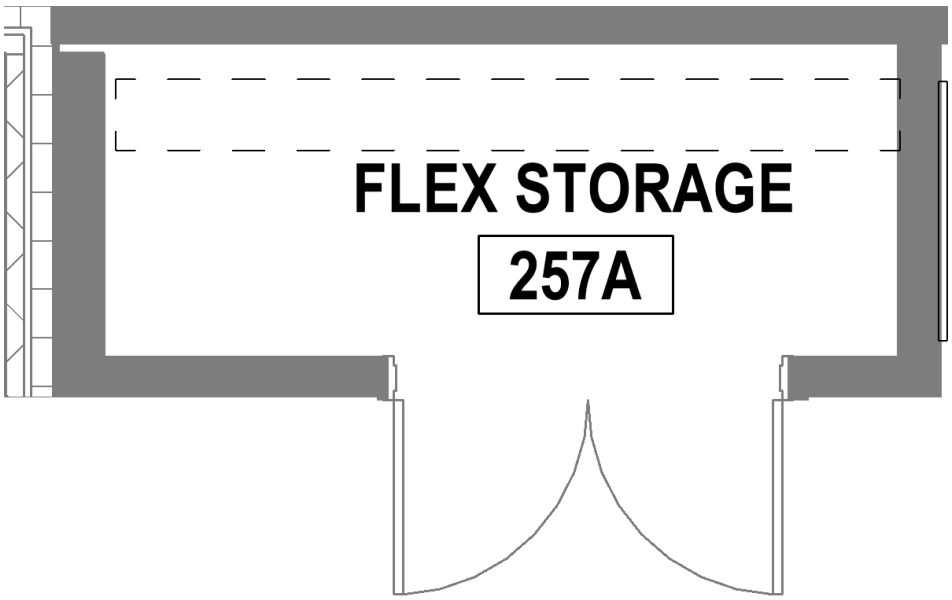
Room Function Number 12.010



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Room Name	GYMNASIUM
Room Number	194
Department (Name)	HEALTH & PHYSICAL EDUCATION

Categorization		Areas	
Room Number	194	Programmed	12,000.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for physical education instruction
Program Area:	12,000 **sq. ft.**
Quantity:	1
Occupant Load:	Typical instruction: (48-50) Students (2) Teachers Community gatherings: 515 - chairs. 600 - Seated Bleacher capacity

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals General public
Adjacency:	Gym storeroom. Health instructor’s office. In the public zone for community access after hours
Orientation / Views:	N/A

Technical Criteria:

Floor Finishes:	Resilient wood sports flooring, full HS basketball court, (4) pickle ball courts, (6) practice basketball courts
Wall Finishes:	Concrete block, painted Acoustical Concrete Block, painted at upper portion of wall (2) Projectable Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Type NCA Acoustic deck, painted
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance. Additional acoustical measures required
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Vision glazing wood door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning & heat
Plumbing / FP:	Fully Sprinklered. (2) Water Fountains
Lighting:	High bay lighting
Electrical:	Typical perimeter power requirements. Power for motorized interior window shades and divider curtain. Power and data for projectors.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access AV system for large audience presentations (2) Interactive projections systems for instruction (2) Scoreboards

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	(6) Standard high retractable basketball hoops (1) motorized room divider curtain. Perimeter wall pads (9) retractable eye hook rope connections for universal use. (2) hooks for adaptive swings
Furnishings:	n/a

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Room Data Sheet

SD - Submission

Dore & Whittier

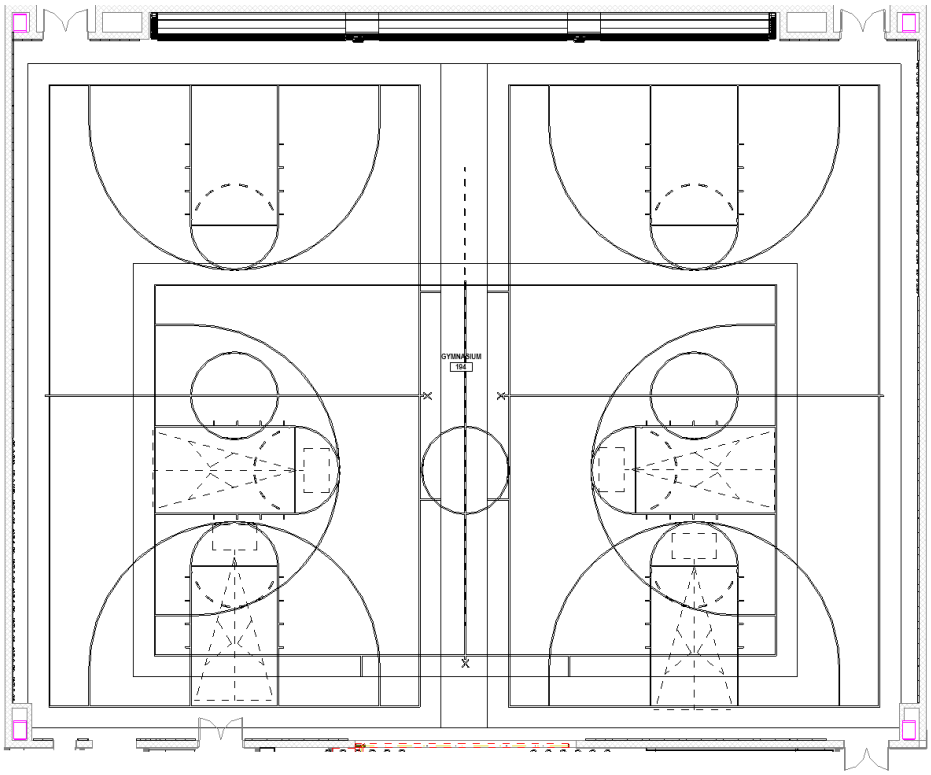
Wilmington Wildwood EC Center

Room Function Number 05.001

Equipment: Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Bleachers are to be motorized and retractable



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Room Function Number 05.003

Room Name	STORAGE
Room Number	194A
Department (Name)	HEALTH & PHYSICAL EDUCATION

Categorization		Areas	
Room Number	194A	Programmed	180.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage for gymnasium
Quantity:	1
Occupant Load:	None

Location Criteria:

Users:	PE instructors, Specialist
Adjacency:	Within gymnasium
Orientation / Views:	None Required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	None required
Windows:	None
Doors:	Flush Wood Door
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
S.04	120000-Furniture-Storage-Pantry Shelving (1) - 48" Wide x 24"	8

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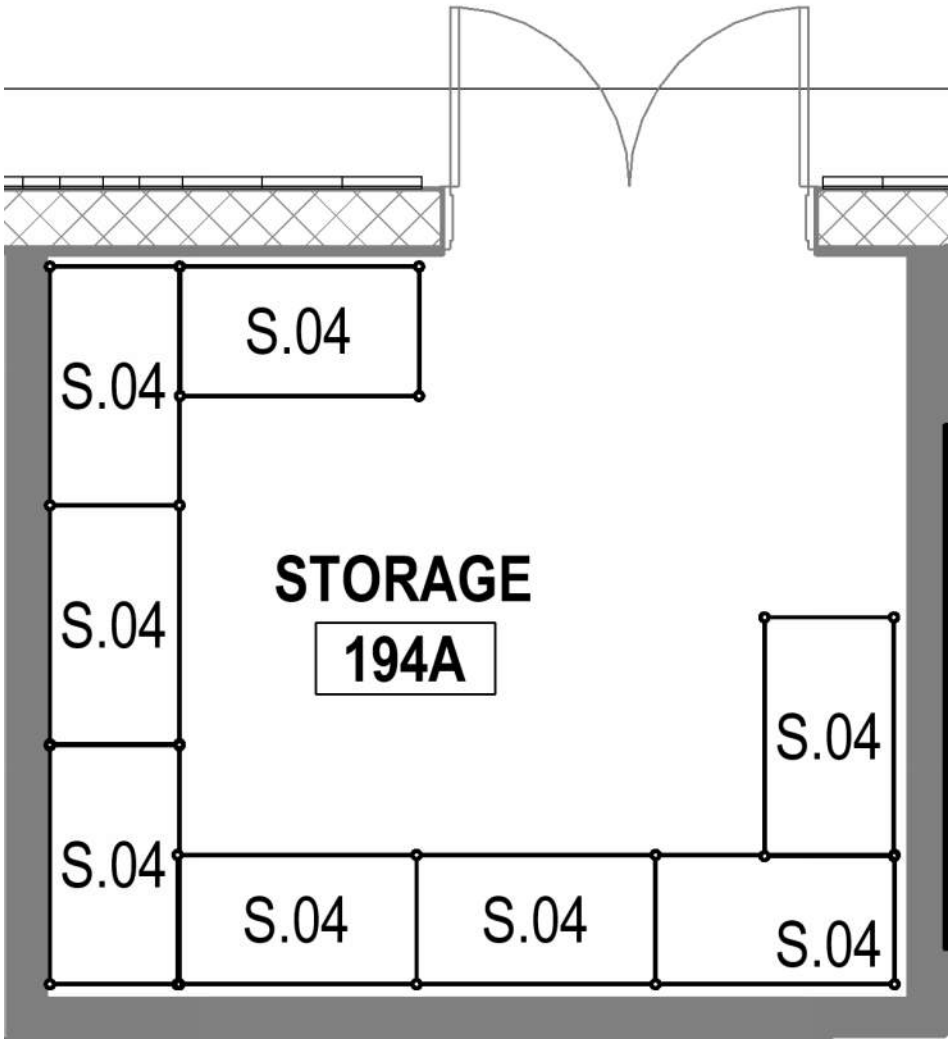

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Room Function Number 05.002

Room Name	PE OFFICE
Room Number	195
Department (Name)	HEALTH & PHYSICAL EDUCATION

Categorization		Areas	
Room Number	195	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for PE instructors
Quantity:	1
Occupant Load:	3

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush Wood Door - Classroom Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system
	Clock System
	Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	3
S.13	120000-Furniture-Storage-Lateral File - 36x18-3high	1

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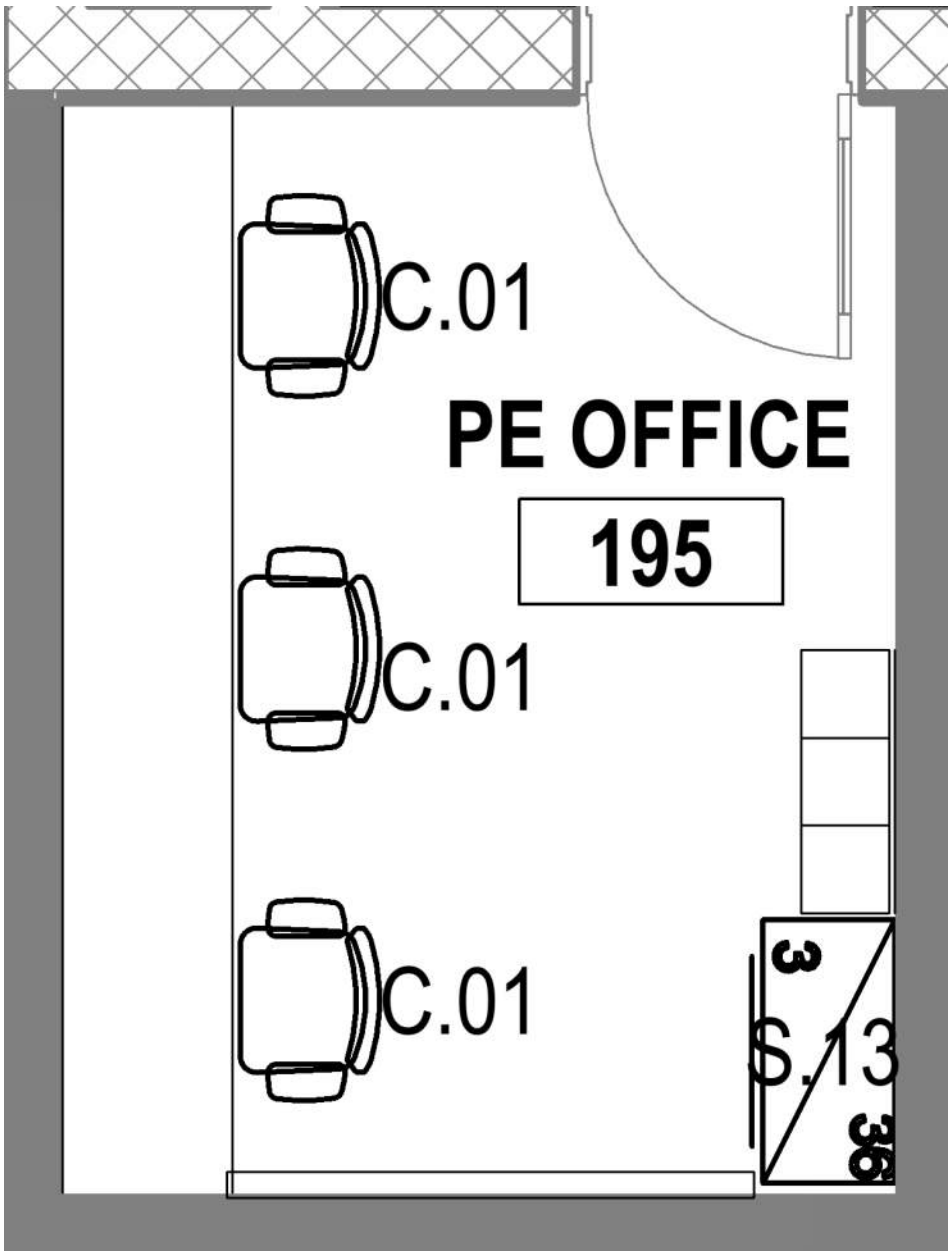
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 05.002



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Room Function Number 10.001

Room Name	LIBRARY
Room Number	252
Department (Name)	MEDIA CENTER

Categorization		Areas	
Room Number	252	Programmed	4,068.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Technology rich learning commons for the school with a focus on literacy across disciplines. The learning commons is a comfortable space for reading, access to many books, space for creative projects, flex space for instruction, showcase area for students to gather as a small community. This hub of learning should be a location where the school community can celebrate learning on display
Quantity:	1
Occupant Load:	2 Classes or Groups (approximately 24 students per group) (2) Staff

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, faculty & staff, visitors
Adjacency:	2nd floor Centrally located to the main entry
Orientation / Views:	Exterior Views and into Cafeteria

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels.
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum clouds, exposed glulam beams
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Curtain wall to exterior, room darkening shades.
Doors:	Double doors with glazing
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed cans and Pendent Lighting
Electrical:	Typical perimeter power requirements. Power for motorized window shades. Power and data for digital displays
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
	SmithSystem_AM_Seating_Education_Flowform_LearnLounge_MobileKit_Double - Double	1
	SmithSystem_AM_Seating_Education_Flowform_LearnLounge_MobileKit_Single - Single	2
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	2
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	20
C.10	SmithSystem_AM_Seating_Education_Flowform_LearnLounge_SingleSeat - Single	2

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Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 10.001

Item: BIM ID	Name	Quantity
C.11c	SmithSystem_AM_Seating_Education_Flowform_LearnLounge_DoubleSeat - Double	1
C.13c	120000-Furniture-ChiarLoungeModular-Curved - 120000-Furniture-ChiarLoungeModular-Curved Yellow	4
C.14b	SmithSystem_AM_Seating_Education_Flowform_TaperedCylinderStool - Stool	4
C.15b	Blu Dot - Bumper - Ottoman - Small	3
C.16	120000-Furniture-Chair_Bean Bag - 120000-Furniture-Chair_Bean Bag	4
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	44
C.21	SmithSystem_AM_Seating_Education_Flowform_SoftRocker - Soft Rocker	6
M.03a	SmithSystem_AM_SpaceDivision_Screen_Flowform_LearnLounge_FlexScreen_Leaves - Straight	1
M.03b	SmithSystem_AM_SpaceDivision_Screen_Flowform_LearnLounge_FlexScreen_Leaves - Curved	2
M.03c	SmithSystem_AM_SpaceDivision_Screen_Flowform_LearnLounge_FlexScreen_Leaves - Surround	1
S.30	120000-Furniture-Accesory-Book Cart - 24" x 60" Existing	1
T.03	120000-Furniture-Table Round1 - 36" - low	2
T.14a	SmithSystem_AM_Table_Education_Orbit_OffsetTriangle - Offset Triangle Table with Casters	4
T.14b	SmithSystem_AM_Table_Education_Flowform_LearnLounge_OffsetRectangle - NoPower	1
T.15b	SmithSystem_AM_Seating_Education_Flowform_SoftSeating_Ottoman_WithSurface - WithPower	3
T.23	SmithSystem_AM_Desking_HeightAdjustable_Numbers_SingleStudent_Petal - Petal	20
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	4
x	SmithSystem_AM_Accesory_Numbers_Casters - Glide	80

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Room Data Sheet

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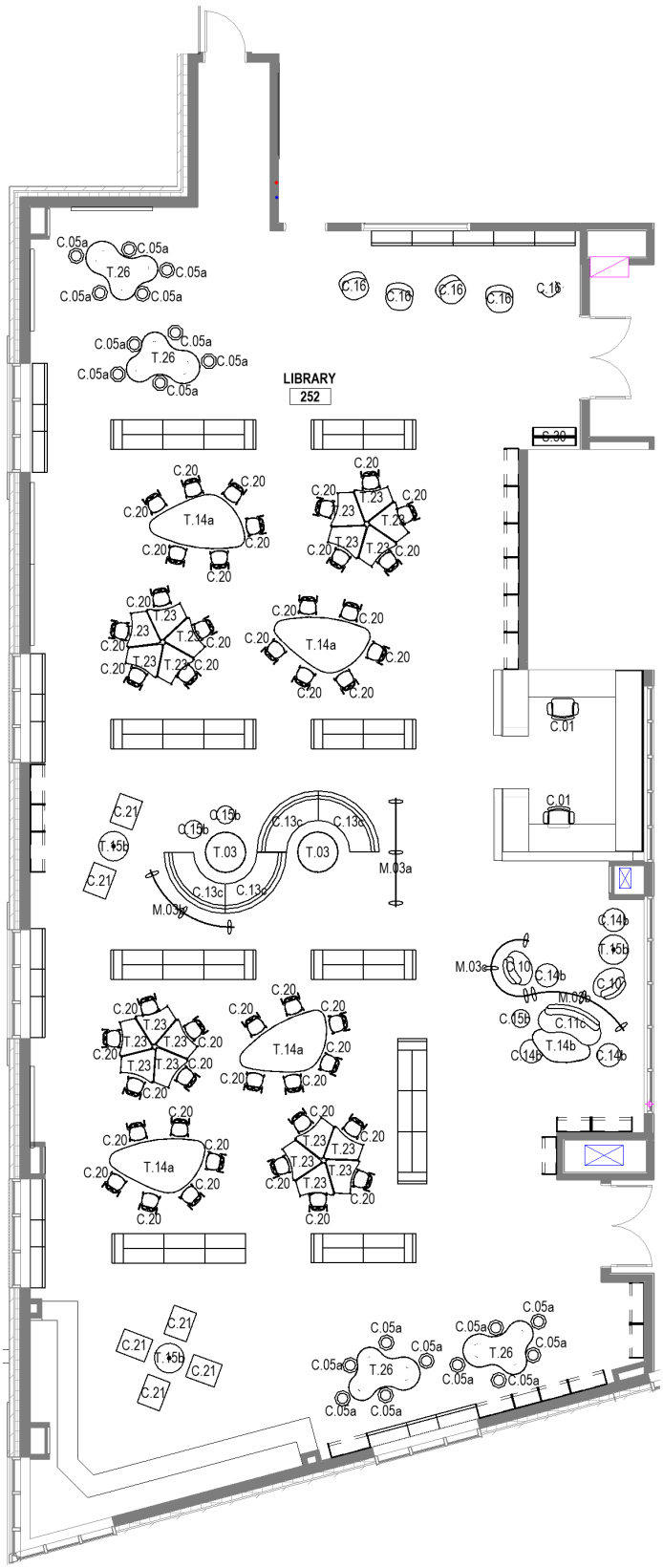
Wilmington Wildwood EC Center

Room Function Number 10.001



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Room Function Number 10.002

Room Name	LIBRARIAN WORKROOM
Room Number	252A
Department (Name)	MEDIA CENTER

Categorization		Areas	
Room Number	252A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Shared workspace for librarians and STE teachers
Quantity:	1
Occupant Load:	Office/workspace to have 4 workstations

Location Criteria:

Users:	Librarians, teachers, specialists, paraprofessionals, faculty & staff
Adjacency:	located within library
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels,
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum clouds, exposed glulam beams
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Window to library
Doors:	door with glazing
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed cans and Pendent Lighting
Electrical:	Typical perimeter power requirements. Power for motorized window shades and divider curtain. Power and data for digital displays
Technology:	Additional power required to support specific room equipment Public Address system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	4
S.30	120000-Furniture-Accesory-Book Cart - 24" x 60" Existing	1

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Room Data Sheet

SD - Submission

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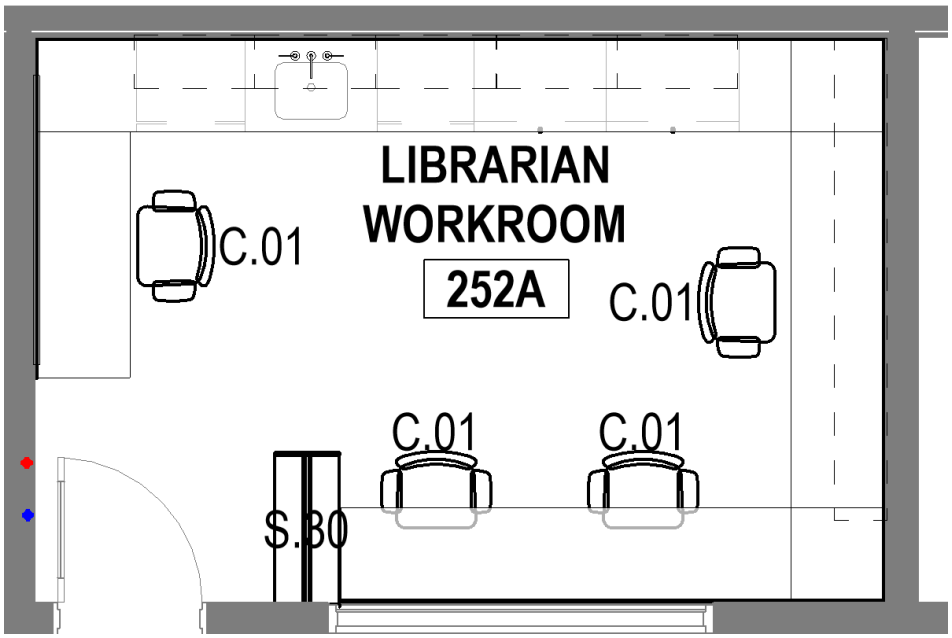
Wilmington Wildwood EC Center

Room Function Number 10.002



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Room Function Number 07.005

Room Name	CAFETERIA
Room Number	168
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	168	Programmed	4,612.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Student dining, large group instruction & meetings and seating area during community events and performances.
Quantity:	1
Occupant Load:	2 seatings of 377 students (Including seating in Quiet Cafe)

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, faculty & staff, visitors, and members of the public during after hours and special events.
Adjacency:	In the public realm and adjacent to Kitchen, Lobby Space, Quite and Gym
Orientation / Views:	Exterior Views and access required

Technical Criteria:

Floor Finishes:	Terrazzo
Wall Finishes:	Gypsum Wall Board, Tile wainscot, painted above, Acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, motorized room darkening shades
Doors:	Flush wood doors. Motorized coiling grille at servery.
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (2) Sinks for lunch/drink disposal and hand washing
Lighting:	Pendent lighting, feature light fixtures, dimmable
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (2) TV displays at kitchen servery AV system to support projection equipment & performance functions

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets. (3) Built in trash receptacle stations
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

n/a

Furniture

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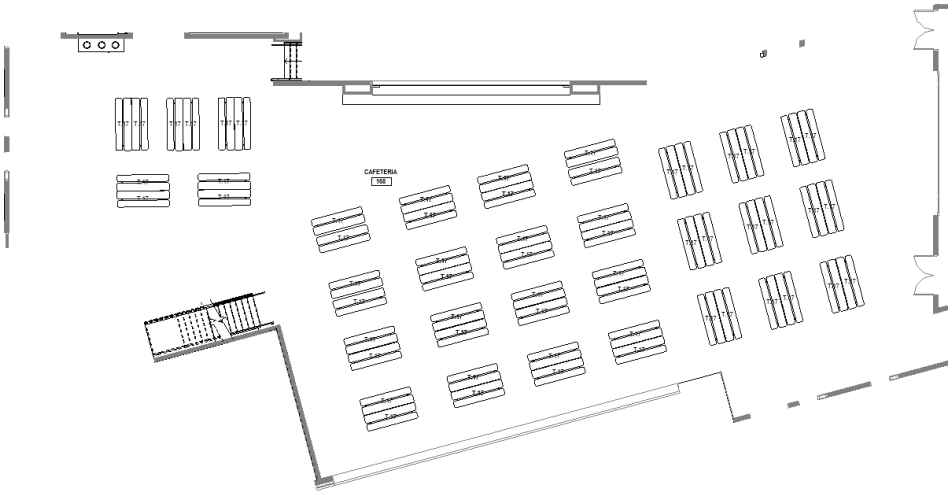
Room Function Number 07.005

Item: BIM ID	Name	Quantity
	120000-Furniture-Table-Cafeteria Round - 120000-Furniture-Table-Cafeteria Round	2
T.17	Table-Fold-KI-Uniframe-Bench-Convertible - INVALID TYPE - Load Family with Type Catalog	64



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Room Function Number 07.006

Room Name	CAFETERIA
Room Number	168A
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	168A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Student dining for small groups in a quiet setting, small group instruction & meetings
Quantity:	1
Occupant Load:	(10-15) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, faculty & staff, visitors
Adjacency:	Cafeteria, Kitchen, Servery
Orientation / Views:	Exterior Views and access not required

Technical Criteria:

Floor Finishes:	Terrazzo
Wall Finishes:	Gypsum Wall Board, tiled wainscot, painted above.
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance.
Windows:	None
Doors:	None
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Pendant lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Motorized folding wall partition
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

All furnishings to be flexible and moveable.

Furniture

Item: BIM ID	Name	Quantity
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	10
C.13a	120000-Furniture-Chair-Bench 2 - 120000-Furniture-Chair-Bench yellow	2
C.13c	120000-Furniture-ChiarLoungeModular-Curved - 120000-Furniture-ChiarLoungeModular-Curved Yellow	1
T.14a	SmithSystem_AM_Table_Education_Orbit_OffsetTriangle - Offset Triangle Table with Casters	1
T.14b	SmithSystem_AM_Table_Education_Flowform_LearnLounge_OffsetRectangle - NoPower	2

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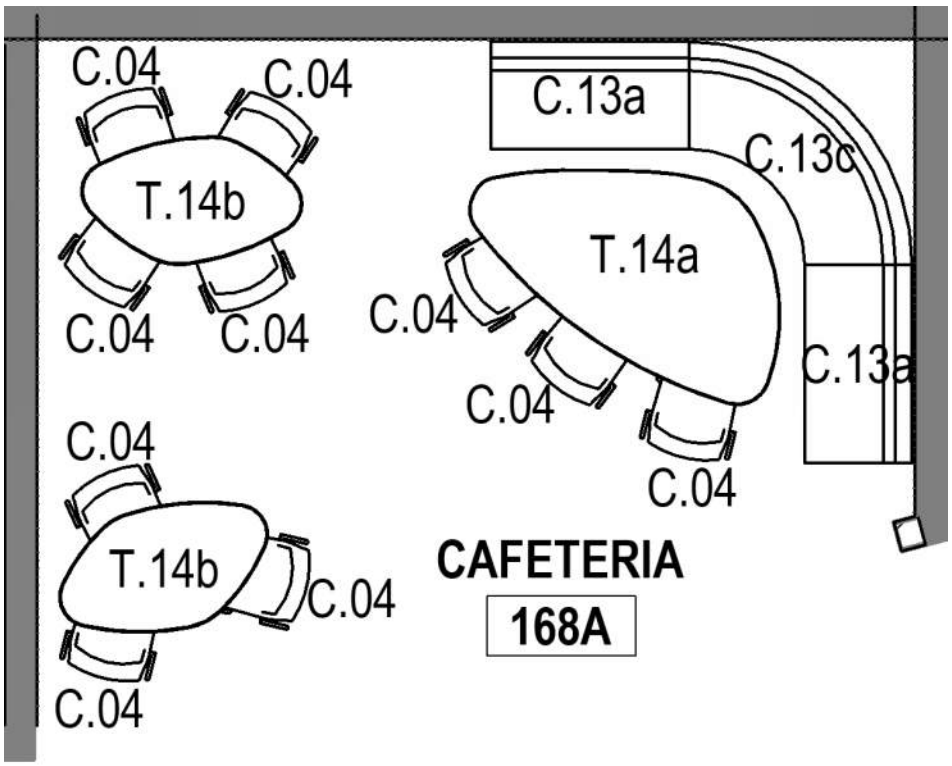

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Room Function Number 07.010

Room Name	STAGE
Room Number	169
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	169	Programmed	1,000.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Raised performance area, open to Cafeteria and Gym
Quantity:	1
Occupant Load:	Stage capacity for 75 students minimum. 50 students with instruments during performances. Chorus Performances: 140 chorus students. However, group is typically split and is 75 students at a time.

Location Criteria:

Users:	Teachers, students, CARES, specialists, paraprofessionals, faculty & staff, visitors
Adjacency:	Cafeteria and Gymnasium
Orientation / Views:	Exterior Views and access not required

Technical Criteria:

Floor Finishes:	Specialty Wood Stage Floor with 2 risers along the entire front of the stage
Wall Finishes:	Gypsum Wall Board, painted (Black)
Ceiling Finishes:	Painted structure above (Black)
Acoustical:	Acoustically open to cafeteria, acoustically designed based on recommendations from acoustical consultant
Windows:	None
Doors:	Open to Cafeteria, open to Gym with movable acoustical partition/door
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Theatrical lighting batten with dimming system
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Wireless network access Large format motorized projection screen at platform proscenium AV system to support projection equipment & performance functions Two rear screen projection systems, one for each side of the stage

Fixtures & Furnishings:

Casework:	Proscenium millwork panelized frame around opening
Specialties:	Cyclorama, back "leg" curtains, proscenium front curtains
Furnishings:	3-tier risers.
Equipment:	Projection Screen. Additional equipment to be determined.
Shelving / Storage:	none

Additional Requirements:

Seating capacity (351 in cafeteria, with 295 clear view of stage, 1000+ in gymnasium with bleachers and folding chairs).

Furniture

Item: BIM ID	Name	Quantity
C.23	120000-Furniture-Chair-Haworth-Very1 - Student Chair-Music	50
Z	1200000 - ME - Generic Model - 1200000 - ME - Generic Model	1

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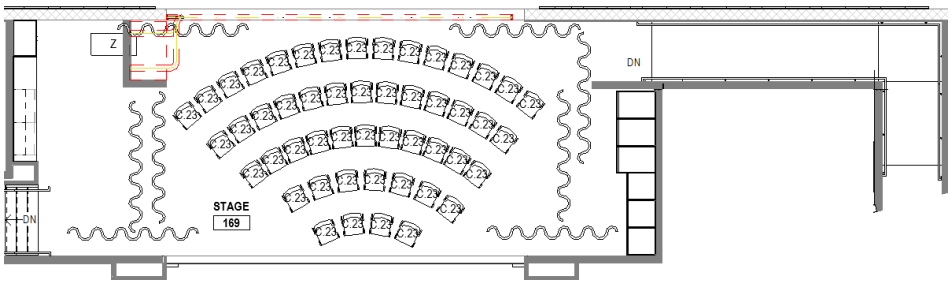
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 07.010



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Room Function Number 07.008

Room Name	CHAIR STORAGE
Room Number	153
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	153	Programmed	452.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage for dining/gym & performance furniture
Quantity:	1
Occupant Load:	0

Location Criteria:

Users:	Faculty & Staff
Adjacency:	Cafeteria & Gymnasium
Orientation / Views:	n/a

Technical Criteria:

Floor Finishes:	Quartz Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	none
Windows:	none
Doors:	(1) Set of Double flush wood doors
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	Perimeter floor to ceiling shelving

Additional Requirements:

Number of chair dollies assume a max of 40 chairs per dolly, and additional dollies to hold all chairs in cafeteria.

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Room Data Sheet

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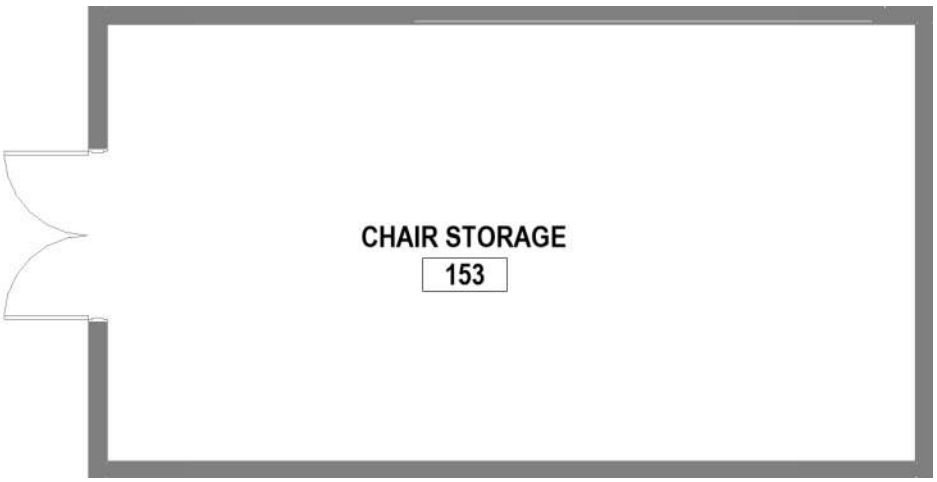
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 07.008



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Room Function Number 07.007

Room Name	KITCHEN
Room Number	162
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	162	Programmed	2,255.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Food preparation & serving
Quantity:	1
Occupant Load:	(10-11) Kitchen Staff

Location Criteria:

Users:	Kitchen Staff & Students
Adjacency:	Cafeteria & Custodial Suite
Orientation / Views:	Exterior Views and access not required

Technical Criteria:

Floor Finishes:	Quarry tile
Wall Finishes:	Tile, Gypsum wall board, painted above
Ceiling Finishes:	Non-porous acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	None
Doors:	Flush wood doors
	Motorized coiling grille at servery
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
	(1) Dedicated single user toilet room
	Plumbing to coordinate with food service equipment layout
Lighting:	Recessed lighting, decorative pendants at servery
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system
	Wireless network access
	Additional power requirements to coordinate with foodservice equipment Motorized operator at servery OH coiling grille

Fixtures & Furnishings:

Casework:	None
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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Room Data Sheet

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Wilmington Wildwood EC Center

Room Function Number 07.007

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Room Function Number 07.001

Room Name	STAFF LUNCH
Room Number	251
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	251	Programmed	289.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Break/Lunch Room for teachers. Collaboration and group planning rooms for teachers.
Quantity:	1
Occupant Load:	(10) Teachers/Faculty

Location Criteria:

Users:	Teachers, specialists, paraprofessionals
Adjacency:	Between learning communities
Orientation / Views:	Interior view to Cafeteria

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Gypsum Wall Board, painted Tile backsplash Projectable Magnetic writable surface for collaboration purposes
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffit
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom lockset
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink, at 2'-10" for Adult use
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	n/a
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Full size refrigerator MicrowaveCoffee Maker
Shelving / Storage:	n/a

Furniture

Item: BIM ID	Name	Quantity
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	8
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	2

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Room Data Sheet

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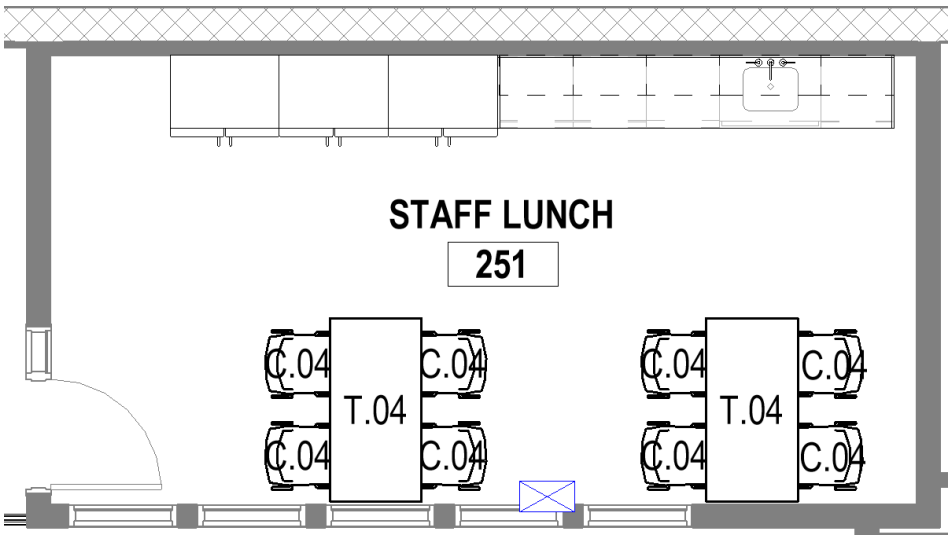
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 07.001



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Room Function Number 07.002

Room Name	QUIET CAFE
Room Number	164
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	164	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Student dining for small groups in a quiet setting, small group instruction & meetings
Quantity:	3
Occupant Load:	(10-15) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, faculty & staff, visitors
Adjacency:	Cafeteria, Kitchen, Servery
Orientation / Views:	Exterior Views and access not required, interior views to and from cafeteria

Technical Criteria:

Floor Finishes:	Terrazzo
Wall Finishes:	Gypsum Wall Board, tiled wainscot, painted above. Folding wall partitions
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Single wood door with full glass panels, acoustic seals and shades for privacy.
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Pendant lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Motorized folding wall partition
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

All furnishings to be flexible and moveable.

Furniture

Item: BIM ID	Name	Quantity
C.13a	120000-Furniture-Chair-Bench 2 - 120000-Furniture-Chair-Bench yellow	2
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	4
T.01c	120000-Furniture-Table Rectangular- 4 leg - 120000-Furniture-Table Rec- 48 x 24	1
T.07	120000-Furniture-Table Round - 36"	1

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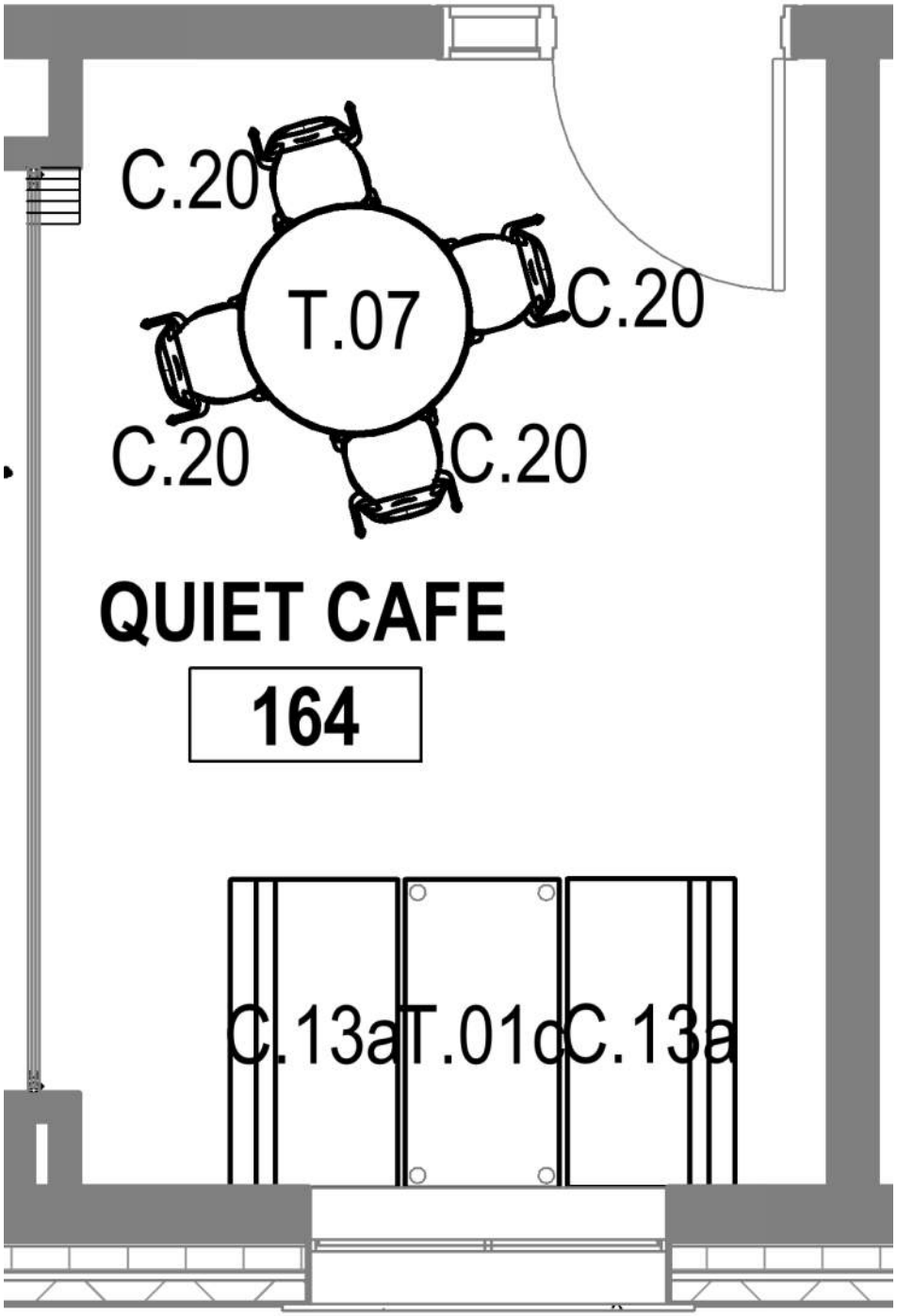

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Room Function Number 07.009

Room Name	OFFICE
Room Number	161
Department (Name)	DINING & FOOD SERVICE

Categorization		Areas	
Room Number	161	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Office for Kitchen staff
Quantity:	1
Occupant Load:	2

Location Criteria:

Users:	Kitchen Staff
Adjacency:	Cafeteria, Kitchen, Shipping & receiving, custodial work and storage areas
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	none
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Metal Door w/ glass.
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	2

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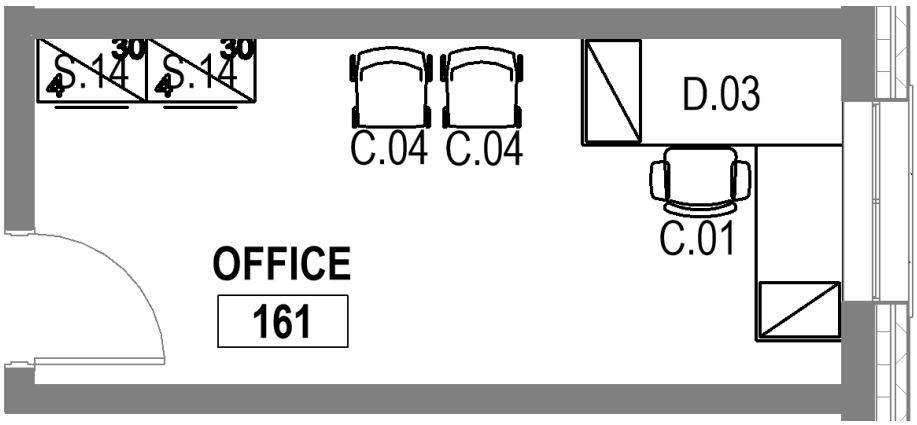
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 07.009



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Room Function Number 08.001

Room Name	MEDICAL
Room Number	190
Department (Name)	MEDICAL

Categorization		Areas	
Room Number	190	Programmed	710.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Open Nurse room for students resting and administration of medication. Home base for Nurses, locked storage of medications and medical supplies. Waiting area for students. Seated respite area by windows for students. This room serves the combination of two functions: an open intake, triage, and seated waiting area; and a resting area with three cots, each with curtains for privacy/ light control.
Quantity:	1
Occupant Load:	(2) Staff (3-7) Visitors/Students

Location Criteria:

Users:	Nurse and Students
Adjacency:	Adjacent to the Administrative suite. Direct access from the student corridor. Near Main office and School Psychologist.
Orientation / Views:	Exterior view preferred Direct egress from the building needed.

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance. Need privacy for confidentiality for calls. Private Office w/ door
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood doors with side light and shade Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible sink Filtered water line for Ref/ice maker
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment. Public Address system. Clock System. Wireless network access. Printer

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including (1) Double lock narcotics cabinet. Storage cabinets for supplies and student files
Specialties:	Types & Configurations indicated in the attached room layout sheets. (3) Cubical curtains for student privacy. Mobile storage cart for supplies. (1) Full size refrigerator w/ ice making capabilities. Privacy curtains for resting cots Tackboard & Markerboard surfaces
Furnishings:	Types & Configurations indicated in the attached room layout sheets.

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Room Function Number 08.001

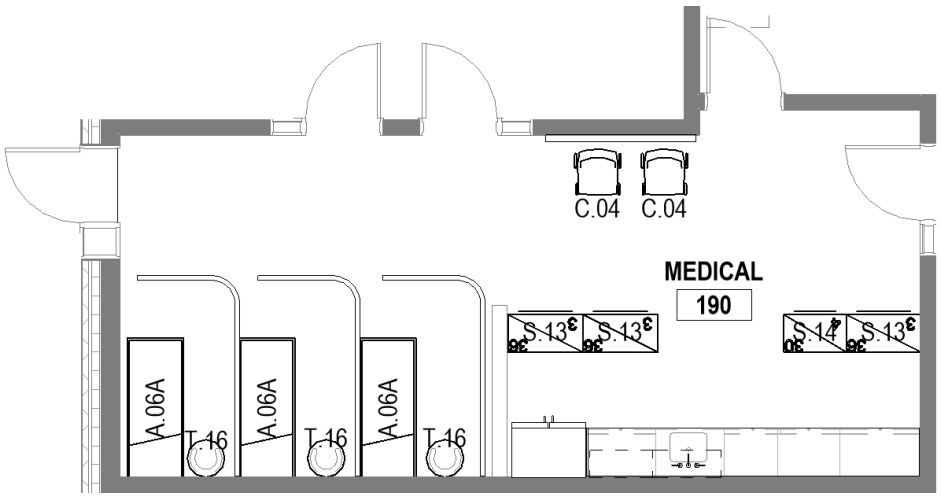
	Storage for diabetics for equipment & testing
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets. The suite must accommodate medical records for 750 students

Additional Requirements:

- Strategy and organization for epinephrine pens to be finalized.
- No waiting space required; square footage allocated for waiting will be reallocated to the exam rooms.

Furniture

Item: BIM ID	Name	Quantity
A.06A	120000-Furniture-Cot - 72x27	3
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
S.13	120000-Furniture-Storage-Lateral File - 36x18-3high	3
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	1
T.16	120000-Furniture-Table-C Table - 27"H	3



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Room Function Number 08.002

Room Name	EXAM
Room Number	190A
Department (Name)	MEDICAL

Categorization		Areas	
Room Number	190A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Nurses, locked storage of medications and medical supplies Closed exam room for student resting and administration of medication
Quantity:	2
Occupant Load:	1 student patient, (1) Staff

Location Criteria:

Users:	Nurse & Students
Adjacency:	Within Nurse suite
Orientation / Views:	Exterior views not required

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	None required
Doors:	Flush wood door with sidelight
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: (1) Built in Nurse workstations. Storage cabinets for supplies and student files
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Resting cot, sanitary paper roll dispenser, and built-in storage base
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
A.06A	120000-Furniture-Cot - 72x27	1
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1

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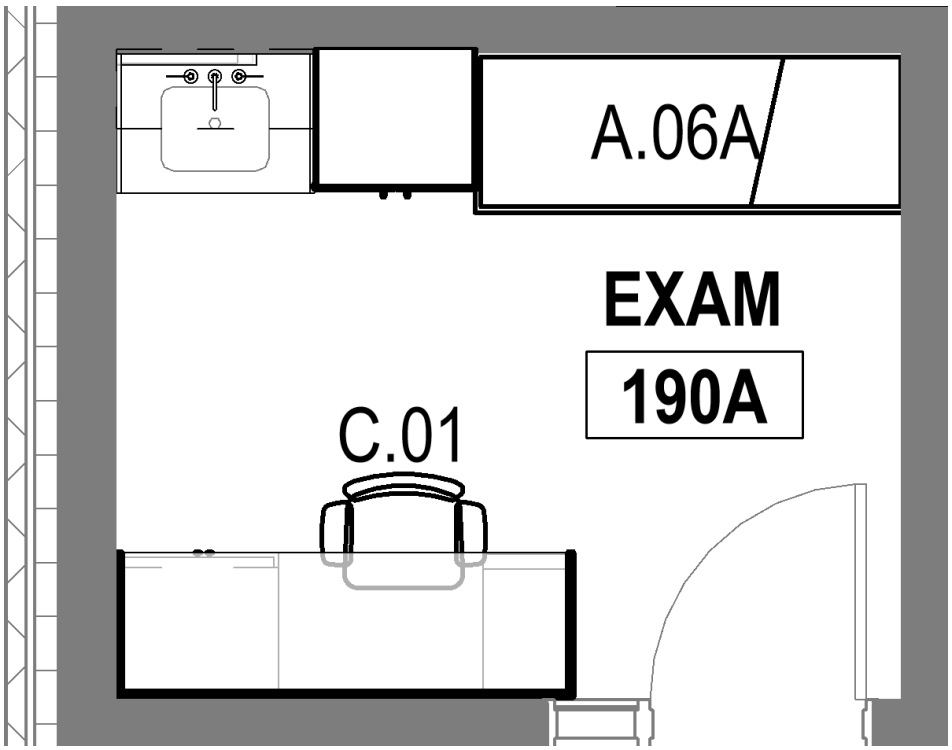

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Room Function Number 08.003

Room Name	TOILET
Room Number	190C
Department (Name)	MEDICAL

Categorization		Areas	
Room Number	190C	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated toilet for medical suite
Quantity:	1
Occupant Load:	(1) Staff (1) Student

Location Criteria:

Users:	Nurses & Students
Adjacency:	Internal to Nurse Suite
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Tiled floor
Wall Finishes:	Wall Tile, Gypsum wall board, tiled wainscot, painted above
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	None
Doors:	Flush wood doors. Privacy Hardware
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible sink (1) Toilet, Accessible
Lighting:	Lay-in light fixtures
Electrical:	Typical perimeter power requirements.
Technology:	Public Address system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

No changing table

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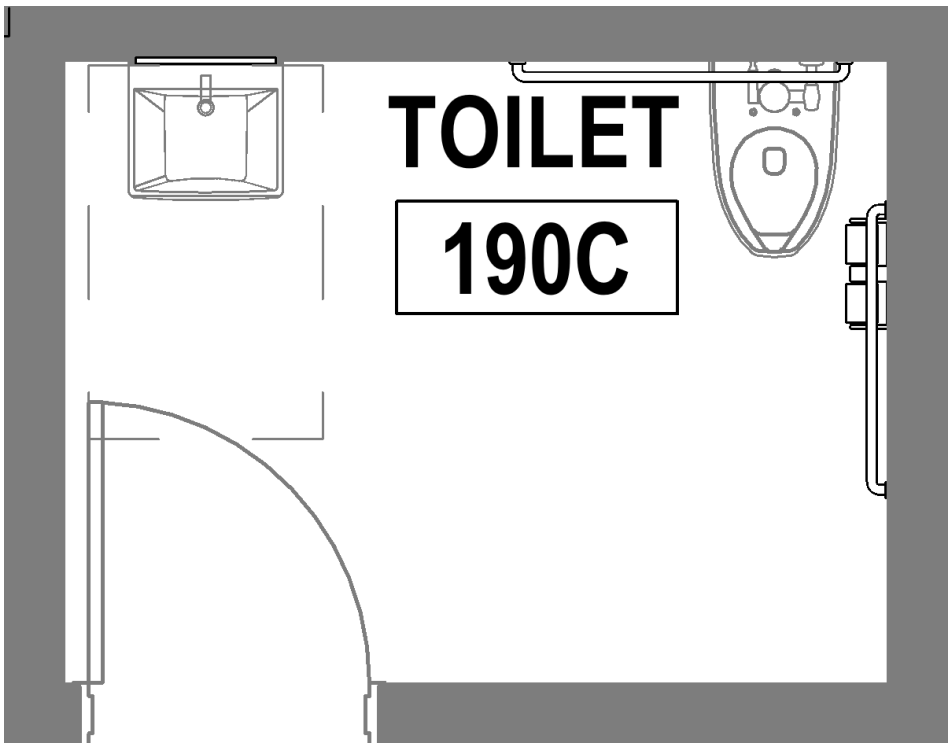
Room Function Number 08.003



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Room Function Number 08.004

Room Name	EXAM
Room Number	190B
Department (Name)	MEDICAL

Categorization		Areas	
Room Number	190B	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Nurses, locked storage of medications and medical supplies Closed exam room for student resting and administration of medication
Quantity:	2
Occupant Load:	1 student patient, (1) Staff

Location Criteria:

Users:	Nurse & Students
Adjacency:	Within Nurse suite
Orientation / Views:	Exterior views not required

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	None required
Doors:	Flush wood door with sidelight
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: (1) Built in Nurse workstations. Storage cabinets for supplies and student files
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Resting cot, sanitary paper roll dispenser, and built-in storage base
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
A.06A	120000-Furniture-Cot - 72x27	1
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1

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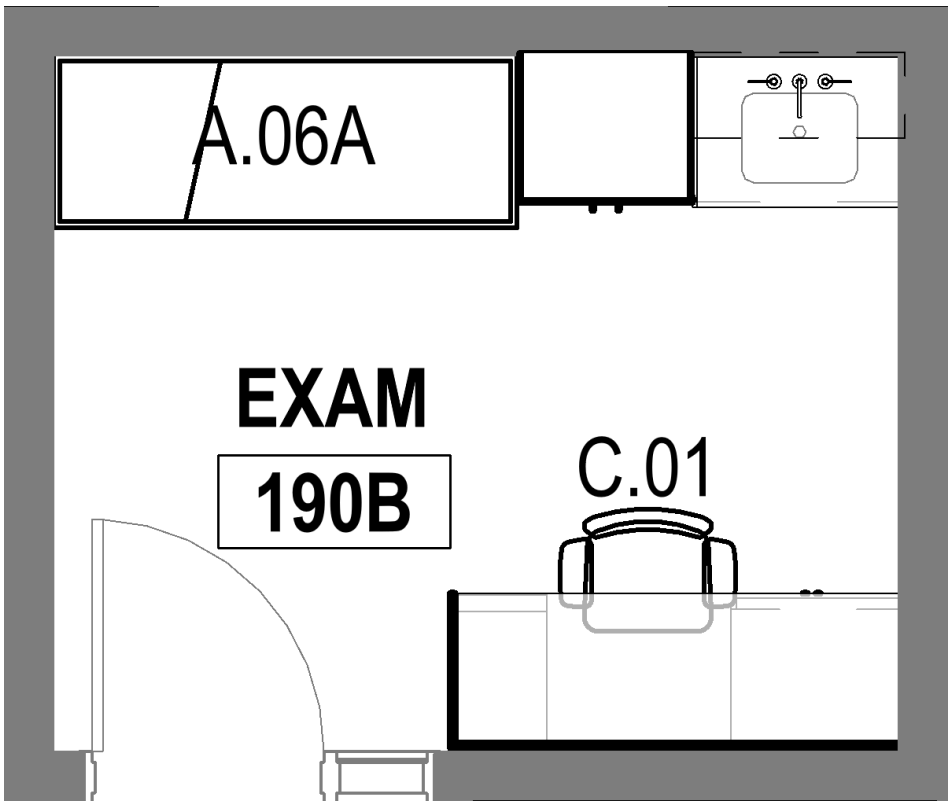

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Room Function Number 09.022

Room Name	GENERAL OFFICE/WAITING
Room Number	177
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	177	Programmed	528.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Administrative support staff; serves as check-in for visitors and students
Quantity:	1
Occupant Load:	(3) Staff (3-5) Visitors/Students

Location Criteria:

Users:	Office aids, secretary, guests, administration, faculty, & students.
Adjacency:	Adjacent to building main entrance, living room/lobby space, administrative suite and Conference Room. Direct visual contact with main entry and building approach.
Orientation / Views:	Interior views to main entry vestibule, main corridor, and lobby/living room, Conference Room, and Principal's Secretary area.

Technical Criteria:

Floor Finishes:	Carpet TIle
Wall Finishes:	Gypsum wall board, painted Store front glass wall system to 9'-6" AFF, Glass to be level 3 ballistic resistant glazingg
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	Exterior View
Doors:	Flush wood door with side light to Administration suite Office hardware set Aluminum and glass door as part of storefront system, glass to be level 3 ballistic resistant glazing. Vestibule door hardware to have electronic lock, with release controlled by office administrative staff or electronic key
Plumbing / FP:	Fully Sprinklered
Lighting:	Specialty pendant lighting at desk area, general lighting throughout.
Electrical:	Typical perimeter power requirements and outlets at (3) workstations
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (3) Flat Panel digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including: Built in Administration Desk w/ accessible transaction surface
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	2
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	5

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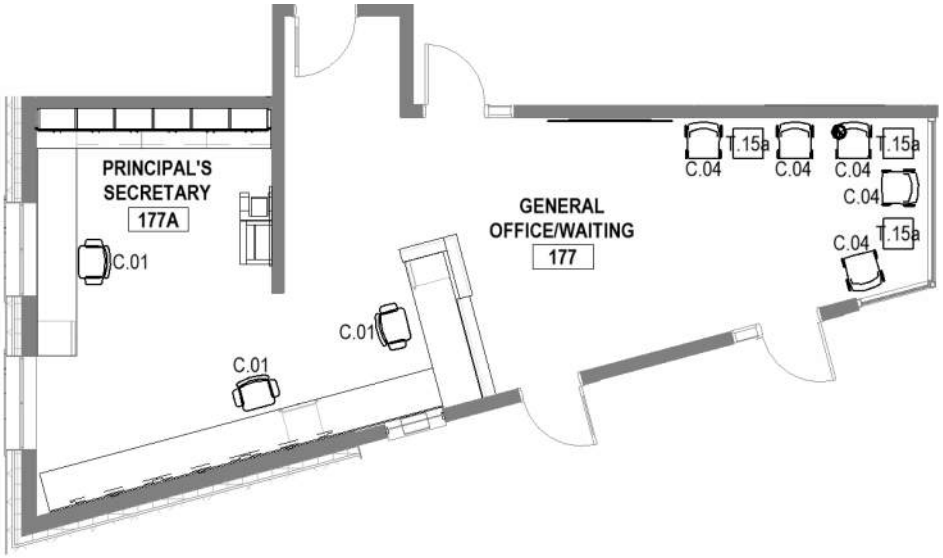
Wilmington Wildwood EC Center

Room Function Number 09.022

Item: BIM ID	Name	Quantity
T.15a	120000-Furniture-Table End Table - Table - Ocasional Table 18" x 18"	3



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Room Function Number 09.026

Room Name	TEACHER WORK ROOM
Room Number	189
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	189	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Mailbox for all staff, CARES, Kitchen. A component of administrative suite. Space for large mail processing, copy and layout, packet production, laminating, and supply storage. This is a standing-work space with 34" high counters and islands.
Quantity:	1
Occupant Load:	4-6

Location Criteria:

Users:	Faculty and Staff
Adjacency:	Component of administrative suite, near general office staff for ease of communication and distribution of mail.
Orientation / Views:	Exterior views not required. Open to Teacher work room

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Not required
Doors:	Flush Wood Door
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	High capacity Copier/Scanner/Printer. Binding machine. Laminator, recycling/shredder, fax machine, locked storage

Furniture

Item: BIM ID	Name	Quantity
C.08a	120000-Furniture-Stool - 30"	2

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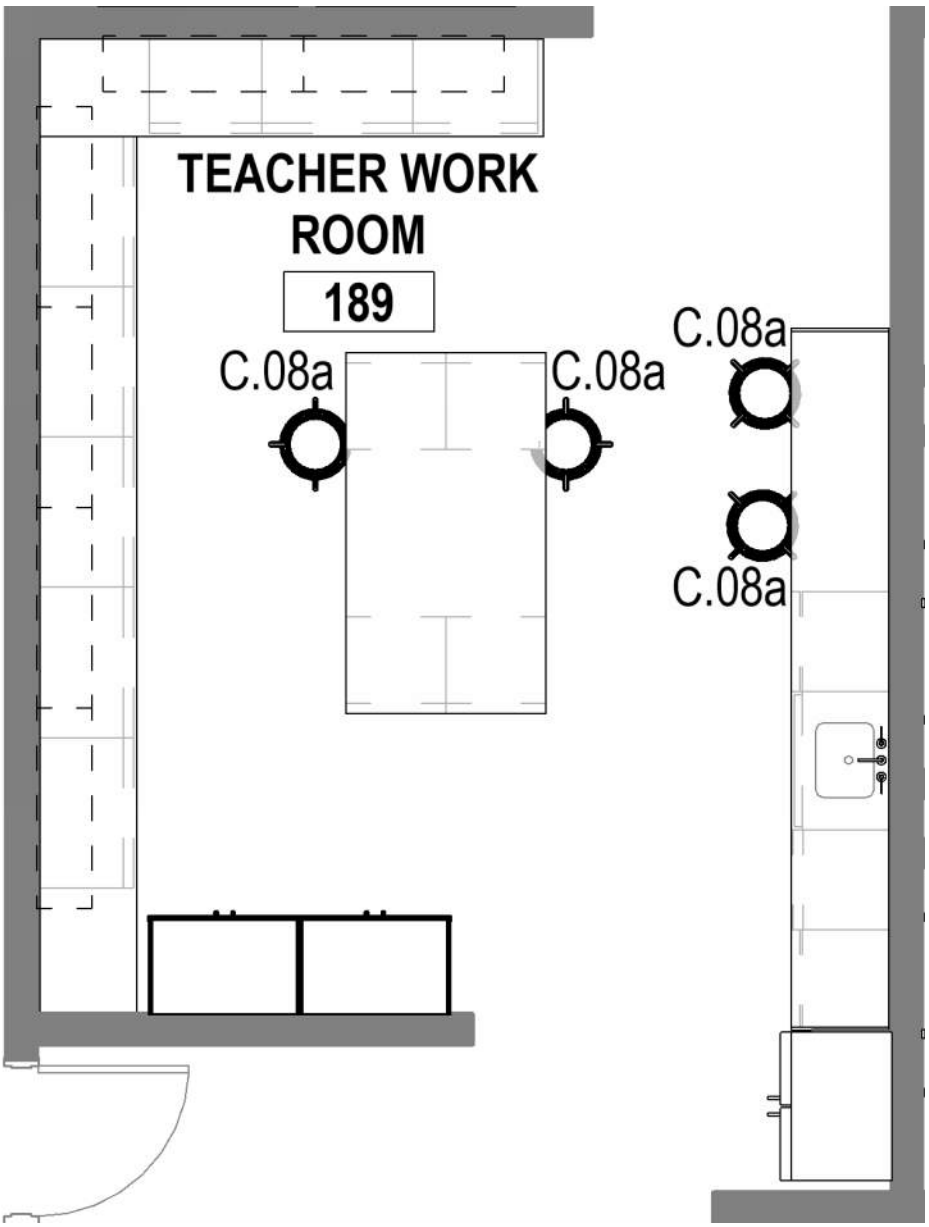
Room Function Number 09.026



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Room Function Number 09.024

Room Name	COPY
Room Number	179
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	179	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Collaboration and group planning rooms for teachers. Provide a space for duplication in the academic space
Quantity:	1
Occupant Load:	(1) Staff

Location Criteria:

Users:	Teachers, specialists, paraprofessionals, Administrators
Adjacency:	Within Administrative suite. Located within General Office Area
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	Not required
Doors:	(1) Flush Wood Door with sidelights. Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	None
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	File Cabinets
Equipment:	None
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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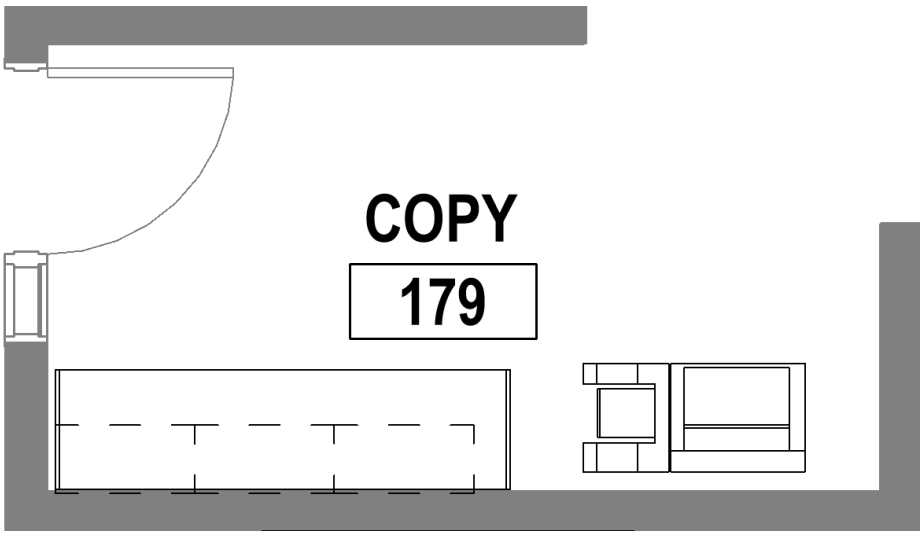
Room Function Number 09.024



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Room Function Number 09.029

Room Name	RECORDS
Room Number	186
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	186	Programmed	110.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	File storage for student records
Quantity:	1
Occupant Load:	(1) Staff

Location Criteria:

Users:	Staff
Adjacency:	Within Administrative Suite
Orientation / Views:	Not required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	None
Doors:	Flush wood door
	Office hardware set
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Technology:	Typical perimeter power requirements

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
S.13	120000-Furniture-Storage-Lateral File - 36x18-3high	4
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	4

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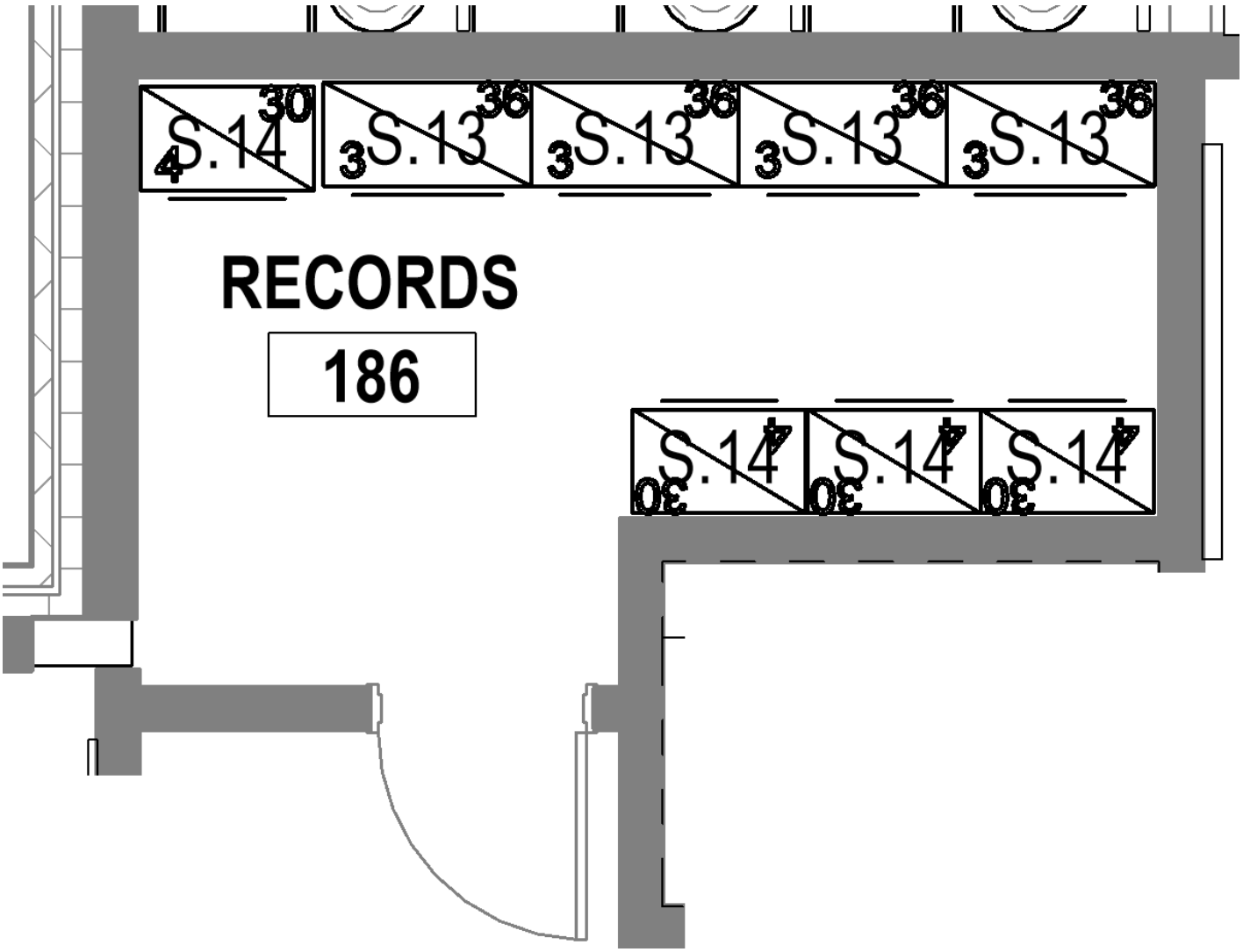
Room Function Number 09.029



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Room Function Number 09.021

Room Name	PRINCIPAL
Room Number	181
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	181	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Principal
Quantity:	1
Occupant Load:	(1) Staff (2-6) Visitors / Students

Location Criteria:

Users:	Principal, students, visitors
Adjacency:	Within Administrative suite. Visually connected to main entry and approach. Near conference room. Adjacent to Principal's Secretary and General Office/Waiting Area
Orientation / Views:	Exterior views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted.
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance for office space.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (1) Flat Panel digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	6
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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Room Data Sheet

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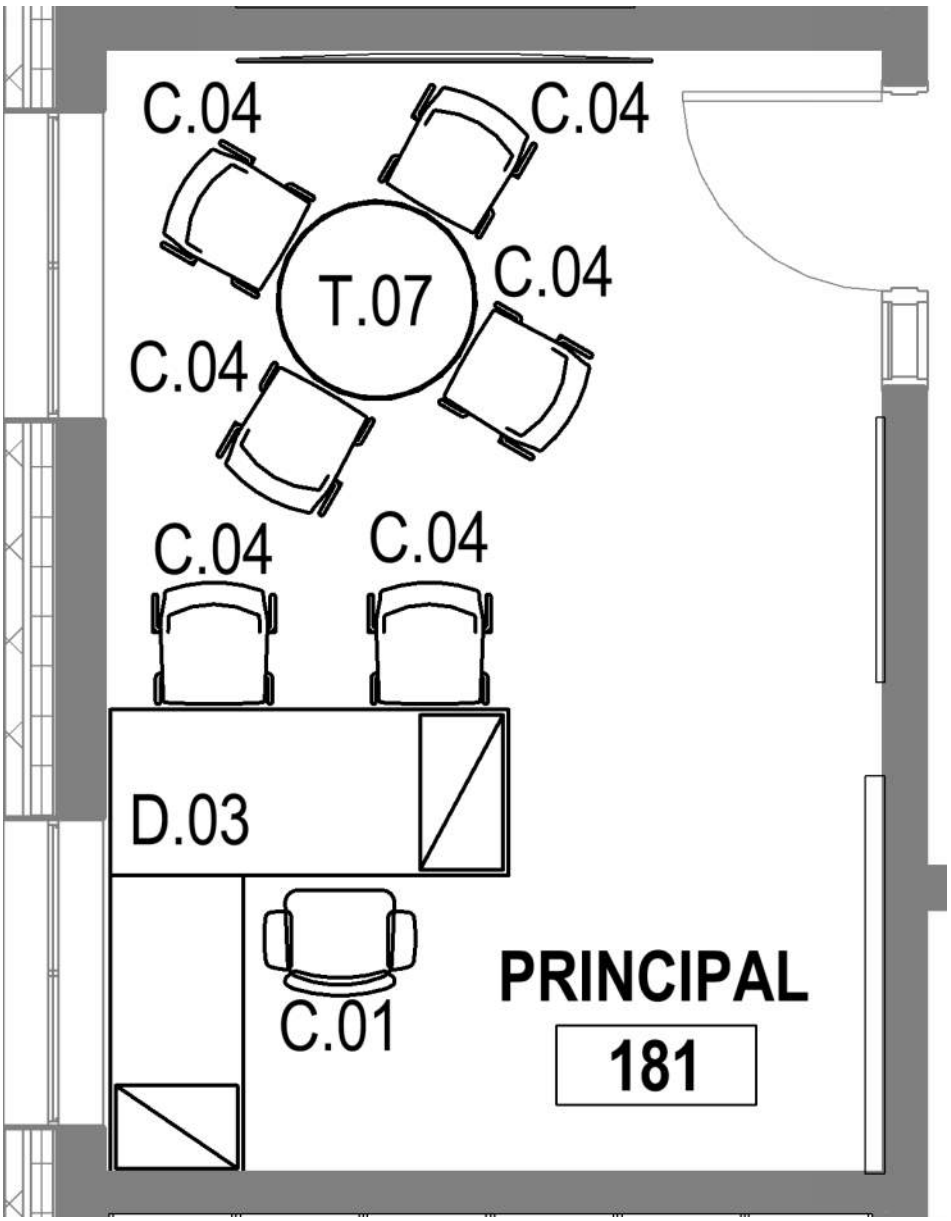
Wilmington Wildwood EC Center

Room Function Number 09.021



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Room Function Number 09.027

Room Name	PRINCIPAL'S SECRETARY
Room Number	177A
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	177A	Programmed	125.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Principal's Administrative Assistant. Serves as check-in for visitors
Quantity:	1
Occupant Load:	1

Location Criteria:

Users:	Home base for Principal's Administrative Assistant. Serves as check-in for visitors
Adjacency:	Within Administrative suite. Visually connected to main entry and approach. Located within the General Office/ Waiting Area.
Orientation / Views:	Exterior views & views to entry vestibule and lobby.

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted. Walls adjacent to vestibule to have Level 3 ballistic resistant fiberglass panels within.
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance for office space.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	N/A
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1

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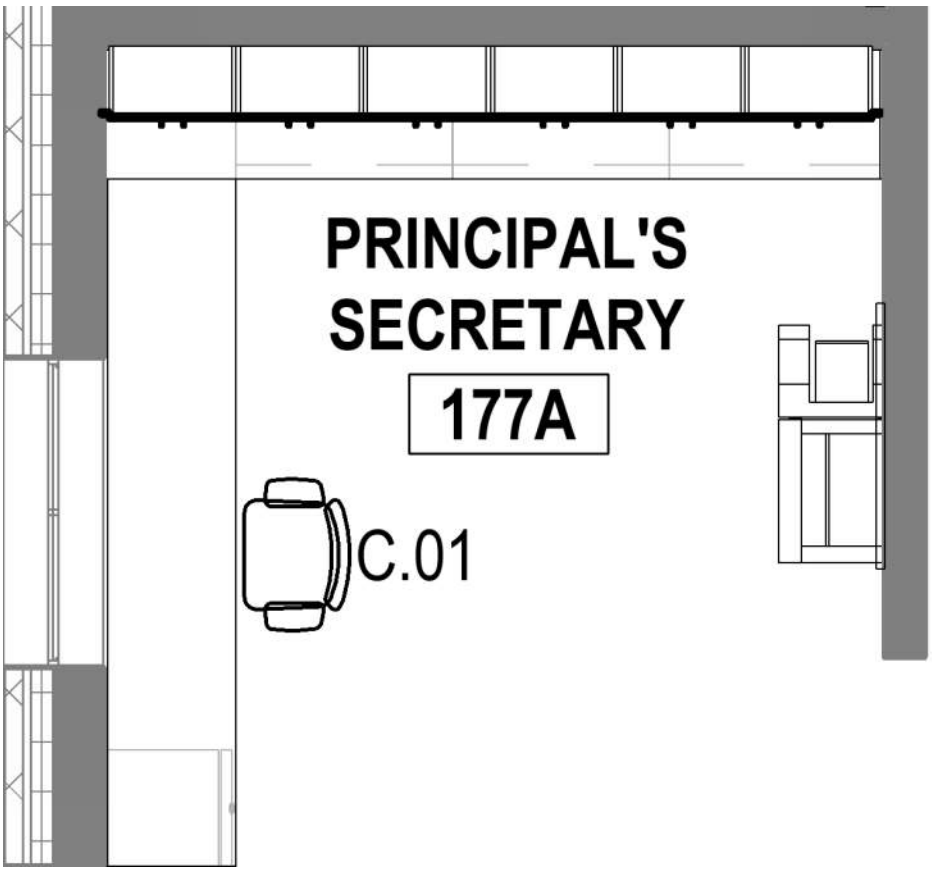
Wilmington Wildwood EC Center

Room Function Number 09.027



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Room Function Number 09.028

Room Name	ASSISTANT PRINCIPAL
Room Number	223
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	223	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Principal
Quantity:	2
Occupant Load:	(1) Staff (2-4) Visitors / Students

Location Criteria:

Users:	Assistant Principal, students, visitors
Adjacency:	Within Administrative suite. Visually connected to main entry and approach. Near conference room. Adjacent to Principal's Secretary and General Office/Waiting Area
Orientation / Views:	Exterior views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted.
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance for office space.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (1) Flat Panel digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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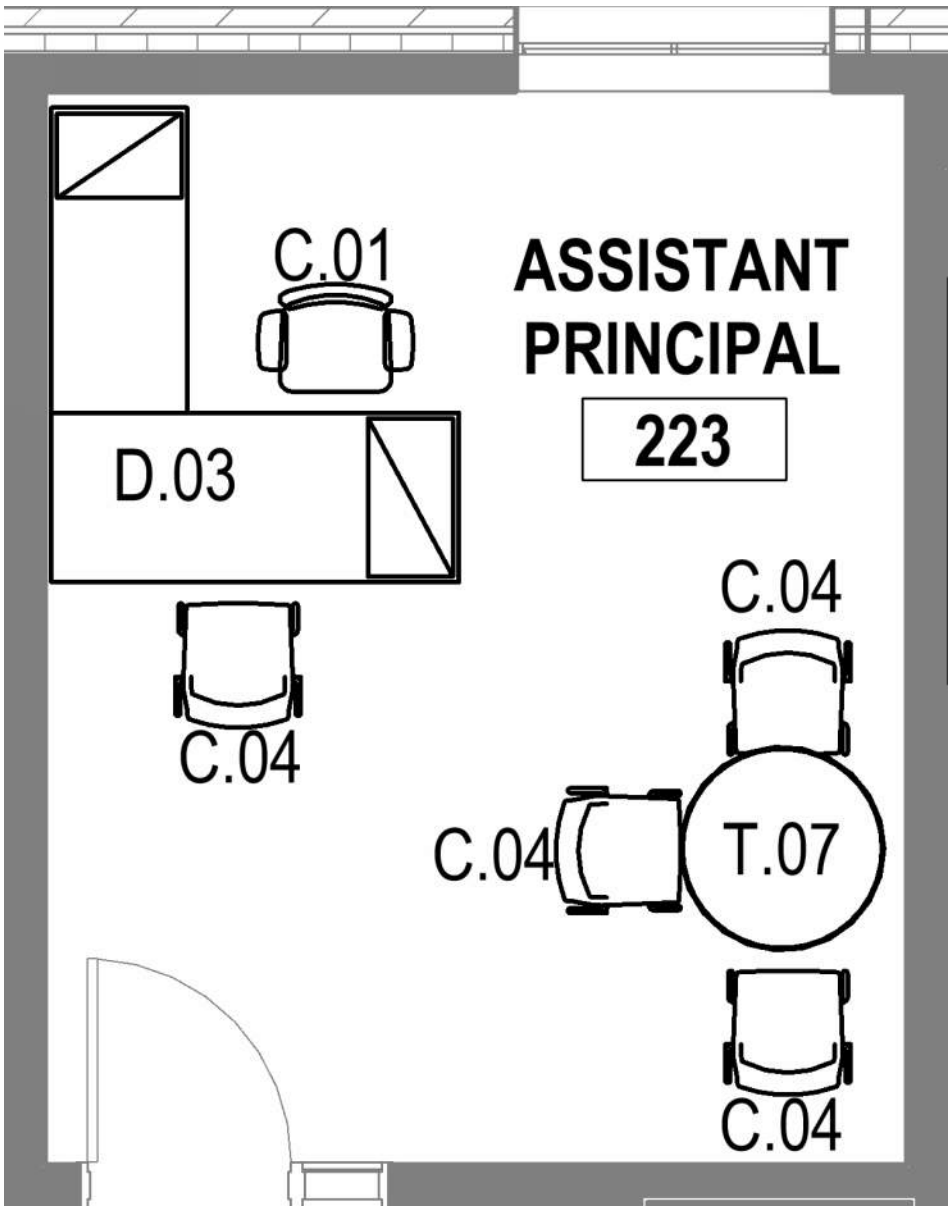

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Room Function Number 09.009

Room Name	ASSISTANT PRINCIPAL
Room Number	305
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	305	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Assistant Principal
Quantity:	2
Occupant Load:	(1) Staff (2-4) Visitors / Students

Location Criteria:

Users:	Assistant Principal, students, visitors
Adjacency:	Within Administrative suite. Visually connected to main entry and approach. Near conference room. Adjacent to Principal's Secretary and General Office/Waiting Area
Orientation / Views:	Exterior views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted.
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance for office space.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (1) Flat Panel digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	6
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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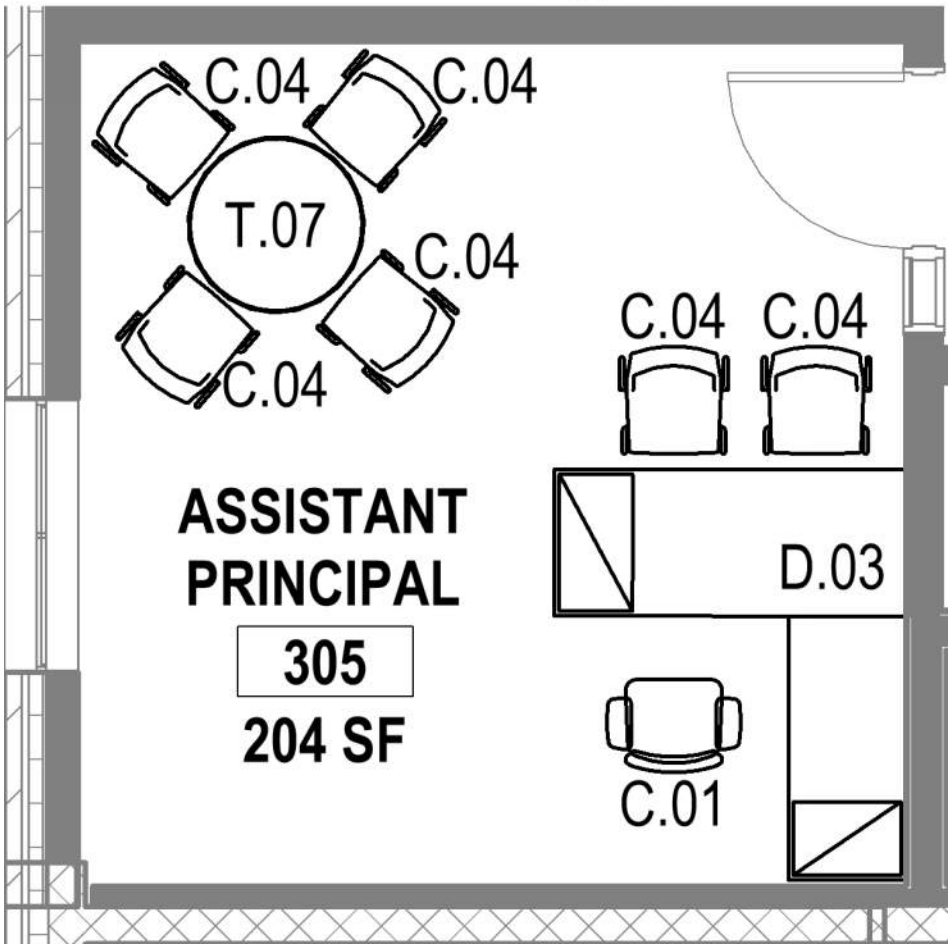
Wilmington Wildwood EC Center

Room Function Number 09.009



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Room Function Number 09.019

Room Name	OFFICE
Room Number	183
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	183	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Administrative support staff; serves as check-in for visitors and students
Quantity:	2
Occupant Load:	(1) Staff (1-2) Visitors/Students

Location Criteria:

Users:	Office aids, secretary, guests, administration, faculty, & students.
Adjacency:	Adjacent to building main entrance, living room/lobby space, administrative suite and Conference Room
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood door with side light to Administration suite Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1

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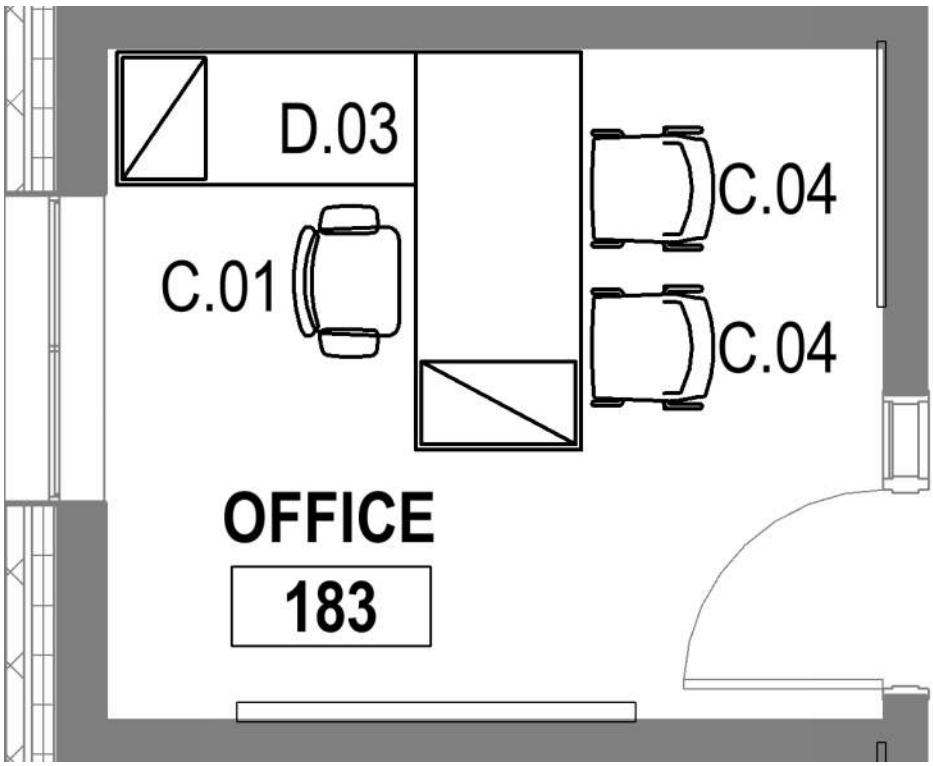
Wilmington Wildwood EC Center

Room Function Number 09.019



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Room Function Number 09.023

Room Name	CONFERENCE ROOM
Room Number	180
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	180	Programmed	300.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Administrative Conference Room
Quantity:	2
Occupant Load:	(12) Users

Location Criteria:

Users:	Principals, students, visitors
Adjacency:	Within Administrative suite. Adjacent to Principal's Secretary and General Office/Waiting Area
Orientation / Views:	Exterior views not required

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum wall board
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	none
Doors:	Flush wood door w/ vision panel and shades for privacy and acoustical seals
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (2-3) Flat Panel digital display

Fixtures & Furnishings:

Casework:	none
Specialties:	Markerboard
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Flat Panel Display
Shelving / Storage:	none

Furniture

Item: BIM ID	Name	Quantity
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	12
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	5

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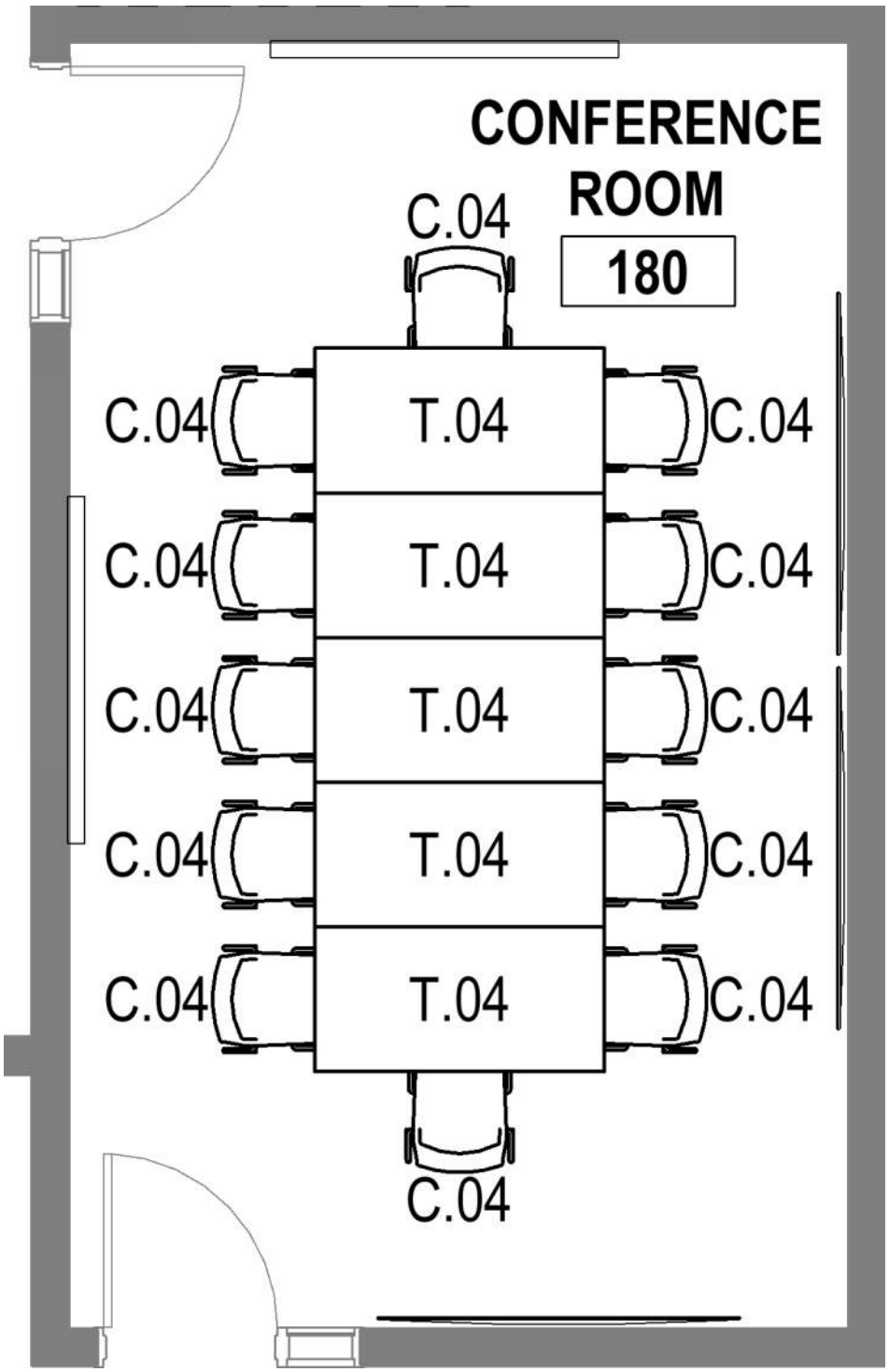

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Room Function Number 09.025

Room Name	CONFERENCE ROOM
Room Number	188
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	188	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Administrative Conference Room
Quantity:	2
Occupant Load:	(8) Users

Location Criteria:

Users:	Principals, students, visitors
Adjacency:	Within Administrative suite. Adjacent to Principal's Secretary and General Office/Waiting Area
Orientation / Views:	Exterior views not required

Technical Criteria:

Floor Finishes:	Carpet tile
Wall Finishes:	Gypsum wall board
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	none
Doors:	Flush wood door w/ vision panel and shades for privacy and acoustical seals
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access (1) Flat Panel digital display

Fixtures & Furnishings:

Casework:	none
Specialties:	Markerboard
Furnishings:	Types & Configurations indicated in the attached room layout sheets.
Equipment:	Types & Configurations indicated in the attached room layout sheets including: Flat Panel Display
Shelving / Storage:	none

Furniture

Item: BIM ID	Name	Quantity
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	8
T.04	120000-Furniture-Table Rectangular - 60X30 FLIP TOP - Inset Leg	3

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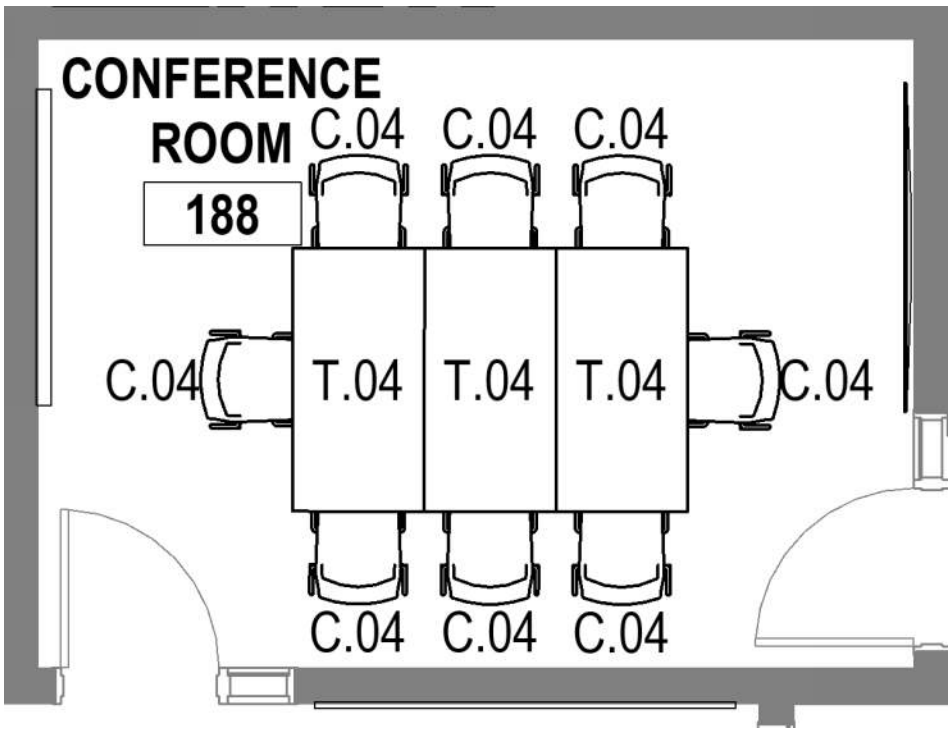
Wilmington Wildwood EC Center

Room Function Number 09.025



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Room Function Number 09.001

Room Name	ADJUSTMENT
Room Number	104
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	104	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Adjustment Counselor capable of supporting typical office tasks, storage of confidential files, confidential phone calls, and in-person meetings with students
Quantity:	3
Occupant Load:	(1) Staff (2-3) Students

Location Criteria:

Users:	Adjustment Counselor and Students
Adjacency:	Near Classrooms / Student facing spacing
Orientation / Views:	Exterior Views required

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Interactive digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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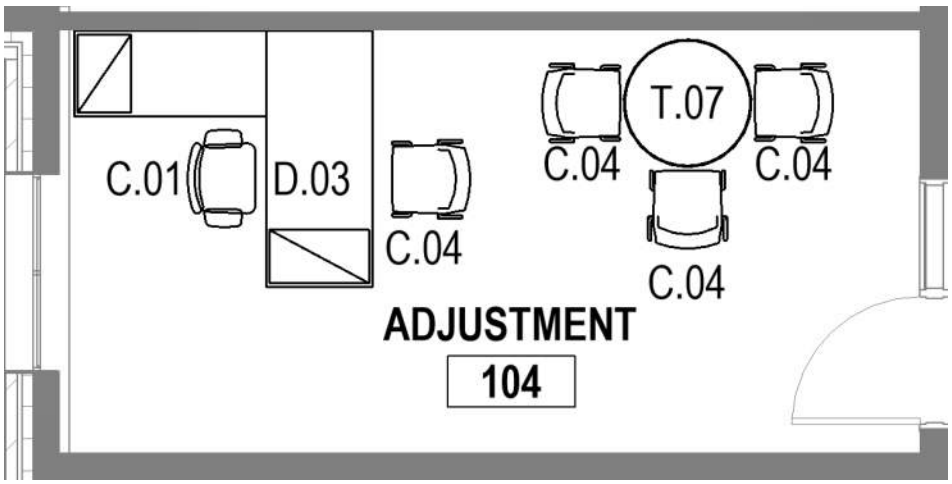
Wilmington Wildwood EC Center

Room Function Number 09.001



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Room Function Number 09.020

Room Name	OFFICE
Room Number	182
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	182	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Administrative support staff; serves as check-in for visitors and students
Quantity:	2
Occupant Load:	(1) Staff (1-2) Visitors/Students

Location Criteria:

Users:	Office aids, secretary, guests, administration, faculty, & students.
Adjacency:	Adjacent to building main entrance, living room/lobby space, administrative suite and Conference Room
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood door with side light to Administration suite Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1

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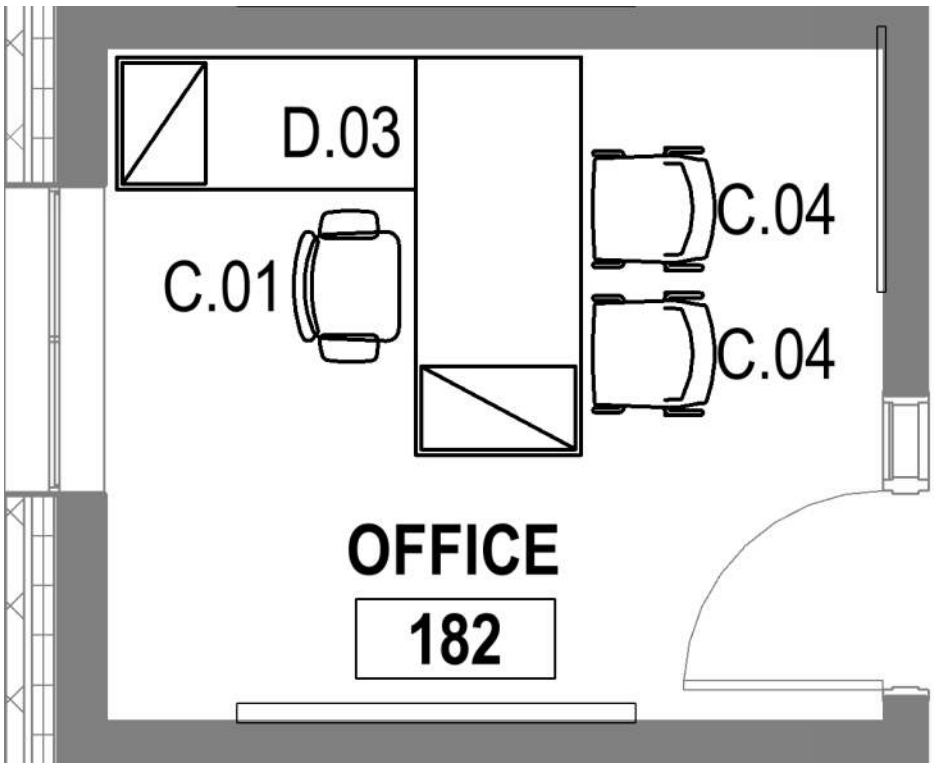
Wilmington Wildwood EC Center

Room Function Number 09.020



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Room Function Number 09.012

Room Name	GUID. STOR.
Room Number	187
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	187	Programmed	35.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Storage for Student files
Quantity:	1
Occupant Load:	1

Location Criteria:

Users:	Administration
Adjacency:	Within Administrative suite. Located within the Special Education Admin Support space
Orientation / Views:	not required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance
Windows:	none
Doors:	Flush wood door
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

n/a

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Room Data Sheet

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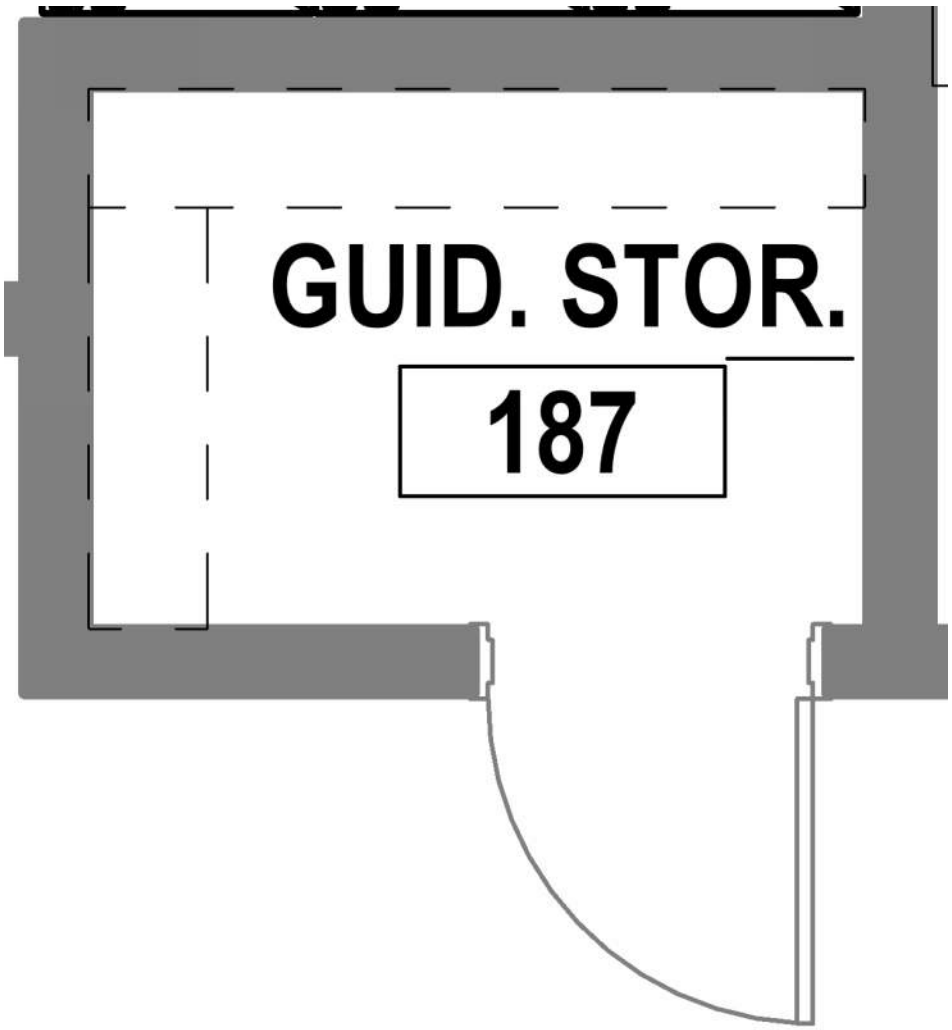
Wilmington Wildwood EC Center

Room Function Number 09.012



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Room Function Number 09.002

Room Name	READ
Room Number	209
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	209	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Reading Tudors and paraprofessionals, Weekly 1-on-1 assessments
Quantity:	6
Occupant Load:	(1) Teacher (3-6) students

Location Criteria:

Users:	Home base for Reading Specialists and paraprofessionals
Adjacency:	Central to learning commons. Direct access off corrido
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	• Deep shelving to accommodate large binders.• Adjustable shelving for various materials (game boxes, thicker items).•Deep drawers for additional storage.
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Open storage for books is preferred. Reduced need for confidential paper files. One lockable storage unit for essential student files may be necessary.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	3
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
T.07	120000-Furniture-Table Round - 36"	1

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Room Data Sheet

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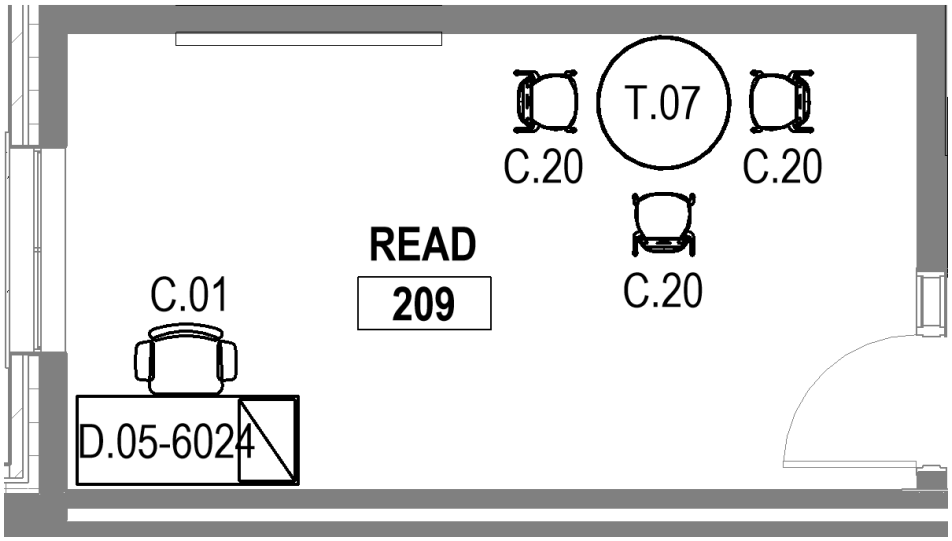
Wilmington Wildwood EC Center

Room Function Number 09.002



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Room Function Number 09.004

Room Name	MATH
Room Number	222
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	222	Programmed	200.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Math Tudors and paraprofessionals
Quantity:	4
Occupant Load:	(1) Teacher (1-2) students

Location Criteria:

Users:	Home base for Math Coaches, and paraprofessionals
Adjacency:	Central to learning commons. Direct access off corrido
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	• Deep shelving to accommodate large binders.• Adjustable shelving for various materials (game boxes, thicker items).•Deep drawers for additional storage.
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Technology and projectable surfaces are essential, including interactive displays, whiteboards, tackboards, and bulletin boards.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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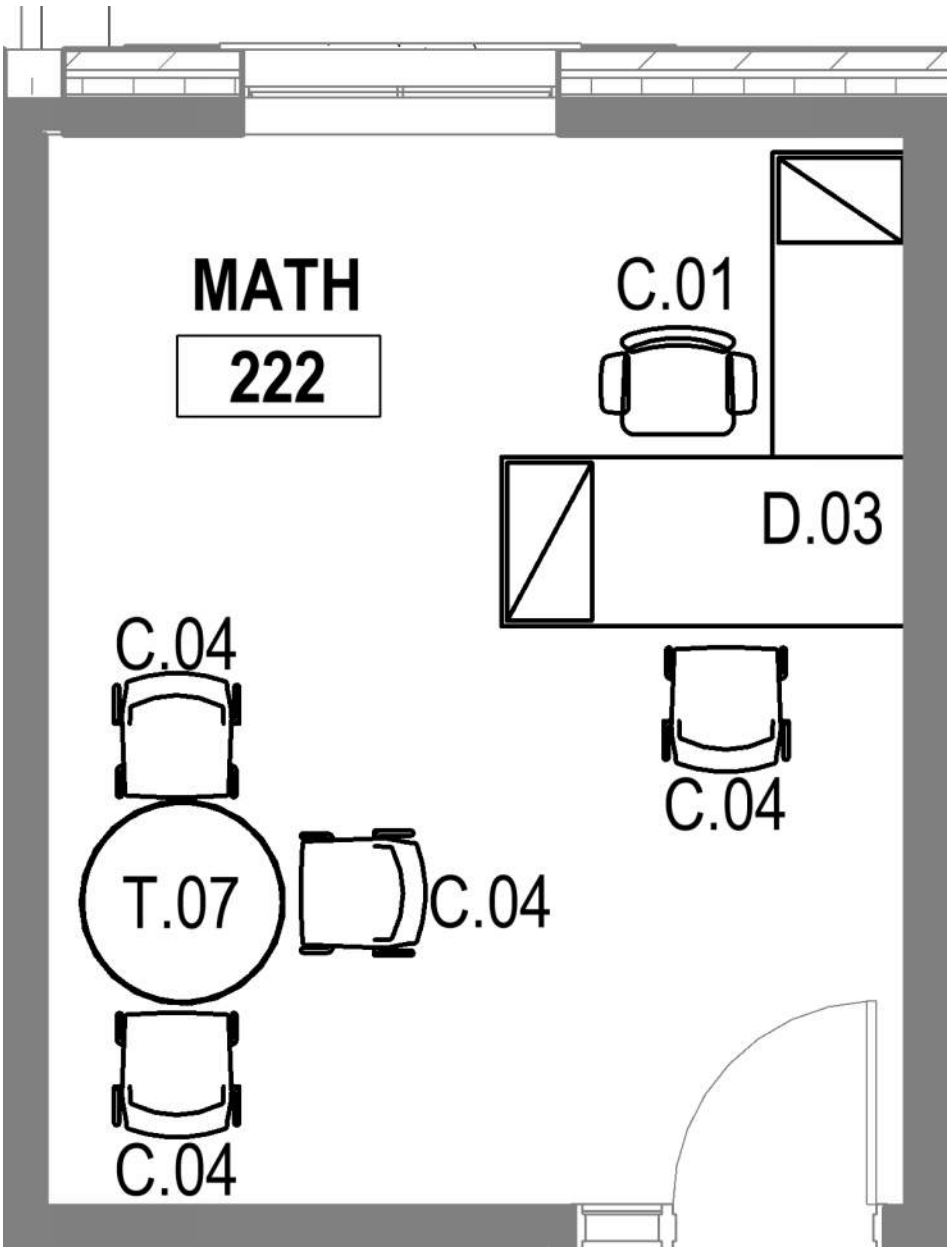
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 09.004



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Room Function Number 09.016

Room Name	IT OFFICE
Room Number	148
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	148	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for IT staff
Quantity:	2
Occupant Load:	(1) Staff

Location Criteria:

Users:	IT technician
Adjacency:	Centrally located, close to Network/Telecom
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood door with side light to Administration suite Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
S.04	120000-Furniture-Storage-Pantry Shelving (1) - 48" Wide x 24"	1

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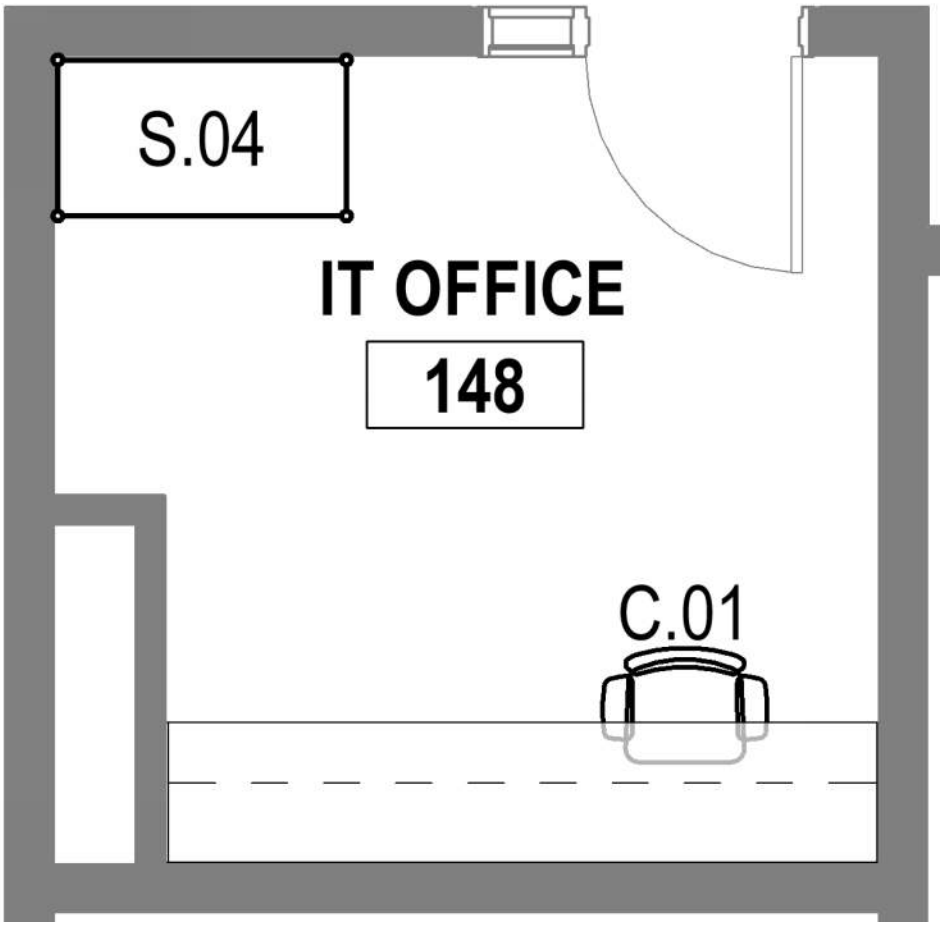
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 09.016



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Room Function Number 09.017

Room Name	LITERACY COORDINATOR
Room Number	185
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	185	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for Reading Tudors and paraprofessionals, Weekly 1-on-1 assessments
Quantity:	1
Occupant Load:	(1) Teacher (3-6) students

Location Criteria:

Users:	Home base for Math Coaches, and paraprofessionals
Adjacency:	Central to learning commons. Direct access off corrido
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	• Deep shelving to accommodate large binders.• Adjustable shelving for various materials (game boxes, thicker items).•Deep drawers for additional storage.
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Open storage for books is preferred. Reduced need for confidential paper files. One lockable storage unit for essential student files may be necessary.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1

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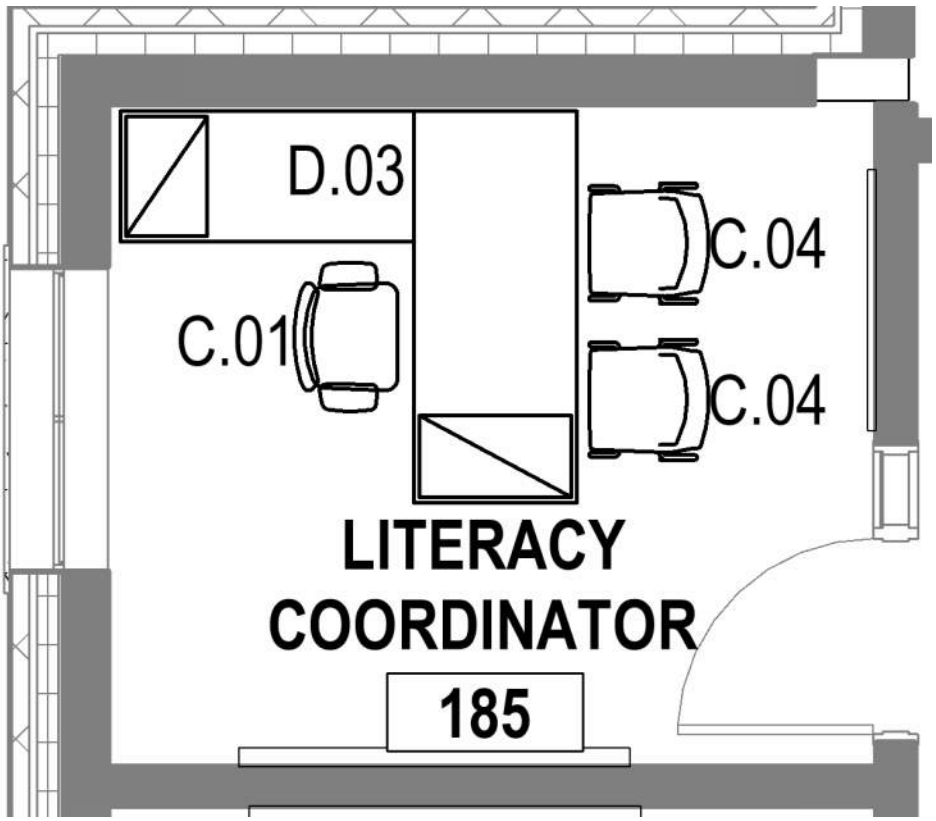
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 09.017



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Room Function Number 09.018

Room Name	STEM COORDINATOR
Room Number	184
Department (Name)	ADMINISTRATION & GUIDANCE

Categorization		Areas	
Room Number	184	Programmed	120.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for STEM coordinator
Quantity:	1
Occupant Load:	(1) Staff (1-2) Visitors/Students

Location Criteria:

Users:	STEM Coordinator, faculty, & students.
Adjacency:	Adjacent to building main entrance, living room/lobby space, administrative suite and Conference Room
Orientation / Views:	Exterior Views

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Office appropriate acoustical requirements
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood door with side light to Administration suite Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating/cooling
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1

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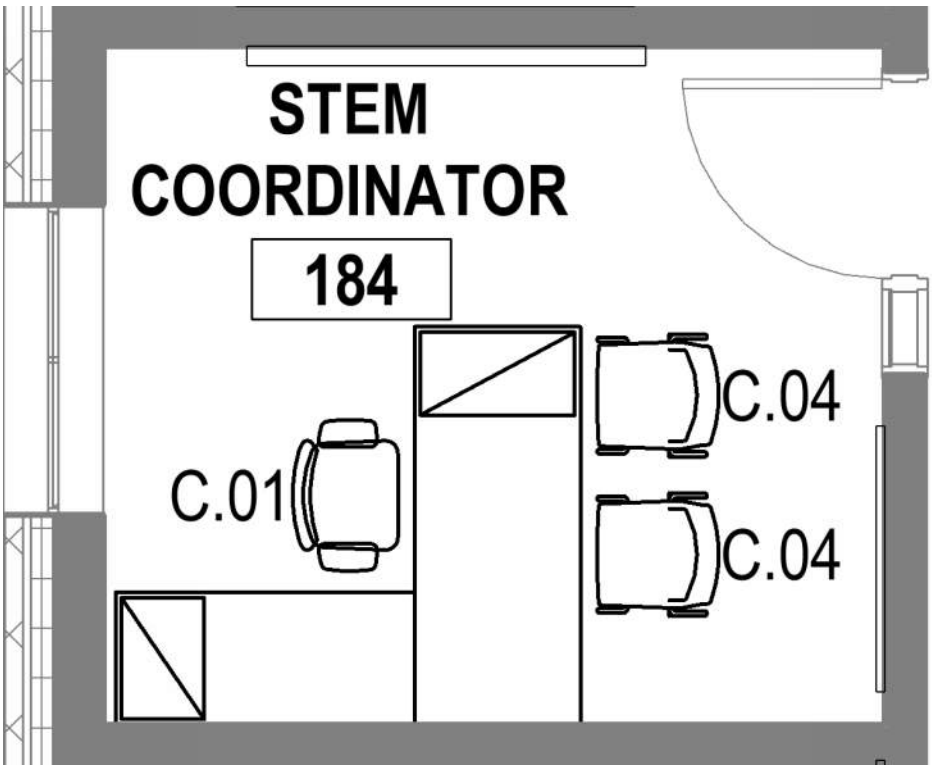

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Room Function Number 11.005

Room Name	CUSTODIAL OFFICE
Room Number	155C
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	155C	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Office for Custodial staff
Quantity:	1
Occupant Load:	5

Location Criteria:

Users:	Custodial Staff
Adjacency:	Shipping & receiving, custodial work and storage areas
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient Flooring
Wall Finishes:	Gypsum wall painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	none
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush wood Door w/ glass.
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access Interactive projector/digital display

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	4
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
T.07	120000-Furniture-Table Round - 36"	1

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Room Data Sheet

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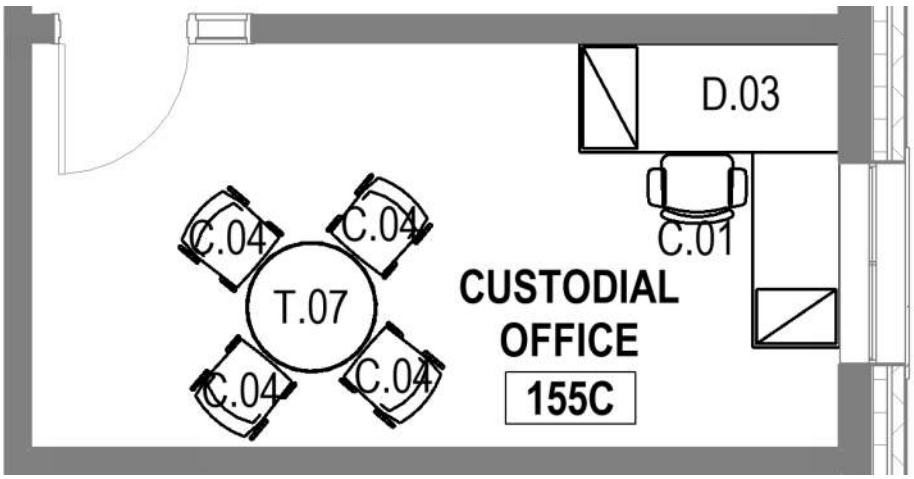
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 11.005



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Room Function Number 11.001

Room Name	CUSTODIAN STORAGE
Room Number	248
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	248	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Open area for shipping/receiving of bulk supplies – paper towels, toilet paper, copier paper, cleaning products, etc. including food and dry goods
Quantity:	1
Occupant Load:	1 staff

Location Criteria:

Users:	Custodial Staff
Adjacency:	Shipping & receiving, custodial work and storage areas
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Quartz tile
Wall Finishes:	Gypsum Wall Board, painted, acoustical panels
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	None
Windows:	None
Doors:	Flush Metal Door
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-in lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support room equipment Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
S.04	120000-Furniture-Storage-Pantry Shelving (1) - 48" Wide x 24"	7

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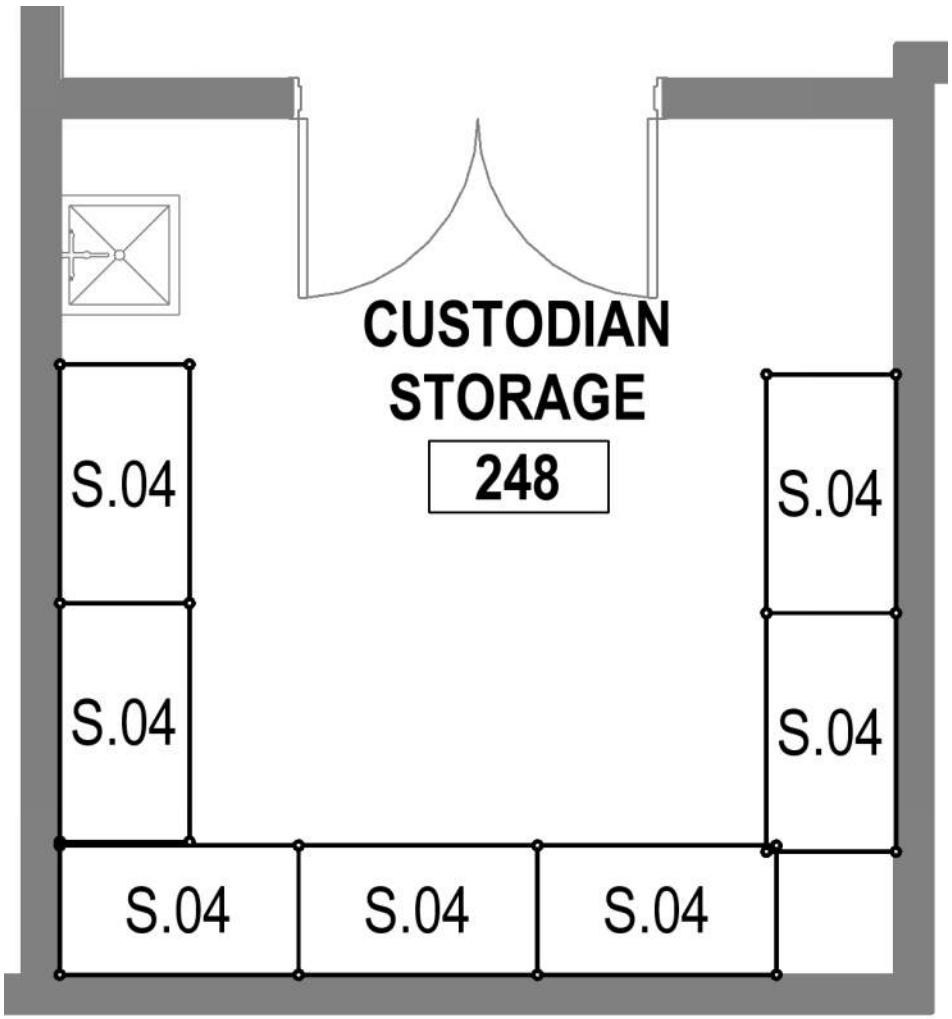
Room Function Number 11.001



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Room Data Sheet

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Wilmington Wildwood EC Center

Room Function Number 11.002

Room Name	CUSTODIAN STORAGE
Room Number	155B
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	155B	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Open area within the custodial/maintenance zone for storage of items related to building maintenance – tools, wire, cleaning equipment, etc.
Program Area:	1 -
Occupant Load:	2

Location Criteria:

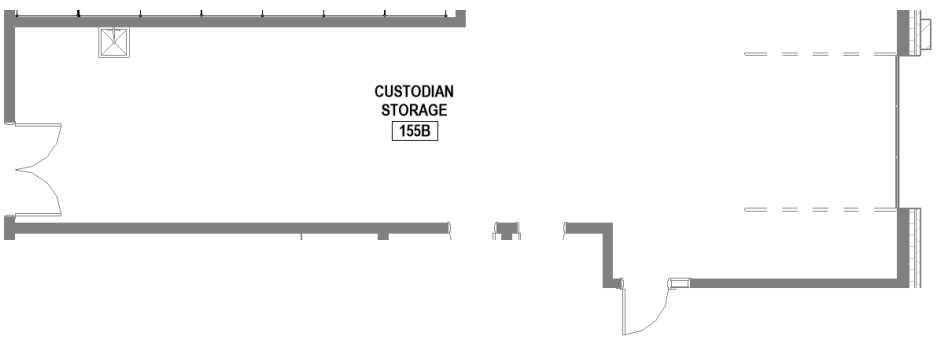
Users:	Custodial Staff
Adjacency:	Shipping & receiving, custodial work and storage areas
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Quartz Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system
Acoustical:	None
Windows:	None required
Doors:	Flush Metal Door w/ glass
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Suspended lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support room equipment Public Address system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets



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Room Function Number 11.003

Room Name	RECEIVING / GENERAL SUPPLY
Room Number	155
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	155	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Open area for shipping/receiving of bulk supplies – paper towels, toilet paper, copier paper, cleaning products, etc. including food and dry goods
Quantity:	1
Occupant Load:	1 staff

Location Criteria:

Users:	Custodial Staff
Adjacency:	Shipping & receiving, custodial work and storage areas
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Quartz tile
Wall Finishes:	CMU, Gypsum wall board, painted
Ceiling Finishes:	Exposed
Acoustical:	None
Windows:	None required
Doors:	Flush Metal Doors w/ vision panel. (Double)
HVAC:	Displacement Ventilation with Air Conditioning. Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Suspended lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support room equipment. Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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Room Data Sheet

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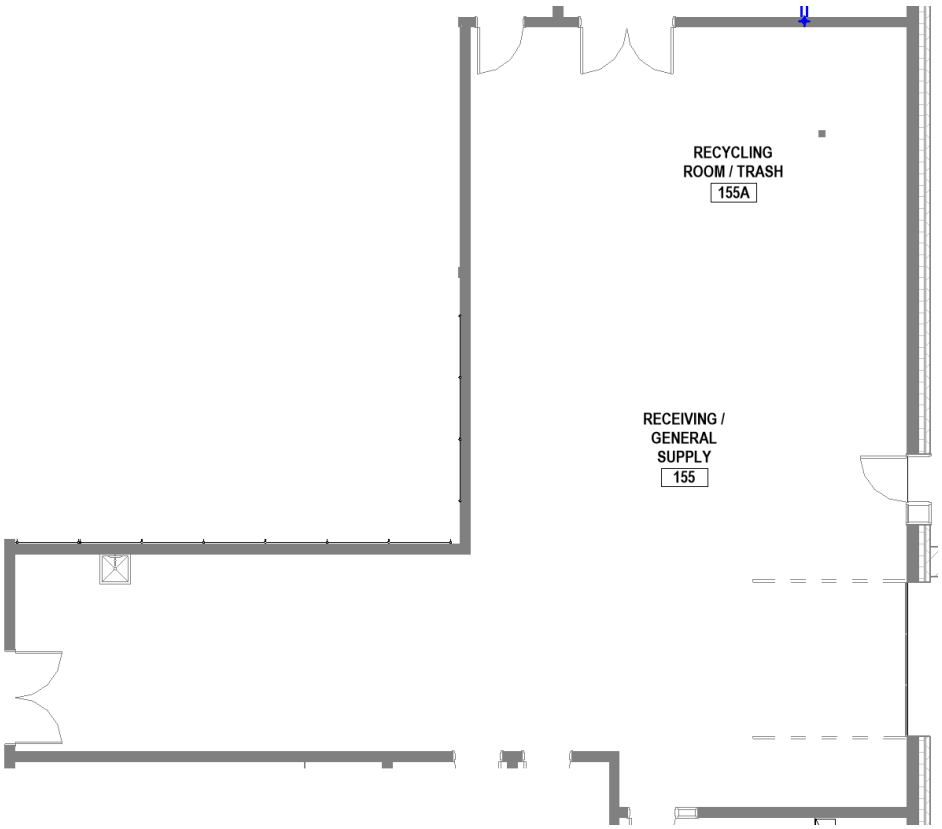
Wilmington Wildwood EC Center

Room Function Number 11.003



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Room Function Number 11.004

Room Name	RECYCLING ROOM / TRASH
Room Number	155A
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	155A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated space for recycling bins and trash receptacles
Quantity:	1
Occupant Load:	2

Location Criteria:

Users:	Custodial Staff
Adjacency:	Shipping & receiving, custodial work and storage areas
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Quartz tile
Wall Finishes:	CMU, Gypsum wall board, painted
Ceiling Finishes:	Exposed
Acoustical:	None
Windows:	None required
Doors:	Flush Metal Doors w/ vision panel. (Double)
HVAC:	Displacement Ventilation with Air Conditioning. Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Suspended lighting
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support room equipment Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

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Room Data Sheet

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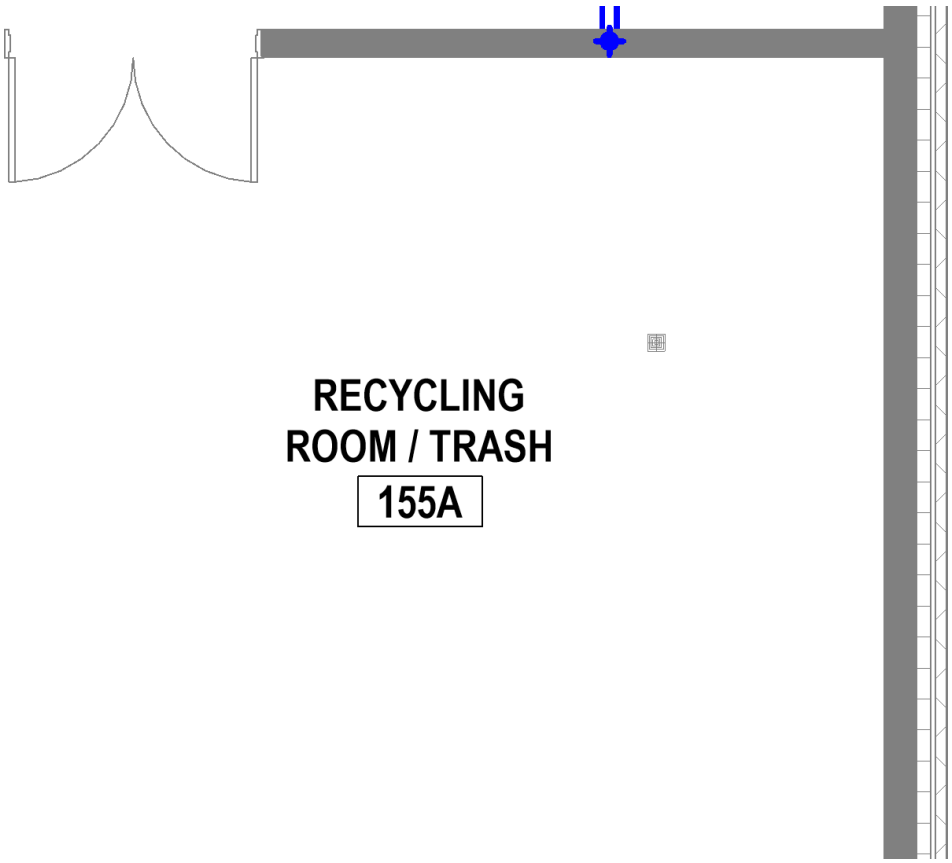
Wilmington Wildwood EC Center

Room Function Number 11.004



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Room Function Number 11.006

Room Name	NETWORK / TELECOM
Room Number	149
Department (Name)	CUSTODIAL & MAINTENANCE

Categorization		Areas	
Room Number	149	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Secure room that houses the rack-mounted network servers, telephone equipment, a small work area for IT personnel, and storage for parts/ components.
Quantity:	1
Occupant Load:	1 Staff

Location Criteria:

Users:	IT Staff
Adjacency:	Central to building
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	static dissipative tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Open to structure
Acoustical:	None
Windows:	None
Doors:	cFlush Metal Door
Technology:	Phone Handset, wall-mounted

Fixtures & Furnishings:

Specialties:	OPEN METAL RACKS TO HOUSE SERVERS, SWITCHES AND SECURITY EQUIPMENT (BY TECH CONSULTANT)
Equipment:	HEAD END NETWORK, COMMUNICATIONS AND TELEPHONE EQUIPMENT, INCLUDING SERVERS, SWITCHES, AND SECURITY PANELS (BY TECH CONSULTANT)

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Room Data Sheet

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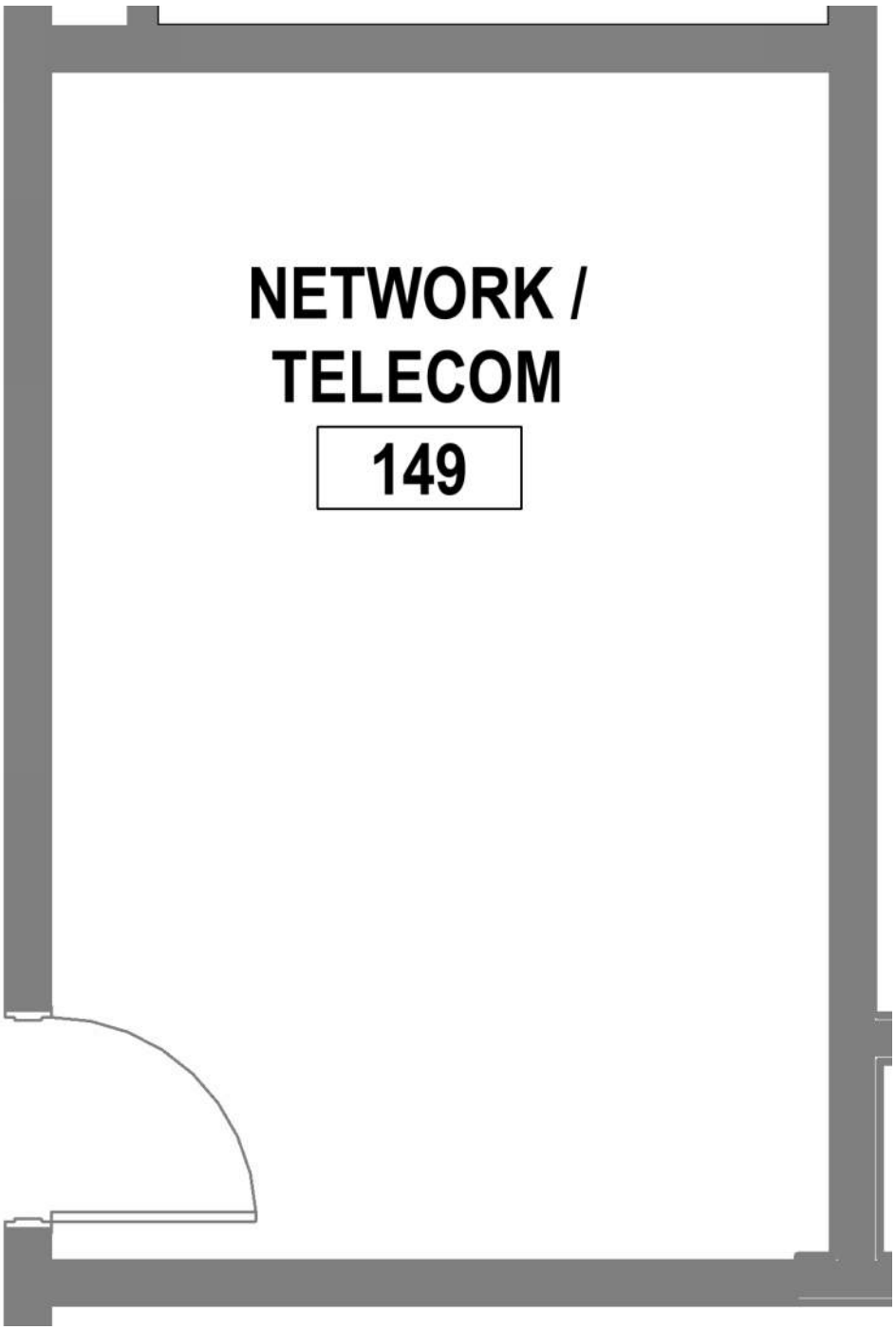
Wilmington Wildwood EC Center

Room Function Number 11.006



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Room Function Number 12.014

Room Name	PRE-K
Room Number	114
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	114	Programmed	1,100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for Pre-K instruction, including a toilet room.
Quantity:	3
Occupant Load:	(15) Students (1) General Education Teacher (1) Para Professional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, ground floor, other Pre-K classrooms and special education spaces, central location. Paired with another Pre-K classroom
Orientation / Views:	Views to Exterior, Connection & Views to Extended Learning Area

Technical Criteria:

Floor Finishes:	Linoleum
Wall Finishes:	Wall Board, painted Magnetic writable surface at teaching wall location, 2’ to 7’ for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Set.
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive projectors (1) Mobile Teachers station

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Communicating doors between Classrooms

Furniture

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Room Data Sheet

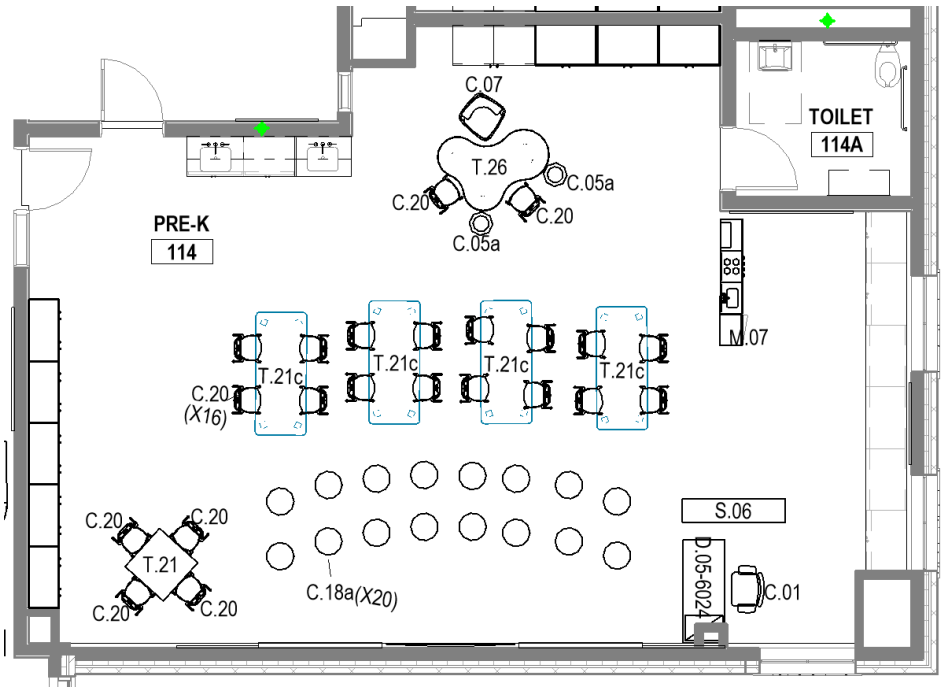
SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 12.014

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.05a	120000-Furniture-Chair-Wobble Stool - VS Hokki - Seat Height - Large	2
C.07	120000-Furniture-Chair-KI-Ruckus - 120000-Furniture-Chair-KI-Ruckus 18"	1
C.18a	Amphi-Jnr-Mats-NorvaNivel - WKPAD	16
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	22
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1
M.07	SSL-CH-Kitchen-Set-1537076 - 1537076	1
S.06	Steelcase Turnstone - Bivi - Storage - Depot - 2 High	1
T.21	120000-Furniture-Table End Table1 - Table - Ocasional Table 30" x 30"	1
T.21c	Elemental Activity Table - RectangleSquare1 - 1.829 m x 0.762 m	4
T.26	120000-Furniture-Table Puzzle-VS1 - Height - lower	1



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Room Function Number 12.012

Room Name	TOILET
Room Number	114A
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	114A	Programmed	0.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Toilet room for K- classroom
Quantity:	3
Occupant Load:	1

Location Criteria:

Users:	Students
Adjacency:	Within Pre-K classroom
Orientation / Views:	none

Technical Criteria:

Floor Finishes:	Tiled flooring
Wall Finishes:	Tile, Painted Gypsum, Gypsum Wall Board
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED Standards
Windows:	None
Doors:	Flush Wood Door
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered. Child Height Wall-hung Toilet, Child height wall-hung sink;
Lighting:	Recessed lay-in fixtures
Electrical:	Typical perimeter power requirements
Technology:	Public Address system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including
Specialties:	Types & Configurations indicated in the attached room layout sheets including
Furnishings:	Types & Configurations indicated in the attached room layout sheets including
Equipment:	Mirror, Soap & paper towel dispensers; H/C grab bars;, wall-mount changing table

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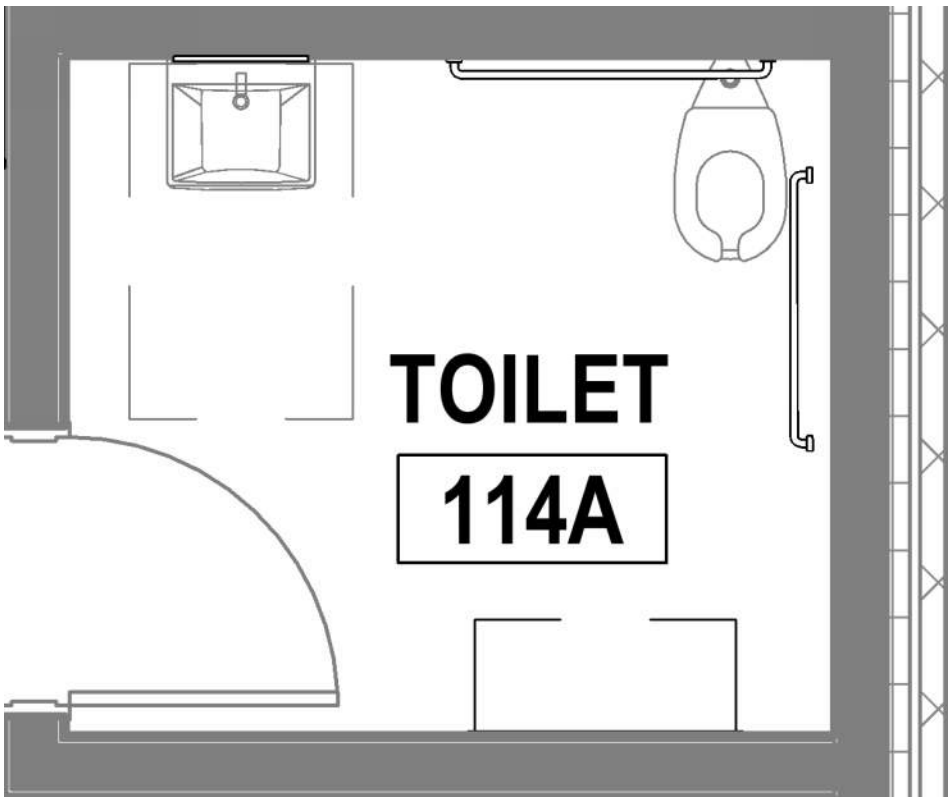
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 12.012



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Room Function Number 01.053

Room Name	EXTENDED LEARNING
Room Number	105A
Department (Name)	CORE ACADEMIC SPACES

Categorization		Areas	
Room Number	105A	Programmed	1,200.00
User Room Number			
Additional Number	105A,105B, 105C, 105D		
Name on Drawing			

Function Criteria:

Description:	Dedicated, communal, multi-use space within each grade level neighborhood intended to serve as environments for breakout spaces, small and large group instruction, assemblies, workshops, indoor sensory pathways, student presentations, dramatic performances, and “messy” creative projects. Features of extended learning areas include, but are not limited to, the following: • Flexibility at a variety of scales, including furniture, technology, and spatial features • Installations of museum-like exhibits and interactive displays tied to units of study and teaching methods; these would be flexible enough to change throughout the building’s lifetime as curriculum and delivery methods change • Natural daylight and views of nature; when possible direct access to outdoor learning environments from extended learning This includes rooms: 105A,105B, 105C, 105D
Quantity:	4
Occupant Load:	4) Teachers/Para professionals (50) Students

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals, administrators, and guest speakers
Adjacency:	Extended learning located immediately outside classrooms to support flexibility of the teaching environment and to allow students and work to “spill out” into the space
Orientation / Views:	Exterior views required

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Tile wainscot on large areas of wall, up to 4'6"
Ceiling Finishes:	Acoustical ceiling panels
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	None
HVAC:	Displacement Ventilation with air conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear and recessed lighting zoned per functions of space
Electrical:	Typical perimeter power requirements
Technology:	Additional power required to support specific room equipment. Public Address system Clock System Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets

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Additional Requirements:

(1) Interactive projectors, wall mounted
(1) Teachers connection stations to coordinate with interactive projector (data & power)
(1) Projector, mobile

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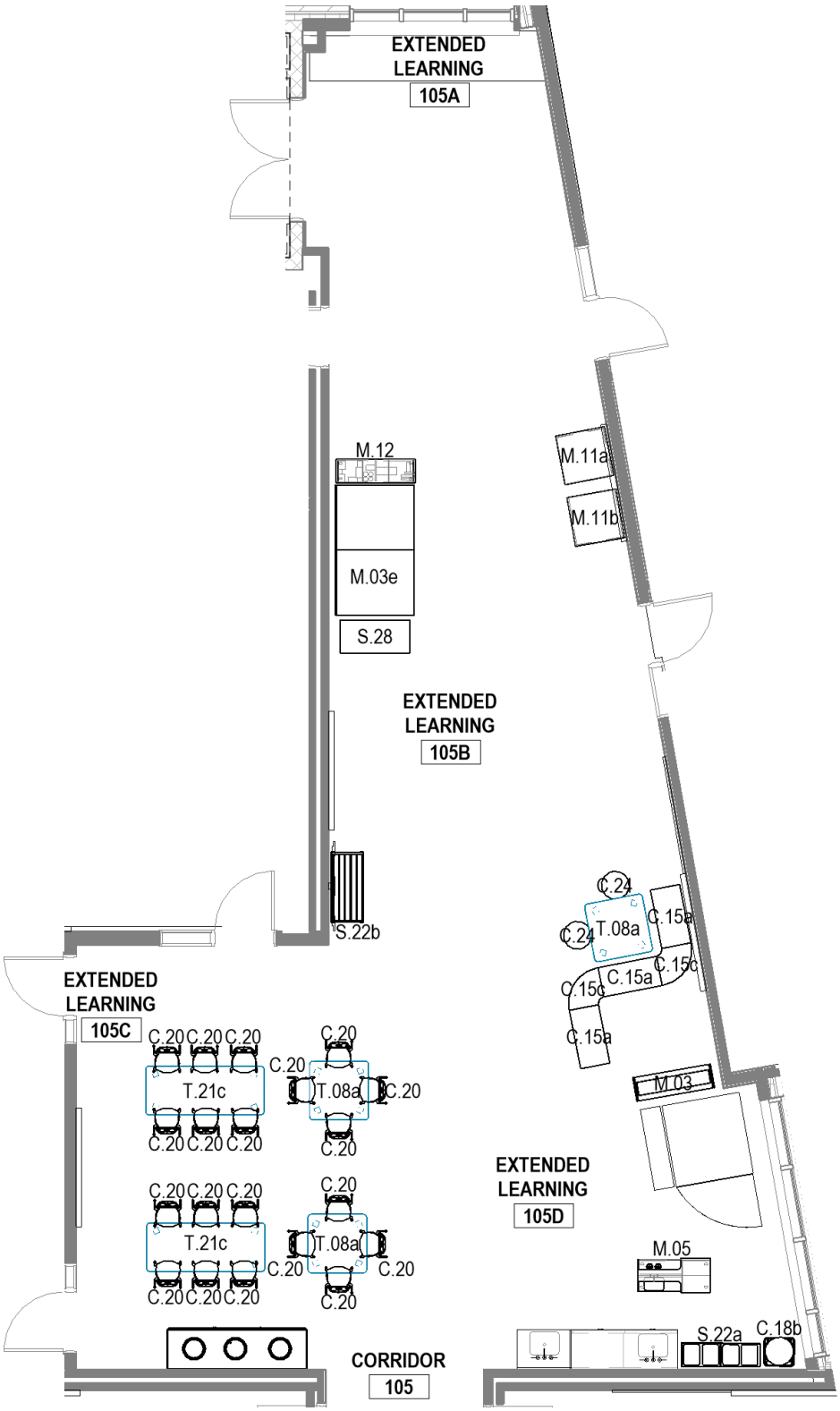
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 01.053



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Room Function Number 12.009

Room Name	TEACH WELLNESS
Room Number	125A
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	125A	Programmed	100.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Location for nursing mothers to use a breast pump privately, provide a space to safely store breast milk and clean pumping eqiupment.
Quantity:	3
Occupant Load:	1

Location Criteria:

Users:	Faculty and Staff
Adjacency:	Within Teacher Collaboration and Centrally located for ease of use
Orientation / Views:	n/a

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED prerequisite
Windows:	None
Doors:	Flush wood door, with acoustic seal. Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully sprinklered. Accessible sink
Lighting:	General recessed lighting, on dimmer
Electrical:	Typical perimeter power requirements. Additional power for breast pump. Additional power for undercounted refrigerator.
Technology:	Public Address system. Clock system Wireless network access

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in attached room layout sheets including: Storage cabinets & countertop
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

n/a

Furniture

Item: BIM ID	Name	Quantity
C.10b	Lounge-Seat-KI-Zoetry-Chair-Std - Wood Arm Cap,Left Removable Tablet,No Power,Plastic Glides	1
T.15a	120000-Furniture-Table End Table - Table - Ocasional Table 18" x 18"	1

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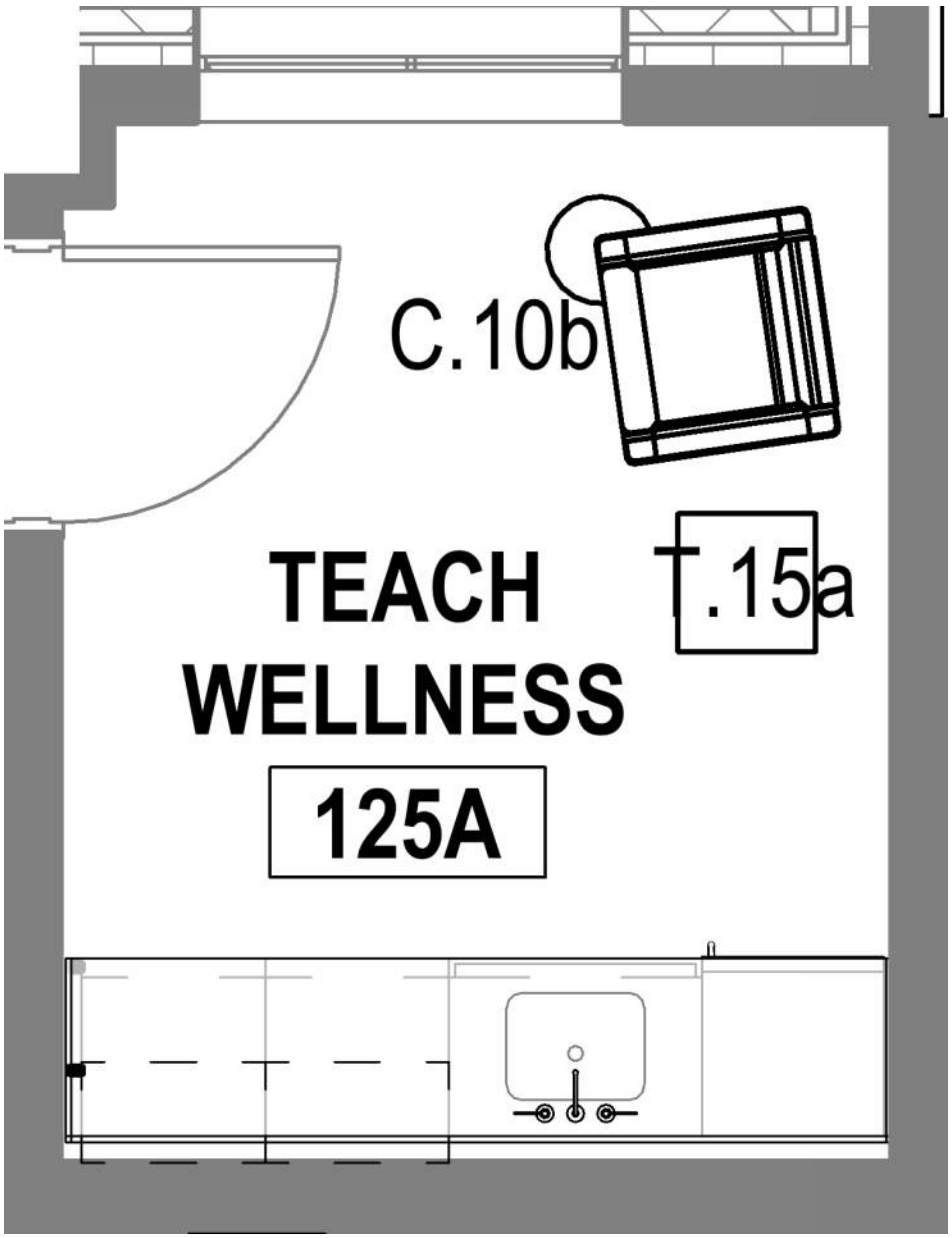
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 12.009



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Room Function Number 12.007

Room Name	CARES OFFICE
Room Number	175
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	175	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for CARES program managers. Operational hours: • Morning: 6:30–9:30 AM • Afternoon: 1:00–5:30 PM
Quantity:	2
Occupant Load:	(2) Staff, 3-4 site coordinators

Location Criteria:

Users:	CARES program managers and site coordinators
Adjacency:	Adjacent to main building entrance
Orientation / Views:	Views to observe Cafeteria where main program is

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Power and data for 2 workstations

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets including: Marker Board for scheduling
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets.• Dedicated casework in program areas like the Art Room, Gym, and Cafeteria.• Storage spaces should be near the cafeteria for convenience.

Additional Requirements:

- Student Spaces:
- Flexible breakout spaces, potentially separated by grade levels.
- Possible use of the art or music room as needed.
- Flex classrooms to accommodate multiple activities.
- Parent Access:
- Designated area for parent drop-off in the morning for AM students.

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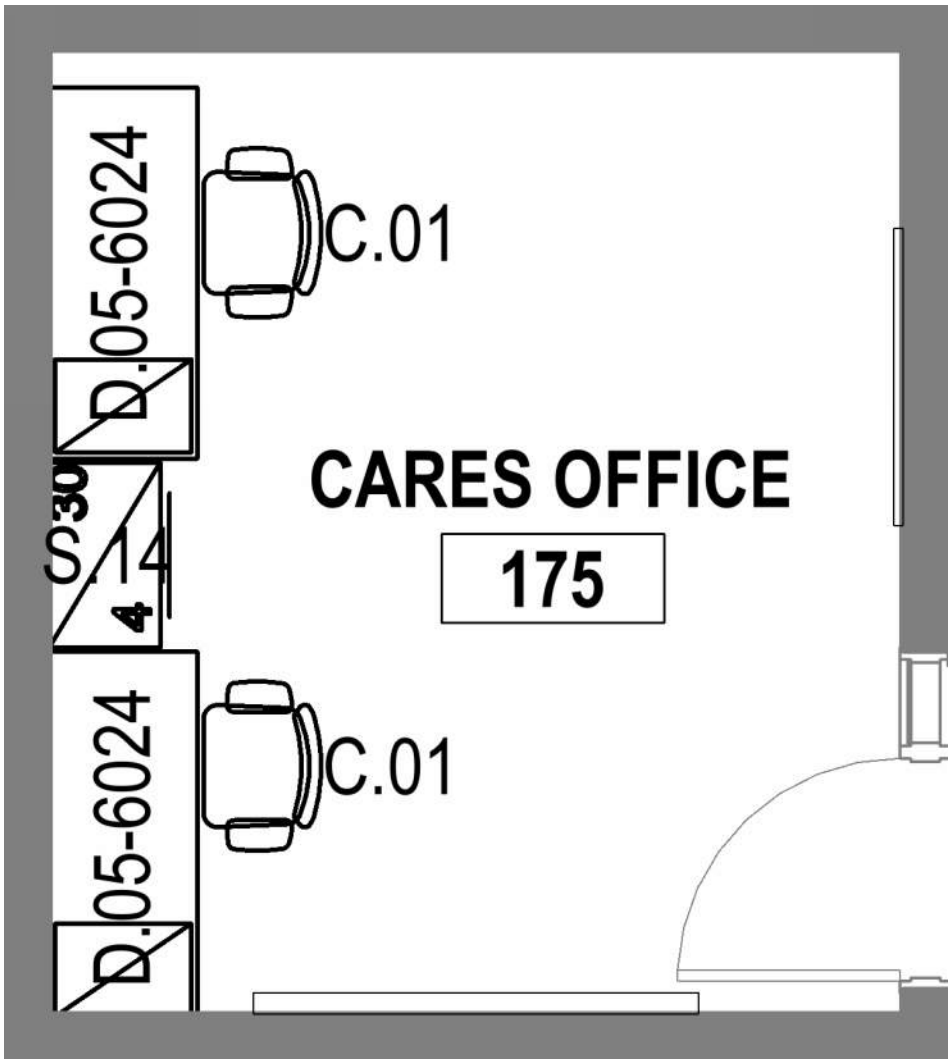
Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	2
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	2
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	1



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Room Function Number 12.008

Room Name	CARES OFFICE
Room Number	176
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	176	Programmed	150.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home base for CARES program managers.
Quantity:	2
Occupant Load:	(2) Staff

Location Criteria:

Users:	CARES program managers
Adjacency:	Adjacent to main building entrance
Orientation / Views:	Views to observe Cafeteria where main program is

Technical Criteria:

Floor Finishes:	Carpet Tile
Wall Finishes:	Gypsum wall board, painted
Ceiling Finishes:	Acoustical ceiling system, painted gypsum soffits.
Acoustical:	Meets or exceeds LEED prerequisite for acoustic performance.
Windows:	Aluminum windows with vision glazing, room darkening shades.
Doors:	Flush wood doors with side light Office hardware set
HVAC:	Displacement Ventilation with Air Conditioning
Plumbing / FP:	Fully Sprinklered
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements.
Technology:	Additional power required to support specific room equipment Public Address system Clock System Wireless network access Power and data for 2 workstations

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets including: Marker Board for scheduling
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.04	120000-Furniture-Chair-Haworth-Very - No Arms	2
D.03	120000-Furniture-Desk Admin L Shaped - open leg - 72x30,54x24	1
S.14	120000-Furniture-Storage-Lateral File - 30x18-4high	2

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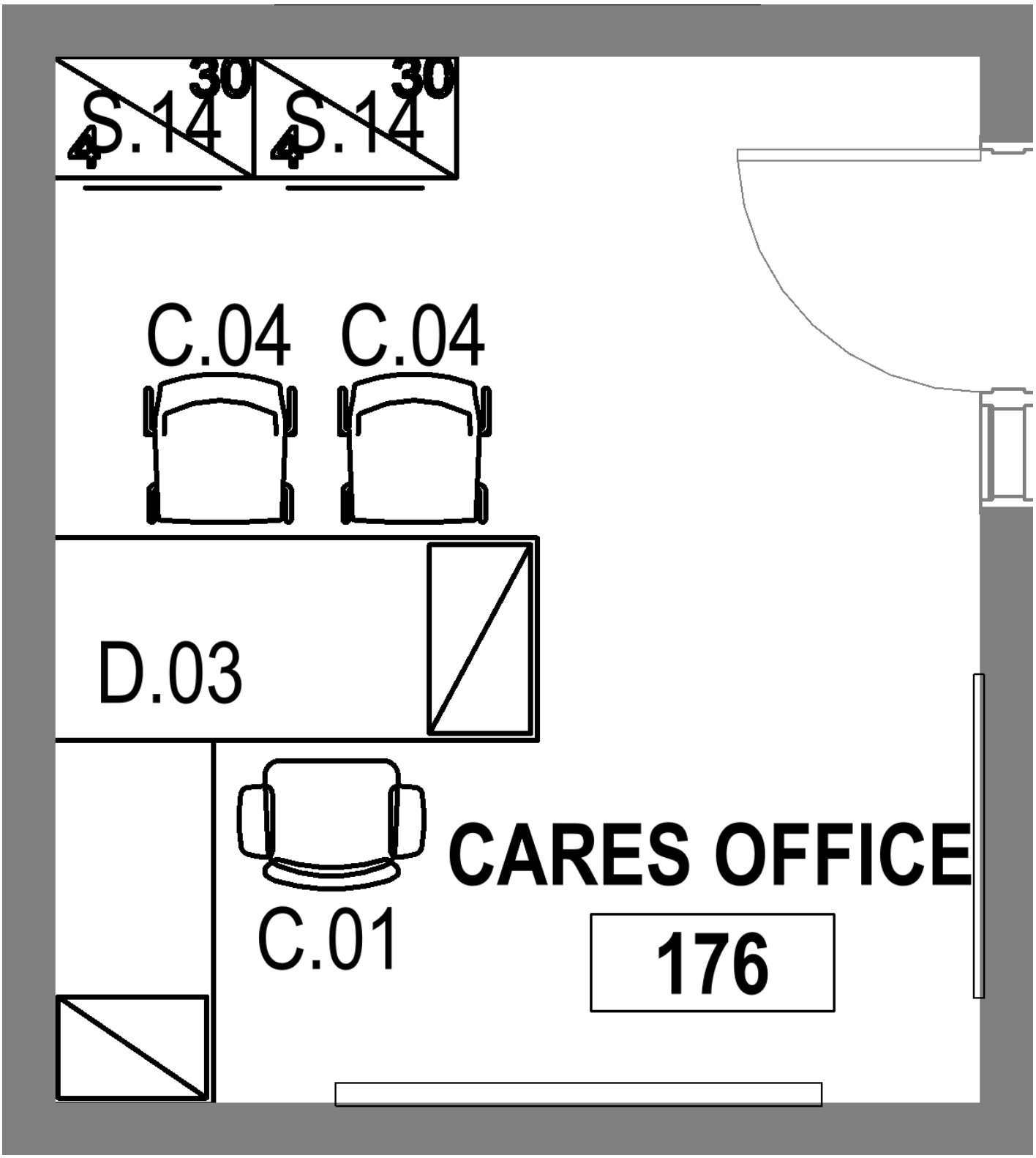

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Room Function Number 12.015

Room Name	HEALTH
Room Number	204
Department (Name)	OTHER - PROGRAM

Categorization		Areas	
Room Number	204	Programmed	900.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Home Base for grade level instruction The following zones are to be included within the classroom: Main teaching wall area; student table/desk seating; teacher desk; small group table; reading nook; wet/messy/ cleanup zone in front of sinks.
Quantity:	1
Occupant Load:	(24) Students (1) General Education Teacher (1) Paraprofessional

Location Criteria:

Users:	Teachers, students, specialists, paraprofessionals
Adjacency:	Within grade level team, along with special education spaces, central location. Paired with another grade level classrooms
Orientation / Views:	Views to Exterior

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted Magnetic writable surface at teaching wall location, 2’ AFF to 7’ AFF for teacher and student use
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	Meets or exceeds LEED pre-requisite for acoustic performance
Windows:	Aluminum windows with vision glazing, room darkening shades
Doors:	Flush Wood Door - Classroom Hardware Se
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered (1) Accessible stainless-steel sink at child height (1) Deep stainless-steel sink
Lighting:	Linear pendant direct/indirect
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Clock System Wireless network access (1) Interactive digital display (1) Mobile Teachers station to coordinate with interactive projector (data & power) Voice amplification/ Sound field system. Phone Handset, wall-mounted, located near door

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets
Specialties:	Types & Configurations indicated in the attached room layout sheets
Furnishings:	Types & Configurations indicated in the attached room layout sheets
Equipment:	Types & Configurations indicated in the attached room layout sheets.
Shelving / Storage:	Types & Configurations indicated in the attached room layout sheets

Additional Requirements:

Equipment/Accessories: Soap & paper towel dispensers

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Room Data Sheet

SD - Submission

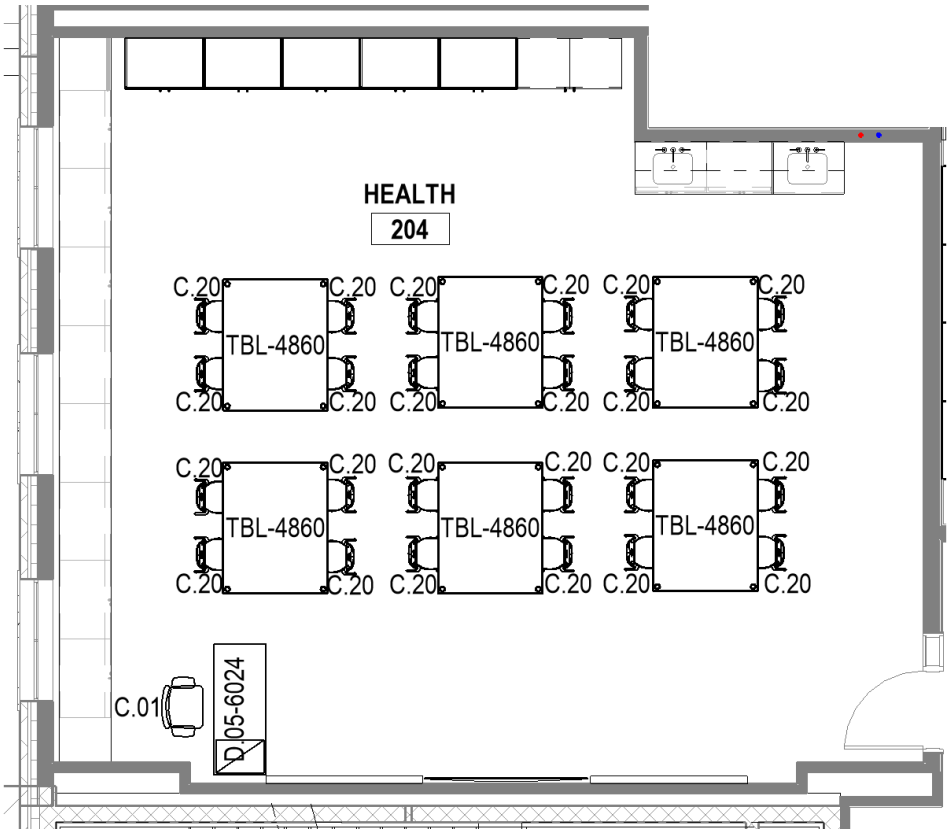
Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 12.015

Furniture

Item: BIM ID	Name	Quantity
C.01	120000-Furniture-Chair-Haworth-Zody - Height Adjustable Arms - C1A	1
C.20	120000-Furniture-Chair-KI-Wave-Medium1 - 120000-Furniture-Chair-KI-Wave-Medium	24
D.05-6024	120000-Furniture-Desk Admin - open leg - 60x24	1



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Room Function Number 13.002

Room Name	PT STORAGE
Room Number	192A
Department (Name)	NON-PROGRAMMED SPACES

Categorization		Areas	
Room Number	192A	Programmed	250.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated Storage to Physical Therapy program. Utilize storage room for sensory room/swing
Quantity:	1
Occupant Load:	1

Location Criteria:

Users:	Specialist
Adjacency:	Adjacent to the Adaptive PE Space and accessed from within the APE space
Orientation / Views:	None

Technical Criteria:

Floor Finishes:	Athletic Rubber Flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system, painted gypsum soffits
Acoustical:	None
Windows:	None
Doors:	Flush Wood Door - Storage Hardware Set
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Lay-In Lighting
Electrical:	Typical perimeter power requirements. Additional power required to support specific room equipment
Technology:	Public Address system Wireless network access

Fixtures & Furnishings:

Casework:	None
Specialties:	None
Furnishings:	None
Equipment:	None
Shelving / Storage:	None

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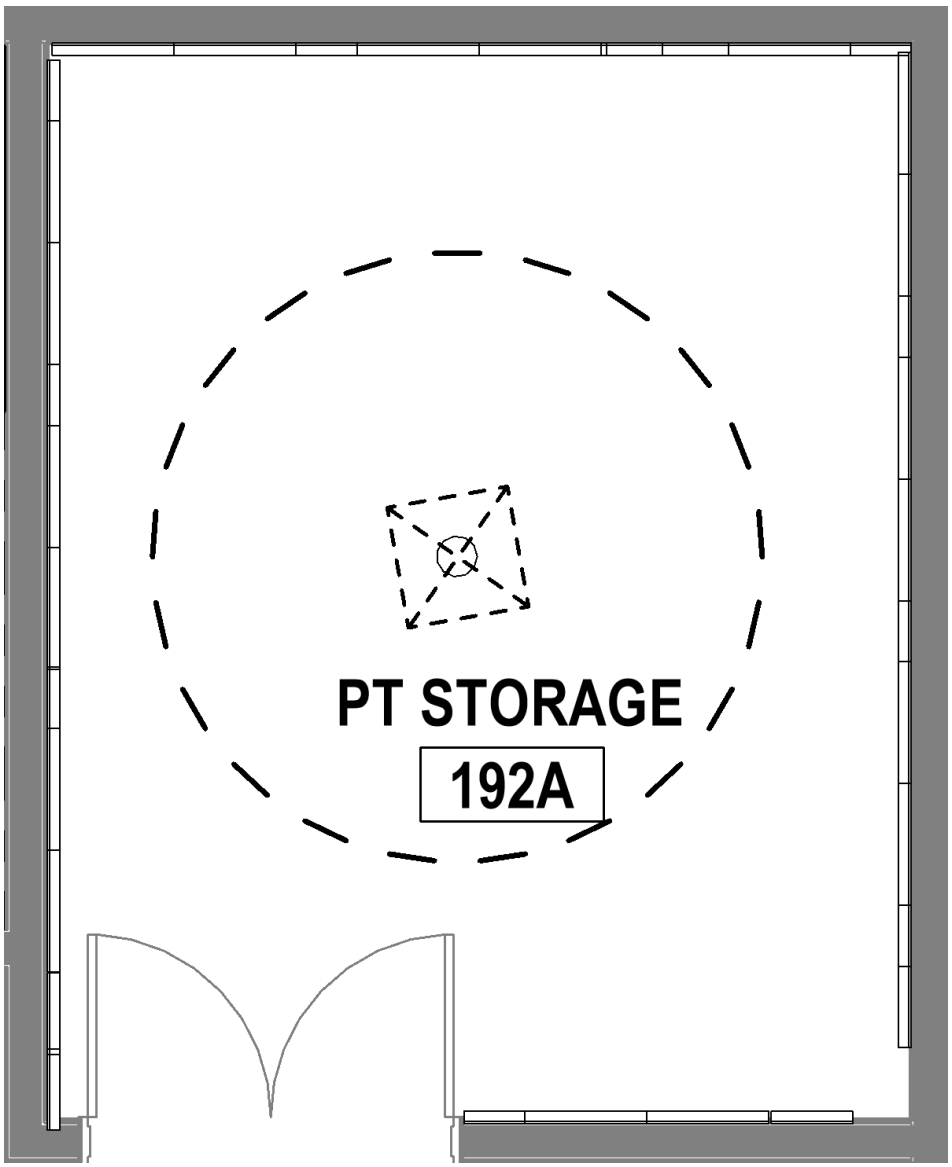
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 13.002



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Room Function Number 13.001

Room Name	CARES STORAGE
Room Number	154
Department (Name)	NON-PROGRAMMED SPACES

Categorization		Areas	
Room Number	154	Programmed	500.00
User Room Number			
Additional Number			
Name on Drawing			

Function Criteria:

Description:	Dedicated storage for Extended Day Program
Quantity:	1
Occupant Load:	0

Location Criteria:

Users:	Cares Staff
Adjacency:	Located adjacent to the Gym and Cafeteria and convenient to access for before/after school activity locations
Orientation / Views:	n/a

Technical Criteria:

Floor Finishes:	Resilient flooring
Wall Finishes:	Gypsum Wall Board, painted
Ceiling Finishes:	Acoustic ceiling tile system
Acoustical:	None
Windows:	None
Doors:	Flush Wood Door
HVAC:	Displacement Ventilation with Air Conditioning Radiant panels at perimeter for supplemental heating
Plumbing / FP:	Fully Sprinklered
Lighting:	Recessed lay-in fixtures
Electrical:	Typical perimeter power requirements
Technology:	Public Address system

Fixtures & Furnishings:

Casework:	Types & Configurations indicated in the attached room layout sheets including
Specialties:	Types & Configurations indicated in the attached room layout sheets including
Furnishings:	Types & Configurations indicated in the attached room layout sheets including
Equipment:	Types & Configurations indicated in the attached room layout sheets including
Shelving / Storage:	Tall storage shelving for indoor/outdoor materials and manipulatives such as games, puzzles, books, etc

Additional Requirements:

- Shelving supplies and vacation program equipment.
- Daily-use storage (lockable cabinets and rolling carts).
- Dedicated casework in program areas like the Art Room, Gym, and Cafeteria.
- Storage spaces should be near the cafeteria for convenience.

Furniture

Item: BIM ID	Name	Quantity
S.04	120000-Furniture-Storage-Pantry Shelving (1) - 48" Wide x 24"	17

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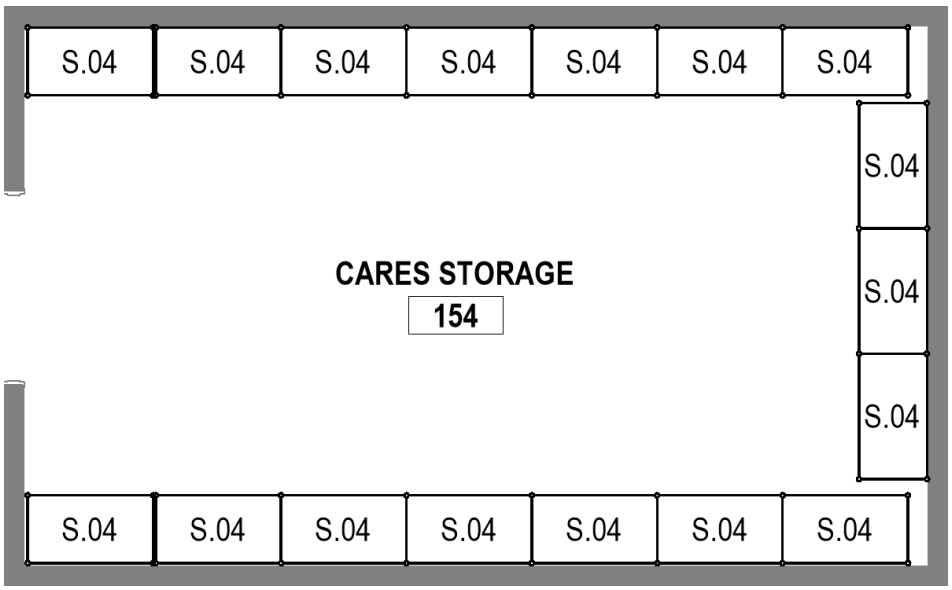
Room Data Sheet

SD - Submission

Dore & Whittier

Wilmington Wildwood EC Center

Room Function Number 13.001



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PROPOSED CONSTRUCTION METHODOLOGY

The project will be constructed under the Construction Management at Risk methodology in accordance with Massachusetts General Laws Chapter 149A.

The decision to pursue the project delivery method of Massachusetts General Laws Chapter 149A over Massachusetts General Laws Chapter 149, Design-Bid-Build (DBB), was made by the School Building Committee based on prior favorable experience with this construction delivery method in the District and the Town as a whole.

The Town and District just completed its Senior Center Building and has construction underway with the Town Hall and School Administration Building. The members of the School Building Committee involved in these two Town projects experienced both methods and felt that the Chapter 149A method proceeded smoother with more proactive knowledge of the costs and conditions than learning about bids coming in high at the end of Construction Documents when everything is already designed. Bringing the Construction Management Firm on earlier had its benefits earlier in the process and it helped to make a smoother construction project progress with its activities, costs and schedule.

The District's confidence resides in the Massachusetts General Laws Chapter 149A construction delivery method as it provides programming, planning and financial advantages over Chapter 149 Construction Delivery Method.

Key in the decision was the ability to bring a Construction Management firm onto the project to provide its cost estimating and scheduling expertise and insight into the construction marketplace in the Schematic Design Phase. The Massachusetts General Laws Chapter 149, Design-Bid-Build (DBB), had a lot of benefits for the Wilmington Elementary School project. However, the complexity of an occupied North Intermediate School site, traffic mitigation and adjacent and/or in close proximity neighbors, the School Building Committee felt that the Construction Management at Risk Massachusetts General Laws Chapter 149A was better suited for the needs of this project with more flexibility, proactivity and advance notice of potential costs.

The Massachusetts General Laws Chapter 149A Construction Delivery Method also made available the ability to coordinate Early Release Packages that would make the availability of equipment and materials that are essential, have potential of cost escalation, and heavily sought after. The ability to be proactive in the management of these long lead time procurement needs i.e. HVAC and electrical equipment, structural steel that would be potentially sourced in Canada and/or Mexico and incur freight and transit costs. The delivery method advantages and disadvantages were discussed at School Building Committee meetings from the end of Preferred Schematic Report Phase and resulted in a vote

of 20:1 in favor of Massachusetts General Laws Chapter 149A, Construction Management at Risk Construction Delivery Method, at the November 19, 2024 School Building Committee meeting.

The Chapter 149A Construction Delivery Method provided a two-step process with Construction Management firms able to be prequalified with the Construction Management Prequalification and Selection Working Group before shortlisting for the interview and proposal stage. Prequalification of all the Construction Management Firms was performed with thorough reference checks. The Prequalification and Selection Working Group consisted of Town Manager, R. Eric Slagle, Finance Committee Member, Marianne Gallezzo, Director of OPM Services, Julie Leduc of Symmes Maini & McKee Associates, Inc. (SMMA) and Principal of Dore + Whittier Architects, Lee P. Dore.

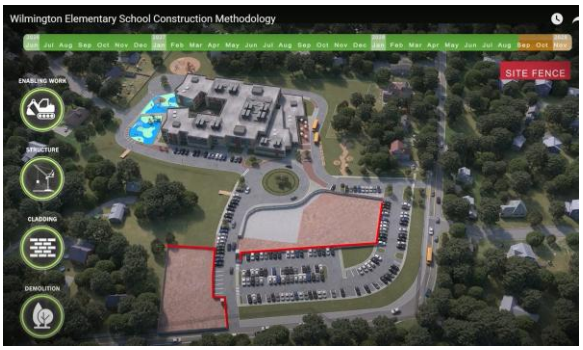
Some of the essential criteria for the District was the ability to have advance knowledge of the potential costs for the proposed new school building, the District's reimbursement rate and the ability to be creative with cost management and/or value engineering and mobilization on a site that was a short distance from the Route 93 exit and on heavily trafficked roads with congestion. The choice of Construction Management at Risk allowed for the Working Group to be able to perform their due diligence through reviewing their Non-Price Proposal and weigh the criteria that mattered the most to them to select the firm that matched their needs most. The District chose to shortlist four (4) firms namely, Consigli Construction Co., Shawmut Design and Construction, W.T. Rich Company, Inc. and Fontaine Bros., Inc. with whom interviews were conducted, two (2) on February 11, 2025 and two (2) on February 12, 2025. before deliberating the final and upon the final review in preparation for their recommendation for the School Building Committee's vote to approve on February 13, 2025, review of the selected firm, Fontaine Bros, Inc. Price Proposal was performed. Fontaine Bros. Inc. demonstrated their ability to be able to think on their feet, ability to cost estimate, manage construction costs, access to real time costs of materials and equipment with their extensive experience building schools, forethought on the subject of laydown space for steel deliveries and other equipment locally, and strong handle on community outreach opportunities to facilitate the Town Meeting and Ballot Vote in the Fall 2025.

The Application to the Inspector General to Proceed with the Construction Manager at Risk Construction Delivery Method was submitted to the Inspector General's office on December 3, 2024. The project received notification from the Inspector General Response to District's Application to Use the Construction Management at Risk Alternative Delivery Method for the Wilmington Wildwood Elementary School Project, dated January 13, 2025, attached.

The cost estimate, project budget, proposed project schedule, estimated reimbursement rate and Total Project Budget Spreadsheet for the Wilmington Elementary School is based on selection of the delivery method of Massachusetts General Laws (M.G.L.) Chapter 149A; Construction Manager at Risk (CMR).

Construction Phasing Plan

In its comments on the PSR submission, the MSBA requested more detail related to a proposed Construction Phasing Site Plan which would illustrate site separation, temporary school circulation, temporary access, parking, laydown areas, trailer location(s), and possible off-site additional logistics area(s). That information is included below.



The construction will broken into two main phases, with some detailed sub-phases. Sequencing depicted in the imagery to the left by Fontaine Brothers, Inc.

- Phase 1 – Site mobilization and site work; Construction Zone to include the field spaces north of the existing building and northern portion of the site. The perimeter of fencing is demarcated by a red line in image. All construction activity, including crew parking, temporary lay down area, and trailer locations to be located within the fenced in area. Existing playground to be relocated on site and provide a separate path for construction access. Existing parking and circulation will remain during construction for continuous school operations.
- Phase 1A –Substantially-Complete new building May 2028; FF&E/Technology fitout July 2028; packing and moving from existing building August 2028; Abatement and Demolition of existing North Intermediate building Summer 2028; Sitework up to the limits of the Phase 1 Fenceline and critical path items necessary for school operation in Fall 2028; open new school September 2028
- Phase 2 – Completion of remaining playgrounds, parking and sitework in non-critical areas

A phased construction approach ensures continuity of education, with students remaining in the current building until the new one is ready for occupancy. Following the move, the existing school will be demolished, allowing for the creation of playgrounds, parking, and final site circulation.

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OFFICE OF THE INSPECTOR GENERAL
MASSACHUSETTS

JEFFREY S. SHAPIRO
Inspector General

January 13, 2025

Via Electronic Mail

R. Eric Slagle, Town Manager
Town of Wilmington
121 Glen Road, Room 111
Wilmington, MA 01887
eslagle@wilmingtonma.gov

Re: Application to Use the Construction Management At-Risk Alternative Delivery Method for the Wilmington Wildwood Elementary School Project

Dear Mr. Slagle:

Good day.

On December 3, 2024, pursuant to Chapter 149A of the Massachusetts General Laws and 945 CMR 2.00, the town of Wilmington (Wilmington) submitted to the Office of the Inspector General (OIG) an application to use the construction management at-risk (CM at-risk) alternative delivery method for the Wildwood Elementary School consolidation project.

Based on all the information provided, Wilmington has met the statutory requirements for using the CM at-risk delivery method for the project. Accordingly, the OIG is issuing this notice to proceed to use the CM at-risk delivery method as specified in M.G.L. c. 149A, §§ 1-13. However, please note that the initial application was missing required responses and exhibited a flawed understanding of the CM at-risk delivery method. It is incumbent upon Wilmington and the project team to fully comprehend the statutory requirements in order to execute the project in accordance with the law.

The OIG reminds Wilmington that it must properly dispose of any surplus equipment and supplies from the current schools using Chapter 30B of the Massachusetts General Laws. Please review a recent OIG letter detailing a school district's failure to follow Chapter 30B during a renovation project.

This approval is conditioned on Wilmington using a CM at-risk firm that the Division of Capital Asset Management and Maintenance (DCAMM) has certified, as well as DCAMM-certified trade contractors. Therefore, Wilmington must require each CM at-risk firm to supply both a certificate of eligibility and an update statement during both the prequalification phase and the technical proposal phase of the selection process. In addition, Wilmington must require each trade contractor to supply a certificate of eligibility and an update statement during the prequalification phase and again at the bidding phase of the selection process. Wilmington must reject as invalid all contractors' statements of qualifications, proposals and bids that do not provide such certificates of eligibility or update statements.

If, during the course of the project, Wilmington changes its Owner's Project Manager (OPM) or Designer, please submit information about the new OPM or Designer to the OIG. Also, if Wilmington decides not to proceed with the CM at-risk delivery method for any reason, please notify the OIG within 30 days of that decision.

As a condition of the approval, Wilmington is required to submit the following project milestone information to the OIG.

1. Selected CM at-risk firm,
2. Date the initial cost-plus CM at-risk contract was signed,
3. Date physical on-site work started,
4. Date the guaranteed maximum price (GMP) was set,
5. Percent of design document completion when the GMP was set,
6. Date of substantial completion, and
7. Final total cost of the project.

At each milestone, Wilmington must use this Form to submit the information.

Wilmington must also provide the OIG with a final report within 70 days of project completion. The final report must discuss Wilmington's experience using CM at-risk, the final project schedule, budget and final actual costs. Wilmington must use this Form to submit the final project report.

The project milestone report and final project report forms are available on the OIG's website.

All correspondence regarding this project may be sent to igo.municipal@mass.gov.

Please feel free to contact Kerri-Anne Hollingshead, Senior Policy Analyst at Kerri-Anne.Hollingshead@mass.gov or 617-722-8871 or me at Jeffrey.S.Shapiro@mass.gov or 617-722-8806 if you have any questions or concerns regarding this building process approval.

Sincerely,

Jeffrey S. Shapiro, Esq., CIG
Inspector General

cc (by email):

Glenn Brand, Ed.D., Superintendent of Schools, Town of Wilmington
Gregory B. Bendel, Select Board Chair, Town of Wilmington
David A. Ragsdale, School Committee, Town of Wilmington
Nicholas Golden, School Committee, Town of Wilmington
Stephen Turner, School Committee, Town of Wilmington

Julie Leduc, Director of OPM Services, Symmes, Maini and McKee Associates
Joshua Giles, Director, Government Outreach and Public Policy, OIG
Kerri-Anne Hollinghead, Senior Policy Analyst, Government Outreach and Public Policy, OIG
Nataliya Urciuoli, Senior Executive Assistant, OIG

DISTRICT'S ANTICIPATED REIMBURSEMENT RATE

The base reimbursement rate for this project from MSBA is 47.84%, with a preliminary estimate of 5% additional incentive points [1% for Maintenance and 4% for Energy Efficiency], for a total of 52.84%.

Category	Reimbursement Points
Reimbursement Rate before Incentives	49.11%
Maintenance	1.67%
Construction Management at Risk	0.00
Major Reconstruction or Reno/Reuse	0.00
Overlay Zoning District – c.40R or c.40S	0.00
Overlay Zoning 100 Units or 50% Units 1, 2, 3 Family Units	0.00
Energy Efficiency – "Green Schools"	4.00%
Model Schools	0.00
Total Incentive Points	5.67%
Anticipated MSBA Reimbursement Rate with Incentives	**54.78%**

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DISTRICT'S TOTAL PROJECT BUDGET

The district's total project budget is updated with schematic design cost estimate information and the updated reimbursement rates for this project from MSBA, see attached.

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Wilmington School District
Wildwood Elementary School

DRAFT

Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5)	Estimated Budget	Scope Items Excluded from the Estimated Basis of Maximum Facilities Grant	Estimated Basis of Maximum Total Facilities	Estimated Maximum Total Facilities Grant[1]
		Enter Budget Values for all light yellow highlighted cells.	Enter Budget Values for Ineligible Costs in light yellow highlighted cells.	
Feasibility Study Agreement				
OPM Feasibility Study	$200,000	$0	$200,000	
A&E Feasibility Study	$800,000	$0	$800,000	
Environmental & Site	$100,000	$0	$100,000	
Other	$100,000	$0	$100,000	
Feasibility Study Agreement Subtotal	**$1,200,000**	**$0**	**$1,200,000**	**$657,360**
Administration				
Legal Fees	$100,000	$100,000	$0	**$0**
Owner's Project Manager				
Design Development	$400,000	$0		
Construction Contract Documents	$600,000	$259,420		
Bidding	$250,000	$0		
Construction Contract Administration	$3,170,000	$1,323,656		
Closeout	$140,000	$0		
Extra Services	$140,000	$0	$140,000	
Reimbursable & Other Services	$80,000	$0	$80,000	
Cost Estimates	$0	$0	$0	
Advertising	$20,000	$0	$20,000	
Permitting	$120,000	$0	$120,000	
Owner's Insurance	$300,000	$0	$300,000	
Other Administrative Costs	$200,000	$0	$200,000	
Administration Subtotal	**$5,520,000**	**$1,683,076**	**$3,836,924**	**$2,101,867**
Architecture and Engineering				
Basic Services				
Design Development	$3,409,156	$720,482		
Construction Contract Documents	$4,772,818	$796,333		
Bidding	$681,831	$0		
Construction Contract Administration	$4,090,986	$4,017,882		
Closeout	$681,831	$0		
Other Basic Services	$175,000	$0		
Basic Services Subtotal	**$13,811,622**	**$5,534,697**	**$8,276,925**	
Reimbursable Services				
Construction Testing	$25,000	$0	$25,000	
Printing (over minimum)	$40,000	$0	$40,000	
Other Reimbursable Costs	$630,000	$0	$630,000	
Hazardous Materials	$300,000	$0	$300,000	
Geotechnical & Geo-Environmental	$250,000	$0	$250,000	
Site Survey	$25,000	$0	$25,000	
Wetlands	$0	$0	$0	
Traffic Studies	$60,000	$0	$60,000	
Architectural / Engineering Subtotal	**$15,141,622**	**$5,534,697**	**$9,606,925**	**$5,262,674**
CM at Risk Pre-Construction Services				
Pre-Construction Services	$320,000	$0	**$320,000**	**$175,296**
Site Acquisition				
Land / Building Purchase	$0	$0	$0	
Appraisal Fees	$0	$0	$0	
Recording fees	$0	$0	$0	
Site Acquisition Subtotal	**$0**	**$0**	**$0**	**$0**
Construction Costs				
SUBSTRUCTURE				
Foundations	$2,196,232			
Basement Construction	$3,622,362			
SHELL				
Super Structure	$11,031,003			
Exterior Closure	$0			
Exterior Walls	$12,000,405			
Exterior Windows	$2,325,955			
Exterior Doors	$167,920			
Roofing	$2,660,570			
INTERIORS				
Interior Construction	$9,676,384			
Staircases	$1,058,675			
Interior Finishes	$6,518,455			
SERVICES				
Conveying Systems	$259,620			
Plumbing	$3,504,350			
HVAC	$13,913,586			
Fire Protection	$1,317,979			
Electrical	$9,832,425			
EQUIPMENT & FURNISHINGS				
Equipment	$1,298,040			
Furnishings	$2,797,852			
SPECIAL CONSTRUCTION & DEMOLITION				
Special Construction	$0	$0		
Existing Building Demolitior	$555,410	$0		
In-Building Hazardous Material Abatement	$1,316,600	$0		
Asbestos Containing Floor Material / Ceiling Tile Abatement	$160,000	$160,000		
Other Hazardous Material Abatement	$0	$0		
BUILDING SITE WORK				
Site Preparation	$4,013,109	$0		
Site Improvements	$8,197,222	$0		
Site Civil / Mechanical Utilities	$2,418,926	$0		

Cell C13 - Scope Excluded OPM Fees (Cell I40)

Cell C15 - Costs beyond MSBA funding cap for OPM Basic Services (Cell K48)

Cell C28 - Scope excluded Designer Fees (Cell I41)

Cell C30 - Costs beyond MSBA funding cap for Designer Basic Services (Cell K52)

Cell C86 - Scope Excluded Sitework Costs such as a

Site Electrical Utilities	$965,690	$0		
Scope Excluded Site Work	$0	$0		
Construction Trades Subtotal	$101,808,770	$160,000		
Contingencies (Design and Pricing)	$10,180,877	$16,000		
Sub-Contractor Bonds	$768,665	$1,208		
D/B/B Insurance	$0	$0		
General Conditions	$12,691,698	$19,946		
D/B/B Overhead & Profit	$0	$0		
GMP Insurance	$0	$0		
GMP Fee	$2,661,713	$4,183		
GMP Contingency	$1,996,285	$3,137		
Escalation to Mid-Point of Construction	$7,635,658	$12,000		
Construction Cost over Funding Cap		$43,961,064		
Construction Budget	**$137,743,666**	**$44,177,538**		**$51,255,525**
Alternates				
Ineligible Work Included in the Base Project	$0	$0	$0	
Alternates Included in the Total Project Budget	$0	$0	$0	
Alternates Excluded from the Total Project Budget	$0		$0	
Subtotal to be Included in Total Project Budget	**$0**	**$0**	**$0**	**$0**
Miscellaneous Project Costs				
Utility Company Fees	$200,000	$0	$200,000	
Testing Services	$500,000	$0	[illegible]	
Swing Space / Modulars	$0	$0		
Other Project Costs (Mailing & Moving)	$350,000	$350,000		
Miscellaneous Project Costs Subtotal	**$1,050,000**	**$350,000**		**$383,460**
Furnishings and Equipment				
Furniture, Fixtures, and Equipment	$1,661,000	$755,000		
Technology	$1,661,000	$755,000		
FF&E Subtotal	**$3,322,000**	**$1,510,000**		**$992,614**
Soft Costs that exceed 20% of Construction Cost		$0	[illegible]	
Project Budget	**$164,297,288**	**$53,255,311**		**$60,828,795**

Sitework Costs such as a stadium, out buildings, concession stand etc. (Enter Direct Construction Costs)

Cell C98 - Represents construction costs over MSBA funding limits (Cell H103)

Cell C112 - Represents the amount exceeding the $1,200 per student allowance for FF&E (Cell J109)

Cell C113 - Represents the amount exceeding the $1,200 per student allowance for Technology (Cell J110)

Cell C116 - Soft costs that exceed 20% of the construction cost (Cell G21)

Board Authorization	
Design Enrollment	755
Total Building Gross Floor Area (GSF)	165,035
Total Project Budget (excluding Contingencies)	$164,297,288
Scope Items Excluded or Otherwise Ineligible	- $53,255,311
Third Party Funding (Ineligible)	- $0
Estimated Basis of Maximum Total Facilities Grant[1]	$111,041,977
Reimbursement Rate[1]	54.78%
Est. Max. Total Facilities Grant (before recovery)[1]	$60,828,795
Cx Costs associated with Ineligible Building Area[2]	- $21,457
Cost Recovery associated with Prior Projects[2]	- $172,410
Estimated Maximum Total Facilities Grant[1]	$60,634,928

Construction Contingency[3]	$6,887,183
Ineligible Construction Contingency[3]	$5,509,746
"Potentially Eligible" Construction Contingency[3]	$1,377,437
Owner's Contingency[3]	$2,066,155
Ineligible Owner's Contingency[3]	$1,377,437
"Potentially Eligible" Owner's Contingency[3]	$688,718
Total Potentially Eligible Contingency[3]	$2,066,155
Reimbursement Rate	54.78%
Potential Additional Contingency Grant Funds[3]	$1,131,840
Maximum Total Facilities Grant	$61,766,768
Total Project Budget	$173,250,626

49.11	Reimbursement Rate Before Incentive Points
5.67	Total Incentive Points
54.78%	MSBA Reimbursement Rate

NOTES

This template was prepared by the MSBA as a tool to assist Districts and consultants in understanding MSBA policies and practices regarding potential impact on the MSBA's calculation of a potential Basis of Total Facilities Grant and potential Total Maximum Facilities Grant. This template does not contain a final, exhaustive list of all evaluations which the MSBA may use in determining whether items are eligible for reimbursement by the MSBA. The MSBA will perform an independent analysis based on a review of information and estimates provided by the District for the proposed school project that may or may not agree with the estimates generated by the District using this template.

1 - The Estimated Basis of Total Facilities Grant and Estimated Maximum Facilities Grant amounts do not include any potentially eligible contingency funds and are subject to review and audit by the MSBA.

2 - Costs associated with the commissioning of ineligible building area is estimated to result in the recovery of a portion of the overall commissioning cost. The OPM has estimated this recovery of funds to be $_____. The proposed demolition of the _____ School is expected to result in the MSBA recovering a portion of state funds previously paid to the District for the _____ project at the existing facilities completed in ____. The MSBA will perform an independent analysis based on a review of its records and information and estimates provided by the District for the proposed school project that may or may not agree with the estimated cost recovery generated by the District and its consultants using this template.

3 - Pursuant to Section 3.21 of the Project Funding Agreement and the applicable policies and guidelines of the Authority, any project costs associated with the reallocation or transfer of funds from either the Owner's contingency or the Construction contingency to other budget line items shall be subject to review by the Authority to determine whether any such costs are eligible for reimbursement by the Authority. All costs are subject to review and audit by the MSBA.

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chair of School Building Committee

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chief Executive Officer

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Superintendent of Schools

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chair of the School Committee

Date: _____

DESIGNER'S CONSTRUCTION COST ESTIMATE

Dore + Whitter's design team cost estimate is attached.

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Schematic Design Cost Estimate

Wildwood Elementary School

Wilmington, MA

MSBA Project ID Number: xxx

PM&C LLC
20 Downer Ave, Suite 5
Hingham, MA 02043
(T) 781-740-8007

Prepared for:

Dore + Whittier

March 18, 2025

PM&C

Wildwood Elementary School
Wilmington, MA

18-Mar-25

Schematic Design Cost Estimate

MAIN CONSTRUCTION COST SUMMARY

	Construction Start	Gross Floor Area	$/sf	Estimated Construction Cost
TRADE COSTS	Dec-26			
NEW BUILDING		165,035	$510.08	$84,181,813
DEMOLITION		55,541	$10.00	$555,410
HAZARDOUS MATERIAL ABATEMENT[1]				$1,476,600
SITEWORK				$15,594,947
SUB-TOTAL		165,035	$616.89	$101,808,770
DESIGN AND PRICING CONTINGENCY	10.0%			$10,180,877
ESCALATION	7.5%			$7,635,658
SUB-TOTAL				$119,625,305
NON TRADES SUB BONDS	1.25%			$768,665
GENERAL CONDITIONS				$8,495,529
GENERAL REQUIREMENTS				$4,196,169
PHASING				NR
BONDS				incl.
GENERAL LIABILITY INSURANCE				incl.
PERMIT				WAIVED
SUB-TOTAL				$133,085,668
CM FEE	2.0%			$2,661,713
GMP Contingency	1.5%			$1,996,285
TOTAL OF ALL CONSTRUCTION		165,035	$834.63	**$137,743,666**

[1] Inspection, Testing and Monitoring Costs are not included

BASIS OF ESTIMATE

This Schematic Design cost estimate was produced from drawings and specifications prepared by Dore + Whittier and their design team dated February 20, 2025. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, construction managers overhead and profit and design contingency. Cost escalation assumes start dates indicated.

Bidding conditions are expected to be public bidding under 149a of the Massachusetts General Laws to pre-qualified construction managers, and pre-qualified sub-contractors, open specifications for materials and manufacturers.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

Items not included in this estimate are:

- All professional fees and insurance
- Building Permit costs
- Land acquisition, feasibility, and financing costs
- All Furnishings, Fixtures and Equipment
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items (e.g. draperies, furniture and equipment)
- Rock excavation; special foundations (unless indicated by design engineers)
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction or occupancy phasing or off hours' work, (except as noted in this estimate)

PM&C

Wildwood Elementary School
Wilmington, MA

18-Mar-25

Schematic Design Cost Estimate

GFA 165,035

CONSTRUCTION COST SUMMARY IN CSI FORMAT

		BUILDING		*SITEWORK*		*TOTAL*	
		Subtotal	*Total*	*Subtotal*	*Total*	*Subtotal*	*Total*
TOTAL PROJECT CSI SUMMARY							
DIV. 2	**EXISTING CONDITIONS**				**$2,032,010**		**$2,032,010**
024116	Structure Demolition			$555,410		$555,410	
028213	Abatement			$1,476,600		$1,476,600	
DIV. 3	**CONCRETE**		**$4,336,971**		**$141,962**		**$4,478,933**
033000	Cast-in-Place Concrete	$4,314,878		$141,962		$4,456,840	
033500	Concrete Finishes	$22,093				$22,093	
DIV. 4	**MASONRY**		**$7,240,495**				**$7,240,495**
040001	**Unit Masonry - FSB**	$7,240,495				$7,240,495	
DIV. 5	**METALS**		**$10,123,051**		**$56,875**		**$10,179,926**
050001	**Metal Fabrications - FSB**	$1,612,057		$56,875		$1,668,932	
051200	Structural Steel Framing	$8,510,994				$8,510,994	
DIV. 6	**WOODS & PLASTICS**		**$1,641,738**				**$1,641,738**
061000	Rough Carpentry	$452,393				$452,393	
061800	Heavy Timber Construction	$671,900				$671,900	
064100	Architectural Woodwork	$517,445				$517,445	
DIV. 7	**THERMAL & MOISTURE PROTECTION**		**$5,838,368**				**$5,838,368**
070001	**Waterproofing, Dampproofing and Caulking - FSB**	$1,123,098				$1,123,098	
070002	**Roofing and Flashing - FSB**	$2,516,145				$2,516,145	
072100	Thermal Insulation	$421,830				$421,830	
076400	Cladding	$974,400				$974,400	
078100	Fireproofing	$637,860				$637,860	
078400	Firestopping	$165,035				$165,035	
DIV. 8	**DOORS & WINDOWS**		**$3,717,965**				**$3,717,965**
080001	**Windows**	$2,456,405				$2,456,405	
080002	**Glass and Glazing - FSB**	$176,800				$176,800	
081113	Doors, Frames and Hardware	$553,410				$553,410	
083100	Access Doors and Frames	$10,000				$10,000	
083323	Overhead Coiling Doors	$10,000				$10,000	
083326	Coiling Grilles	$25,300				$25,300	
087100	Door Hardware	$481,800				$481,800	
089000	Louvers	$4,250				$4,250	
DIV. 9	**FINISHES**		**$13,128,557**				**$13,128,557**
090002	**Tiling - FSB**	$1,591,030				$1,591,030	
090003	**Acoustical Ceilings - FSB**	$1,026,345				$1,026,345	
090005	**Resilient Flooring - FSB**	$838,210				$838,210	
090007	**Painting - FSB**	$556,319				$556,319	
092900	Gypsum Board Assemblies	$6,650,858				$6,650,858	
096400	Wood Flooring	$470,540				$470,540	
096620	**Terrazzo - FSB**	$1,138,900				$1,138,900	
096700	Fluid-Applied Flooring	$23,400				$23,400	
096810	Carpet	$108,395				$108,395	
098316	Acoustic Spray						
098400	Acoustic Room Components	$724,560				$724,560	
DIV 10	**SPECIALTIES**		**$2,492,666**				**$2,492,666**
101100	Visual Display Surfaces	$412,588				$412,588	
101200	Display Cases						
101400	Signage	$331,278				$331,278	
102100	Toilet Compartments and Cubicles	$103,500				$103,500	
102200	Operable Partitions	$150,180				$150,180	
102226	Operable Glass Partitions						
102600	Wall Protection	$5,000				$5,000	
102800	Toilet Accessories	$86,100				$86,100	
104300	Fire Protection Specialties	$20,500				$20,500	
105000	Lockers	$3,520				$3,520	
108213	Equipment Enclosure	$1,380,000				$1,380,000	
DIV. 11	**EQUIPMENT**		**$1,257,140**				**$1,257,140**
113100	Appliances	$25,000				$25,000	
114000	Food Service Equipment	$800,000				$800,000	
115213	Projection Screens	$20,000				$20,000	
116200	Theatre Equipment	$75,000				$75,000	
116600	Athletic Equipment	$327,140				$327,140	
117900	Miscellaneous Equipment	$10,000				$10,000	

PM&C

Wildwood Elementary School
Wilmington, MA

18-Mar-25

Schematic Design Cost Estimate

GFA 165,035

CONSTRUCTION COST SUMMARY IN CSI FORMAT

		BUILDING		*SITEWORK*		*TOTAL*	
		Subtotal	*Total*	*Subtotal*	*Total*	*Subtotal*	*Total*
TOTAL PROJECT CSI SUMMARY							
DIV. 12	**FURNISHINGS**		**$2,857,677**				**$2,857,677**
122113	Window Treatments	$125,277				$125,277	
123200	Fixed Casework and Equipment	$2,447,575				$2,447,575	
124813	Entrance Mats and Frames	$59,825				$59,825	
126100	Fixed Audience Seating	$225,000				$225,000	
DIV. 13	**SPECIAL CONSTRUCTION**						
DIV. 14	**CONVEYING SYSTEMS**		**$255,000**				**$255,000**
142000	**Passenger Elevators - FSB**	$255,000				$255,000	
DIV. 21	**FIRE SUPPRESSION**		**$1,317,979**		**$226,977**		**$1,544,956**
210000	**Fire Protection - FSB**	$1,317,979		$226,977		$1,544,956	
DIV. 22	**PLUMBING**		**$3,504,350**				**$3,504,350**
220000	**Plumbing - FSB**	$3,504,350				$3,504,350	
DIV. 23	**HVAC**		**$13,913,586**				**$13,913,586**
230000	**HVAC - FSB**	$13,913,586				$13,913,586	
DIV. 26	**ELECTRICAL**		**$9,832,425**		**$860,800**		**$10,693,225**
260000	**Electrical**	$9,832,425		$860,800		$10,693,225	
DIV. 31	**EARTHWORK**		**$2,723,845**		**$5,077,683**		**$7,801,528**
311000	Site Preparation			$1,012,368		$1,012,368	
312000	Earthwork	$2,723,845		$3,914,705		$6,638,550	
312500	Erosion and Sedimentation Control			$150,610		$150,610	
DIV. 32	**EXTERIOR IMPROVEMENTS**				**$7,326,664**		**$7,326,664**
321000	Pavings			$2,345,287		$2,345,287	
323000	Site Improvements			$4,209,512		$4,209,512	
329900	Landscaping			$771,865		$771,865	
DIV. 33	**UTILITIES**				**$1,903,986**		**$1,903,986**
331000	Water Utilities			$40,000		$40,000	
333000	Sanitary Utilities			$167,095		$167,095	
334000	Storm Utilities			$1,696,891		$1,696,891	
SUBTOTAL DIRECT (TRADE) COST			**$84,181,813**		**$17,626,957**		**$101,808,770**

PM&C

Wildwood Elementary School 18-Mar-25
Wilmington, MA

Schematic Design Cost Estimate GFA 165,035

CONSTRUCTION COST SUMMARY

BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*
BUILDING + SITE SUMMARY				
A10	**FOUNDATIONS**		**$5,818,594**	$35.26
A1010	Standard Foundations	$2,196,232		
A1020	Special Foundations	$0		
A1030	Lowest Floor Construction	$3,622,362		
B10	**SUPERSTRUCTURE**		**$11,031,003**	$66.84
B1010	Upper Floor Construction	$5,301,353		
B1020	Roof Construction	$5,729,650		
B20	**EXTERIOR CLOSURE**		**$14,494,280**	$87.83
B2010	Exterior Walls	$12,000,405		
B2020	Windows	$2,325,955		
B2030	Exterior Doors	$167,920		
B30	**ROOFING**		**$2,660,570**	$16.12
B3010	Roof Coverings	$2,648,070		
B3020	Roof Openings	$12,500		
C10	**INTERIOR CONSTRUCTION**		**$9,676,384**	$58.63
C1010	Partitions	$6,319,051		
C1020	Interior Doors	$1,269,920		
C1030	Specialties/Millwork	$2,087,413		
C20	**STAIRCASES**		**$1,058,675**	$6.41
C2010	Stair Construction	$691,000		
C2020	Stair Finishes	$367,675		
C30	**INTERIOR FINISHES**		**$6,518,455**	$39.50
C3010	Wall Finishes	$1,714,279		
C3020	Floor Finishes	$2,758,498		
C3030	Ceiling Finishes	$2,045,678		
D10	**CONVEYING SYSTEMS**		**$259,620**	$1.57
D1010	Elevator	$259,620		

PM&C

Wildwood Elementary School 18-Mar-25
Wilmington, MA

Schematic Design Cost Estimate GFA 165,035

CONSTRUCTION COST SUMMARY

BUILDING SYSTEM	*SUB-TOTAL*	*TOTAL*	*$/SF*
BUILDING + SITE SUMMARY			
D20 PLUMBING		**$3,504,350**	$21.23
D2000 Plumbing	$3,504,350		
D30 HVAC		**$13,913,586**	$84.31
D3000 HVAC	$13,913,586		
D40 FIRE PROTECTION		**$1,317,979**	$7.99
D4000 Fire Protection	$1,317,979		
D50 ELECTRICAL		**$9,832,425**	$59.58
D5010 Service & Distribution	$2,285,616		
D5020 Lighting & Power	$3,020,225		
D5030 Communication & Security Systems	$3,371,339		
D5040 Other Electrical Systems	$1,155,245		
E10 EQUIPMENT		**$1,298,040**	$7.87
E1010 Equipment	$1,298,040		
E20 FURNISHINGS		**$2,797,852**	$16.95
E2010 Fixed Furnishings	$2,797,852		
E2020 Movable Furnishings			
F10 SPECIAL CONSTRUCTION		**$0**	$0.00
F1000 Special Construction	$0		
F20 DEMOLITION & HAZMAT REMOVALS		**$0**	$0.00
F2010 Building Elements Demolition	$0		
F2020 Hazardous Components Abatement	$0		
TOTAL DIRECT BUILDING COST (Trade Costs)		**$84,181,813**	$510.08

Wildwood Elementary School 18-Mar-25
Wilmington, MA

Schematic Design Cost Estimate GFA 165,035

CONSTRUCTION COST SUMMARY

BUILDING SYSTEM	*SUB-TOTAL*	*TOTAL*	*$/SF*
BUILDING + SITE SUMMARY			
G10 SITE PREPARATION		**$4,013,109**	
G20 SITE IMPROVEMENTS		**$8,197,222**	
G30 SITE MECHANICAL UTILITIES		**$2,418,926**	
G40 SITE ELECTRICAL UTILITIES		**$965,690**	
TOTAL DIRECT SITE COST (Trade Costs)		**$15,594,947**	$94.49
TOTAL DIRECT PROJECT COST (Trade Costs)		**$99,776,760**	$604.58

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
033000	*CONCRETE*						
	Strip Footings	*239*	*CY*				
	Foundation Walls	*438*	*CY*				
	Spread Footings	*1,142*	*CY*				
	Piers	*44*	*CY*				
	Elevator Pit	*30*	*CY*				
	Total Foundation Concrete	*1,893*	*CY*				
	Strip footings/Grade Beams						
	Formwork	**5,500**	sf	18.00	99,000		
	Re-bar	**38,750**	lbs.	2.25	87,188		
	Concrete material; 4,500 psi	**239**	cy	170.00	40,630		
	Placing concrete	**239**	cy	120.00	28,680		
	Foundation walls						
	Formwork	**17,600**	sf	22.00	387,200		
	Re-bar	**43,300**	lbs.	2.25	97,425		
	Concrete material; 4,500 psi	**438**	cy	170.00	74,460		
	Placing concrete	**438**	cy	120.00	52,560		
	Form shelf	**1,850**	lf	12.00	22,200		
	Column Footings						
	Formwork	**12,614**	sf	18.00	227,052		
	Re-bar	**78,268**	lbs.	2.25	176,103		
	Concrete material	**1,142**	cy	170.00	194,140		
	Placing concrete	**1,142**	cy	120.00	137,040		
	Set anchor bolts grout plates	**166**	ea	165.00	27,390		
	Piers						
	Formwork	**2,240**	sf	24.00	53,760		
	Re-bar, 300 lbs/cy	**13,200**	lbs	2.25	29,700		
	Concrete material	**44**	cy	170.00	7,480		
	Placing concrete	**44**	cy	120.00	5,280		
	Elevator Pits; 12" walls/footing/slab	**1**	ea				
	Formwork	**480**	sf	26.00	12,480		
	Re-bar	**288**	lbs	2.25	648		
	Concrete material	**10**	cy	170.00	1,700		
	Placing concrete	**10**	cy	120.00	1,200		
	Slab, complete	**20**	cy	290.00	5,800		
	Sump pit premium	**1**	ea	1,500.00	1,500		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Bituminous dampproofing at brick shelf	**11,100**	sf	4.00	NR		
	Waterproofing at elevator pits	**340**	sf	18.00	6,120		
072100	*THERMAL INSULATION*						
	Insulation, 2"	**11,100**	sf	3.50	38,850		
312000	*EARTHWORK*						
	Strip footings						
	Excavation	**2,433**	cy	14.00	34,062		
	Store onsite	**2,433**	cy	12.00	29,196		
	Backfill with existing material	**2,194**	cy	16.00	35,104		
	Spread footings						
	Excavation	**5,112**	cy	14.00	71,568		
	Store onsite	**5,112**	cy	12.00	61,344		
	Backfill with existing material	**3,970**	cy	16.00	63,520		
	Miscellaneous						
	Gravel fill beneath footings, 12"	**947**	cy	16.00	15,152		
	Perimeter drain	**1,850**	lf	22.00	40,700		
	Allowance for dewatering	**1**	ls	30,000.00	30,000		
	SUBTOTAL					**2,196,232**	
	A1020 SPECIAL FOUNDATIONS						
	No Work in this section						
	SUBTOTAL					-	
	A1030 LOWEST FLOOR CONSTRUCTION						
033000	*CONCRETE*						

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	New Slab on grade, 5" thick	*79,325*	*sf*				
	Vapor barrier	**79,325**	sf	1.50	118,988		
	Mesh reinforcing 15% lap	**91,224**	sf	1.85	168,764		
	Concrete - 5" thick	**1,296**	cy	170.00	220,320		
	Placing concrete	**1,296**	cy	120.00	155,520		
	Moisture mitigation admixture				NR		
	Finishing and curing concrete	**79,325**	sf	4.00	317,300		
	Control joints - saw cut	**79,325**	sf	0.10	7,933		
	Misc.						
	Equipment pads, allowance	**1**	ls	5,000.00	5,000		
	Ramp @ Platform	**220**	sf	35.00	7,700		
072100	*THERMAL INSULATION*						
	Insulation, 2"	**79,325**	sf	3.50	277,638		
312000	*EARTHWORK*						
	Slab on grade						
	Cut - over excavated 5' of fill beneath building	**16,396**	cy	8.00	131,168		
	Stockpile - process (for reuse on site fills outside of building) - removed from landfill disposal below	**3,000**	cy	10.00	30,000		
	Fill - import structural - 25% swell	**26,885**	cy	55.00	1,478,675		
312000	*SOIL DISPOSAL - conversion factor 1.7 to tons*						
	Load excess soils for disposal - soil above impacted soils per PEER's report	**5,147**	cy	2.50	w/ G10		
	Clean non-regulated	**8,750**	tn	18.00	w/ G10		
312000	*SOIL DISPOSAL - conversion factor 1.7 to tons*						
	Load excess soils for disposal - impacted soils	**8,249**	cy	2.50	w/ G10		
	Landfill	**14,023**	tn		w/ G10		
	Compact existing sub-grade	**79,325**	sf	0.50	39,663		
	Compacted granular fill, 12"	**3,085**	cy	48.00	148,080		
	Underslab drainage	**79,325**	sf	2.00	158,650		
	Radon system	**79,325**	sf	3.00	237,975		
	Plumbing E&B	**79,325**	sf	1.50	118,988		
	SUBTOTAL					**3,622,362**	
	TOTAL - FOUNDATIONS						**$5,818,594**
B10	***SUPERSTRUCTURE***	$6,640	per ton				
		1,383	TNS TOTAL FLOORS AND ROOF				
		16.5	/SF				
B1010	**FLOOR CONSTRUCTION**						
033000	*CONCRETE*						
	Concrete on Metal Deck	*88,695*	*sf*				
	WWF reinforcement	**101,999**	sf	1.85	188,698		
	Concrete topping to metal decking, 5-1/4" thick; light weight	**1,509**	cy	280.00	422,520		
	Place and finish concrete	**88,695**	sf	4.00	354,780		
	Rebar to decks	**26,609**	lbs	2.25	59,870		
051200	*STRUCTURAL STEEL FRAMING*						
	Structural steel, 14 psf	**621**	tns	5,000.00	3,105,000		
	Premium for floor over gym, 11 psf	**27**	tns	5,000.00	135,000		
	Metal deck 3"	**88,695**	sf	7.00	620,865		
	Premium for cellular acoustic deck at gym	**4,925**	sf	6.00	29,550		
	Shear studs	**19,710**	ea	3.50	68,985		
	Beam penetrations, allow	**1**	ls	50,000.00	50,000		
078400	*FIREPROOFING/FIRESTOPPING*						
	Fireproofing at steel, 1 hour	**88,695**	sf	3.00	266,085		
	SUBTOTAL					**5,301,353**	
B1020	**ROOF CONSTRUCTION**						
033000	*CONCRETE*						
	WWF reinforcement	**18,343**	sf	1.85	33,935		
	Concrete topping to metal decking, 5-1/4" thick; light weight	**271**	cy	280.00	75,880		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Place and finish concrete - Gym roof and RTUs	**15,950**	sf	4.00	63,800		
	Rebar to decks	**4,785**	lbs	2.25	10,766		
051200	*STRUCTURAL STEEL FRAMING*						
	Structural steel, 14 psf; typical	**597**	tns	5,000.00	2,985,000		
	Premium for gym roof, 11 psf	**42**	tns	5,000.00	210,000		
	Canopies, 20 psf	**27**	tns	5,000.00	135,000		
	Roof edge, bent plate, etc.				incl		
	Shear studs	**3,544**	ea	3.50	12,404		
	Expansion joints	**1**	ls	15,000.00	15,000		
	Roof deck 'N' 3"	**85,240**	sf	7.00	596,680		
	Premium for cellular acoustic deck at gym	**7,590**	sf	6.00	45,540		
	Roof deck @ canopies	**2,710**	sf	7.00	18,970		
	Roof screen support, 10psf	**69**	tn	7,000.00	483,000		
061800	*HEAVY TIMBER CONSTRUCTION*						
	GLB-1; 12" x 24"	**1,190**	lf	250.00	297,500		
	GLB-2; 12" x 30"	**190**	lf	300.00	57,000		
	Glulam install	**1,380**	lf	230.00	317,400		
078400	*FIREPROOFING/FIRESTOPPING*						
	Fireproofing at steel and deck, 1 hour	**77,650**	sf	3.50	271,775		
	Intumescent fireproofing, at gymnasium	**1**	ls	100,000.00	100,000		
	SUBTOTAL					**5,729,650**	
	TOTAL - SUPERSTRUCTURE						**$11,031,003**
B20	***EXTERIOR CLOSURE***	*77,230*	*sf*				
B2010	**EXTERIOR WALLS**	65,545	sf				
042000	*MASONRY*						
	Brick veneer; including detailing	**23,730**	sf	52.00	1,233,960		
	CUVM	**31,035**	sf	70.00	2,172,450		
	Cast stone panels	**6,920**	sf	160.00	1,107,200		
	Cast stone banding/sill, F6/A6.50	**1,130**	lf	200.00	226,000		
	Cast stone sill, L13& L27/A6.50	**1,490**	lf	140.00	208,600		
	Cast stone lintel	**1,240**	lf	120.00	148,800		
	CMU back up, 8"	**5,540**	sf	38.00	210,520		
	4" rigid insulation polyiso	**64,305**	sf	5.00	321,525		
	Miscellaneous flashings	**65,545**	sf	1.00	65,545		
	Staging to exterior wall	**77,230**	sf		incl		
	Canopies						
	Brick at column	**1,105**	sf	55.00	60,775		
	CUVM at column	**735**	sf	80.00	58,800		
	Cast stone panels/trim	**1,200**	sf	160.00	192,000		
	4" rigid insulation polyiso	**3,040**	sf	5.00	15,200		
	Mockup	**1**	ls	50,000.00	50,000		
055000	*MISC. METALS*						
	Brick relieving angle				w/ B10		
	Misc. metals at masonry including loose lintels	**74,125**	sf	1.50	111,188		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Air barrier	**65,545**	sf	9.00	589,905		
	Air barrier at roof edge/overhang	**12,005**	sf	9.00	108,045		
	Air barrier at canopy columns and soffits	**5,730**	sf	9.00	51,570		
	Miscellaneous sealants to closure	**65,545**	sf	0.75	49,159		
	Air barrier/flashing at windows	**6,665**	lf	7.00	46,655		
072100	*THERMAL INSULATION*						
	6" Batt insulation in stud backup	**60,005**	sf	5.00	300,025		
	Insulation at window openings	**6,665**	lf	7.00	46,655		
076400	*CLADDING*						

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	MCM roof edge and soffit	**12,805**	sf	70.00	896,350		
	4" rigid insulation	**12,005**	sf	5.00	60,025		
	Canopies						
	MCM roof edge and soffit	**1,115**	sf	70.00	78,050		
	4" rigid insulation	**1,115**	sf	5.00	5,575		
090003	*ACOUSTICAL TILE*						
	WD-1 Metal works LMS	**1,910**	sf	50.00	95,500		
	4" rigid insulation	**1,910**	sf	5.00	9,550		
092900	*GYPSUM BOARD ASSEMBLIES*						
	Framing and sheathing at roof edge and soffits	**12,005**	sf	24.00	288,120		
	Framing to canopy columns and soffits	**5,730**	sf	24.00	137,520		
	CMFS - 8"	**60,005**	sf	18.00	1,080,090		
	Gypsum Sheathing	**60,005**	sf	4.50	270,023		
	Drywall lining to interior face of stud backup	**60,005**	sf	5.00	300,025		
101400	*SIGNAGE*						
	Exterior signage, allow	**1**	ls	25,000.00	25,000		
108213	*EQUIPMENT ENCLOSURE*						
	Metal panel roof screen, acoustic; 12'	**13,800**	sf	100.00	1,380,000		
	SUBTOTAL					**12,000,405**	
B2020	**WINDOWS**	11,685	sf				
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**6,665**	lf	12.00	79,980		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Backer rod & double sealant	**6,665**	lf	10.00	66,650		
080001	*METAL WINDOWS*						
	Aluminum framed windows, triple glazed	**7,325**	sf	155.00	1,135,375		
	Aluminum Curtainwall, triple glazed	**4,360**	sf	185.00	806,600		
	Storefront	**160**	sf	160.00	25,600		
	Premium for SGS-1	**1,700**	sf	75.00	127,500		
	Sunshades at South elevation windows	**320**	lf	250.00	80,000		
089000	*LOUVERS*						
	Louvers , allow	**50**	sf	85.00	4,250		
	SUBTOTAL					**2,325,955**	
B2030	**EXTERIOR DOORS**						
081110	*HOLLOW METAL*						
	Frame						
	Single	**3**	ea	600.00	1,800		
	Double	**5**	ea	800.00	4,000		
	Sidelight	**21**	sf	70.00	1,470		
	Door						
	F, flush	**3**	ea	1,000.00	3,000		
	FG, 2 glass panels	**10**	ea	1,500.00	15,000		
083323	*OVERHEAD DOOR*						
	Single leaf HM door and frame	**1**	ea	1,600.00	1,600		
	Double leaf HM door and frame	**1**	pr	2,600.00	2,600		
083323	*OVERHEAD DOOR*						
	Coiled doors, motorized						
	10' x 10'	**1**	ea	10,000.00	10,000		
084410	*CURTAINWALL*						
	Glazed aluminum entrance door and hardware in CW frame; single	**1**	ea	8,000.00	8,000		
	Glazed aluminum entrance door and hardware in CW frame; pair	**3**	pr	16,000.00	48,000		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Premium for SGS-1, security glazing to doors	**136**	sf	75.00	10,200		
087100	*DOOR HARDWARE*						
	Exterior door hardware	**13**	ea	1,400.00	18,200		
	Auto openers	**5**	lvs	5,000.00	25,000		
080002	*GLASS AND GLAZING*						
	Glass in doors and sidelights - IG8	**114**	sf	150.00	17,100		
090007	*PAINTING*						
	Paint doors and frames	**13**	ea	150.00	1,950		
	SUBTOTAL					**167,920**	
	TOTAL - EXTERIOR CLOSURE						**$14,494,280**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**	*87,950*	*SF*				
050001	*MISCELLANEOUS METALS*						
	Roof ladders	**1**	ea	5,000.00	5,000		
	Stair grate and landing	**1**	ea	7,500.00	7,500		
061000	*ROUGH CARPENTRY*						
	Roof blocking	**87,950**	sf	1.50	131,925		
070002	*ROOFING AND FLASHING*	87,950	*total area*				
	TPO - coverboard, minimum 9" rigid insulation, AVB	**85,240**	sf	26.00	2,216,240		
	Premium for FR deck sheathing at R1.1	**69,290**	sf	2.00	138,580		
	Canopies	**2,710**	sf	25.00	67,750		
	Miscellaneous Roofing						
	Miscellaneous flashings and sealants	**87,950**	sf	0.50	43,975		
	Walkway pads	**3,710**	sf	10.00	37,100		
	Roof Edge Cladding/Fascia						
	MCM roof edge detail				w/ B2010		
	SUBTOTAL					**2,648,070**	
B3020	**ROOF OPENINGS**						
070002	*ROOFING AND FLASHING*						
	Roof hatch	**2**	ea	5,000.00	10,000		
	Elevator vent	**1**	ea	2,500.00	2,500		
	SUBTOTAL					**12,500**	
	TOTAL - ROOFING						**$2,660,570**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
040001	*MASONRY*						
	E/E1; 8" CMU	**11,897**	sf	40.00	475,880		
	G: 12" CMU	**14,098**	sf	45.00	634,410		
	H; 6" CMU	**1,218**	sf	5.00	6,090		
	Premium for polished ground faced CMU at stair shafts	**7,770**	sf	6.00	46,620		
	Premium for acoustic block at gym	**612**	sf	10.00	6,120		
050001	*MISCELLANEOUS METALS*						
	Seismic clips to CMU	**486**	ea	300.00	145,800		
	Misc. metals & lintels at CMU partitions	**27,213**	sf	2.00	54,426		
061000	*ROUGH CARPENTRY*						
	Wood blocking and misc. rough carpentry as req'd in partitions	**165,035**	gsf	1.00	165,035		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Miscellaneous sealants at partitions	**185,268**	sf	1.00	185,268		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
078400	*FIRESTOPPING*						
	Firestopping at partitions	**165,035**	gsf	1.00	165,035		
080001	*METAL WINDOWS*						
	Interior Storefront at vestibules/main office	**211**	sf	135.00	28,485		
	Interior Storefront at Media	**377**	sf	135.00	50,895		
	Premium for bullet resistant glass	**125**	sf	350.00	43,750		
080002	*GLASS AND GLAZING*						
	Borrowed lights	**1,054**	sf	50.00	52,700		
	Transaction window	**1**	ls	7,500.00	7,500		
081113	*HOLLOW METAL DOORS & FRAMES*						
	Borrowed lights	**1,054**	sf	35.00	36,890		
092900	*GYPSUM BOARD ASSEMBLIES*	*185,268*	*sf*				
	A2/A2A - 6" MS, 2 layers GWB b/s, insulation	**121,424**	sf	25.50	3,096,312		
	B - 3-5/8" MS, 1 layer GWB b/s, insulation	**4,122**	sf	18.50	76,257		
	BR - 6" MS, 1 layer GWB b/s, BR fiberglass o/s, insulation	**440**	sf	70.50	31,020		
	F4- 3-5/8" MS, 1 layer GWB o/s, insulation	**44,729**	sf	13.50	603,842		
	F6- 6" MS, 1 layer GWB o/s, insulation	**11,604**	sf	15.50	179,862		
	S7 - shaft wall	**2,949**	sf	26.00	76,674		
102200	*OPERABLE PARTITIONS*						
	Folding partitions at teacher collaboration/Quiet cafe, 9' high	**744**	sf	120.00	89,280		
	Folding partition at platform, 15' high	**435**	sf	140.00	60,900		
	SUBTOTAL					**6,319,051**	
C1020	**INTERIOR DOORS**						
061000	*ROUGH CARPENTRY*						
	Wood blocking at openings	**5,636**	lf	4.00	22,544		
070001	*WATERPROOFING, DAMPPROOFING AND CAULKING*						
	Backer rod & double sealant	**5,636**	lf	3.50	19,726		
080002	*GLASS AND GLAZING*						
	Sidelight	**1,990**	sf	50.00	99,500		
081113	*HOLLOW METAL DOORS & FRAMES*						
	Single	**268**	ea	450.00	120,600		
	Double	**54**	ea	600.00	32,400		
	Sidelight	**1,990**	sf	35.00	69,650		
081400	*WOOD DOORS*						
	Type F	**285**	ea	650.00	185,250		
	Type FG, 2 glazed panels	**27**	ea	850.00	22,950		
	Type G, glazed panel	**64**	ea	800.00	51,200		
	premium for acoustic gasketing	**1**	ls	2,500.00	2,500		
	premium for ballistic doors	**1**	lvs	2,500.00	2,500		
083110	*ACCESS DOORS AND FRAMES*						
	Access doors	**1**	ls	10,000.00	10,000		
083323	*OVERHEAD GRILLES*						
	OHG 22' x 11'-5"	**1**	ea	25,300.00	25,300		
084110	*ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS*						
	Aluminum door, single leaf full lite w/ hardware	**1**	ea	6,000.00	6,000		
	Aluminum door, dbl leaf full lite w/ hardware	**3**	pr	12,000.00	36,000		
	premium for ballistic doors	**5**	lvs	10,000.00	50,000		
087100	*DOOR HARDWARE*						
	Hardware; includes install	**376**	set	1,100.00	413,600		
	Auto openers	**5**	lvs	5,000.00	25,000		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
090007	*PAINTING*						
	Paint door & frame	**376**	ea	200.00	75,200		
	SUBTOTAL					**1,269,920**	
C1030	**SPECIALTIES / MILLWORK**						
055000	*MISCELLANEOUS METALS*						
	Misc. metals as req'd throughout, allowance	**165,035**	gsf	3.50	577,623		
	Handrail at ramp	**90**	lf	150.00	13,500		
	Railing at open to below spaces (resin panel below)	**58**	lf	300.00	17,400		
061000	*ROUGH CARPENTRY*						
	Backer panels in electrical closets	**1**	ls	10,000.00	10,000		
	Rough carpentry & blocking as req'd throughout, allowance	**165,035**	gsf	0.26	42,909		
064020	*INTERIOR ARCHITECTURAL WOODWORK*						
	Window sills; solid surface	**1,240**	lf	60.00	74,400		
	Resin panel at open to below railing	**58**	lf	250.00	14,500		
	Media						
	Circulation desk	**1**	ls	19,250.00	19,250		
	Custom window seats	**2**	ea	12,000.00	24,000		
	Perimeter bookcase, metal BB02-36	**37**	ea	750.00	27,750		
	Freestanding mobile bookcase,BC3-36 double sided	**18**	ea	1,500.00	27,000		
	Bookcase end unit bookcase, metal BC3-EP	**12**	ea	400.00	4,800		
	Wood veneer panels at bookcase - top and side; 14"	**175**	lf	120.00	21,000		
	Wood veneer panels at mobile bookcase - top; 28"	**54**	lf	240.00	12,960		
	Admin						
	Mail box cubbies	**15**	lf	700.00	10,500		
	Reception desk	**15**	lf	900.00	13,500		
	ELA/SPED						
	Window seats, allow	**6**	ea	4,800.00	28,800		
	Stair 5						
	Built-in seating, allow	**1**	ea	15,000.00	15,000		
	Display cases, allow	**1**	ls	30,000.00	30,000		
	Miscellaneous wood trim and millwork throughout	**165,035**	gsf	1.00	165,035		
101100	*VISUAL DISPLAY SURFACES*						
	Markerboard/Tackboards	**165,035**	gsf	2.50	412,588		
101400	*SIGNAGE*						
	Room signage	**327**	loc	175.00	57,225		
	Code and wayfinding signage	**165,035**	gsf	0.50	82,518		
	Dedication plaque	**1**	ea	1,500.00	1,500		
	Custom graphics	**165,035**	gsf	1.00	165,035		
102110	*TOILET COMPARTMENTS*						
	Toilet partition - standard	**34**	ea	1,900.00	64,600		
	Toilet partition - ADA	**14**	ea	2,500.00	35,000		
	Toilet partition - urinal screen	**1**	ea	900.00	900		
	Curtain at nurse	**3**	loc	1,000.00	3,000		
102800	*TOILET ACCESSORIES*						
	Gang bathrooms	**14**	rms	3,000.00	42,000		
	Individual bathrooms	**35**	rms	1,200.00	42,000		
	Custodial closet accessories	**7**	rms	300.00	2,100		
102600	*CORNER GUARDS*						
	Corner guards	**1**	ls	5,000.00	5,000		
104400	*FIRE PROTECTION SPECIALTIES*						
	Fire extinguisher cabinets	**56**	ea	350.00	19,600		
	AED cabinets - allowance	**2**	ea	450.00	900		
105000	*LOCKERS*						
	Staff lockers at kitchen, double tier	**11**	ope	320.00	3,520		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	SUBTOTAL					**2,087,413**	
	TOTAL - INTERIOR CONSTRUCTION						**$9,676,384**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
033000	*CONCRETE*						
	Concrete to stairs	**4**	flt	4,000.00	16,000		
055000	*MISCELLANEOUS METALS*						
	Stairs 1 & 3	**4**	flt	65,000.00	260,000		
	Stair 2	**2**	flt	65,000.00	130,000		
	Stair 4	**3**	flt	75,000.00	225,000		
	Stair 5, Cafeteria	**1**	flt	60,000.00	60,000		
	SUBTOTAL					**691,000**	
C2020	**STAIR FINISHES**						
064020	*INTERIOR ARCHITECTURAL WOODWORK*						
	Resin panel at Cafeteria stair railing	**33**	lf	250.00	8,250		
090005	*RESILIENT FLOORS*						
	Rubber tread/riser	**600**	lf	45.00	27,000		
	Raised rubber flooring	**1,245**	sf	25.00	31,125		
	Steps at stage; wood riser and tread	**90**	lf	120.00	10,800		
090007	*PAINTING*						
	Paint to stairs	**10**	flt	3,500.00	35,000		
966620	*TERRAZZO FLOORING*						
	Precast terrazzo treads, Stairs 2, 4 & 5	**840**	lf	225.00	189,000		
	Terrazzo at landings	**1,330**	sf	50.00	66,500		
	SUBTOTAL					**367,675**	
	TOTAL - STAIRCASES						**$1,058,675**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
064020	*INTERIOR ARCHITECTURAL WOODWORK*						
	Wood wall panel - Cafeteria	**230**	sf	90.00	20,700		
090002	*TILE*						
	Corridors, cafeteria, etc.; 52"	**16,470**	sf	34.00	559,980		
	Kitchen; full height	**2,450**	sf	34.00	83,300		
	Bathroom wet wall; full height; 7'	**4,249**	sf	34.00	144,466		
	Bathroom wainscot; 7'	**9,625**	sf	36.00	346,500		
	Custodian wainscot; 48"	**1,036**	sf	34.00	35,224		
090007	*PAINTING*						
	Paint to GWB	**334,133**	sf	0.90	300,720		
	Paint to CMU	**37,863**	sf	1.25	47,329		
098400	*ACOUSTIC ROOM COMPONENTS*						
	AWP-1; Wood fiber acoustic wall panel						
	Gymnasium	**920**	sf	28.00	25,760		
	Cafeteria, custom printed image	**760**	sf	45.00	34,200		
	AWP-2; Fabric wrapped acoustical wall panel						
	Cafeteria	**260**	sf	45.00	11,700		
	Music, allow	**300**	sf	45.00	13,500		
	Media/Lobby	**500**	sf	45.00	22,500		
	Acoustic Wood						
	Cafeteria	**760**	sf	90.00	68,400		
	SUBTOTAL					**1,714,279**	

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
C3020	**FLOOR FINISHES**						
003300	*CONCRETE FINISHES*						
	Sealed Concrete	**2,645**	sf	2.50	6,613		
	EPF - Epoxy paint	**3,870**	sf	4.00	15,480		
090002	*TILE*						
	Ceramic floor tile at bathrooms	**6,145**	sf	38.00	233,510		
	Ceramic tile base	**2,240**	lf	32.00	71,680		
	Kitchen tile, assume Quarry tile	**2,670**	sf	40.00	106,800		
	Quarry tile base	**290**	lf	33.00	9,570		
090005	*RESILIENT FLOORS*						
	LIN - Linoleum sheet; Marmoleum up to 10 colors	**84,065**	sf	7.00	588,455		
	RAF- Rubber Athletic Flooring	**2,370**	sf	18.00	42,660		
	RSF - Rubber sheet	**4,625**	sf	14.00	64,750		
	RST - Rubber tile	**540**	sf	16.00	8,640		
	SDT-1, Static dissapative tile	**465**	sf	12.00	5,580		
	Rubber base	**1**	ls	70,000.00	70,000		
096400	*WOOD FLOORING*						
	Wood athletic flooring at Gym	**11,715**	sf	32.00	374,880		
	Ventilating cove base	**465**	lf	10.00	4,650		
	ST-1 , stage	**1,190**	sf	25.00	29,750		
	Moisture mitigation	**11,715**	sf	4.00	46,860		
966620	*TERRAZZO FLOORING*						
	Terrazzo						
	Corridors	**8,590**	sf	40.00	343,600		
	Cafeteria	**8,335**	sf	40.00	333,400		
	Flex classroom	**1,025**	sf	40.00	41,000		
	Quiet café	**450**	sf	40.00	18,000		
	Stairs 2 & 4 at first floor level	**1,005**	sf	40.00	40,200		
	Terrazzo base	**2,680**	lf	40.00	107,200		
096700	*EPOXY FLOORING*						
	EPX-1, resinous epoxy w/ integral base	**900**	sf	26.00	23,400		
	Moisture mitigation	**900**	sf	4.00	3,600		
096820	*CARPETING+ WOM*						
	Carpet tile	**15,485**	sf	7.00	108,395		
	Moisture mitigation				NR		
124810	*ENTRANCE FLOOR MAT AND FRAMES*						
	Walkoff Carpet tiles	**1,200**	sf	18.00	21,600		
	Walkoff Mat - Interior Foot Grille	**695**	sf	55.00	38,225		
	SUBTOTAL					**2,758,498**	
C3030	**CEILING FINISHES**						
090003	*ACOUSTICAL TILE*						
	ACP-1a, 24x24 tile - Armstrong Calla	**88,935**	sf	7.00	622,545		
	ACP-4a, 24x24 tile - Armstrong KitchenZone	**2,900**	sf	8.00	23,200		
	ACP-5a, 24x24 tile - Ceramaguard Fine Fissured	**5,380**	sf	7.50	40,350		
	ACP-6a, 24x24 tile - Optima	**2,000**	sf	9.00	18,000		
	WD-1, Woodworks linear ceiling	**4,535**	sf	50.00	226,750		
090007	*PAINTING*						
	Paint to GWB ceilings	**14,570**	sf	1.00	14,570		
	Paint all exposed structure, deck & mep/fp systems to be painted, incl at Tectum ceilings	**32,620**	sf	2.50	81,550		
092900	*GYPSUM BOARD ASSEMBLIES*						
	GWB ceiling (GWB-1)	**14,570**	sf	18.00	262,260		
	GWB ceiling, 2 hour rated	**65**	sf	20.00	1,300		
	GWB soffits throughout	**165,035**	gsf	1.50	247,553		
098400	*ACOUSTIC ROOM COMPONENTS*						
	Tectum panels attached to underside of deck	**10,520**	sf	30.00	315,600		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Acoustibuilt cloud assemblies						
	4' x 8'	**21**	ea	1,600.00	33,600		
	6' x 12'	**44**	ea	3,600.00	158,400		
	SUBTOTAL					**2,045,678**	
	TOTAL - INTERIOR FINISHES						**$6,518,455**
D10	***CONVEYING SYSTEMS***						
D1010	**ELEVATOR**						
	Passenger elevator, 3 stop, 1 opening; 4500 lbs; 100 fpm	**1**	ea	255,000.00	255,000		
	Pit ladders	**1**	ea	1,620.00	1,620		
	Sill angles	**1**	ea	3,000.00	3,000		
	SUBTOTAL					**259,620**	
	TOTAL - CONVEYING SYSTEMS						**$259,620**
D20	***PLUMBING***						
D2000	**PLUMBING, GENERALLY**						
	Equipment						
	Domestic water service and meter	**1**	ea	15,000.00	15,000		
	Reduced pressure backflow preventer, 4"	**1**	ea	8,500.00	8,500		
	Domestic water heater EWH-1/2, 120 gal. / 18 KW	**2**	ea	40,000.00	80,000		
	Point of use water heaters at lavatories (3/P3.01) - excluded				NIC		
	Thermostatic mixing valve	**2**	ea	3,500.00	7,000		
	Expansion tank, 35 gal.	**2**	ea	2,500.00	5,000		
	Recirc. Pump	**2**	ea	1,800.00	3,600		
	Acid waste neutralization tank (10/P3.01) - excluded				NIC		
	Interior grease interceptor	**2**	ea	4,200.00	8,400		
	Exterior grease interceptor - by div 33, connections by PC	**1**	ea	5,000.00	5,000		
	Elevator sump pump with oil separator	**1**	ea	11,000.00	11,000		
	Domestic water booster system	**1**	ea	36,000.00	36,000		
	Plumbing Fixtures & Specialties						
	Water closet P-1, wall/manual	**34**	ea	1,900.00	64,600		
	Water closet P-1A, P-1B, wall/manual	**49**	ea	1,900.00	93,100		
	Urinal P-2, P-2A, manual	**8**	ea	1,850.00	14,800		
	Lavatory P-3, P-3A, P-3B, wall/sensor	**75**	ea	2,100.00	157,500		
	Countertop sink P-5, P-5A	**126**	ea	1,750.00	220,500		
	Electric water cooler with bottle fill P-6, bi-level	**7**	ea	4,450.00	31,150		
	Mop sink P-7	**7**	ea	1,750.00	12,250		
	Floor drain FD1	**14**	ea	1,100.00	15,400		
	Floor drain FD2	**7**	ea	1,200.00	8,400		
	Trap primer	**10**	ea	950.00	9,500		
	Roof drain RD1	**19**	ea	1,800.00	34,200		
	Overflow drain OD1	**19**	ea	1,800.00	34,200		
	Downspout nozzle	**19**	ea	1,200.00	22,800		
	Hose bibb HB	**14**	ea	450.00	6,300		
	Freezeproof wall hydrant WH	**12**	ea	550.00	6,600		
	Domestic Water Type L Copper Pipe						
	Domestic water piping with fittings & hangers	**165,035**	gsf	6.00	990,210		
	Rough-in & connection to kitchen equipment/fixtures	**1**	ls	25,000.00	25,000		
	Sanitary W&V, Cast Iron Pipe						
	Sanitary waste pipe with fittings below grade	**165,035**	gsf	1.50	247,553		
	Sanitary waste pipe with fittings & hangers above grade	**165,035**	gsf	3.00	495,105		
	Rough-in & connection to kitchen equipment/fixtures	**1**	ls	25,000.00	25,000		
	Storm Drainage, Cast Iron Pipe						
	Storm piping with fittings, below grade	**165,035**	gsf	2.50	412,588		
	Pipe Insulation						
	Domestic water pipe insulation	**165,035**	gsf	1.00	165,035		
	Stormwater pipe insulation, horizontal	**165,035**	gsf	0.25	41,259		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Radon Mitigation System						
	Radon mitigation pipe, stacks, fans, etc. - excluded				NIC		
	Miscellaneous						
	Project management, coordination and BIM	**1**	ls	100,000.00	100,000		
	Testing and flushing	**1**	ls	10,000.00	10,000		
	Coring, cutting, sleeves & sealing	**1**	ls	10,000.00	10,000		
	Hydraulic lifts/rigging	**1**	ls	15,000.00	15,000		
	Commissioning Support	**1**	ls	5,000.00	5,000		
	Fees & permits	**1**	ls	51,800.00	51,800		
	SUBTOTAL					**3,504,350**	
	TOTAL - PLUMBING						**$3,504,350**
D30	***HVAC***						
D3000	**HVAC, GENERALLY**						
	Heating & Cooling Equipment						
	Heat pump chillers ASHP-1/2 (375 gsf/ton)	**440**	ton	3,250.00	1,430,000		
	Pumps P-1 through P-10 w/VFD	**10**	ea	30,000.00	300,000		
	Expansion Tanks ET-1A/1B/2A/2B	**4**	ea	4,000.00	16,000		
	Buffer Tank	**4**	ea	6,000.00	24,000		
	Air Separator AS-AS-1/2	**2**	ea	9,000.00	18,000		
	Chemical Shot Feeder	**2**	ea	3,500.00	7,000		
	Glycol feeder units GF-1/2	**2**	ea	7,500.00	15,000		
	Radiant panels - hydronic	**4,800**	lf	140.00	672,000		
	Unit heaters - hydronic	**8**	ea	1,800.00	14,400		
	Cabinet unit heaters - hydronic	**14**	ea	2,200.00	30,800		
	Electric unit heaters	**1**	ea	1,600.00	1,600		
	Misc. perimeter heating devices	**165,035**	gsf	0.50	82,518		
	Ductless split systems (EMR, MDF, IDF, Electric Rooms)?	**11**	ea	8,500.00	93,500		
	Air Distribution Equipment						
	RTU-A through RTU-H w/HW coil, CHW coil, ERW (0.6 cfm/gsf)	**84,000**	cfm	24.00	2,016,000		
	MAU-1, Roof mounted w/ HW coil, CHW coil	**4,500**	cfm	20.00	90,000		
	Roof curbs	**9**	ea	6,000.00	54,000		
	Exhaust Fans						
	Miscellaneous exhaust fans	**1**	ls	50,000.00	50,000		
	Kitchen hood exhaust fan	**1**	ea	8,000.00	8,000		
	Sheet Metal & Accessories						
	Galvanized steel ductwork and accessories	**180,000**	lb	17.00	3,060,000		
	Duct accessories	**165,035**	gsf	0.50	82,518		
	Registers, grilles & diffusers	**165,035**	gsf	1.20	198,042		
	VAV terminal unit	**61**	ea	1,500.00	91,500		
	Sound attenuators	**16**	ea	1,800.00	28,800		
	Hydronic Piping						
	Hot/chilled water distribution piping w/fittings, valves and accessories	**165,035**	gsf	15.00	2,475,525		
	Refrigerant Piping						
	Refrigerant piping - split system	**1,100**	lf	50.00	55,000		
	Condensate Drain Piping						
	Condensate piping with fittings & hangers	**440**	lf	35.00	15,400		
	Insulation						
	Duct insulation	**65,000**	sf	6.00	390,000		
	Hydronic pipe insulation	**165,035**	gsf	3.00	495,105		
	Condensate drain pipe insulation	**440**	lf	12.00	5,280		
	Refrigerant pipe insulation	**1,100**	lf	12.00	13,200		
	Radon Mitigation System						
	Radon ventilation fan	**17**	ea	1,000.00	17,000		
	4" PVC (Sched 40) - Risers	**750**	lf	54.00	40,500		
	4" PVC (Sched 40) Roof stacks	**17**	ea	1,500.00	25,500		
	Misc. Radon Mitigation accessories	**1**	ls	9,000.00	9,000		
	Automatic Temperature Controls						
	Automatic temperature controls DDC	**165,035**	gsf	7.50	1,237,763		
	Balancing						
	System testing & balancing	**165,035**	gsf	1.00	165,035		
	Miscellaneous						

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Testing and start-up	**1**	ls	20,000.00	20,000		
	Coring, cutting, sleeves & sealing	**1**	ls	15,000.00	15,000		
	Hydraulic lifts/rigging	**1**	ls	30,000.00	30,000		
	Management / Shop drawings / BIM / As-Builts	**1**	ls	300,000.00	300,000		
	Commissioning Support	**1**	ls	15,000.00	15,000		
	Fees and Permits	**1**	ls	205,600.00	205,600		
	SUBTOTAL					**13,913,586**	
	TOTAL - HVAC						**$13,913,586**
D40	***FIRE PROTECTION***						
D4000	**FIRE PROTECTION, GENERALLY**						
	Equipment						
	8" Fire service	**1**	ea	15,000.00	15,000		
	8" Double check valve assembly	**1**	ea	10,000.00	10,000		
	Wet alarm check valve assembly	**1**	ea	6,500.00	6,500		
	Electric bell	**1**	ea	800.00	800		
	Fire department connection	**1**	ea	2,650.00	2,650		
	Fire pump, jockey pump and control panel, 750 GPM / 30 HP	**1**	ls	90,000.00	90,000		
	Zone control valve assembly	**6**	ea	2,800.00	16,800		
	Fire department valve with cabinet	**16**	ea	1,200.00	19,200		
	Sprinkler Heads & Distribution Piping						
	Sprinkler heads	**1,451**	ea	95.00	137,845		
	Main piping	**3,600**	lf	54.00	194,400		
	Distribution piping	**15,961**	lf	44.00	702,284		
	Miscellaneous						
	Project management, coordination and BIM	**1**	ls	75,000.00	75,000		
	Hydraulic calculations	**1**	ls	5,000.00	5,000		
	Coring, cutting, sleeves & sealing	**1**	ls	10,000.00	10,000		
	Hydraulic lifts/rigging	**1**	ls	10,000.00	10,000		
	Commissioning Support	**1**	ls	3,000.00	3,000		
	Fees & permits	**1**	ls	19,500.00	19,500		
	SUBTOTAL					**1,317,979**	
	TOTAL - FIRE PROTECTION						**$1,317,979**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Gear & Distribution						
	Normal Power						
	3000A 277/480V main switchboard	**1**	ls	210,000.00	210,000		
	Submetering	**1**	ls	40,000.00	40,000		
	Meter socket	**1**	ea	350.00	350		
	KHP 277/480V double tub panelboard	**1**	ea	6,500.00	6,500		
	MHP 277/480V panelboard	**7**	ea	3,300.00	23,100		
	LP 277/480V panelboard	**7**	ea	1,700.00	11,900		
	112.5KVA K-13 type transformer	**1**	ea	15,722.00	15,722		
	75KVA K-13 type transformer	**5**	ea	8,861.00	44,305		
	45KVA K-13 type transformer	**9**	ea	6,650.00	59,850		
	30KVA K-13 type transformer	**2**	ea	5,728.00	11,456		
	400A 208/120V distribution panelboard	**1**	ea	7,500.00	7,500		
	400A 120/208V double tub panelboard	**5**	ea	6,600.00	33,000		
	150A 120/208V double tub panelboard	**8**	ea	4,650.00	37,200		
	150A 120/208V panelboard	**1**	ea	2,320.00	2,320		
	100A 120/208V double tub panelboard	**2**	ea	1,700.00	3,400		
	100A disconnect switch	**1**	ea	1,106.00	1,106		
	TVSS	**29**	ea	425.00	12,325		
	Feeders	**165,035**	sf	2.00	330,070		
	Generator Power						
	Generator package, Milton Cat materials allowance	**1**	ls	300,000.00	300,000		
	Installation labor package items:						
	600KW diesel fueled generator set in weatherproof enclosure and 100kw integral load bank, and exterior camlock	**1**	ls	25,000.00	25,000		
	Exterior quick connect with camlock & switches	**1**	ea	2,500.00	2,500		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	1000A 3 pole automatic transfer switch	**1**	ea	2,500.00	2,500		
	200A 3 pole automatic transfer switch	**1**	ea	1,200.00	1,200		
	Docking station	**1**	ea	1,500.00	1,500		
	Remote annunciator panel	**1**	ea	750.00	750		
	Note: 600KW on riser, 350KW in narrative						
	1000A 480/277V distribution panelboard	**1**	ea	50,000.00	50,000		
	225A 277/480V panelboard	**1**	ea	2,670.00	2,670		
	ELP 277/480V panelboard	**5**	ea	1,600.00	8,000		
	OLP panelboard	**1**	ea	2,500.00	2,500		
	75KVA dry type transformer	**2**	ea	8,861.00	17,722		
	45KVA dry type transformer	**2**	ea	6,650.00	13,300		
	400A 120/208V panelboard	**2**	ea	3,300.00	6,600		
	150A 120/208V panelboard	**2**	ea	2,320.00	4,640		
	100A 120/208V panelboard	**6**	ea	1,600.00	9,600		
	TEP panelboard	**3**	ea	1,600.00	4,800		
	EPO	**3**	ea	350.00	1,050		
	TVSS	**22**	ea	425.00	9,350		
	UPS 24kw	**1**	ea	17,000.00	17,000		
	125A 120/208V double tub panelboard	**1**	ea	3,400.00	3,400		
	100A disconnect	**1**	ea	1,106.00	1,106		
	Feeders	**165,035**	sf	2.25	371,329		
	Photovoltaics						
	Infrastructure for future system, allow	**1**	ls	10,000.00	10,000		
	Grounding and Lightning Protection						
	Grounding	**1**	ls	35,000.00	35,000		
	Telecom closet grounding	**3**	ea		Included above		
	Lightning protection system: master label, Heary Bros.	**165,035**	sf	0.50	82,518		
	Equipment Wiring						
	CUH feed, connection & safety switch, allow	**14**	ea	1,200.00	16,800		
	DDC system power	**1**	ls	2,500.00	2,500		
	Elevator cab feed, connection & safety switch, allow	**1**	ea	1,800.00	1,800		
	Elevator feed, connection & safety switch, allow	**1**	ea	4,000.00	4,000		
	Elevator sump pump feed & connection, allow	**1**	ea	1,500.00	1,500		
	EUH feed, connection & safety switch, allow	**1**	ea	1,200.00	1,200		
	EWC feed & connection, allow	7	ea	1,200.00	8,400		
	Fire pump feeds & connections, allow	**1**	ls	10,000.00	10,000		
	Heat pump chillers ASHP-1/2 feed, connection & safety switch, allow	**2**	ea	7,500.00	15,000		
	Jockey pump feed, connection & safety switch, allow	**1**	ea	1,500.00	1,500		
	KEF feed, connection & safety switch, allow	**1**	ea	1,600.00	1,600		
	Kiln 50A feed, connection, 60A FSS & special purpose receptacle	**1**	ls	2,500.00	2,500		
	MAU-1 feed, connection & safety switch WP, allow	**1**	ea	3,500.00	3,500		
	Miscellaneous exhaust fans feed, connection & safety switches, allow	**1**	ls	10,000.00	10,000		
	Projection screen feed, connection & LV to control station, allow	**1**	ls	2,000.00	2,000		
	Pumps with VFD connection feed, connection & safety switch, allow	**10**	ea	2,200.00	22,000		
	Recirc. Pump feed, connection & safety switch, allow	**2**	ea	1,500.00	3,000		
	RTU feed, connection & safety switch WP, allow	**8**	ea	6,200.00	49,600		
	RTU light/recep 20A feed, connection & SS, allow	**8**	ea	1,853.00	14,824		
	UH feed, connection & safety switch, allow	**8**	ea	1,275.00	10,200		
	Kitchen equipment wiring, allow	**1**	ls	12,000.00	12,000		
	Gymnasium equipment wiring, allow	**1**	ls	10,000.00	10,000		
	Equipment wiring not yet detailed, allow	**165,035**	sf	1.50	247,553		
	SUBTOTAL					**2,285,616**	
D5020	**LIGHTING & POWER**						
	Lighting						
	Type LP12	**1**	ea	1,200.00	1,200		
	Type LP2	**1**	ea	300.00	300		
	Type LP4	**44**	ea	430.00	18,920		
	Type LP6	**62**	ea	650.00	40,300		
	Type LP8	**380**	ea	864.00	328,320		
	Type LPG	**30**	ea	450.00	13,500		
	Type LR2	**25**	ea	540.00	13,500		
	Type LR22	**46**	ea	540.00	24,840		
	Type LR4	**202**	ea	430.00	86,860		
	Type LR6	**90**	ea	650.00	58,500		
	Type LR8	**94**	ea	864.00	81,216		
	Type LS2	**8**	ea	300.00	2,400		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Type LS4	**22**	ea	430.00	9,460		
	Type LS6	**21**	ea	650.00	13,650		
	Type LS8	**35**	ea	865.00	30,275		
	Type LWS	**620**	lf	110.00	68,200		
	Type SL3	**41**	ea	300.00	12,300		
	Type SL4	**5**	ea	300.00	1,500		
	Type UC	**176**	lf	100.00	17,600		
	Type PC1 pendant	**126**	ea	900.00	113,400		
	Type PC2 pendant	**63**	ea	900.00	56,700		
	Type RC1	**115**	ea	380.00	43,700		
	Type RC2	**88**	ea	380.00	33,440		
	Type RC4	**9**	ea	380.00	3,420		
	Rooftop fixture, allow	**8**	ea	225.00	1,800		
	Elevator pit light, allow	**2**	ea	225.00	450		
	Exit	**50**	ea	279.00	13,950		
	Lighting not yet detailed, allow	**165,035**	sf	1.90	313,567		
	Lighting Control						
	Lighting control system	**165,035**	sf	1.35	222,797		
	Occupancy sensor	**445**	ea	225.00	100,125		
	Daylight sensor	**57**	ea	225.00	12,825		
	Single pole LV switch	**284**	ea	65.00	18,460		
	Single pole switch	**14**	ea	35.00	490		
	Single pole switch WP, allow	**8**	ea	45.00	360		
	Photocell	**1**	ea	225.00	225		
	Lighting control not yet detailed, allow	**165,035**	sf	0.25	41,259		
	Lighting Circuitry						
	Device Box	**2,550**	ea	35.70	91,035		
	3/4" EMT	**10,000**	lf	9.00	90,000		
	#12 THHN	**50,000**	lf	1.00	50,000		
	12/2 MC	**26,000**	lf	5.25	136,500		
	Cat cabling	**40,000**	lf	2.00	80,000		
	Branch Devices						
	Duplex receptacle	**841**	ea	25.50	21,446		
	Double duplex receptacle	**195**	ea	49.30	9,614		
	Double duplex receptacle in floor box	**4**	ea	49.30	197		
	GFI duplex receptacle	**113**	ea	38.25	4,322		
	Special purpose receptacle, allow	**12**	ea	72.25	867		
	Connection to electric bell	**1**	ea	106.25	106		
	Connection to panel	**6**	ea	106.25	638		
	Floor box	**4**	ea	1,020.00	4,080		
	Branch devices not yet detailed, allow	**165,035**	sf	0.35	57,762		
	Branch Circuitry						
	WP device plate	**10**	ea	21.25	213		
	Device plate	**1,200**	ea	5.10	6,120		
	Device Box	**1,250**	ea	35.70	44,625		
	3/4" EMT	**6,000**	lf	9.00	54,000		
	3/4" PVC in slab, allow to floor boxes	**120**	lf	9.00	1,080		
	#12 THHN	**35,000**	lf	1.00	35,000		
	12/2 MC	**6,000**	lf	5.25	31,500		
	Branch circuitry not yet detailed, allow	**165,035**	sf	1.75	288,811		
	Performance Lighting:						
	Cafeteria performance platform lighting system: ETC as BOD, dimming, stage & house control, accessories, initial hang/focus, start-up & training, allow	**1**	ls	170,000.00	170,000		
	Rough-in: system installation labor, 120V power, boxes & conduit, LV cabling, allow	**1**	ls	42,500.00	42,500		
	SUBTOTAL					**3,020,225**	
D5030	**COMMUNICATION & SECURITY SYSTEMS**						
	Telecommunications						
	Head-end/PBX/system equipment - Cisco proprietary				By Owner		
	P phone	**94**	ea		By Owner		
	Network switches, allowance	**1**	ls	500,000.00	500,000		
	Telephone system, allowance	**1**	ls	85,000.00	85,000		
	MDF fit-out	**1**	ea	17,000.00	17,000		
	IDF fit-out	**2**	ea	5,000.00	10,000		
	1 Port data device	**190**	ea	25.50	4,845		
	1 Port data device, CCTV camera	**7**	ea	25.50	179		

	CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
	Building Detail							
930		2 Port data device	**63**	ea	51.00	3,213		
931		AV Teacher 2-port device	**137**	ea	51.00	6,987		
932		AV FP Flat panel display	**95**	ea	25.50	2,423		
933		Telephone device	**94**	ea	25.50	2,397		
934		TV 2-port	**94**	ea	51.00	4,794		
935		WAP 2-port	**116**	ea	51.00	5,916		
936		AP wireless access point	**116**	ea	1,000.00	116,000		
937		Backbone cabling, allow	**600**	lf	35.00	21,000		
938		Cat cabling	**200,000**	lf	2.00	400,000		
939		Rough-in						
940		MDF rough-in	**1**	ea	4,000.00	4,000		
941		IDF rough-in	**2**	ea	2,500.00	5,000		
942		Device box with 1" conduit stub	**663**	ea	120.00	79,560		
943		Device box with 1" & 1.25" conduit stub	**232**	ea	200.00	46,400		
944		3/4" PVC in slab, allow to floor boxes	**120**	lf	9.00	1,080		
945		4" EMT, allow 2 runs from MDF to the IDFs	**500**	lf	57.67	28,835		
946		4" EMT sleeve, allow	**8**	ea	297.50	2,380		
947		Cable tray, allow	**200**	lf	59.50	11,900		
948		Backboard	**3**	ea	850.00	2,550		
949		Telecommunications not yet detailed, allow	**165,035**	sf	0.50	82,518		
950		Public address/Master clock system						
951		Head-end	**1**	ls	20,000.00	20,000		
952		Clock, allow	**60**	ea	127.50	7,650		
953		Speaker, ceiling mount	**60**	ea	212.50	12,750		
954		Speaker TB talk back	**60**	ea	250.00	15,000		
955		Speaker V volume controlled	**85**	ea	250.00	21,250		
956		CB call button	**60**	ea	120.00	7,200		
957		Speaker cabling	**15,000**	lf	2.00	30,000		
958		Rough-in						
959		Speaker back box	**145**	ea	55.25	8,011		
960		Device box with 1" conduit stub	**205**	ea	150.00	30,750		
961		MC circuitry, clock	**2,000**	lf	5.25	10,500		
962		MC/PA not yet detailed, allow	**1**	ls	20,000.00	20,000		
963		Audio/Visual						
964		Audio Visual equipment, installation labor & LV cabling						
965		Cafetorium Performance audio/visual package, allow	**1**	ls	75,000.00	75,000		
966		Gym audio system, allow	**1**	ls	50,000.00	50,000		
967		Classroom speech reinforcement system: equipment with installation labor, LV cabling & testing: Lightspeed Topcat proprietary	**60**	loc	2,500.00	150,000		
968		Rough-in:						
969		Caf AV Rough-in, allow	**1**	ls	25,000.00	25,000		
970		Gym AV Rough-in, allow	**1**	ls	25,000.00	25,000		
971		Classroom AV Rough-in, allow	**60**	ea	800.00	48,000		
972		Digital signage Rough-in, allow	**1**	ls	35,000.00	35,000		
973		Two-Way Communications						
974		Two-Way Communications - elevator lobby, allow	**1**	ls	6,000.00	6,000		
975		Rough-in				Included above		
976		Bi-directional amplification system						
977		BDA/DAS system	**165,035**	sf	0.85	140,280		
978		Rough-in				Included above		
979		Fire alarm system						
980		Fire alarm control panel w/mass notification	**1**	ea	20,000.00	20,000		
981		Fire alarm remote annunciator	**1**	ea	2,125.00	2,125		
982		Terminal cabinet	**7**	ea	1,402.50	9,818		
983		MNS local operator console, allow	**1**	ea	2,975.00	2,975		
984		MNS message board	**7**	ea	637.50	4,463		
985		Master box	**1**	ea	1,445.00	1,445		
986		Exterior beacon	**2**	ea	255.00	510		
987		Exterior bell	**1**	ea	255.00	255		
988		Knox box	**1**	ea	297.50	298		
989		Manual pull station	**16**	ea	136.00	2,176		
990		Smoke detector	**144**	ea	153.00	22,032		
991		CO detector	**12**	ea	153.00	1,836		
992		Duct smoke detector, allow	**16**	ea	637.50	10,200		
993		Audio/visual device	**441**	ea	136.00	59,976		
994		Visual device	**33**	ea	119.00	3,927		
995		Mass notification visual device	**200**	ea	136.00	27,200		
996		FP equipment connection, allow	**20**	ea	212.50	4,250		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Kitchen connection	**1**	ea	212.50	213		
	Elevator recall connection	**2**	ea	297.50	595		
	Connections to public address, AV etc.	**1**	ls	2,125.00	2,125		
	Monitoring/control module	**60**	ea	212.50	12,750		
	Testing and programming	**1**	ls	12,000.00	12,000		
	Device Box	**968**	ea	35.70	34,558		
	3/4" EMT	**9,500**	lf	9.00	85,500		
	FA cable	**31,000**	lf	1.28	39,680		
	FAMC	**32,500**	lf	5.30	172,250		
	Security systems						
	Head-end	**1**	ls	50,000.00	50,000		
	Access Control System - Genetec proprietary						
	Video Surveillance & Management System - Axis Communications cameras, Genetec VMS NVX proprietary						
	Video Intercom & Door Control System - AiPhone proprietary						
	CCTV camera	**7**	ea	1,250.00	8,750		
	Card reader & additional devices for secure door	**4**	ea	1,500.00	6,000		
	Door contact	**8**	ea	250.00	2,000		
	Duress button, allow	**2**	ea	150.00	300		
	Video intercom system, allow	**1**	ls	10,000.00	10,000		
	Motion detector	**41**	ea	200.00	8,200		
	Security circuitry	**10,000**	lf	2.00	20,000		
	Additional security equipment not yet detailed	**165,035**	sf	2.75	453,846		
	Rough-in:						
	Head-end, antenna etc. rough-in	**1**	ls	5,000.00	5,000		
	Secure door rough-in	**4**	ea	750.00	3,000		
	1 gang device box with conduit stub	**60**	ea	120.00	7,200		
	Rough-in not yet detailed	**165,035**	sf	0.50	82,518		
	SUBTOTAL					**3,371,339**	
D5040	**OTHER ELECTRICAL SYSTEMS**						
	Common Work Results for Electrical	**165,035**	gsf	7.00	1,155,245		
	Temporary power and lights				Included above		
	Coordination, management & support				Included above		
	Testing, seismic, labelling, etc.				Included above		
	Fees and permits				waived		
	SUBTOTAL					**1,155,245**	
	TOTAL - ELECTRICAL						**$9,832,425**
E10	***EQUIPMENT***						
114000	*FOODSERVICE EQUIPMENT*						
	Food service equipment	**1**	ls	800,000.00	800,000		
110000	*EQUIPMENT*						
	Residential appliances, allow	**1**	ls	25,000.00	25,000		
	Art						
	Kiln	**2**	ea	5,000.00	10,000		
	Gym						
	Basketball backstops	**6**	ea	14,000.00	84,000		
	Volleyball sleeves	**1**	ls	5,000.00	5,000		
	Climbing wall, 40' x 8'	**1**	ea	48,000.00	48,000		
	Climbing wall, 32' x 8'	**1**	ea	38,400.00	38,400		
	Cargo nets	**1**	ls	2,500.00	2,500		
	Climbing rope system	**1**	ls	5,000.00	5,000		
	Score board in Gym	**2**	loc	20,000.00	40,000		
	Divider curtain @ gym	**1**	ea	30,000.00	30,000		
	Wall pads - gym	**1,086**	sf	30.00	32,580		
	Wall pads - Calm rooms	**2,752**	sf	30.00	82,560		
115213	*PROJECTION SCREENS*						
	Projection screens - Cafeteria & Gymnasium	**2**	ea	10,000.00	20,000		
116100	*THEATRICAL EQUIPMENT*						
	Rigging equipment, allowance - Cafeteria & Gymnasium	**1**	loc	75,000.00	75,000		
	SUBTOTAL					**1,298,040**	

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST

Building Detail

	TOTAL - EQUIPMENT						**$1,298,040**
	E20 FURNISHINGS						
	E2010 FIXED FURNISHINGS						
122100	*WINDOW TREATMENT*						
	Window treatment, roller shades @ Exterior windows	**7,325**	sf	9.00	65,925		
	Motorized shades, allow	**1**	ls	35,000.00	35,000		
	Manual blackout shades at interior sidelights and borrowed lights	**3,044**	sf	8.00	24,352		
123000	*CASEWORK*						
	Pre-K	**3**	rms		-		
	Base cabinet, SSM countertop	**57**	lf	525.00	29,925		
	Base cabinet, SSM countertop; open shelves	**27**	lf	475.00	12,825		
	Wall cabinet	**24**	lf	300.00	7,200		
	Teacher's wardrobe, 48"	**3**	ea	3,200.00	9,600		
	Tall storage, 36"	**9**	ea	2,400.00	21,600		
	Cubbies, 4 ea; 36" x 84"	**15**	ea	1,800.00	27,000		
	Strides PK-K	**2**	rms		-		
	Base cabinet, SSM countertop	**40**	lf	525.00	21,000		
	Base cabinet, SSM countertop; open shelves	**18**	lf	475.00	8,550		
	Wall cabinet	**16**	lf	300.00	4,800		
	Teacher's wardrobe, 48"	**2**	ea	3,200.00	6,400		
	Tall storage, 36"	**6**	ea	2,400.00	14,400		
	Cubbies, 4 ea; 36" x 84"	**8**	ea	1,800.00	14,400		
	Teacher Work Room	**1**	rms		-		
	Base cabinet, SSM countertop	**47**	lf	525.00	24,675		
	Wall cabinet	**43**	lf	300.00	12,900		
	Work island, 11' x 4'	**1**	ea	10,000.00	10,000		
	Admin Work Space	**1**	rms		-		
	Base cabinet, SSM countertop	**12**	lf	525.00	6,300		
	Solid surface work counter	**30**	lf	200.00	6,000		
	Wall cabinet	**12**	lf	300.00	3,600		
	Music	**1**	rms		-		
	Base cabinet, SSM countertop	**18**	lf	525.00	9,450		
	Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
	Teacher's wardrobe, 48"	**1**	ea	3,200.00	3,200		
	Tall storage, 36"	**1**	ea	2,400.00	2,400		
	Art	**1**	rms		-		
	Base cabinet, SSM countertop	**32**	lf	525.00	16,800		
	Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
	Wall cabinet	**16**	lf	300.00	4,800		
	Teacher's wardrobe, 48"	**1**	ea	3,200.00	3,200		
	Tall storage, 36"	**1**	ea	2,400.00	2,400		
	Kindergarten	**7**	rms		-		
	Base cabinet, SSM countertop	**140**	lf	525.00	73,500		
	Base cabinet, SSM countertop; open shelves	**63**	lf	475.00	29,925		
	Wall cabinet	**56**	lf	300.00	16,800		
	Teacher's wardrobe, 48"	**7**	ea	3,200.00	22,400		
	Tall storage, 36"	**21**	ea	2,400.00	50,400		
	Cubbies, 4 ea; 36" x 84"	**35**	ea	1,800.00	63,000		
	Strides PK-K	**1**	rms		-		
	Base cabinet, SSM countertop	**20**	lf	525.00	10,500		
	Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
	Wall cabinet	**8**	lf	300.00	2,400		
	Teacher's wardrobe, 48"	**1**	ea	3,200.00	3,200		
	Tall storage, 36"	**3**	ea	2,400.00	7,200		

	CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
	Building Detail							
1124		Cubbies, 4 ea; 36" x 84"	**3**	ea	1,800.00	5,400		
1125		Teacher Collaboration	**3**	rms		-		
1126		Base cabinet, SSM countertop	**84**	lf	525.00	44,100		
1127		Wall cabinet	**36**	lf	300.00	10,800		
1128		PT/OT	**1**	rms		-		
1129		Base cabinet, SSM countertop	**20**	lf	525.00	10,500		
1130		Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
1131		Wall cabinet	**9**	lf	300.00	2,700		
1132		Teacher's wardrobe, 48"	**1**	ea	3,200.00	3,200		
1133		Tall storage, 36"	**3**	ea	2,400.00	7,200		
1134		Nurses Suite	**1**	rms		-		
1135		Base cabinet, SSM countertop	**30**	lf	525.00	15,750		
1136		Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
1137		Wall cabinet	**18**	lf	300.00	5,400		
1138		Tall storage, 27"	**2**	ea	2,000.00	4,000		
1139		Stage	**1**	rms		-		
1140		Base cabinet, SSM countertop	**8**	lf	525.00	4,200		
1141		Wall cabinet	**9**	lf	300.00	2,700		
1142		Tall storage, 36"	**1**	ea	2,400.00	2,400		
1143		Music storage	**14**	lf	900.00	12,600		
1144		Flex Classroom	**1**	rms		-		
1145		Base cabinet, SSM countertop	**42**	lf	525.00	22,050		
1146		Adjustable shelves, 3 rows	**8**	lf	150.00	1,200		
1147		Tall storage, 36"	**6**	ea	2,400.00	14,400		
1148		Instrumental Storage	**1**	rms		-		
1149		Base cabinet, SSM countertop	**8**	lf	525.00	4,200		
1150		Tall storage, 36"	**2**	ea	2,400.00	4,800		
1151		Health Classroom	**1**	rms		-		
1152		Base cabinet, SSM countertop	**23**	lf	525.00	12,075		
1153		Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
1154		Wall cabinet	**8**	lf	300.00	2,400		
1155		Teacher's wardrobe, 48"	**1**	ea	3,200.00	3,200		
1156		Tall storage, 36"	**5**	ea	2,400.00	12,000		
1157		General Classroom w/ access	**11**	rms		-		
1158		Base cabinet, SSM countertop	**286**	lf	525.00	150,150		
1159		Base cabinet, SSM countertop; open shelves	**99**	lf	475.00	47,025		
1160		Wall cabinet	**220**	lf	300.00	66,000		
1161		Teacher's wardrobe, 24"	**11**	ea	1,600.00	17,600		
1162		Tall storage, 36"	**11**	ea	2,400.00	26,400		
1163		General Classroom w/o access L2	7	rms		-		
1164		Base cabinet, SSM countertop	**182**	lf	525.00	95,550		
1165		Base cabinet, SSM countertop; open shelves	**63**	lf	475.00	29,925		
1166		Wall cabinet	**56**	lf	300.00	16,800		
1167		Teacher's wardrobe, 48"	7	ea	3,200.00	22,400		
1168		Tall storage, 36"	**21**	ea	2,400.00	50,400		
1169		General Classroom w/o access L3	**14**	rms		-		
1170		Base cabinet, SSM countertop	**364**	lf	525.00	191,100		
1171		Base cabinet, SSM countertop; open shelves	**126**	lf	475.00	59,850		
1172		Wall cabinet	**112**	lf	300.00	33,600		
1173		Teacher's wardrobe, 48"	**14**	ea	3,200.00	44,800		
1174		Tall storage, 36"	**28**	ea	2,400.00	67,200		
1175		Stages	**2**	rms		-		
1176		Base cabinet, SSM countertop	**48**	lf	525.00	25,200		
1177		Base cabinet, SSM countertop; open shelves	**18**	lf	475.00	8,550		
1178		Wall cabinet	**16**	lf	300.00	4,800		
1179		Teacher's wardrobe, 48"	**2**	ea	3,200.00	6,400		
1180		Tall storage, 36"	**4**	ea	2,400.00	9,600		
1181		Cubbies, 4 ea; 36" x 84"	**10**	ea	1,800.00	18,000		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Building Detail							
	Strides 1-5	**3**	rms		-		
	Base cabinet, SSM countertop	**75**	lf	525.00	39,375		
	Base cabinet, SSM countertop; open shelves	**27**	lf	475.00	12,825		
	Wall cabinet	**24**	lf	300.00	7,200		
	Teacher's wardrobe, 48"	**3**	ea	3,200.00	9,600		
	Tall storage, 36"	**6**	ea	2,400.00	14,400		
	Cubbies, 4 ea; 36" x 84"	**15**	ea	1,800.00	27,000		
	Flex CR 257	**1**	rms		-		
	Base cabinet, SSM countertop	**36**	lf	525.00	18,900		
	Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
	Wall cabinet	**18**	lf	300.00	5,400		
	Teacher's wardrobe, 48"	**5**	ea	3,200.00	16,000		
	Staff lunch	**1**	rms		-		
	Base cabinet, SSM countertop	**11**	lf	525.00	5,775		
	Wall cabinet	**11**	lf	300.00	3,300		
	ELL	**2**	rms		-		
	Base cabinet, SSM countertop	**32**	lf	525.00	16,800		
	STE	**1**	rms		-		
	Base cabinet, SSM countertop	**45**	lf	525.00	23,625		
	Base cabinet, SSM countertop; open shelves	**9**	lf	475.00	4,275		
	Wall cabinet	**21**	lf	300.00	6,300		
	Teacher's wardrobe, 48"	**6**	ea	3,200.00	19,200		
	Library Workroom	**1**	rms		-		
	Base cabinet, SSM countertop	**16**	lf	525.00	8,400		
	Solid surface work counter	**24**	lf	200.00	4,800		
	Wall cabinet	**12**	lf	300.00	3,600		
	Adjustable shelves, 3 rows	**10**	lf	150.00	1,500		
	Corridors L2 & 3						
	Cubbies, 4 ea; 36" x 84"	**160**	ea	1,800.00	288,000		
	Tall storage, 36"	**50**	ea	2,400.00	120,000		
126100	*FIXED AUDIENCE SEATING*						
	Bleacher, motorized telescoping, 600 seat capacity	**1**	ls	225,000.00	225,000		
	SUBTOTAL					**2,797,852**	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner				NIC		
	SUBTOTAL					-	
	TOTAL - FURNISHINGS						**$2,797,852**
F10	***SPECIAL CONSTRUCTION***						
F1000	**SPECIAL CONSTRUCTION**						
	No items in this section						
	SUBTOTAL					-	
	TOTAL - SPECIAL CONSTRUCTION						
F20	***SELECTIVE BUILDING DEMOLITION***						
F2010	**BUILDING ELEMENTS DEMOLITION**						
	See summary						
	SUBTOTAL					-	
F2020	**HAZARDOUS COMPONENTS ABATEMENT**						
	See summary						
	SUBTOTAL					-	
	TOTAL - SELECTIVE BUILDING DEMOLITION						

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
G10	***SITE PREPARATION***						
G1010	**SITE CLEARING**						
311000	*GENERAL CONDITIONS*						
	Mobilization & Demobilization	**1**	ea	80,000.00	80,000		
	Temporary signs	**1**	ls	20,000.00	20,000		
	Wheel wash rack	**1**	ls	20,000.00	20,000		
	Engineering/layout	**1**	ls	50,000.00	50,000		
	As-builts	**1**	ls	5,000.00	5,000		
	Concrete pump staging areas	**2**	loc	10,000.00	20,000		
	Concrete washout area	**1**	ea	2,500.00	2,500		
	Dewatering allowance	**1**	ea	25,000.00	25,000		
	Snow removal - allowance	**1**	ls		GR's		
	Winter conditions - allowance	**1**	ls		GR's		
	Police details	**1**	ls		GR's		
	Site security	**1**	ls		GR's		
	Job site construction trailer	**1**	ls		GR's		
	Temp utilities for job trailer	**1**	ls		GR's		
311000	*PHASING*						
	6' high site construction fence	**3,743**	lf	30.00	112,290		
	Site construction fence maintenance	**3,743**	lf	10.00	37,430		
	6' high site construction fence sliding gate	**1**	loc	10,000.00	10,000		
	Site construction entrance and removal/restoration	**1**	loc	12,000.00	12,000		
	Site construction fence maintenance	**3,743**	lf	8.00	29,944		
	Relocate play equipment and site furnishings and furnish to owner	**1**	ls	25,000.00	25,000		
	Remove exisitng irrigation from fields	**1**	ls	10,000.00	10,000		
	Provide extended sidewalk for pedestrian access during construction	**1**	ls	25,000.00	25,000		
	Provide connection to salem street - sewer	**1**	ls	50,000.00	50,000		
	Temporary paving; 2" thick - staging area	*32,315*	*sf*				
	Cut and prep	**239**	cy	15.00	3,585		
	gravel base; 6" thick	**598**	cy	48.00	28,704		
	Binder pavement	**32,315**	sf	2.00	64,630		
	geotextile	**32,315**	sf	0.55	17,773		
311000	*SITE SALVAGE ITEMS*						
	Salvage soccer field plaque for relocation	**1**	ls	500.00	500		
	Salvage playground memorial signage for relocation	**1**	ls	2,500.00	2,500		
	Salvage bench	**1**	ea	500.00	500		
311000	*SITE DEMOLITION AND RELOCATIONS*						
	Demolish existing paving	**71,729**	sf	1.25	89,661		
	Demolish existing concrete	**7,364**	sf	2.00	14,728		
	Demolish curbing	**1,061**	lf	6.00	6,366		
	Demolish steps	**127**	lf	20.00	2,540		
	Demolish fencing	**922**	lf	5.00	4,610		
	Demolish existing handrails	**37**	lf	25.00	925		
	Demolish existing school sign	**1**	loc	2,500.00	2,500		
	Demolish existing irrigation pumphouse	**1**	loc	5,000.00	5,000		
	Miscellaneous site demolition; furnishings, concrete pads, signs etc.	**1**	ls	25,000.00	25,000		
311000	*UTILITY DEMOLITION*						
	Demolish existing utility lines	**1,609**	lf	25.00	40,225		
	Demolish temporary drain line	**263**	lf	25.00	6,575		
	Demolish existing utility structures	**11**	ea	500.00	5,500		
	Demolish existing AC units	**5**	ea	500.00	2,500		
	Cut/cap utility lines	**1**	ls	25,000.00	25,000		
311000	*ROADWAY WORK*						
	Sawcut	**620**	lf	8.25	5,115		
	Remove pavement	**298**	sf	3.50	1,043		
	Temp pavement patching	**298**	sf	8.00	2,384		
	Steel plates	**1**	ls	2,500.00	2,500		
	Police details	**5**	dy	850.00	4,250		
	Permanent pavement patch	**298**	sf	10.00	2,980		
311000	*VEGETATION & TOPSOIL MANAGEMENT*						
	Clear and grub	**8**	acre	5,000.00	40,000		
	Remove existing trees	**4**	ea	850.00	3,400		
	Remove infield mix	**18,747**	sf	0.50	9,374		
	Strip + dispose topsoil	**6,306**	cy	6.00	37,836		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
	Strip + stockpoile topsoil	**7,000**	cy	11.00	77,000		
312000	*SOIL DISPOSAL - conversion factor 1.7 to tons*						
	Load excess soils for disposal	**6,306**	cy	2.50	15,765		
	Clean non-regulated	**10,720**	tn	18.00	192,960		
	Premium for arsenic disposal	**10,720**	tn	30.00	321,600		
	Street sweeping allowance during hauling	**12**	dys	1,500.00	18,000		
312000	*EROSION & SEDIMENT CONTROL*						
	Silt Fence; installation and removal - shown on C1.00	**3,743**	lf	20.00	74,860		
	Silt Sacks; installation and removal	**3**	ea	250.00	750		
	Street sweeping & dust control allowance	**1**	ls	50,000.00	50,000		
	Erosion Control monitoring & maintenance	**1**	ls	25,000.00	25,000		
	SUBTOTAL					1,768,303	
312000	*BUILDING SOILS*						
	SOIL DISPOSAL - conversion factor 1.7 to tons						
	Load excess soils for disposal - soil above impacted soils per PEER's report	**5,147**	cy	2.50	12,868		
	Clean non-regulated	**8,750**	tn	18.00	157,500		
312000	*SOIL DISPOSAL - conversion factor 1.7 to tons*						
	Load excess soils for disposal - impacted soils	**8,249**	cy	2.50	20,623		
	Clean non-regulated	**14,023**	tn	18.00	252,414		
312000	*SITE EARTHWORK*						
	Site cut to design subgrade - phase 1	*1,860*	*cy*				
	Cut	**1,860**	cy	8.00	14,880		
	Stockpile - process	**1,860**	cy	10.00	18,600		
	Site fill to design subgrade - phase 1	*8,095*	*cy*				
	Fill - using site cut soils	**1,860**	cy	10.00	18,600		
	Fill - using building cut soils	**3,000**	cy	10.00	30,000		
	Fill - imported; swell 25%	**4,044**	cy	48.00	194,112		
	Site cut to design subgrade - phase 2	*2,930*	*cy*				
	Cut	**2,930**	cy	8.00	23,440		
	Stockpile - process	**2,930**	cy	10.00	29,300		
	Site fill to design subgrade - phase 2	*4,299*	*cy*				
	Fill - using cut soils	**2,930**	cy	10.00	29,300		
	Fill - imported; swell 25%	**1,711**	cy	48.00	82,128		
312000	*SOIL DISPOSAL FOR SUBSURFACE SYSTEMS*						
	SOIL DISPOSAL - conversion factor 1.7 to tons						
	Load excess soils for disposal	**8,865**	cy	2.50	22,163		
	Clean non-regulated	**15,071**	tn	18.00	271,278		
312000	*SOIL ALLOWANCES*						
	Allowance for unsuitables	**500**	cy	100.00	50,000		
	Allowance for arsenic soil disposal - premium	**1**	ls	750,000.00	750,000		
312000	*ESTABLISHING GRADE*						
	Sub grade establishment	**544,000**	sf	0.15	81,600		
	Fine grading throughout the site	**544,000**	sf	0.25	136,000		
312000	*HAZARDOUS MATERIALS*						
	UST removal allowance	**1**	ls	50,000.00	50,000		
	SUBTOTAL					2,244,806	
	TOTAL - SITE PREPARATION						**$4,013,109**
G20	***SITE IMPROVEMENTS***						
G2010	**ROADWAYS**						
321000	***ROADWAYS AND PARKING LOTS***						
	Asphalt Paving; parking lots and roadway	*143,085*	*sf*				
	dense grade; 18" thick - per geotech	**7,949**	cy	50.00	397,450		
	asphalt top; 1.5" thick	**1,368**	tns	210.00	287,280		
	asphalt binder; 3" thick	**2,736**	tns	200.00	547,200		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
320000	*CURBING*						
	VGC	**5,020**	lf	65.00	326,300		
	PCC	**2,056**	lf	40.00	82,240		
	ADA Curb cuts	**28**	ea	850.00	23,800		
320000	*ROAD MARKINGS AND SIGNS*						
	Parking spot	**190**	ea	85.00	16,150		
	Parking spot ADA	**9**	ea	250.00	2,250		
	Sign allowance	**1**	ls	25,000.00	25,000		
	Pavement markings allowance	**1**	ls	20,000.00	20,000		
	Crosswalk hatching	**10**	loc	2,500.00	25,000		
	SUBTOTAL					1,752,670	
321000	***PEDESTRIAN PAVING***						
	Concrete sidewalks	*52,066*	*sf*				
	gravel base; 18" thick - per geotech	**2,893**	cy	50.00	144,650		
	Broom finish concrete paving; 6" thick	**52,066**	sf	17.00	885,122		
	Concrete pads	*930*	*sf*				
	gravel base; 18" thick - per geotech	**52**	cy	50.00	2,600		
	Broom finish concrete paving; 8" thick	**930**	sf	19.00	17,670		
	SUBTOTAL					1,050,042	
323000	***SITE IMPROVEMENTS***						
	SITE FURNISHINGS						
	Bollards - qty per spec	**19**	ea	2,800.00	53,200		
	Bollards - with light (wiriing w/ electrical) - qty per spec	**18**	ea	3,000.00	54,000		
	School sign - allowance, not drawn	**1**	ea	25,000.00	25,000		
	Bike racks - qty per plans	**18**	ea	1,075.00	19,350		
	Raised planters - reinforced plastic composite	**6**	ea	2,500.00	15,000		
	Flagpole	**2**	ea	7,000.00	14,000		
	Flagpole foundation	**2**	ea	4,500.00	9,000		
	Trash and Recycling receptacles - qty per plans	**13**	ea	2,500.00	32,500		
	Benches - backed with armrest - qty per spec	**12**	ea	3,500.00	42,000		
	Benches - sculptural	**3**	ea	5,500.00	16,500		
	Benches - curved	**3**	ea	4,500.00	13,500		
	Benches - free form	**4**	ea	5,900.00	23,600		
	Modular block seats - movable	**9**	ea	1,200.00	10,800		
	Tables with integral seats - incl. ADA tables	**8**	ea	3,500.00	28,000		
	Lightpost foundations	**32**	ea	875.00	28,000		
	Shade sails with engineered footings	**3**	ea	45,000.00	135,000		
	Shed - 10'x 12'	**1**	ea	12,000.00	12,000		
	Outdoor chalkboards per spec	**1**	ls	13,000.00	13,000		
	Soccer goals	**2**	ea	4,500.00	9,000		
	Allowance to install salvaged items	**1**	ls	10,000.00	10,000		
320000	*SPORTS COURTS*						
	Pavement areas	*10,593*	*sf*				
	gravel base; 8" thick	**263**	cy	50.00	13,150		
	asphalt top; 1.5" thick	**99**	tns	225.00	22,275		
	asphalt binder; 1.5" thick	**99**	tns	200.00	19,800		
	Basketball hoops	**4**	ea	6,700.00	26,800		
	Basketball court color coating	**10,593**	sf	3.00	31,779		
	PLAY AREAS						
	Playgrounds	26,374	*sf*				
	gravel base; 12" thick	**977**	cy	50.00	48,850		
	Play surfacing	**26,374**	sf	36.00	949,464		
	Drainage allowance	**26,374**	sf	4.00	105,496		
	PIP edging	**989**	lf	65.00	64,285		
	Allowance for play equipment	**1**	ls	1,024,380.00	1,024,380		
	Allowance to reinstall salvaged play equipment	**1**	ls	200,000.00	200,000		
	Synthetic lawn - gathering area	5,367	*sf*				
	Synthetic lawn system	**5,367**	sf	25.00	134,175		
	Synthetic lawn edging - CIP curb with nailer board per spec	**1,189**	lf	80.00	95,120		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
	Hardscape play	*8,542*	*sf*				
	gravel base; 8" thick	**212**	cy	50.00	10,600		
	asphalt top; 1.5" thick	**80**	tns	225.00	18,000		
	asphalt binder; 1.5" thick	**11**	tns	200.00	2,200		
	Allownce for painted games	**1**	ls	25,000.00	25,000		
	FENCING						
	4' Ht - Chain link fence	**617**	lf	65.00	40,105		
	4' Ht - Chain link double gate	**2**	ea	2,500.00	5,000		
	4' Ht - Ornamental - crash rated at playground - carried steel fencing	**633**	lf	390.00	246,870		
	4' Ht - Ornamental single gate	**2**	ea	2,800.00	5,600		
	8' Ht - Ornamental - Metal louver screen fence	**172**	lf	1,350.00	232,200		
	8' Ht - Ornamental single gate	**1**	ea	3,800.00	3,800		
	8' Ht - Ornamental double gate	**1**	ea	15,000.00	15,000		
	10' Ht - Chain link fence - sport courts	**581**	lf	125.00	72,625		
	10' Ht - Chain link double gate	**2**	ea	4,000.00	8,000		
	Wood privacy fence	**317**	lf	65.00	20,605		
	Vehicular gate	**3**	ea	8,500.00	25,500		
329900	*SITE WALLS*						
	Prefabricated stone wall- 4' ht. - per LA spec	*175*	*lf*				
	Prefabricated wall	**175**	lf		incl. below		
	Excavation	**36**	cy	100.00	incl. below		
	Backfill - (assume using onsite soils)	**11**	cy	35.00	incl. below		
	Wall drain	**175**	lf	22.00	incl. below		
	Monolithic granite seatwall - slab footer - 1.5' ht.	*131*	*lf*				
	Granite seatwall	**131**	lf	1,500.00	196,500		
	Concrete - below grade and to frost	**131**	lf	350.00	45,850		
	Excavation	**27**	cy	100.00	2,700		
	Backfill - (assume using onsite soils)	**8**	cy	25.00	200		
	Wall drain	**131**	lf	22.00	2,882		
	Cast-in-place seat wall - 1.5' ht.	*72*	*lf*				
	Concrete	**72**	lf	471.00	33,912		
	Excavation	**15**	cy	100.00	1,500		
	Backfill - (assume using onsite soils)	**5**	cy	35.00	175		
	Wall drain	**72**	lf	22.00	1,584		
	Segmental Wall- 4' ht. - between parking lot and basketball - per civil plans	*175*	*lf*				
	Large block wall	**875**	sf	55.00	48,125		
	Excavate and prepare wall base	**39**	cy	100.00	3,900		
	Backfill wall - crushed stone	**26**	cy	65.00	1,690		
	Backfill-controlled placement; above grade - on-site soils no geogrid	**104**	cy	35.00	3,640		
	Geotextiles	**1,313**	sf	2.50	3,283		
	Wall drain	**175**	lf	22.00	3,850		
	Wall cap	**175**	lf	100.00	17,500		
	Guardrail - grouted into cap	**175**	lf	325.00	56,875		
	SUBTOTAL					4,454,295	
	Landscaping						
329900	*TOPSOIL*						
	Screen topsoil	**7,000**	cy	7.50	52,500		
	Export tailings from screening process - assume clean rock	**2,100**	cy	8.50	17,850		
	Amend/Place	**4,900**	cy	20.00	98,000		
	Topsoil - imported 6" thick; swell 25%	**4,641**	cy	65.00	Removed		
	Soil and mulch at planting areas; 12" thick	**167**	cy	80.00	13,360		
	Drip strip allownce	**1**	ls	30,000.00	30,000		
329900	*LAWN AND SEED - included size of septic field in seeding*	*200,518*	*sf*				
	Topsoil required - imported 6" thick	**3,713**	cy		incl. above		
	Scarify subgrade	**200,518**	sf	0.25	50,130		
	Power rake and hydroseed disturbed areas	**187,018**	sf	0.45	84,158		
	Sod at U8 soccer field	**13,500**	sf	1.75	23,625		
	Slope stabilization matting; 3:1 slopes	**10,568**	sf	1.25	13,210		
329900	*TREES*						

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
	Deciduous trees; 3-3.5" cal.	**93**	ea	2,500.00	232,500		
	Evergreen trees	**62**	ea	1,500.00	93,000		
329900	*SHRUBS AND GROUNDCOVERS*						
	Deciduous shrub	**3,200**	sf	10.00	32,000		
	Shrubs and perennials	**3,200**	sf	5.00	16,000		
329900	*MAINTENANCE*						
	1-yr plant maintenance	**1**	ls	37,350.00	37,350		
	1-yr lawn maintenance	**1**	ls	10,000.00	10,000		
	Irrigation to establish lawn areas	**1**	ls	50,000.00	50,000		
329900	*IRRIGATION*						
	Natural lawn with irrigation areas	**7,762**	sf	3.00	NIC		
	U8 field irrigation	**13,500**	sf	2.75	37,125		
	Potential irrigation at soccer fields	**17,966**	sf	2.75	49,407		
	Irrigation of three natural turf fields	**25,593**	sf	1.50	NIC		
	SUBTOTAL					940,215	
	TOTAL - SITE IMPROVEMENTS						**$8,197,222**
G30	***SITE MECHANICALS***						
G3010	**WATER SUPPLY**						
210000	*FIRE PROTECTION*						
	8" CLDI	**2,361**	lf	67.50	159,368		
	6" CLDI	**70**	lf	49.64	3,475		
	Fire department connection	**1**	ea	2,500.00	2,500		
	Gate valve	**14**	ea	1,850.00	25,900		
	Fire hydrant	**4**	ea	6,500.00	26,000		
	Thrust blocks	**15**	ea	500.00	7,500		
331000	*WATER UTILITIES*						
	6" CLDI	**45**	lf	49.64	2,234		
331000	*CONNECTIONS*						
	Connect to existing water line; 6/8/10 (in roadway)	**2**	ea	20,000.00	40,000		
312000	*EXCAVATION & BACKFILL*	*2,476*	*lf*				
	DI gravity piping excavation	**2,201**	cy	46.75	102,897		
	Trench bedding	**495**	cy	38.50	19,058		
	Pressure test & chlorinate	**2,476**	lf	5.00	12,380		
	Allowance for temporary support of existing utilities	**1**	ea	15,000.00	NR		
	SUBTOTAL					401,312	
G3020	**SANITARY SEWER**						
333000	*SANITARY SEWER*						
	8" PVC	**1,211**	lf	45.00	54,495		
	SMH - 0-5' deep	**12**	ea	4,800.00	57,600		
	Grease trap - 5,000 gal.	**1**	ea		w/ plumbing		
333000	*CONNECTIONS*						
	Connect to existing structure (inside site)	**1**	ea	5,000.00	5,000		
312000	*EXCAVATION & BACKFILL - Gravity*	*1,211*	*lf*				
	PVC gravity piping excavation	**1,076**	cy	46.75	50,303		
	Trench bedding	**359**	cy	38.50	13,822		
	Pressure testing	**1,211**	lf	4.00	4,844		
	Video Inspection	**1**	ls	10,000.00	NR		
	Grease trap; 5,000 gal. (e/b only) incl. shoring	**1**	ea	10,000.00	10,000		
	Allowance for temporary support of existing utilities	**1**	ea	15,000.00	NR		
	SUBTOTAL					196,064	
G3030	**STORM SEWER**						
334000	*STORM DRAINAGE*						
	15" HDPE	**10**	lf	90.00	900		
	12" HDPE	**2,622**	lf	70.00	183,540		
	4' Dia. DMH - 0-5' deep	**31**	ea	4,800.00	148,800		
	DMH - 0-5' doghouse	**2**	ea	8,000.00	16,000		
	WQS - not shown carried 1 per sub-surface system inlet				NR		
	CO	**2**	ea	1,200.00	2,400		

CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
Site Detail							
	CB - 4' Dia.	**23**	ea	4,200.00	96,600		
	Roof drain connections	**2**	ea	500.00	1,000		
334000	*CONNECTIONS*						
	Connect to existing structure installed during phasing	**3**	ea	5,000.00	15,000		
334000	*SUBSURFACE DRAINAGE SYSTEMS*						
	Underground recharger	*18,280*	*sf*				
	Cultech 330 HD Chambers	**514**	ea	425.00	218,450		
	Cultech 330 HD end cap and installation - allowance	**50**	ea	350.00	17,500		
	Excavate	**4,062**	cy	15.00	60,930		
	Load excess soils for disposal	**4,062**	cy	2.50	w_G10		
	Clean non-regulated	**6,905**	tn	18.00	w_G10		
	Install stone base; 12" thick	**1,117**	tn	65.00	72,605		
	Fine grade base	**18,280**	sf	0.25	4,570		
	Back-fill infiltration bed with 1-2" crushed stone; 2.3 cy/ea	**1,478**	cy	60.00	88,680		
	Geotextile fabrics	**45,700**	sf	0.75	34,275		
	Infiltration System	*5,739*	*sf*				
	36" HDPE	**1,440**	lf	100.00	144,000		
	Excavate - assume 8' to remove buried organics	**2,551**	cy	15.00	38,265		
	Load excess soils for disposal	**2,551**	cy	2.50	w_G10		
	Clean non-regulated	**4,337**	tn	18.00	w_G10		
	Install sand backfill for over-ex; 36" thick	**797**	cy	50.00	39,850		
	Install stone base; 12" thick	**266**	cy	55.00	14,630		
	Fine grade base	**5,739**	sf	0.25	1,435		
	Back-fill infiltration bed with 1-2" crushed stone	**3,189**	cy	50.00	159,450		
	Geotextile fabrics	**14,348**	sf	0.75	10,761		
	Temporary drainage						
	Temporary drainage line for existing parking	**263**	lf	80.00	21,040		
	12" HDPE	**72**	lf	70.00	5,040		
	15" HDPE	**120**	lf	90.00	10,800		
	4' Dia. DMH - 0-5' deep	**5**	ea	4,800.00	24,000		
	DMH - 0-5' doghouse	**1**	ea	8,000.00	8,000		
	CB - 4' Dia.	**2**	ea	4,200.00	8,400		
	Infiltration System	*5,068*	*sf*				
	36" HDPE	**1,260**	lf	100.00	126,000		
	Excavate - assume 8' to remove buried organics	**2,252**	cy	15.00	33,780		
	Load excess soils for disposal	**2,252**	cy	2.50	w_G10		
	Clean non-regulated	**3,828**	tn	18.00	w_G10		
	Install sand backfill for over-ex; 36" thick	**704**	cy	50.00	35,200		
	Install stone base; 12" thick	**235**	cy	55.00	12,925		
	Fine grade base	**5,068**	sf	0.25	1,267		
	Back-fill infiltration bed with 1-2" crushed stone	**2,815**	cy	50.00	140,750		
	Geotextile fabrics	**12,670**	sf	0.75	9,503		
	Provide protection for system once installed	**5,068**	sf	3.00	15,204		
	SUBTOTAL					1,821,550	
G3060	**FUEL DISTRIBUTION**						
220001	*NATURAL GAS*						
	No work in this section						
	SUBTOTAL					-	
	TOTAL - SITE MECHANICAL UTILITIES						**$2,418,926**
G40	***SITE ELECTRICAL UTILITY***						
G40	**ELECTRICAL**						
	Civil						
	Concrete:						
	Power/Telecom ductbank	**540**	lf	45.00	24,300		
	Primary ductbank	**130**	lf	30.00	3,900		
	Secondary ductbank	**130**	lf	40.00	5,200		
	Generator ductbank	**180**	lf	35.00	6,300		
	Concrete pad	**1**	ea	2,500.00	2,500		
	Light pole bases, allow	**1**	ls	20,000.00	20,000		
	Excavation & Backfill:						

	CODE	DESCRIPTION	QTY	UNIT	UNIT COST	COST	SUBTOTAL COST	TOTAL COST
		Site Detail						
384		Power/Telecom ductbank	**540**	lf	25.00	13,500		
385		Primary ductbank	**130**	lf	18.00	2,340		
386		Secondary ductbank	**130**	lf	25.00	3,250		
387		Generator ductbank	**180**	lf	20.00	3,600		
388		Lighting/Security/EV circuitry, allow	**1**	ls	20,000.00	20,000		
389								
390		Power						
391		Manhole, new	**1**	ea	8,500.00	8,500		
392		Power/Telecom ductbank	**540**	lf	150.00	81,000		
393		Primary ductbank	**130**	lf	50.00	6,500		
394		Primary cabling	**1**	ls	55,000.00	55,000		
395		Transformer	**1**	ls	200,000.00	200,000		
396		Transformer grounding (transformer by Util Co)	**1**	ls	1,000.00	1,000		
397		Secondary ductbank	**130**	lf	1,050.00	136,500		
398		Generator ductbank	**180**	lf	660.00	118,800		
399		Telecommunications						
400		Manhole, new	**1**	ea	8,500.00	8,500		
401		Communication ductbank, empty	**250**	lf	100.00	25,000		
402		Photovoltaic				NIC		
403		Electric Vehicle Stations						
404		Dual EV stations (allow)				NIC		
405		Empty conduit for future EV stations, allow	**1**	ls	25,000.00	25,000		
406		Security						
407		Site cameras with conduit & wiring, allow	**1**	ls	20,000.00	20,000		
408		Site lighting						
409		Site lighting fixtures with poles, grounding, installation labor, control & circuitry, allow	**1**	ls	175,000.00	175,000		
410		SUBTOTAL					965,690	
… 412								
413		***TOTAL - SITE ELECTRICAL UTILTIES***						**$965,690**

CONSTRUCTION MANAGER'S CONSTRUCTION COST ESTIMATE

Fontaine Brother's cost estimate is attached.

Value Engineering Log is also attached.

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FONTAINE BROS., INC.

WILMINGTON ELEMENTARY SCHOOL

RECONCILED SD ESTIMATE

Project #2633
Wilmington, MA

March 18, 2025

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Wilmington Elementary School

Wilmington, Massachusetts

Deliverable

Schematic Design Documents - Reconciled Cost Estimate

Key Project Stakeholders

Owners Project Manager: SMMA

Architect: Dore + Whittier

Design Document Details

SD Drawings Dated: February 20, 2025

SD Specifications Dated: February 20, 2025

Cost Estimating Narrative Dated: February 20, 2025

Fontaine Bros., Inc.

Springfield Office
510 Cottage Street
Springfield, Massachusetts 01104
(413) 781-2020

Worcester Office
12 East Worcester Street, Suite 2A
Worcester, MA 01604
(508) 796-5133

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Fontaine Bros. CSI Summary

CSI Division		Cost/SF		Total Amount
Wilmington Elementary School				
02-0000	*EXISTING CONDITIONS & DEMO*	165,035 sf	12.12 /sf	$ 2,000,000
03-0000	*CONCRETE*	165,035 sf	25.49 /sf	$ 4,206,151
04-0000	*MASONRY*	165,035 sf	40.68 /sf	$ 6,714,301
05-0000	*METALS*	165,035 sf	59.88 /sf	$ 9,881,746
06-0000	*ROUGH CARPENTRY*	165,035 sf	7.61 /sf	$ 1,256,385
06-2000	*FINISH CARPENTRY*	165,035 sf	2.52 /sf	$ 415,100
07-0000	*THERMAL & MOIST PROTECT*	165,035 sf	24.19 /sf	$ 3,992,734
07-5000	*ROOFING*	165,035 sf	14.44 /sf	$ 2,383,315
07-5000	*ROOF ACCESSORIES*	165,035 sf	0.46 /sf	$ 75,432
07-8000	*FIREPROOFING / CAULKING*	165,035 sf	5.20 /sf	$ 857,595
08-0000	*DOORS & WINDOWS*	165,035 sf	21.93 /sf	$ 3,619,170
09-0000	*FINISHES*	165,035 sf	86.63 /sf	$ 14,296,233
10-0000	*SPECIALTIES*	165,035 sf	5.93 /sf	$ 978,750
11-0000	*EQUIPMENT*	165,035 sf	8.11 /sf	$ 1,338,650
12-0000	*FURNISHINGS*	165,035 sf	18.21 /sf	$ 3,004,925
14-0000	*CONVEYING SYSTEMS*	165,035 sf	1.44 /sf	$ 237,000
21-0000	*FIRE SUPRESSION*	165,035 sf	7.67 /sf	$ 1,265,731
22-0000	*PLUMBING*	165,035 sf	21.31 /sf	$ 3,516,468
23-0000	*HVAC*	165,035 sf	85.43 /sf	$ 14,098,382
26-0000	*ELECTRICAL*	165,035 sf	39.89 /sf	$ 6,583,774
27-0000	*COMMUNICATIONS*	165,035 sf	12.04 /sf	$ 1,986,947
28-0000	*ELECTRONIC SAFETY & SECURITY*	165,035 sf	7.11 /sf	$ 1,173,130
31-0000	*EARTHWORK*	165,035 sf	41.29 /sf	$ 6,813,866
32-0000	*EXTERIOR IMPROVEMENTS*	165,035 sf	48.59 /sf	$ 8,018,367
33-0000	*UTILITIES*	165,035 sf	21.10 /sf	$ 3,482,007
		Total Direct Cost		**$ 102,196,156**
		Design Contingency		$ 10,219,616
		Escalation		$ 7,664,712
		Construction Contingency		$ 1,532,942
		Sub Default Insurance		$ 750,000
		Project Requirements		$ 4,196,169
		GCs & GRs (Price Proposal)		$ 5,733,391
		General Liability Insurance		$ 1,509,454
		Performance Bond		$ 958,055
		Builder Risk Insurance		$ 266,050
		Pollution Insurance		$ 66,168
		CM Fee		$ 2,756,994
		Project Toal		**$ 137,849,707**

Item	Description	Takeoff Qty		Unit Cost		Total Amount
02-0000.000	***EXISTING CONDITIONS & DEMO***					
01	Hazardous Material Abatement	1.00	ls	1,200,000.00	/ls	1,200,000
01	Hazardous Material Abatement - Roofing Assumption	1.00	ls	250,000.00	/ls	250,000
110	Demolition	1.00	ls	450,000.00	/ls	450,000
110	Premium Time	1.00	ls	100,000.000	/ls	100,000
						2,000,000
	EXISTING CONDITIONS & DEMO			***12.119/sf***		***2,000,000***
	165,035.00 sf					
03-0000.000	***CONCRETE***					
105	Stairs and Landings	10.00	Flt	4,200.00	/Flt	42,000
105	Stairs and Landings, Cafeteria Stair	1.00	Flt	4,200.00	/Flt	4,200
105	Stage Ramp	1.00	ls	22,000.00	/ls	22,000
125	Concrete Material - Footings, Piers & FND Walls	1,493.00	cy	125.00	/cy	186,625
125	Concrete Form & Place - Footings, Walls & Piers	34,000.00	sf	20.00	/sf	680,000
125	General Concrete - Winter Conditions	1.00	ls	200,000.000	/ls	200,000
125	Concrete Foundations Coordination	1.00	ls	125,000.00	/ls	125,000
100	Place & Finish - SOD, RTU Pads	7,000.00	sf	11.00	/sf	77,000
100	Place & Finish - SODs	87,000.00	sf	11.00	/sf	957,000
100	SOD Concrete	1,776.00	cy	125.00	/cy	222,000
100	Place & Finish - SODs - House Keeping Pads, Allow	250.00	sf	28.00	/sf	7,000
100	Building Wrap and Weather Protection - For SOD Heating					
100	SOD Concrete RTU	114.00	cy	125.00	/cy	14,250
12	15 mil Vapor Barrier	76,300.00	sf	1.00	/sf	76,300
20	2" Rigid Foundation Insulation - Vertical	9,442.00	sf	3.00	/sf	28,326
120	2" Rigid Insulation Under Slab, Full Coverage	76,300.00	sf	3.00	/sf	228,900
14	Re-Bar, Footings, Piers, Walls	101.00	tons	2,500.00	/tons	252,500
14	Re-Bar, SOG	10.00	tons	2,500.00	/tons	25,000
14	Re-Bar, SOD	22.00	tons	2,500.00	/tons	55,000
14	Re-Bar, SOD, RTU Pads	6.00	tons	2,500.00	/tons	15,000
10	Place & Finish SOG - Included Saw Cuts for CJs and Sealant	76,300.00	sf	11.00	/sf	839,300
10	SOG Concrete	1,178.00	cy	125.00	/cy	147,250
500	Grout Elevator Sill Angles	3.00	ea	500.00	/ea	1,500
						4,206,151
	CONCRETE			***25.486/sf***		***4,206,151***
	165,035.00 sf					

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
		CONCRETE			***25.486/sf***		***4,206,151***
		165,035.00 sf					
04-0000.000		***MASONRY***					
	2	Cast Stone Lintels	1,580.00	lf	135.00	/lf	213,300
	2	Cast Stone Banding - Decorative / Stepped, 12"	1,615.00	lf	157.00	/lf	253,555
	2	Cast Stone Banding - 6" Band	105.00	lf	88.00	/lf	9,240
	2	Cast Stone Veneer & Banding	8,500.00	sf	160.00	/sf	1,360,000
	110	Brick Veneer, Type 1 - Glen Gery, Rustic Red Flashed	26,086.00	sf	46.00	/sf	1,199,956
	110	Brick Veneer, Type 2 - Glen Gery, Bermuda Blue Glazed	830.00	sf	48.00	/sf	39,840
	110	Exterior Mock up - Masonry Allowance	1.00	ls	25,000.00	/ls	25,000
	102	Interior 12" CMU walls	13,342.00	sf	42.00	/sf	560,364
	102	Interior 8" CMU walls - Ground Face	9,800.00	sf	38.00	/sf	372,400
	102	Interior 6" CMU walls - Ground Face	854.00	sf	34.00	/sf	29,036
	102	Acoustical Masonry Units - Gym 12" - Jandris "Sound Cell"	652.00	sf	65.00	/sf	42,380
	102	CUVM Veneer - Custom Cast Stone, Light Buff	29,364.00	sf	70.00	/sf	2,055,480
	5	Masonry Staging - Exterior	64,000.00	sf	6.25	/sf	400,000
	5	Masonry Staging - Interior	24,600.00	sf	6.25	/sf	153,750
							6,714,301
		MASONRY			***40.684/sf***		***6,714,301***
		165,035.00 sf					
05-0000.000		***METALS***					
a 01		Structural Steel - 12' Equipment Screen Wall, Allowance	70.00	tn	4,800.00	/tn	336,000
a 01		Structural Steel - Floor Structure, 14 PSF	795.00	tn	4,800.00	/tn	3,816,000
a 01		Structural Steel - Roof Structure, 25 PSF - Gym	97.00	tn	4,800.00	/tn	465,600
a 01		Structural Steel - Roof Structure, 14 PSF	311.00	tn	4,800.00	/tn	1,492,800
a 01		Structural Steel - Coordination, Roof	1.00	ls	200,000.000	/ls	200,000
a 01		Structural Steel - Braced Frames (HSS 8x8x1/2 Assumed)					
a 01		Structural Steel - Coordination, Floors	1.00	ls	150,000.00	/ls	150,000
a 01		Structural Steel - Floor Structure, Gym 25 PSF	60.00	tn	4,800.00	/tn	288,000
	320	Metal Roof Decking -3"	36,690.00	sf	6.50	/sf	238,485
	320	Metal Roof Decking - Acoustic, Gymnasium, Cafeteria	7,590.00	sf	8.00	/sf	60,720
	618	Metal Floor Deck - 5-1/4"	98,770.00	sf	8.00	/sf	790,160
	618	Metal Floor Deck - 3"	22,397.00	sf	6.50	/sf	145,581
	618	Metal Floor Deck - Acoustical	4,925.00	sf	8.00	/sf	39,400
	10	Stairs - Feature Stair, Cafeteria	1.00	Flt	75,000.00	/Flt	75,000
	10	Stairs - Egress	7.00	Flt	40,000.00	/Flt	280,000

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	10	Stairs - Feature Stair, Stair 4	3.00	Flt	75,000.00	/Flt	225,000
	10	Misc. Metals Allowance	165,000.00	sf	2.00	/sf	330,000
	10	Misc. Metals Coordination	1.00	ls	200,000.000	/ls	200,000
	10	Bollards	20.00	ea	1,600.00	/ea	32,000
	10	Catwalk, Railings & Ladder Allowance - None Shown - NIC					
	10	Bollards - Light Type	20.00	ea	2,500.00	/ea	50,000
	140	Loose Lintels - Masonry	1,580.00	lf	35.00	/lf	55,300
	140	Overhead Door supports	2.00	ea	5,000.00	/ea	10,000
	140	Misc. Folding Door Support	5.00	ea	3,500.00	/ea	17,500
	140	Exterior Louvers, Allowance	1.00	ls	85,000.00	/ls	85,000
	140	Patient Lift Support - Assume Nurses office / PT	2.00	ea	2,500.00	/ea	5,000
	140	Misc Metals - Roof	165,000.00	sf	1.00	/sf	165,000
	140	Misc Metals - Floor Construction	165,000.00	sf	1.25	/sf	206,250
	140	Misc Metals - Exterior Walls	165,000.00	sf	0.50	/sf	82,500
	140	Metal Stair Landing and Single Step @ Roof Door	1.00	ea	10,000.00	/ea	10,000
	140	Misc Metals - Cafe Railing - Resin Panels (LED Lit, Color Changing)	87.00	lf	350.00	/lf	30,450
	140	Unistrut Ceiling Systems - None Shown - NIC					
							9,881,746
		METALS				***59.877/sf***	***9,881,746***
		165,035.00 sf					

06-0000.000 ROUGH CARPENTRY

	2	General Roof Blocking	165,035.00	sf	1.00	/sf	165,035
	2	Roof Blocking Perimeter	2,800.00	lf	20.00	/lf	56,000
	2	Window Blocking	7,225.00	lf	15.00	/lf	108,375
	2	In-Wall Blocking	165,000.00	sf	0.85	/sf	140,250
	2	Misc. Blocking	1.00	ls	50,000.00	/ls	50,000
	2	Temporary Safety and Railings	1.00	ls	25,000.00	/ls	25,000
50-11		Glu-Lam 12" x 24"	1,105.00	lf	250.00	/lf	276,250
50-11		Glu-Lam 12" x 30"	175.00	lf	285.00	/lf	49,875
50-11		Glu-Lam Installation	1,280.00	lf	230.00	/lf	294,400
50-11		Glu-Lam Connections Allowance	1.00	ls	25,000.00	/ls	25,000
50-11		Glu-Lam Temp Protection	1.00	ls	20,000.00	/ls	20,000
50-11		Glu-Lam 16" x 16" - Columns	168.00	lf	275.00	/lf	46,200
							1,256,385
		ROUGH CARPENTRY				***7.613/sf***	***1,256,385***
		165,035.00 sf					

06-2000.000 FINISH CARPENTRY

Item	Description	Takeoff Qty		Total Unit Cost		Total Amount
2	Stage Front / Proscenium / Trim - Allowance	1.00	ls	25,000.00	/ls	25,000
2	Admin Office, Custom Desk	1.00	ls	20,000.00	/ls	20,000
2	Library - Custom Circulation Desk	1.00	ls	20,000.00	/ls	20,000
2	Custom Mailbox	1.00	ls	12,000.00	/ls	12,000
2	Wood Wall Panels	230.00	sf	70.00	/sf	16,100
2	Custom Teacher Station	1.00	ls	12,000.00	/ls	12,000
2	Custom Trash / Recycle Stations	21.00	lf	650.00	/lf	13,650
2	Custom Lego Walls	110.00	sf	120.00	/sf	13,200
2	Decorative Slat Wall	115.00	sf	50.00	/sf	5,750
2	Millwork and FF&E Protection	1.00	ls	65,000.00	/ls	65,000
2	Millwork not yet shown	165,000.00	sf	1.00	/sf	165,000
2	Window Seating	72.00	lf	450.00	/lf	32,400
2	Stair built in Seating - Stair 5	1.00	allow	15,000.00	/allow	15,000
						415,100
	FINISH CARPENTRY			***2.515/sf***		***415,100***
	165,035.00 sf					

07-0000.000 THERMAL & MOIST PROTECT

2	Elevator Pit Waterproofing	1.00	ea	8,500.00	/ea	8,500
2	Foundation Damproofing	24,060.00	sf	4.50	/sf	108,270
2	4" Rigid Cavity Wall Insulation (Masonry)	64,000.00	sf	6.00	/sf	384,000
2	4" Rigid Cavity Wall Insulation (Panels)	10,094.00	sf	6.00	/sf	60,564
10	Air Vapor Barrier, Fluid Applied, Carlise Fire-Resistive Barritech	83,000.00	sf	9.00	/sf	747,000
2	MCM Composite Panels - Allucabond	6,094.00	sf	70.00	/sf	426,580
2	MCM Composite Panels @ Roof Edges & Flats	9,681.00	sf	70.00	/sf	677,670
2	Roof Screen w/Acoustic Metal Panel - 12' Height	14,237.00	sf	100.00	/sf	1,423,700
2	Linear Metal Ceilings at Canopys	2,235.00	sf	70.00	/sf	156,450
						3,992,734
	THERMAL & MOIST PROTECT			***24.193/sf***		***3,992,734***
	165,035.00 sf					

07-5000.000 ROOFING

2	EPDM Roofing, 9" Tapered Insul, Deck Sheathing	76,985.00	sf	27.50	/sf	2,117,088
2	EPDM Roofing, 9" Tapered Insul, Deck Sheathing	9,681.00	sf	27.50	/sf	266,228
						2,383,315

Item	Description	Takeoff Qty		Total Unit Cost		Total Amount
	ROOFING			***14.441/sf***		***2,383,315***
	165,035.00 sf					
07-7000.000	***ROOF & WALL ACCESSORIES***					
10	Elevator Vents, None Shown	1.00	ea	3,560.83	/ea	3,561
10	Roof Ladders	1.00	ea	7,960.83	/ea	7,961
20	Roof Walkway pads (24" Width)	1,826.00	lf	35.00	/lf	63,910
						75,432
	ROOF & WALL ACCESSORIES			***0.457/sf***		***75,432***
	165,035.00 sf					
07-8000.000	***FIREPROOFING / CAULKING***					
002	Misc. Fire Stopping w/ Trades					
2	Fireproofing, Columns, Beams, Floor Decking - 1 Hr.	126,092.00	sf	2.25	/sf	283,707
2	Fireproofing, Roof Decking - 1 Hr.	44,280.00	sf	2.25	/sf	99,630
2	Fireproofing, Low -> Medium Density - Premium	170,372.00	sf	0.60	/sf	102,223
2	Gymnasium, Intumescent Paint - Allowance	1.00	ls	100,000.000	/ls	100,000
2	Patch Days	10.00	cds	3,200.00	/cds	32,000
2	Building Wrap and Weather Protection, for Fireproofing Work	1.00	ls	75,000.00	/ls	75,000
40	Misc. Interior Caulking	165,035.00	sf	0.50	/sf	82,518
2	Exterior Joint/Control & Caulking	165,035.00	sf	0.50	/sf	82,518
						857,595
	FIREPROOFING / CAULKING			***5.196/sf***		***857,595***
	165,035.00 sf					
08-0000.000	***DOORS & WINDOWS***					
10	Interior Ballistic Doors 177A	1.00	lfs	25,000.00	/lfs	25,000
10	Interior Doors					
10	Type - F WOOD, 6' - 0"x7' - 0" 45 MIN	7.00	pair	850.00	/pair	5,950
10	Type - F WOOD, 3' - 0"x7' - 0"	206.00	lfs	850.00	/lfs	175,100
10	Type - F WOOD, 4' - 0"x7' - 0"	5.00	pair	850.00	/pair	4,250
10	Type - F WOOD, 6' - 0"x7' - 0"	22.00	pair	1,500.00	/pair	33,000

Item	Description	Takeoff Qty		Total Unit Cost	Amount
10	Type - F WOOD, 3' - 0"x7' - 0" 90 MIN	7.00	lfs	850.00 /lfs	5,950
10	Type - F HM, 3' - 0"x7' - 0"	2.00	lfs	850.00 /lfs	1,700
10	Type - F WOOD, 6' - 0"x7' - 0" 90 MIN	2.00	pair	1,500.00 /pair	3,000
10	Type - F WOOD, 3' - 0"x7' - 0" 45 MIN	1.00	lfs	850.00 /lfs	850
10	Type - FG HM, 6' - 0"x7' - 0", Full Lite	1.00	pair	1,350.00 /pair	1,350
10	Type - FG WOOD, 6' - 0"x7' - 0", Full Lite	8.00	pair	1,350.00 /pair	10,800
10	Type - FG WOOD, 3' - 0"x7' - 0", Full Lite	4.00	lfs	1,350.00 /lfs	5,400
10	Type - G WOOD, 3' - 0"x7' - 0", Half Lite	52.00	lfs	600.00 /lfs	31,200
10	Type - G WOOD, 6' - 0"x7' - 0", Half Lite	6.00	pair	1,200.00 /pair	7,200
10	STC Premium	2.00	lfs	150.00 /lfs	300
10	Fire Rating Premium	27.00	lfs	250.00 /lfs	6,750
220	EXTERIOR DOORS				
220	Type - FG HM, 6' - 0"x7' - 0" 45 MIN, Full Lite	5.00	pair	1,650.00 /pair	8,250
220	Type - FG HM, 3' - 0"x7' - 0" 45 MIN, Full Lite	3.00	ea	1,650.00 /ea	4,950
100	Interior Frames				
100	Frame Install - Installed w/ GWB				
100	Type -1 HM, 3' - 0Wx7' - 0H	137.00	ea	350.00 /ea	47,950
100	Type -1 HM, 3' - 0Wx7' - 0H 90 MIN	7.00	ea	350.00 /ea	2,450
100	Type -1 HM, 3' - 0Wx7' - 0H 45 Min	1.00	ea	350.00 /ea	350
100	Type -2 HM, 6' - 0Wx7' - 0H	23.00	ea	400.00 /ea	9,200
100	Type -2 HM, 6' - 0Wx7' - 0H 90 Min	2.00	ea	400.00 /ea	800
100	Type -2 HM, 6' - 0Wx7' - 0H 45 min	1.00	ea	400.00 /ea	400
100	Type -2 HM, 4' - 0Wx7' - 0H	5.00	ea	375.00 /ea	1,875
100	Type -3 HM, 3' - 0Wx7' - 0H, Sidelite 17sf Glazing	59.00	ea	450.00 /ea	26,550
100	Type -4 HM, 6' - 0Wx7' - 0H, Transome 6sf Glazing	2.00	ea	450.00 /ea	900
100	Type -5 HM, 3' - 0Wx7' - 0H, Sidelite & Transome 21sf Glazing	2.00	ea	600.00 /ea	1,200
100	Type -1A HM, 3' - 0Wx7' - 0H	1.00	ea	400.00 /ea	400
100	Type -1B HM, 3' - 0Wx7' - 0H	1.00	ea	350.00 /ea	350
100	Type -2A HM, 6' - 0Wx7' - 0H	12.00	ea	400.00 /ea	4,800
100	Type -2A HM, 6' - 0Wx7' - 0H 45 min	10.00	ea	400.00 /ea	4,000
100	Type -3A HM, 3' - 0Wx7' - 0H, Sidelite 8sf Glazing	62.00	ea	450.00 /ea	27,900
100	Fire Rating Premium	21.00	ea	200.00 /ea	4,200
100	Borrowed Lite Frames	10.00	ea	450.00 /ea	4,500
50	OHD - Overhead Sectional Door 10' x 10'	1.00	ea	15,000.00 /ea	15,000
50	OHG - Overhead Coiling Door - 22' x 11'5" - Kitchen	1.00	ea	25,000.00 /ea	25,000
10	Interior Storefront	225.00	sf	120.00 /sf	27,000
10	PT Mirrors, Allow	1.00	ls	5,000.00 /ls	5,000
10	Transome & Sidelite Glazing	1,494.00	sf	85.00 /sf	126,990
10	Borrowed Lites - BL-2	61.00	sf	85.00 /sf	5,185
10	Borrowed Lites - BL-4	234.00	sf	85.00 /sf	19,890
10	Admin Transaction Window, Ballistic Level 3	1.00	ea	12,500.00 /ea	12,500
10	Interior Storefront, Ballistic Level 3 Rated - Vestibule 172	1.00	ls	10,000.00 /ls	10,000
10	Transome & Sidelite Glazing - Exterior Doors	120.00	sf	125.00 /sf	15,000
10	Interior Storefront, Ballistic Level 3 Rated - Vestibule 101	1.00	ls	5,500.00 /ls	5,500
1000	Interior Aluminum Doors				
1000	ALUMINUM, Single Door	1.00	lfs	25,000.00 /lfs	25,000
1000	ALUMINUM, Double Door	2.00	lfs	7,000.00 /lfs	14,000
1000	Exterior Aluminum Doors				
1000	ALUMINUM, Single Door	1.00	lfs	8,000.00 /lfs	8,000
1000	ALUMINUM, Double Door	6.00	lfs	8,000.00 /lfs	48,000
1000	Exterior Aluminum Curtainwall, Triple Glazed	5,100.00	sf	160.00 /sf	816,000
1000	Exterior Aluminum Storefront Systems, Triple Glazed	225.00	sf	160.00 /sf	36,000
1000	Exterior Aluminum Windows, Triple Glazed	7,100.00	sf	160.00 /sf	1,136,000
1000	Exterior Aluminum Windows, Ballistic Rated	0.00	NIC		

Item	Description	Takeoff Qty		Total Unit Cost		Total Amount
1000	School guard, Curtain wall & Storefront	1,005.00	sf	70.00	/sf	70,350
1000	School guard, W1 Windows (Not Full Pane)	639.00	sf	70.00	/sf	44,730
1000	Sunshades	320.00	lf	250.00	/lf	80,000
1000	ALUMINUM, Double Door - Ballistic	4.00	lfs	25,000.00	/lfs	100,000
10	Door and Hardware Install	326.00	ea	550.00	/ea	179,300
10	Finish Hardware - Allowance	369.00	lfs	750.00	/lfs	276,750
10	Door and Hardware Install - Exterior	13.00	lfs	550.00	/lfs	7,150
10	Exterior Finish Hardware - Allowance	13.00	lfs	1,500.00	/lfs	19,500
10	Exterior Finish Hardware - Auto Openers	5.00	lfs	4,500.00	/lfs	22,500
						3,619,170
	DOORS & WINDOWS			***21.930/sf***		***3,619,170***
	165,035.00 sf					
09-0000.000	***FINISHES***					
100	Interior Walls					
100	Typical Interior Partitions	186,992.00	sf	22.00	/sf	4,113,824
100	Fire Rated Partitions	6,827.00	sf	24.00	/sf	163,848
100	Ballistic Fiberglass Panels Level 3 - Office || Vestibule Wall ONLY	180.00	sf	30.00	/sf	5,400
100	FRP - Included in above partitions					
100	Exterior Walls					
100	EXT WALL Back Up, 8" or 6" LGMF, GWB interior Face, Batt Insul	83,000.00	sf	24.50	/sf	2,033,500
100	Exterior Wall - Densglass Sheathing	83,000.00	sf	6.00	/sf	498,000
100	Drywall General Conditions					
100	General Carp / Labor	165,000.00	sf	2.00	/sf	330,000
100	Lifts & Staging	1.00	ls	45,000.00	/ls	45,000
100	Mock ups	1.00	ls	20,000.00	/ls	20,000
100	Miscellaneous					
100	Wall and Soffit Coordination	1.00	ls	50,000.00	/ls	50,000
100	Misc. Touchup and Patching Allowance	1.00	ls	50,000.00	/ls	50,000
100	Misc. Engineering & Associated Work	1.00	ls	25,000.00	/ls	25,000
2499	GWB Ceilings	14,167.00	sf	15.00	/sf	212,505
2499	GWB Ceilings - Rated	50.00	sf	20.00	/sf	1,000
2499	GWB Soffiting Allowance	165,035.00	sf	1.50	/sf	247,553
2499	GWB Ceiling Clouds	2,588.00	sf	25.00	/sf	64,700
2499	GWB Ceilings, Exterior Canopy Soffits	690.00	sf	15.00	/sf	10,350
50	Wall Tile - Painted Mosaic Tile Mural	360.00	sf	45.00	/sf	16,200
50	Wall Tile - Restrooms (Assumed 7' Height) 12" x 24"	12,404.00	sf	32.00	/sf	396,928
50	Wall Tile - Corridors - 4' AFF, 18" x 36"	1,542.00	sf	32.00	/sf	49,344
50	Wall Tile - Corridors - 4'6" AFF, 18" x 36"	15,152.00	sf	32.00	/sf	484,864
50	Wall Tile - Kitchen Walls 10' AFF	2,450.00	sf	32.00	/sf	78,400
50	Wall Tile - Custodial, Allowance	1,040.00	sf	32.00	/sf	33,280
10	Ceramic Floor Tile					
10	Ceramic Floor Tile, 12" x 24"	8,045.00	sf	24.00	/sf	193,080
10	Waterproofing Membrane / Crack Suppression Membrane	8,045.00	sf	7.50	/sf	60,338
10	Floor Protection	8,045.00	sf	0.75	/sf	6,034
2	Terrazzo	17,328.00	sf	45.00	/sf	779,760
2	Terrazzo Treads - Cafeteria Stair	26.00	ea	720.00	/ea	18,720

Item		Description	Takeoff Qty		Total Unit Cost		Amount
	2	Terrazzo Treads - Stair 2	72.00	ea	720.00	/ea	51,840
	2	Terrazzo Treads - Stair 4	72.00	ea	900.00	/ea	64,800
	2	Terrazzo inlays, Allowance	1.00	ls	12,000.00	/ls	12,000
	2	Floor Protection	17,328.00	ls	1.50	/ls	25,992
	2	Terrazzo Landings	1,300.00	sf	50.00	/sf	65,000
	2	QZT-1 Quartz Tile					
	2	Wax and Seal Quartz Tile					
	2	Floor Protection					
	2	ACP-1a - Typical Classrooms, 2x2	72,899.00	sf	8.50	/sf	619,642
	2	ACP-2 - Stairwells 2x4	1,365.00	sf	7.00	/sf	9,555
	2	ACP-2a - Cooridors, 2x2	17,858.00	sf	8.50	/sf	151,793
	2	ACP-4a - Kitchen, 2x2, Washable	2,846.00	sf	8.50	/sf	24,191
	2	ACP-5a - Restrooms, 2x2, Washable	4,808.00	sf	8.00	/sf	38,464
	2	ACP-6a - Music / Art, 2x2, High NRC	1,972.00	sf	9.00	/sf	17,748
	2	Wood Slat Ceiling	4,775.00	sf	60.00	/sf	286,500
	2	Floors Moisture Mitigation Testing	10.00	loc	400.00	/loc	4,000
	2	Floors Moisture Mitigation - Epoxy & Gym	12,865.00	sf	5.00	/sf	64,325
	2	Common Work Results for Flooring	165,035.00	sf	0.65	/sf	107,273
	40	Epoxy Flooring (Custodial) - Dur-a-Flex	880.00	sf	25.00	/sf	22,000
	40	Floor Protection	880.00	sf	1.50	/sf	1,320
	145	2-1/2" Wood Athletic Flooring System - Gymnasium	11,985.00	sf	28.00	/sf	335,580
	145	Wood Flooring, Stage, Allowance	1,453.00	sf	27.00	/sf	39,231
	145	Floor Protection	13,438.00	sf	1.50	/sf	20,157
	2	LIN - Linoleum Flooring, BOD = Forbo	82,510.00	sf	8.00	/sf	660,080
	2	Static Dissipative Flooring	360.00	sf	15.00	/sf	5,400
	2	RAF-1 - Rubber Athletic Flooring, 6mm Thick	2,321.00	sf	24.00	/sf	55,704
	2	RSF-1 Resilient Sheet Flooring, BOD = Nora Systems Norament	5,263.00	sf	8.00	/sf	42,104
	2	Resilient Base	20,736.00	lf	3.50	/lf	72,576
	2	Floor Protection	90,455.00	sf	0.75	/sf	67,841
	2	Rubber Tile Landings & Treads	5.00	flt	4,500.00	/flt	22,500
	002	Seal concrete	2,714.00	sf	4.00	/sf	10,856
	002	Floor Protection	2,714.00	sf	0.75	/sf	2,036
	002	Paint Concrete Floors, Epoxy Paint	3,854.00	sf	2.00	/sf	7,708
f 10		Carpet Tile, BOD = Interface, Aerial	1,287.00	sy	69.00	/sy	88,803
f 10		Floor Protection	11,583.00	sf	0.75	/sf	8,687
	20	Metal Grating Frames, Vestibule	690.00	sf	29.00	/sf	20,010
	20	Walk Off Mats	690.00	sf	15.00	/sf	10,350
	2	Custom Graphic Wall Allowance	1,120.00	sf	45.00	/sf	50,400
	2	Custom Graphic Wall Allowance	165,035.00	sf	0.727	/sf	120,035
	2	Acoustical Wall Panels, Custom Colors	913.00	sf	75.00	/sf	68,475
	2	Acoustical Wood Wall Panels, Cafeteria	762.00	sf	85.00	/sf	64,770
	2	Tectum Panels w/Custom Images	452.00	sf	65.00	/sf	29,380
	2	Acoustical Wall Panels, Cafeteria	256.00	sf	50.00	/sf	12,800
	2	Tectum Panels - Ceiling	10,178.00	sf	30.00	/sf	305,340
	2	Acoustical Wall Panels, Allowance for Locations Not Shown	1.00	ls	25,000.00	/ls	25,000
	30	Paint Exterior HM Door Frames	4.00	ea	250.00	/ea	1,000
	30	Paint Exterior HM Doors	8.00	lfs	350.00	/lfs	2,800
	10	Paint Walls	355,000.00	sf	1.00	/sf	355,000
	10	Paint Touch up Allowance	1.00	ls	25,000.00	/ls	25,000
	20	Paint Exposed Ceilings	19,966.00	sf	3.50	/sf	69,881
	30	Paint Pan Stairs & Rails	9.00	Flt	2,500.00	/Flt	22,500
	40	Paint Doors And Frames	392.00	lfs	230.00	/lfs	90,160
	40	Painting Sequencing Allowance	1.00	ls	30,000.00	/ls	30,000

Item	Description	Takeoff Qty		Total Unit Cost		Total Amount
						14,296,233
	FINISHES			***86.625/sf***		***14,296,233***
	165,035.00 sf					
10-0000.000	***SPECIALTIES***					
2	Magnetic White Boards 6' x 5'	136.00	ea	1,000.00	/ea	136,000
2	Tackboards 4'x4'	200.00	ea	480.00	/ea	96,000
2	Tackboards 4'x6'	9.00	ea	720.00	/ea	6,480
2	Tackboards 4'x8'	172.00	ea	960.00	/ea	165,120
2	Tackboards 6'x6'-6"	58.00	ea	1,170.00	/ea	67,860
2	Wall Hung TV - By Others - NIC					
110	ADA Classroom / Office / Typ Doors	298.00	ea	85.00	/ea	25,330
110	LEED Plaques	3.00	ea	850.00	/ea	2,550
110	10x8 ADA Elevator	3.00	ea	110.00	/ea	330
110	12x16 Wayfinding	6.00	ea	215.00	/ea	1,290
110	14x10 Stair Signage	5.00	ea	425.00	/ea	2,125
110	Time Capsule Plaque	1.00	ea	800.00	/ea	800
110	36x42 Dedication Plaque	3.00	ea	8,000.00	/ea	24,000
110	Vinyl Door Numbering	319.00	ea	50.00	/ea	15,950
110	Misc. Signage	1.00	ls	15,000.00	/ls	15,000
110	6" Aluminum Lettering	54.00	letter	70.00	/letter	3,780
110	18" Aluminum Lettering, Face Lit - 'Wilmington Elementary'	20.00	letter	620.00	/letter	12,400
2	Plastic Toilet Partitions - Standard Height, 55"	23.00	ea	1,200.00	/ea	27,600
2	Plastic Toilet Partitions - ADA	14.00	ea	1,800.00	/ea	25,200
2	Urinal Screen	1.00	ea	500.00	/ea	500
2	Toilet Partition Installation	1.00	ls	45,000.00	/ls	45,000
20	Curtains & Track	3.00	ea	3,000.00	/ea	9,000
2	Operable Partition - 23' x 8' Height	3.00	ea	30,000.00	/ea	90,000
2	Operable Partition - 12' x 8' Height	2.00	ea	15,000.00	/ea	30,000
2	42" Grab Bars	96.00	ea	100.00	/ea	9,600
2	Toilet Paper Dispensers	72.00	ea	65.00	/ea	4,680
2	Paper Towel Dispensers	49.00	ea	100.00	/ea	4,900
2	18 x 36 Framed Mirrors	77.00	ea	350.00	/ea	26,950
2	Janitor Mop Racks	8.00	ea	250.00	/ea	2,000
2	Changing Table - Prek / K Toilets	15.00	ea	850.00	/ea	12,750
2	PT Dispenser w/Trash - Single Bathrooms	35.00	ea	225.00	/ea	7,875
2	PT Dispenser w/Trash - Gang Bathrooms	14.00	ea	225.00	/ea	3,150
2	Sanitary Napkin Disposal, Single Bathrooms	35.00	ea	100.00	/ea	3,500
2	Hand Dryers	20.00	ea	850.00	/ea	17,000
2	Toilet Accessories - Installation	1.00	ls	20,000.00	/ls	20,000
2	Changing Table - Family Toilets, Allow for 4	4.00	ea	850.00	/ea	3,400
2	Sharps Container	1.00	ea	250.00	/ea	250
2	Hand Sanatizer Stations	53.00	ea	80.00	/ea	4,240
30	Extinguishers & Recessed Cabinets	1.00	allow	30,000.00	/allow	30,000
30	AED and Cabinet Allowance	1.00	ls	15,000.00	/ls	15,000
10	Lockers, 12x12 Corridors, Kitchen, Per Narrative	12.00	ea	470.00	/ea	5,640
10	Lockers, 18x15 Corridors, Custodial, Per Narrative	10.00	ea	550.00	/ea	5,500
50	Metal Storage Shelving - NIC					

Item	Description	Takeoff Qty		Unit Cost	Total Amount
					978,750
	SPECIALTIES			***5.931/sf***	***978,750***
	165,035.00 sf				
11-0000.000	***EQUIPMENT***				
80	Nurses Office Refrigerator	1.00	ea	1,500.00 /ea	1,500
80	Staff Room Refrigerator	3.00	ea	2,000.00 /ea	6,000
80	Teacher Collab Refrigerator	4.00	ea	1,500.00 /ea	6,000
100	Front Load Washer	1.00	ea	2,000.00 /ea	2,000
100	Front Load Dryer	1.00	ea	2,000.00 /ea	2,000
2	Food Service Equipment - Allowance	1.00	ls	800,000.000 /ls	800,000
001	Smart Board & Short Throw Projectors				
001	Smart Board & Short Throw Projectors - Prek / K Classrooms				
001	Smart Board & Short Throw Projectors - Classrooms				
001	Smart Board & Short Throw Projectors - Art Classrooms				
001	Smart Board & Short Throw Projectors - Music Classrooms				
001	Smart Board & Short Throw Projectors - Staff				
001	Smart Board & Short Throw Projectors - Media / Library				
010	Rigging and Curtain System	1.00	allow	75,000.00 /allow	75,000
010	Projector Screens	1.00	ls	20,000.00 /ls	20,000
10	Motorized Basketball Hoops, Winch, Connectors.	6.00	ea	12,500.00 /ea	75,000
10	Motorized Divider Curtain in Gym	1.00	ea	20,000.00 /ea	20,000
10	Volley Ball Equipment - Allowance	1.00	ls	9,000.00 /ls	9,000
10	Pickle Ball Equipment - Allowance	1.00	ls	5,000.00 /ls	5,000
38	Wall Pads - 6' tall x 2' wide, Fire Rated - Gym, Allowance	730.00	sf	35.00 /sf	25,550
38	Interior Scoreboard w/Shot Clock	2.00	ea	20,000.00 /ea	40,000
38	Traverse Wall, climbing Wall - Allowance	580.00	sf	200.00 /sf	116,000
38	Climbing Ropes	6.00	ea	2,000.00 /ea	12,000
38	Adaptive Swings & Hooks - Gym	4.00	ea	4,500.00 /ea	18,000
38	Calming Room Wall Padding - 6' Height, Inc. Doors	1,860.00	sf	40.00 /sf	74,400
38	Pull up bar	1.00	ea	1,200.00 /ea	1,200
38	PT Platform Swing	1.00	ea	5,500.00 /ea	5,500
001	Kiln (Furnish & Install)	2.00	ea	12,000.00 /ea	24,000
001	Owner Training - Kiln Vendor	1.00	ls	500.00 /ls	500
					1,338,650
	EQUIPMENT			***8.111/sf***	***1,338,650***
	165,035.00 sf				

Item	Description	Takeoff Qty		Unit Cost		Total Amount
12-0000.000	***FURNISHINGS***					
2	Window Shades - Manual	227.00	ea	400.00	/ea	90,800
10	Manufactured Casework					
10	Base Cabinets w/Tops	2,045.00	lf	500.00	/lf	1,022,500
10	Base Cabinets w/Stainless Tops (Art Room)	40.00	lf	550.00	/lf	22,000
10	Base Cabinets w/Solid Surface Tops (Admin)	42.00	lf	550.00	/lf	23,100
10	Typical Tall Cabinets	614.00	lf	900.00	/lf	552,600
10	Tall Tote Storage Cabinets	195.00	lf	925.00	/lf	180,375
10	Typical Wall Cabinets	616.00	lf	300.00	/lf	184,800
10	Typical Cubbies	620.00	lf	700.00	/lf	434,000
10	Pre-K Cubbies	185.00	lf	700.00	/lf	129,500
10	Bookcases	245.00	lf	450.00	/lf	110,250
001	Instrument & Music Library Storage System, Allowance	1.00	ea	30,000.00	/ea	30,000
10	Telescopic Bleachers - Gym, 84' Length, 600 Seat	1.00	ls	225,000.00	/ls	225,000
						3,004,925
	FURNISHINGS			***18.208/sf***		***3,004,925***
	165,035.00 sf					
14-0000.000	***CONVEYING SYSTEMS***					
2	Elevator Usage - Operator	1.00	ls	12,000.00	/ls	12,000
2	Elevator, Holeless Hydraulic, 4500lbs	3.00	stop	75,000.00	/stop	225,000
						237,000
	CONVEYING SYSTEMS			***1.436/sf***		***237,000***
	165,035.00 sf					
21-0000.000	***FIRE SUPRESSION***					
1	Fire Protection General Conditions					
1	Hydraulic Calculations	1.00	ls	2,600.00	/ls	2,600
1	Testing & Inspection	1.00	ls	2,200.00	/ls	2,200
1	Drain & Fill System	1.00	ls	2,800.00	/ls	2,800
1	Coordination and Management	1.00	ls	26,000.00	/ls	26,000
1	Commissioning Assistance	1.00	ls	15,000.00	/ls	15,000
1	Permits and Fees	1.00	ls	8,500.00	/ls	8,500
1	Coordination Drawings / BIM	1.00	ls	25,000.00	/ls	25,000
1	Seismic Restraints / Bracing - includes design	1.00	ls	12,000.00	/ls	12,000
1	Coring & Patching / Firestopping	1.00	ls	4,500.00	/ls	4,500
1	Fire Protection Standpipe					
1	6" Fire Sprinkler Pipe w/ Fittings & Hangers	520.00	lf	82.25	/lf	42,770

Item		Description	Takeoff Qty		Total Unit Cost		Amount
	1	6" Fire Standpipe Riser	200.00	lf	82.25	/lf	16,450
	1	6" Riser Check Valve	4.00	ea	1,980.00	/ea	7,920
	1	4" Sprinkler Horizontal Standpipe w/ Fittings & Hangers	2,115.00	lf	52.50	/lf	111,038
	1	2-1/2" Sprinkler Drain Pipe w/ Fittings & Hangers	330.00	lf	41.10	/lf	13,563
	1	FDC-1 - Fire Department Connection Valve	1.00	ea	3,200.00	/ea	3,200
	1	4" Zone Control Valve Assembly	4.00	ea	3,650.00	/ea	14,600
	1	2-1/2" FDV in Recessed Cabinet	16.00	ea	880.00	/ea	14,080
	1	2-1/2" FDV - Riser Fire Department Valve	12.00	ea	325.00	/ea	3,900
	1	Fire Hose Cabinet (Stage Area)	1.00	ea	3,000.00	/ea	3,000
	1	Fire Protection Sprinkler System					
	1	6" Sprinkler Main Piping w/ Fittings & Hangers	220.00	lf	78.80	/lf	17,336
	1	Sprinkler Head - Concealed / Upright / Sidewall	1,520.00	ea	80.00	/ea	121,600
	1	4" Sprinkler Main Piping w/ Fittings & Hangers	2,280.00	lf	74.40	/lf	169,632
	1	2-1/2" Sprinkler Pipe	880.00	lf	45.55	/lf	40,084
	1	Fire Pump					
	1	8" Fire Sprinkler Pipe - Incoming Service Main	30.00	lf	106.60	/lf	3,198
	1	8" Backflow Preventer	1.00	ea	21,250.00	/ea	21,250
	1	Electric Fire Pump (750 GPM / 40 HP)	1.00	ea	85,000.00	/ea	85,000
	1	Jockey Pump (10 GPM / 2 HP)	1.00	ea	2,900.00	/ea	2,900
	1	Jockey Pump Controller	1.00	ea	2,200.00	/ea	2,200
	1	Fire Pump Controller	1.00	ea	4,500.00	/ea	4,500
	1	Combination Test Connection and Drain Valve	4.00	ea	525.00	/ea	2,100
	1	6" Butterfly Valve w/ Tamper Switch	4.00	ea	1,250.00	/ea	5,000
	1	4" Butterfly Valve w/ Tamper Switch	4.00	ea	1,050.00	/ea	4,200
	1	6" Water alarm check valve	1.00	ea	2,600.00	/ea	2,600
	1	6" OS&Y Gate Valve	4.00	ea	1,085.00	/ea	4,340
	1	4" OS&Y Gate Valve	4.00	ea	775.00	/ea	3,100
	1	4" Check Valve	4.00	ea	1,250.00	/ea	5,000
	1	4"Storz Connection	1.00	ea	560.00	/ea	560
	1	4" PRV Valve	4.00	ea	330.00	/ea	1,320
	1	EB-1 - Electric Bell	1.00	ea	525.00	/ea	525
	1	Tamper Switch	12.00	ea	485.00	/ea	5,820
	1	Flow Switch	12.00	ea	380.00	/ea	4,560
	1	2" Sprinkler Pipe	4,558.00	lf	41.80	/lf	190,524
	1	1-1/2" Sprinkler Pipe	5,318.00	lf	38.75	/lf	206,073
	1	1-1/4" Sprinkler Pipe	6,077.00	lf	33.65	/lf	204,491
	1	Misc. Valves, Tags & Fittings	1.00	ls	51,250.00	/ls	51,250
	1	Hoisting & Rigging / Floor Loading	1.00	ls	25,000.00	/ls	25,000
	1	Market Reduction	-165,035.00	ls	1.50	/ls	(247,553)
							1,265,731
		FIRE SUPRESSION			***7.669/sf***		***1,265,731***
		165,035.00 sf					

22-0000.000 PLUMBING

	1	Kitchen Plumbing Connections					
	1	3-Compartment Sink - C&HW & Indirect Waste Connection Only	1.00	ea	1,210.00	/ea	1,210
	1	Cooks Table w/ Sink - Connection Only	1.00	ea	880.00	/ea	880
	1	Walk-in Cooler Indirect Waste Connection	1.00	ea	450.00	/ea	450
	1	Disposer - CW & Waste Connection Only	1.00	ea	880.00	/ea	880

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	1	Fill Faucet - HW Connection Only	2.00	ea	585.00	/ea	1,170
	1	Fill Faucet - HW Connection Only	2.00	ea	585.00	/ea	1,170
	1	Freezer Indirect Waste Connection	1.00	ea	250.00	/ea	250
	1	Hand Sink - Connection Only	4.00	ea	625.00	/ea	2,500
	1	Hand Sprayer - C&HW Connection Only	2.00	ea	950.00	/ea	1,900
	1	Plumbing Fixtures					
	1	P-1 - Water Closet (Wall Hung)	46.00	ea	1,325.00	/ea	60,950
	1	P-1A - ADA Water Closet (Wall Hung)	32.00	ea	1,400.00	/ea	44,800
	1	P-1B - ADA Water Closet (Wall Hung)	19.00	ea	1,400.00	/ea	26,600
	1	P-2 - Urinal	1.00	ea	1,175.00	/ea	1,175
	1	P-2A - Urinal	7.00	ea	1,250.00	/ea	8,750
	1	P-3 - Lavatory (Wall Hung)	65.00	ea	1,090.00	/ea	70,850
	1	P-3A - ADA Lavatory (Wall Hung)	20.00	ea	1,150.00	/ea	23,000
	1	P-3B - ADA Lavatory (Wall Hung)	6.00	ea	1,150.00	/ea	6,900
	1	P-5 - Sink (Recessed)	12.00	ea	990.00	/ea	11,880
	1	P-5A - ADA Clssroom Sink (Recessed)	119.00	ea	1,100.00	/ea	130,900
	1	P-7 - Mop Sink	8.00	ea	1,275.00	/ea	10,200
	1	Exam Room Sink	3.00	ea	1,090.00	/ea	3,270
	1	Art Room Sink	2.00	ea	1,200.00	/ea	2,400
	1	DF-1 - Bi-Level Water Cooler	7.00	ea	2,280.00	/ea	15,960
	1	Emergency Shower / Eyewash Station (Kitchen)	1.00	ea	3,650.00	/ea	3,650
	1	Wall Carrier	190.00	ea	595.00	/ea	113,050
	1	Domestic Water Distribution					
	1	4" Domestic Water Pipe - Mains	480.00	lf	215.00	/lf	103,200
	1	3" Domestic Water Pipe - Mains	390.00	lf	49.85	/lf	19,442
	1	2-1/2" Domestic Water Pipe - Mains	420.00	lf	41.40	/lf	17,388
	1	2" Domestic Water Pipe - Mains	1,440.00	lf	31.25	/lf	45,000
	1	1-1/2" Domestic Water Pipe - Mains	980.00	lf	15.75	/lf	15,435
	1	1-1/4" Domestic Water Pipe - Mains	350.00	lf	25.90	/lf	9,065
	1	1" Domestic Water Pipe - Mains	350.00	lf	13.30	/lf	4,655
	1	3/4" Domestic Water Pipe - Mains	880.00	lf	56.60	/lf	49,808
	1	1/2" Domestic Water Pipe - Mains	1,560.00	lf	26.85	/lf	41,886
	1	3/4" Domestic Water Pipe - Branch	4,200.00	lf	56.60	/lf	237,720
	1	1/2" Domestic Water Pipe - Branch (Type "L" Cu.)	13,040.00	lf	26.85	/lf	350,124
	1	Misc. Valves,Tags & Fittings	1.00	ls	134,058.00	/ls	134,058
	1	Pipe Insulation - (1/2" - 1-1/4")	20,380.00	lf	7.65	/lf	155,907
	1	Sanitary Waste & Vent Piping (Under Ground)					
	1	10" Sanitary Waste & Vent Pipe (U)	280.00	lf	196.25	/lf	54,950
	1	8" Sanitary Waste & Vent Pipe (U)	420.00	lf	148.200	/lf	62,244
	1	6" Sanitary Waste & Vent Pipe (U)	880.00	lf	72.60	/lf	63,888
	1	4" Sanitary Waste & Vent Pipe (U)	1,530.00	lf	46.80	/lf	71,604
	1	4" Kitchen Waste & Vent Pipe (U)	360.00	lf	46.80	/lf	16,848
	1	2" Kitchen Waste & Vent Pipe (U)	200.00	lf	29.60	/lf	5,920
	1	Cleanout	32.00	ea	395.00	/ea	12,640
	1	Sanitary Waste & Vent Piping (Above Ground)					
	1	4" Sanitary Waste & Vent Pipe (A)	4,365.00	lf	46.80	/lf	204,282
	1	3" Sanitary Waste & Vent Pipe (A)	720.00	lf	38.40	/lf	27,648
	1	2" Sanitary Waste & Vent Pipe (A)	1,485.00	lf	29.60	/lf	43,956
	1	1-1/2" Sanitary Waste & Vent Pipe (A)	8,800.00	lf	20.65	/lf	181,720
	1	4" Kitchen Waste & Vent Pipe (A)	240.00	lf	46.80	/lf	11,232
	1	2" Kitchen Waste & Vent Pipe (A)	540.00	lf	29.60	/lf	15,984
	1	1-1/2" Kitchen Waste & Vent Pipe (A)	250.00	lf	20.65	/lf	5,163
	1	Floor / Wall Cleanout	16.00	ea	425.00	/ea	6,800
	1	Sanitary and Vent Equipment					
	1	Recessed Grease Interceptor 150 Lbs. / 75 Gallon)	2.00	ea	8,800.00	/ea	17,600
	1	Oil Interceptor - 50 GPM (Zurn 1186)	1.00	ea	7,600.00	/ea	7,600
	1	FS-1 - Floor Sink	8.00	ea	1,290.00	/ea	10,320
	1	FD1- 2" Floor Drain	18.00	ea	440.00	/ea	7,920
	1	FD1A- 3" Floor Drain	1.00	ea	545.00	/ea	545

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	1	FD2- 3" Floor Drain	7.00	ea	545.00	/ea	3,815
	1	Trap Primer	34.00	ea	885.00	/ea	30,090
	1	Neutralization Tank (5 Gallon) - Not Required - NIC					
	1	Solids Interceptor (Art Room Sinks)	2.00	ea	3,225.00	/ea	6,450
	1	SP-1 - Elevator Sump Pump	1.00	ea	2,680.00	/ea	2,680
	1	Storm Drainage Piping					
	1	RD-1 - 15" Round Roof Drain / 6" Hub	20.00	ea	1,025.00	/ea	20,500
	1	OD-1 - 15" Round Roof Overflow Drain / 6" Hub	20.00	ea	1,180.00	/ea	23,600
	1	12" Storm Pipe (U)	440.00	lf	92.45	/lf	40,678
	1	10" Storm Pipe (U)	820.00	lf	86.25	/lf	70,725
	1	10" Storm Pipe (A)	180.00	lf	94.60	/lf	17,028
	1	8" Storm Pipe (U)	360.00	lf	73.55	/lf	26,478
	1	8" Storm Pipe (A)	460.00	lf	82.40	/lf	37,904
	1	6" Storm Pipe (U)	680.00	lf	39.62	/lf	26,942
	1	6" Storm Pipe (A)	2,200.00	lf	68.45	/lf	150,590
	1	4" Storm Pipe (A)	1,200.00	lf	52.50	/lf	63,000
	1	Drain Pipe Insulation	4,040.00	lf	12.45	/lf	50,298
	1	Hot Food Well - H&CW & Indirect Waste Connection	2.00	ea	600.00	/ea	1,200
	1	Cold Food Well - H&CW & Indirect Waste Connection	4.00	ea	600.00	/ea	2,400
	1	Prep Table w/ Double Sink - Connection Only	1.00	ea	650.00	/ea	650
	1	Steamer Unit, CW & Indirect Waste Connection	1.00	ea	950.00	/ea	950
	1	Warewasher Conveyor - H&CW & Indirect Waste Connection	1.00	ea	1,400.00	/ea	1,400
	1	Washing Machine Valve Box and Connection	1.00	ea	880.00	/ea	880
	1	Water Filter Assembly (FBO) 3/4" CW Connection	2.00	ea	245.00	/ea	490
	1	Misc. Kitchen Equipment Connections	1.00	ea	10,000.00	/ea	10,000
	1	Radon Mitigation System					
	1	Pipe Insulation - (1-1/2" - 5")	3,710.00	lf	12.90	/lf	47,859
	1	Domestic Water Equipment					
	1	BFP-1 - 4" Backflow Preventer	1.00	ea	5,250.00	/ea	5,250
	1	Triplex Water Booster Pump Station (5 HP /___Gallon)	1.00	ea	36,000.00	/ea	36,000
	1	TM-1 - Thermostatic Mixing Valve	1.00	ea	3,000.00	/ea	3,000
	1	RP-5 - HW Recirculating Pump	1.00	ea	1,650.00	/ea	1,650
	1	RP-4 - Lab HW Recirc Pump	1.00	ea	1,650.00	/ea	1,650
	1	RP-2 - In-Line Recirc Pump (15 GPM / 1/4 HP)	2.00	ea	1,650.00	/ea	3,300
	1	RP-1 - In-Line Recirc Pump (15 GPM / 1/4 HP)	1.00	ea	1,650.00	/ea	1,650
	1	Pre-assembeled Water Temperature Control Station	1.00	ea	2,450.00	/ea	2,450
	1	HB - Hose Bib	16.00	ea	390.00	/ea	6,240
	1	FPHB - Frostproof Hose Bib	14.00	ea	480.00	/ea	6,720
	1	EWH-6 - Mini Electric Water Heater (2.5 Gal / 1.5 KW)	1.00	ea	990.00	/ea	990
	1	EWH-2 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00	/ea	18,200
	1	EWH-1 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00	/ea	18,200
	1	EWH-1 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00	/ea	18,200
	1	EH-1 - Tankless Electric Water Heater (Locate at P-3A Fixture)	1.00	ea	1,750.00	/ea	1,750
	1	ET-2 - Expansion Tank	1.00	ea	4,800.00	/ea	4,800
	1	Elevator Sump Pump	1.00	ea	1,850.00	/ea	1,850
	1	6" Reverse Backflow Preventer	1.00	ea	12,500.00	/ea	12,500
	1	4" Water Meter	1.00	ea	2,200.00	/ea	2,200
	1	2" RPBP - Reverse Backflow Preventer	2.00	ea	1,250.00	/ea	2,500
	1	Radon In-Line Exhaust Fan	16.00	ea			
	1	4" PVC (Sched 40) - Perforated Pipe	3,990.00	lf			
	1	4" PVC (Sched 40) - Risers	1,220.00	lf			
	1	Riser Supports	184.00	ea			

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	1	Crushed Stone	120.00	cy			
	1	Labeling	1.00	ea			
	1	Fireproof Roof Seal / Boot	16.00	ea			
	1	Electrical Power Feed and Connection (15A)	16.00	ea			
	1	Plumbing General Conditions					
	1	Testing & Disinfection	1.00	ls	18,000.00	/ls	18,000
	1	Coordination & Management	1.00	ls	90,000.00	/ls	90,000
	1	Commissioning	1.00	ls	45,000.00	/ls	45,000
	1	Permits and Fees	1.00	ls	18,000.00	/ls	18,000
	1	Coordination Drawings / BIM	1.00	ls	60,000.00	/ls	60,000
	1	Seismic Restraints / Bracing	1.00	ls	35,000.00	/ls	35,000
	1	Coring & Patching / Firestopping	1.00	ls	22,500.00	/ls	22,500
	1	Hoisting & Rigging / Floor Loading	1.00	ls	15,000.00	/ls	15,000
	1	Equipment start up and inspection	1.00	ls	25,000.00	/ls	25,000
	1	Access Panels - Furnish Only	1.00	ls	10,000.00	/ls	10,000
	1	Market Adjustment	-165,035.00	sf	1.00	/sf	(165,035)
							3,516,468
		PLUMBING			***21.307/sf***		***3,516,468***
		165,035.00 sf					

23-0000.000 HVAC

	1	Chilled Water Systems					
	1	Air Source Heat Pump - Simultaneous Heat Pump / Chiller (500Tons)	1.00	ls	1,495,000.00	/ls	1,495,000
	1	HVAC Air Distribution					
	1	Ductwork Galvanized	180,000.00	lbs	16.75	/lbs	3,015,000
	1	Kitchen Grease Duct	1.00	ls	60,000.00	/ls	60,000
	1	Kitchen Dishwasher Aluminum Duct	1.00	ls	35,000.00	/ls	35,000
	1	RGD's / Low Wall Returns	165,035.00	sf	1.00	/sf	165,035
	1	Misc. Ductwork Accessories - Volume Dampers, Fire Dampers, Volume Dampers etc.	165,035.00	sf	3.50	/sf	577,623
	1	Refrigerant Piping (Includes Hangers & Supports)					
	1	Refrigerant Piping - Insulated Line Set	1,360.00	lf	39.60	/lf	53,856
	1	Misc. Valves, Tags & Fitings	1.00	ls	5,385.60	/ls	5,386
	1	Condensate Piping					
	1	Condensate Drain Pipe (Type "L" Cu.)	165,000.00	sf	0.15	/sf	24,750
	1	Hydronic Piping & Pumps (Includes Hangers & Supports)					
	1	Hydronic CW/HW Piping - Mains (Blk Stl. Welded)	165,000.00	sf	12.00	/sf	1,980,000
	1	Hydronic CW/HW Piping - Branch (Type "L" Cu.)	165,000.00	sf	3.25	/sf	536,250
	1	Hydronic Pumps - Primary / Secondary	1.00	ls	85,000.00	/ls	85,000
	1	Insulation					
	1	Duct wrap insulation	65,000.00	sf	6.85	/sf	445,250
	1	Pipe Insulation	165,000.00	sf	3.00	/sf	495,000
	1	Exhaust Fans					
	1	Exhaust Fans	165,000.00	sf	0.75	/sf	123,750
	1	Central Air Handling Equipment					
	1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (17,000 Cfm)	2.00	ea	408,000.00	/ea	816,000
	1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (3,000 Cfm)	2.00	ea	72,000.00	/ea	144,000

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (4,000 Cfm)	1.00	ea	96,000.00	/ea	96,000
	1	Heating & Cooling Terminal Equipment					
	1	Split A/C (1 Ton) - Indoor Unit	5.00	ea	2,785.00	/ea	13,925
	1	Split A/C (1.Ton) - Condenser Unit	5.00	ea	3,990.00	/ea	19,950
	1	Split A/C (2 Ton) - Indoor Unit	3.00	ea	3,465.00	/ea	10,395
	1	Split A/C (2.Ton) - Condenser Unit	3.00	ea	5,260.00	/ea	15,780
	1	CUH - Electric Cabinet unit Heater	19.00	ea	2,880.00	/ea	54,720
	1	EUH - Electric Unit Heater	15.00	ea	1,990.00	/ea	29,850
	1	Perimeter Heating (Radiant Ceiling Panel / Baseboard)	165,000.00	sf	3.75	/sf	618,750
	1	VAV - Variable Air Volume Box	211.00	ea	1,100.00	/ea	232,100
	1	Testing & Balancing					
	1	Testing & balancing	165,000.00	sf	0.75	/sf	123,750
	1	HVAC General Requirements					
	1	Commissioning Support	1.00	ls	45,000.00	/ls	45,000
	1	Coordination & management	1.00	ls	180,000.00	/ls	180,000
	1	Permits and fees	1.00	ls	45,000.00	/ls	45,000
	1	Coordination / BIM	1.00	ls	80,000.00	/ls	80,000
	1	Seismic restraints / bracing	1.00	ls	28,000.00	/ls	28,000
	1	Coring & patching / firestopping	1.00	ls	20,000.00	/ls	20,000
	1	Hoisting & rigging / floor loading	1.00	ls	25,000.00	/ls	25,000
	1	Equipment start up and inspection	1.00	ls	15,000.00	/ls	15,000
	1	Access panels - furnish only	1.00	ls	5,000.00	/ls	5,000
	1	Roof Curb / Pads and Accessories	1.00	ls	15,000.00	/ls	15,000
	1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (20,000 Cfm)	1.00	ea	480,000.00	/ea	480,000
	1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (10,000 Cfm)	2.00	ea	240,000.00	/ea	480,000
	1	MAU - Kitchen Make-up Air Unit, 4,500 CFM	1.00	ea	55,000.00	/ea	55,000
	1	Roof Curbs and Dunnage	9.00	ea	4,500.00	/ea	40,500
	1	Sound Attenuation	1.00	ls	75,000.00	/ls	75,000
	20	Building Management System					
	20	Building Management System	165,035.00	sf	7.50	/sf	1,237,763
							14,098,382
		HVAC			***85.427/sf***		***14,098,382***
		165,035.00 sf					

26-0000.000 ELECTRICAL

	2	Normal Power and Distribution					
	2	Main Switchboard 4000/3000A MCB 277/480v 4-section	1.00	ea	257,195.00	/ea	257,195
	2	Panel EV 400A MCB ST 120/208v 42p w/SPD	1.00	ea	7,196.00	/ea	7,196
	2	Panel KPP 225A MCB ST 120/208v 84p w/SPD	1.00	ea	9,449.00	/ea	9,449
	2	Panel LP1A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00	/ea	4,255
	2	Panel LP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199
	2	Panel LP2A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00	/ea	4,255
	2	Panel LP2B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199
	2	Panel LP2C 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199
	2	Panel LP3A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00	/ea	4,255
	2	Panel LP3B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	2	Panel MHP1A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP1B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP2A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP2B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP2C 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP3A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MHP3B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
	2	Panel MP1A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Lighting and Branch				
	2	Lighting fixture budget, Material Only	1.00	ls	1,275,000.00 /ls	1,275,000
	2	Lighting Installation below:				
	2	Type LP2 LED 2' Linear pendant dir/ind	1.00	ea	269.00 /ea	269
	2	Type LP4 LED 4' Linear pendant dir/ind	49.00	ea	332.00 /ea	16,268
	2	Type LP6 LED 6' Linear pendant dir/ind	53.00	ea	360.00 /ea	19,080
	2	Type LP8 LED 8' Linear pendant dir/ind	353.00	ea	360.00 /ea	127,080
	2	Type LP12 LED 12' Linear pendant dir/ind	1.00	ea	374.00 /ea	374
	2	Type LPG LED High-bay lensed	29.00	ea	663.00 /ea	19,227
	2	Type LR2 LED 3" x 2' Linear recessed	25.00	ea	142.00 /ea	3,550
	2	Type LR22 LED 2x2 Recessed troffer	46.00	ea	128.00 /ea	5,888
	2	Type LR4 LED 3" x 4' Linear recessed	203.00	ea	170.00 /ea	34,510
	2	Type LR6 LED 3" x 6' Linear recessed	91.00	ea	211.00 /ea	19,201
	2	Type LR8 LED 3" x 8' Linear recessed	106.00	ea	239.00 /ea	25,334
	2	Type LS2 LED 2' Utility light chain hung	7.00	ea	258.00 /ea	1,806
	2	Type LS4 LED 4' Utility light chain hung	24.00	ea	259.00 /ea	6,216
	2	Type LS6 LED 6' Utility light chain hung	24.00	ea	258.00 /ea	6,192
	2	Type LS8 LED 8' Utility light chain hung	34.00	ea	294.00 /ea	9,996
	2	Type LWS LED 6"x 7' Recessed wall grazer	4.00	ea	670.00 /ea	2,680
	2	Type LWS LED 6"x 8' Recessed wall grazer	7.00	ea	205.00 /ea	1,435
	2	Type LWS LED 6"x9' Recessed wall grazer	37.00	ea	767.00 /ea	28,379
	2	Type LWS LED 6"x14' Recessed wall grazer	14.00	ea	1,295.00 /ea	18,130
	2	Type PC1 LED Architectural pendant	130.00	ea	357.00 /ea	46,410
	2	Type PC2 LED Architectural pendant	63.00	ea	357.00 /ea	22,491
	2	Type PC3 LED Architectural pendant	96.00	ea	357.00 /ea	34,272
	2	Type RC1 LED 4" Recessed down light	112.00	ea	183.00 /ea	20,496
	2	Type RC2 LED 4" Recessed down light	88.00	ea	183.00 /ea	16,104
	2	Type RC4 LED 6" Recessed down light	12.00	ea	183.00 /ea	2,196
	2	Panel MP1B 225A MCB 120/208v 84p w/SPD	1.00	ls	9,449.00 /ls	9,449
	2	Panel MP2A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ls	9,449.00 /ls	9,449
	2	Panel MP2B 225A MCB 120/208v 84p w/SPD	1.00	ea	9,449.00 /ea	9,449
	2	Panel MP2C 225A MCB 120/208v 84p w/SPD	1.00	ea	6,873.00 /ea	6,873
	2	Panel MP3A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel MP3B 150A MCB 120/208v 42p w/SPD	1.00	ea	6,959.00 /ea	6,959
	2	Panel OLP 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
	2	Panel PP1A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP1B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP1S 150A MCB ST 120/208v 84p w/SPD	1.00	ea	6,873.00 /ea	6,873
	2	Panel PP2A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP2B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP2C 100A MCB ST 120/208v 84p w/SPD	1.00	ea	8,665.00 /ea	8,665
	2	Panel PP3A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP3B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	2	T-4 30KVA K13 Transformer 480-120/208v	2.00	ea	5,327.00	/ea	10,654
	2	T-5 45KVA K13 Transformer 480-120/208v	8.00	ea	6,657.00	/ea	53,256
	2	T-6 75KVA K13 Transformer 480-120/208v	5.00	ea	9,969.00	/ea	49,845
	2	T-7 112.5KVA K13 Transformer 480-120/208v	1.00	ea	13,876.00	/ea	13,876
	2	Disconnect , cut & make safe existing on site electrical utilities	1.00	ls	15,000.00	/ls	15,000
	2	60A 3w Feeder EMT copper	50.00	lf	22.11	/lf	1,106
	2	125A 3w Feeder EMT copper	100.00	lf	60.25	/lf	6,025
	2	150A 3w Feeder EMT copper	150.00	lf	69.31	/lf	10,397
	2	100A Feeder EMT copper	25.00	lf	82.95	/lf	2,074
	2	150A Feeder EMT copper	1,750.00	lf	49.53	/lf	86,678
	2	200A Feeder EMT copper	75.00	lf	91.71	/lf	6,878
	2	225A Feeder EMT copper	100.00	lf	109.39	/lf	10,939
	2	400A Feeder EMT copper	1,450.00	lf	175.30	/lf	254,185
	2	Feeder pri/sec 30KVA K-13 3PH Transformer	2.00	lf	1,055.50	/lf	2,111
	2	Feeder Pri/sec 45KVA K-13 3PH Transformer	8.00	lf	1,366.74	/lf	10,934
	2	Feeder Pri/sec 75KVA K-13 Transformer	5.00	lf	2,242.63	/lf	11,213
	2	Feeder Pri/sec 75KVA K-13 Transformer	1.00	lf	2,242.63	/lf	2,243
	2	PV Systems					
	2	Infrastructure raceway for future PV installation	1.00	ls	10,000.00	/ls	10,000
	2	Machine and Equipment Power					
	2	Mechanical equipment circuits & connections	166,850.00	sf	3.75	/sf	625,688
	2	Emergency Power and Distribution					
	2	600KW Diesel genset sound attenuated weather enclosure unit mounted load bank	1.00	ea	325,000.00	/ea	325,000
	2	Generator cam lock cabinet 125A 3p 480v	1.00	ea	21,133.00	/ea	21,133
	2	ATS-LS 200A 4p ISO-bypass Auto transfer switch life safety					
	2	ATS-OS 1000A 4p Auto transfer switch optional standby					
	2	Dist. Panel NEDP 1000A MLO 277/480v	1.00	ea	23,339.00	/ea	23,339
	2	Panel EHP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00	/ea	4,618
	2	Panel EHP2B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00	/ea	4,618
	2	Panel EHP3B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00	/ea	4,618
	2	Panel ELP1A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel ELP1B 200A MCB 277/480v 42p w/SPD	1.00	ea	4,354.00	/ea	4,354
	2	Panel ELP2A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel ELP2B 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel ELP2C 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel ELP3A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel ELP3B 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00	/ea	3,906
	2	Panel EP1A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00	/ea	3,838
	2	Panel EP1B 225A MCB 120/208v 84p w/SPB 200% N	1.00	ea	7,331.00	/ea	7,331
	2	Panel EP2A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00	/ea	3,838
	2	Panel EP2B 150 MCB 120/208v 30p w/SPD 200% N	1.00	ea	4,398.00	/ea	4,398
	2	Panel EP2C 225A MCB 120/208v 84p	1.00	ea	6,995.00	/ea	6,995
	2	Panel EP3A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00	/ea	3,838
	2	Panel EP3B 150 MCB 120/208v 30p w/SPD 200% N	1.00	ea	4,062.00	/ea	4,062
	2	Panel KHP 400A MLO 277/480v 84p w/SPD	1.00	ea	11,142.00	/ea	11,142
	2	Panel LP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199
	2	Panel TEP1A 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	Panel TEP1B 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	Panel TEP3A 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	T-5 45KVA K13 Transformer 480-120/208v	1.00	ea	6,657.00	/ea	6,657

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	2	T-6 75KVA K13 Transformer 480-120/208v	2.00	ea	9,969.00 /ea	19,938
	2	125A 3w Feeder EMT copper	320.00	lf	60.25 /lf	19,280
	2	100A Feeder EMT copper	200.00	lf	82.95 /lf	16,590
	2	150A Feeder EMT copper	1,000.00	lf	49.53 /lf	49,530
	2	200A Feeder EMT copper	25.00	lf	91.71 /lf	2,293
	2	400A Feeder EMT copper	150.00	lf	175.00 /lf	26,250
	2	1000A Feeder EMT copper	29.00	lf	673.35 /lf	19,527
	2	1200A Nipple set w/cable	1.00	lf	4,690.83 /lf	4,691
	2	4/ # 3 MI Feeder w/terminations	1,350.00	lf	152.47 /lf	205,835
	2	Feeder Pri/sec 45KVA K-13 3PH Transformer	1.00	lf	1,366.74 /lf	1,367
	2	Feeder Pri/sec 75KVA K-13 Transformer	2.00	lf	2,242.63 /lf	4,485
	2	Type SL3 LED 6" Canopy recessed down light	41.00	ea	218.00 /ea	8,938
	2	Type SL4 LED Wall pack	5.00	ea	474.00 /ea	2,370
	2	Type UC LED 3' undercabinet	61.00	ea	166.00 /ea	10,126
	2	Type Exit Edge lit dual face	1.00	ea	189.00 /ea	189
	2	Type Exit Edge lit single face	51.00	ea	189.00 /ea	9,639
	2	3/4" - EMT 7#12	2,000.00	lf	14.52 /lf	29,040
	2	#10/2C MC Cable	11,000.00	lf	7.23 /lf	79,530
	2	Luminary cable MC 12/2 & 14/2 1-10VDC	33,600.00	lf	6.09 /lf	204,624
	2	3/4" - EMT 5#12-2#16 10vdc	800.00	lf	18.09 /lf	14,472
	2	Lighting and Branch Devices				
	2	[DS] Lighting photo control	54.00	ea	191.32 /ea	10,331
	2	[LVD} Wall mount dimming controller	290.00	ea	236.12 /ea	68,475
	2	[OS] Ceiling occupancy senser	429.00	ea	177.43 /ea	76,117
	2	[OSH] High Level Ceiling occupancy senser	21.00	ea	267.74 /ea	5,623
	2	[R] Emergency lighting relay	54.00	ea	505.21 /ea	27,281
	2	[RC] Lighting control room controller	95.00	ea	753.88 /ea	71,619
	2	25' CAT 6 Lighting control cable	915.00	ea	59.06 /ea	54,040
	2	Lighting control wall box	303.00	ea	68.97 /ea	20,898
	2	20A 120-277V S/P Switch , box & plate	13.00	ea	88.08 /ea	1,145
	2	Lighting controls programming	166,850.00	sf	1.50 /sf	250,275
	2	Device Branch				
	2	20A 125V 3W Single recept, box & plate	837.00	ea	95.00 /ea	79,515
	2	20A 125V Duplex receptacle, box & plate	100.00	ea	114.00 /ea	11,400
	2	20A 125V Duplex GFCI receptacle, box & plate	8.00	ea	120.00 /ea	960
	2	20A 125V Duplex GFCI receptacle, box & WP plate	194.00	ea	138.00 /ea	26,772
	2	(2) 20A 125V Duplex receptacle, box & plate	6.00	ea	2,656.00 /ea	15,936
	2	[BKS] Backstop controller , & backstop circuit & connection	4.00	ea	2,130.00 /ea	8,520
	2	[CDC] Curtain controller circuit & connection	5.00	ea	1,765.00 /ea	8,825
	2	[FB1] 12 Gang floor box w/ branch & Telcom raceways	2.00	ea	477.00 /ea	954
	2	60A 250/600V DSN SW NON-FUS - NEMA 1	2.00	ea	237.00 /ea	474
	2	6-50R 250V 4W Kiln receptacle, box & plate	1.00	ea	3,020.00 /ea	3,020
	2	Motorized kitchen roll-up grill	6.00	ea	1,868.00 /ea	11,208
	2	Motorized shade controller circuit & connection	2.00	ea	8,782.00 /ea	17,564
	2	Score board & shot clock circuits & connections	1.00	ea	1,668.00 /ea	1,668
	2	Bleacher controller circuit & connect	2.00	ea	255.00 /ea	510
	2	Hand Dryer connection	20.00	ea	155.00 /ea	3,100
	2	60A 250V DSN SW Fusible -Kiln Disconnect	1.00	ea	578.00 /ea	578
	2	6-50R 250V 4W Kiln receptacle, box & plate	1.00	ea	271.00 /ea	271
	2	Kitchen equipment connections 20A 3w allowance	1.00	allow	30,000.00 /allow	30,000
	2	Projection screen motor circuit & connect	2.00	ea	330.00 /ea	660
	2	Projection screen wall controller	2.00	ea	330.00 /ea	660
	2	Score board & shot clock circuits & connections	2.00	ea	6,414.00 /ea	12,828
	2	Auto flush/faucet valve connection	50.00	ea	202.00 /ea	10,100
	2	Emergency pull switch & light	4.00	ea	923.00 /ea	3,692
	2	Kiln circuit & connect	1.00	ea	1,490.00 /ea	1,490
	2	Kiln EPO shut down	1.00	ea	1,018.00 /ea	1,018

Item		Description	Takeoff Qty		Total Unit Cost		Amount
	2	Bleacher controller circuit & connect	2.00	ea	2,230.00	/ea	4,460
	2	Score board & shot clock circuits & connections	2.00	ea	5,927.00	/ea	11,854
	2	3/4" - EMT 3#12	1,500.00	lf	13.26	/lf	19,890
	2	3/4" - EMT 5#10	500.00	lf	16.49	/lf	8,245
	2	3/4" - EMT 5#12	1,000.00	lf	14.43	/lf	14,430
	2	3/4" - EMT 7#10	1,500.00	lf	17.82	/lf	26,730
	2	3/4" - EMT 7#12	4,000.00	lf	14.50	/lf	58,000
	2	1" - EMT 4#6	300.00	lf	32.00	/lf	9,600
	2	#10/3C MC Cable	3,000.00	lf	6.51	/lf	19,530
	2	#12/3C MC Cable	14,000.00	lf	4.20	/lf	58,800
	2	#12/2C MC Cable	18,000.00	lf	3.35	/lf	60,300
	2	Allowance for unidentified devices & circuits	166,850.00	sf	1.50	/sf	250,275
	2	Lightning and Power Specialties					
	2	Building & service grounding	1.00	ls	30,000.00	/ls	30,000
	2	Lighting protection	1.00	ls	90,000.00	/ls	90,000
	2	Temporary power and lights	1.00	ls	225,000.00	/ls	225,000
	2	Subcontractor general conditions	1.00	ls	350,000.00	/ls	350,000
	2	BIM Coordination	1.00	ls	45,000.00	/ls	45,000
	2	Testing and commissioning	1.00	ls	50,000.00	/ls	50,000
	2	Theater Lighting					
	2	Cafetorium stage track & lighting w/installation	1.00	allow	45,000.00	/allow	45,000
	2	Cafetorium LED Railing Fixtures	87.00	lf	200.00	/lf	17,400
	2	Theatrical lighting w/installation	1.00	allow	200,000.000	/allow	200,000
	2	Market Reduction	-165,035.00	ls	3.00	/ls	(495,105)
							6,583,774
		ELECTRICAL			***39.893/sf***		***6,583,774***
		165,035.00 sf					

27-0000.000 COMMUNICATIONS

	001	Public Address Systems					
	001	Common spoace sound system	1.00	ea	25,000.00	/ea	25,000
	001	Classroom recall box & sound reinforcement	60.00	ea	3,500.00	/ea	210,000
	001	Public address Systems equipment & installation	1.00	ea	75,000.00	/ea	75,000
	001	Program Clock System					
	001	Equipment & programming allowance	1.00	ls	25,000.00	/ls	25,000
	001	12" Surface wireless clock	80.00	ea	410.00	/ea	32,800
	001	16" Surface wireless clock w/wire guard	2.00	ea	600.00	/ea	1,200
	001	DAS Radio Repeater System					
	001	Radio repeater system allowance	1.00	ls	85,000.00	/ls	85,000
	001	Av System					
	001	AV raceway rough common spaces	1.00	ls	35,000.00	/ls	35,000
	001	AV raceway rough in for classrooms	47.00	ea	1,500.00	/ea	70,500
	001	Digital signs	1.00	ls	25,000.00	/ls	25,000
	001	AV Equipment Cafeteria / Gym F&I	1.00	ls	120,000.00	/ls	120,000
	001	Telephone and Communications Systems					
	001	Telecomm Backbone raceways, cable tray & sleeves	1.00	sf	50,000.00	/sf	50,000
	001	Technology wall/floor sleeves & fire proofing	16.00	ea	344.00	/ea	5,504
	001	Technology cableing & deevics	166,850.00	sf	2.25	/sf	375,413
	001	Technology backbone fiber & copper	166,850.00	sf	0.50	/sf	83,425
	001	IDF closet fit up	6.00	ea	12,000.00	/ea	72,000

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	001	Network Switching	165,035.00	sf	3.00	/sf	495,105
	001	Telephone System	165,035.00	ls	0.515	/ls	85,000
	001	Wireless Access points	116.00	ea	1,000.00	/ea	116,000
							1,986,947
		COMMUNICATIONS			***12.040/sf***		***1,986,947***
		165,035.00 sf					
28-0000.000		***ELECTRONIC SAFETY & SECURITY***					
	10	Security Access Control &CCTV					
	10	Access control & CCTV installation & wiring	166,850.00	sf	2.50	/sf	417,125
	10	Access control & CCTV head end equipment , programming & commissioning	166,850.00	sf	1.50	/sf	250,275
	10	Fire Alarm System					
	10	Equipment ,devices and programming	1.00	ea	145,000.00	/ea	145,000
	10	F/A Control w/voice module	1.00	ea	4,500.00	/ea	4,500
	10	F/A Radio master box	1.00	ea	834.00	/ea	834
	10	F/A Remote annunciator	1.00	ea	556.00	/ea	556
	10	F/A Battery cabinet w/72 hour batteries	1.00	ea	834.00	/ea	834
	10	F/A Terminal cabinet	7.00	ea	556.00	/ea	3,892
	10	F/A Document cabinet	1.00	ea	278.00	/ea	278
	10	F/A Graphic map display panel	1.00	ea	417.00	/ea	417
	10	F/A Knox box	1.00	ea	530.00	/ea	530
	10	F/A Pull station installed w/back box	15.00	ea	217.00	/ea	3,255
	10	F/A Smoke detector installed w/back box	146.00	ea	374.00	/ea	54,604
	10	F/A CO detector installed w/.back box	12.00	ea	197.00	/ea	2,364
	10	F/A Mass Notification Speaker/strobe wall mount installed w/back box	39.00	ea	236.00	/ea	9,204
	10	F/A Mass notification strobe ceiling mount installed w/back box	196.00	ea	220.00	/ea	43,120
	10	F/A Speaker/strobe ceiling mount installed w/back box	177.00	ea	271.00	/ea	47,967
	10	F/A Speaker/strobe wall mount installed w/back box	32.00	ea	236.00	/ea	7,552
	10	F/A Strobe wall mount installed w/back box	29.00	ea	188.00	/ea	5,452
	10	F/A Strobe wall mount installed w/back box	5.00	ea	187.00	/ea	935
	10	F/A Control/ monitor module relay	12.00	ea	334.00	/ea	4,008
	10	F/A SLC/NAC 3/4" EMT & loop circuits	4,200.00	lf	11.14	/lf	46,788
	10	F/A 14/4 FPLP/MC cable	18,000.00	lf	3.98	/lf	71,640
	10	F/A 16/2 FPLP/MC cable	10,000.00	lf	2.95	/lf	29,500
	10	Area of refuge	1.00	ea	22,500.00	/ea	22,500
							1,173,130
		ELECTRONIC SAFETY & SECURITY			***7.108/sf***		***1,173,130***
		165,035.00 sf					

31-0000.000 EARTHWORK

Item	Description	Takeoff Qty		Total Unit Cost	Total Amount
10	Site Demolition	1.00	ls	536,932.10 /ls	536,932
10	Mobilization	1.00	ls	10,738.64 /ls	10,739
10	Construction Stakeout	1.00	ls	37,585.25 /ls	37,585
10	Saw Cutting	700.00	lf	4.993 /lf	3,495
10	Soil Classification Costs	1.00	ls	50,000.00 /ls	50,000
10	Winter Conditions Allowance Plowing	2.00	seas	35,000.00 /seas	70,000
10	Soil Testing/Classification Costs - By others				
10	EROSION CONTROL				
10	SWPPP Plan & Monitoring	1.00	ls	16,107.97 /ls	16,108
10	Stone Construction Entrance & Drives	3,000.00	sy	64.432 /sy	193,296
10	Silt Fence - Install	2,705.00	lf	2.953 /lf	7,988
10	Erosion Controls - Maintain	32.00	mnth	279.205 /mnth	8,935
10	Erosion Controls - Remove	2,705.00	lf	1.396 /lf	3,776
10	12" Straw Wattle	2,705.00	lf	5.638 /lf	15,250
10	Dust Control	1.00	ls	161,079.62 /ls	161,080
10	Street Sweeping	250.00	hours	204.034 /hours	51,009
10	Misc. Erosion Control Measures	2,705.00	lf	17.182 /lf	46,477
10	Inlet Protection	27.00	ea	104.165 /ea	2,812
10	Site Re-Phasing Allowance	1.00	ls	75,000.00 /ls	75,000
10	Temp Laydown Areas				
10	Temp Access Roads	3,000.00	sy	17.182 /sy	51,545
10	Winter Conditions Allowance Plowing	2.00	seas	50,000.00 /seas	100,000
20	Remove & Salvage				
20	Benches	1.00	ea	107.38 /ea	107
20	Soccer Plaque	1.00	ea	268.470 /ea	268
20	Playground Memorial Plaque	1.00	ea	268.470 /ea	268
20	Remove & Dispose				
20	Existing Fence	980.00	lf	12.886 /lf	12,629
20	Existing Curb	1,482.00	lf	13.960 /lf	20,689
20	Concrete Walks	6,152.00	sf	4.295 /sf	26,426
20	Remove & Dispose Exisitng Asphalt	7,997.00	sy	2.148 /sy	17,175
20	Irrigation Systems & Pump House	1.00	ls	5,369.32 /ls	5,369
10	Site Grading				
10	Site Cut to Fill	3,881.00	cy	20.00 /cy	77,620
10	Site Fill - Building Excavation Material	18,766.00	cy	15.00 /cy	281,490
10	Subgrading & Compaction	47,240.00	sy	3.222 /sy	152,188
10	Stockpile on site	8,425.00	cy	16.108 /cy	135,710
10	Truck and Dispose - Assumed Clean / Unrestricted	23,500.00	ton	15.00 /ton	352,500
10	Load and Truck - 3,000 CY Arsenic Allowance	3,000.00	cy	10.00 /cy	30,000
10	Dispose - Allowance, Assume Arsenic	23,500.00	ton	40.00 /ton	940,000
10	Building Excavation				
10	Building Excavation	18,385.00	cy	15.00 /cy	275,775
10	Building Pad Fills	25,150.00	cy	55.00 /cy	1,383,250
10	E&B Footings	2,422.00	lf	161.080 /lf	390,135
10	E&B Column Footings	86.00	ea	268.466 /ea	23,088
10	Sand and Gravel Base Under Slab - 12"	2,978.00	cy	55.00 /cy	163,790
10	Gravel Base Below Paving	5,983.00	cy	50.00 /cy	299,150
10	Gravel Base Below Basketball Court/Play Surface	1,546.00	cy	50.00 /cy	77,300
10	Gravel Base Below Sidewalk/Pavers/Conc Pads/Loading Dock	2,663.00	cy	50.00 /cy	133,150
10	Gravel Base Below Turf Field	740.00	sy	15.034 /sy	11,125
10	Underslab Utility E&B	2,500.00	lf	42.00 /lf	105,000
10	Foundation Perimeter Drains				
10	4" Perforated PVC Pipe	5,415.00	lf	8.591 /lf	46,520
10	4" PVC Fittings	40.00	ea	805.398 /ea	32,216

Item	Description	Takeoff Qty		Total Unit Cost	Total Amount
10	Filter Fabric	5,360.00	sf	6.443 /sf	34,535
10	3/4" Crushed Stone	1,030.00	cy	64.432 /cy	66,365
10	Radon Mitigation				
10	Radon Mitigation	1.00	ls	248,000.00 /ls	248,000
10	Dewatering	1.00	ls	30,000.00 /ls	30,000
					6,813,866
	EARTHWORK			***41.287/sf***	***6,813,866***
	165,035.00 sf				
32-0000.000	***EXTERIOR IMPROVEMENTS***				
25	Grade Basketball Court/Play Surface	1,546.00	sy	8.054 /sy	12,451
25	Grade Sidewalk/Pavers/Conc Pads/Loading Dock	2,663.00	sf	1.289 /sf	3,432
25	HMA, Parking and Drives	15,895.00	sy	25.773 /sy	409,658
25	Fine Grading - Driveway/Parking	15,895.00	sy	1.289 /sy	20,483
25	HMA, Basketball Court	600.00	sy	25.773 /sy	15,464
25	Fine Grading - Basketball	600.00	sy	1.289 /sy	773
6	Site Concrete, Flatwork	60,733.00	sf	19.00 /sf	1,153,927
6	Site Concrete, Foundations	3,250.00	sf	40.00 /sf	130,000
2	Vertical Granite Curb	4,886.00	lf	107.386 /lf	524,690
2	Precast Concrete Curbing	2,215.00	lf	53.693 /lf	118,930
6	Line Painting	1.00	ls	32,215.93 /ls	32,216
6	Painted Courts	2.00	ea	27,276.15 /ea	54,552
6	Painted 4-Square	3.00	ea	2,416.193 /ea	7,249
6	Temp Line Striping	1.00	ls	15,000.00 /ls	15,000
001	Exterior Score Board Allowance				
001	Basketball Goals	4.00	ea	7,565.00 /ea	30,260
001	Soccer Goals	2.00	ea	8,400.00 /ea	16,800
001	Player Benches	8.00	ea	1,290.00 /ea	10,320
20	Synthetic Lawn Areas - Gathering Area	5,093.00	sf	20.00 /sf	101,860
20	Rubber Play Surfacing @ Playground	27,000.00	sf	36.90 /sf	996,300
001	Traffic Signs, Allow	1.00	ls	10,738.64 /ls	10,739
001	Entry Signs, Allow	1.00	ea	16,107.97 /ea	16,108
001	Basket Ball Hoops	4.00	ea	9,127.845 /ea	36,511
001	Trash receptacles	8.00	ea	5,000.00 /ea	40,000
001	Flagpole - 40' Ht.	2.00	ea	15,000.00 /ea	30,000
001	Bike racks	16.00	ea	977.00 /ea	15,632
001	Shade Structure Footing E&B	3.00	ea	8,053.98 /ea	24,162
001	Granite Benches	130.00	lf	1,877.00 /lf	244,010
001	Radial Benches	12.00	ea	5,975.00 /ea	71,700
001	Tables & Chairs	8.00	ea	7,725.00 /ea	61,800
001	Free Form Bench	4.00	ea	7,425.00 /ea	29,700
001	Sculpture Bench	3.00	ea	13,275.00 /ea	39,825
001	Shade Sails	3.00	ea	48,767.00 /ea	146,301
001	Garden Beds	6.00	ea	1,835.00 /ea	11,010
001	Storage Shed	1.00	ea	25,000.00 /ea	25,000
001	Playground Equipment Remove & Relocate Existing Allowance	1.00	allow	200,000.000 /allow	200,000
001	Playground Equipment - Pre-K	1.00	allow	283,500.00 /allow	283,500
001	Playground Equipment - K -> 2nd	1.00	allow	331,380.00 /allow	331,380
001	Playground Equipment - 3 -> 5	1.00	allow	409,500.00 /allow	409,500
001	Playground Underdrainage	1.00	ls	100,000.000 /ls	100,000

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	20	4' Ht - Crash Rated Fence	630.00	lf	390.00	/lf	245,700
	20	4' Ht - Chain link fence	610.00	lf	63.00	/lf	38,430
	20	10' Ht - Chain link fence	585.00	lf	120.00	/lf	70,200
	20	6' Ht - Wood Fence	315.00	lf	135.00	/lf	42,525
	20	4' single gate - Crash Rated	2.00	ea	2,100.00	/ea	4,200
	20	4' double swing gate	1.00	ea	1,200.00	/ea	1,200
	20	10' Double Swing Gate	2.00	ea	3,000.00	/ea	6,000
	20	42" x 24' Vehicular Gate	3.00	ea	12,000.00	/ea	36,000
	20	8' Ht Mtl. Louvered Fencing	170.00	lf	1,350.00	/lf	229,500
	20	Louvered Single Gate	1.00	ea	4,500.00	/ea	4,500
	20	Louvered Double Gate	3.00	ea	7,500.00	/ea	22,500
	30	Concrete Block Walls	692.00	sf	80.540	/sf	55,734
	30	Cast in Place Curved Concrete Walls, Allowance	86.00	lf	650.00	/lf	55,900
	2	Irrigation Systems - Temp irrigation, Establishment, allowance	1.00	ls	30,000.00	/ls	30,000
	2	Drip Strips at Plantings	1,200.00	sf	25.00	/sf	30,000
	2	Irrigation Systems - U-8 Fields only	32,601.00	sf	2.75	/sf	89,653
	25	Mulching	45.00	cy	165.00	/cy	7,425
	10	Strip & Stockpile Topsoil	11,860.00	cy	10.00	/cy	118,600
	10	Screen Topsoil	11,860.00	cy	10.00	/cy	118,600
	10	Transport and Place Topsoil	11,860.00	cy	16.108	/cy	191,040
	10	Planting Soil - 18"	325.00	cy	85.00	/cy	27,625
	10	Place Screened Topsoil - Lawn Areas	4,575.00	cy	15.00	/cy	68,625
	10	Export Topsoil	7,560.00	cy	30.00	/cy	226,800
	5	Lawn and Planting Maintenance	1.00	ls	15,000.00	/ls	15,000
	5	Fine Rake And Seed	193,000.00	sf	0.45	/sf	86,850
	5	Seed or Sod Allow @ Learning Area and U-8 Field	14,707.00	sf	2.50	/sf	36,768
	120	Deciduous Tree 3" Caliper	90.00	ea	2,000.00	/ea	180,000
	120	Evergreen Trees - 8'-10'	45.00	ea	2,100.00	/ea	94,500
	120	Evergreen Trees - 10'-15'	17.00	ea	3,250.00	/ea	55,250
	120	Shrubs - Allowance	3,200.00	sf	10.00	/sf	32,000
	120	Perennials - Allowance	3,200.00	sf	5.00	/sf	16,000
							8,018,367
		EXTERIOR IMPROVEMENTS			***48.586/sf***		***8,018,367***
		165,035.00 sf					

33-0000.000 UTILITIES

c	4	6" DIP Water	135.00	lf	207.00	/lf	27,945
c	4	8" DIP Water	2,363.00	lf	127.00	/lf	300,101
c	4	Connect to Existing Water Mains	1.00	ls	25,772.74	/ls	25,773
c	4	Hydrants & Tees	4.00	ea	10,094.323	/ea	40,377
c	4	6" Valves & Fittings	1.00	ls	10,000.00	/ls	10,000
c	4	8" Valves & Fittings	1.00	ls	25,000.00	/ls	25,000
c	4	Water Main Testing - Air	2,500.00	lf	1.50	/lf	3,750
c	4	Water Main Flushing	2,500.00	lf	1.25	/lf	3,125
c	4	Water Main Clorination	2,500.00	lf	1.25	/lf	3,125
	8	8" SDR-35	1,287.00	lf	94.00	/lf	120,978
	8	Connect to Existing Sewer Manhole	1.00	ea	6,121.03	/ea	6,121
	8	Sewer Manhole	12.00	ea	4,000.00	/ea	48,000
	8	Grease Trap & Acid Waste Tank	1.00	ea	12,886.38	/ea	12,886
	8	Set Frame & Cover	12.00	ea	1,035.205	/ea	12,422

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	8	Brick Invert	12.00	ea	536.932 /ea	6,443
	8	Sewer Main Testing - Air	1,287.00	lf	3.222 /lf	4,146
	8	Sewer Main Testing - Mandrel	1,287.00	lf	2.685 /lf	3,455
	8	Manhole Testing - Air	12.00	ea	268.466 /ea	3,222
	12	12" HDPE	2,828.00	lf	78.00 /lf	220,584
	12	15" HDPE	9.00	lf	156.00 /lf	1,404
	12	Infiltration System Cultec R330XLHD	514.00	ea	1,170.00 /ea	601,380
	12	4' Diameter Catch Basin	27.00	ea	4,630.00 /ea	125,010
	12	Drain Manholes	35.00	ea	3,800.00 /ea	133,000
	12	Set Frame & Grate Cover	62.00	ea	1,396.023 /ea	86,553
	12	Brick Invert	62.00	ea	300.682 /ea	18,642
	12	Infiltration System - 36" HDPE	1,260.00	lf	268.466 /lf	338,267
	12	Infiltration System - 36" HDPE	1,400.00	lf	268.466 /lf	375,852
	12	Water quality Monitors - NIC				
	008	Electrical Site Lighting - Excavation - Site Contractor Scope Below:				
	008	UG Electric Duct Bank 2-2.5"	950.00	lf	12.886 /lf	12,242
	008	Site Lighting Conduit Trench	3,535.00	lf	12.886 /lf	45,553
	008	Light Pole Bases	50.00	ea	354.375 /ea	17,719
	008	Electrical Manhole	3.00	ea	1,288.637 /ea	3,866
	008	Transformer Pad, Precast	1.00	ea	2,684.66 /ea	2,685
	008	E&B for Generator Pads	1.00	ls	5,369.32 /ls	5,369
	001	Electrical Site Distribution - Electrical Contractor				
	001	Primary service pole riser 5" GRC	1.00	ea	4,145.00 /ea	4,145
	001	Primary service duct bank 2x5" PVC	660.00	lf	115.00 /lf	75,900
	001	Transformer pad grounding	1.00	ea	2,192.00 /ea	2,192
	001	Primary service 3- #4/0-1C 15KV SHLD 133%	700.00	ea	78.92 /ea	55,244
	001	#4/0 15KV Load break elbows	3.00	ea	908.00 /ea	2,724
	001	#4/0 15KV Termonations	3.00	ea	838.00 /ea	2,514
	001	Secondary service 3000A (8) 4" PVC 1-Spare	130.00	lf	900.45 /lf	117,059
	001	6'x 12'x 6' Tutility manhole	1.00	ea	111.52 /ea	112
	001	Manhole racks & grounding	1.00	ea	5,840.00 /ea	5,840
	001	Generator pad grounding	1.00	ea	3,226.00 /ea	3,226
	001	1200A Generator feeder (3) 4" PVC copper	175.00	lf	390.57 /lf	68,350
	001	125A Generator feeder 2" PVC copper	175.00	lf	28.26 /lf	4,946
	001	Electrical Site Distribution - Electrical Contractor				
	001	Type SL1/3 LED Single head luminaire on 12.5' pole	30.00	ea	4,500.00 /ea	135,000
	001	18" x 6' Precast concrete pole base	30.00	ea	1,095.00 /ea	32,850
	001	1" PVC 4 #8	3,000.00	ea	10.40 /ea	31,200
	001	125A Generator feeder 2" PVC copper	175.00	lf	28.26 /lf	4,946
	001	Generator aux circuits 2" PVC	175.00	lf	96.09 /lf	16,816
	001	Quazite ingrade pull box 17" x 30" x24"	10.00	ea	1,136.00 /ea	11,360
	001	Site Communications - Electrical Contractor				
	001	Telcom service pole riser	1.00	ea	5,267.00 /ea	5,267
	001	Telcom service duct bank 4x 4" PVC	780.00	ea	58.05 /ea	45,279
	001	6'x 12'x 6' Tutility manhole	2.00	ea	1,112.00 /ea	2,224
	001	Manhole racks & grounding	2.00	ea	5,840.00 /ea	11,680
	001	2500KVA 15KV loop feed pad transformer	1.00	ls	198,138.00 /ls	198,138
						3,482,007
		UTILITIES			***21.099/sf***	***3,482,007***
		165,035.00 sf				

Estimate Totals

Description	Amount	Totals	Rate
Direct Cost	**102,196,156**	**102,196,156**	
Design Contingency	10,219,616		10.000 %
Escalation	7,664,712		7.500 %
Construction Contingency	1,532,942		1.500 %
Subtotal	**19,417,270**	**121,613,426**	
Sub Default Insurance	750,000		
Project Requirements	4,196,169		
GCs & GRs (Price Proposal)	5,733,391		
Preconstruction			
General Liability Insurance	1,509,454		1.095 %
Performance Bond	958,055		0.695 %
Builder Risk Insurance	266,050		0.193 %
Pollution Insurance	66,168		0.048 %
	13,479,287	**135,092,713**	
		135,092,713	
General Building Permit - Waived			
Subtotal		**135,092,713**	
CM Fee	2,756,994		2.000 %
Subtotal	**2,756,994**	**137,849,707**	
Project GSF 165,035			
Total		**137,849,707**	

Fontaine Bros. UNI Format Summary

Wilmington Elementary School

CSI Division		Cost/SF	Total Amount
A10 FOUNDATIONS			
A1010 Standard Foundations	165,035 sf	12.32 /sf	2,032,444
A1030 Slab on Grade	165,035 sf	22.38 /sf	3,694,201
B10 SUPERSTRUCTURE			
B1010 Floor Construction	165,035 sf	40.45 /sf	6,676,391
B1020 Roof Construction	165,035 sf	26.08 /sf	4,304,140
B20 EXTERIOR VERTICAL ENCLOSURES			
B2010 Exterior Walls	165,035 sf	73.89 /sf	12,194,503
B2020 Exterior Windows	165,035 sf	14.40 /sf	2,376,455
B2030 Exterior Doors	165,035 sf	0.92 /sf	152,150
B30 EXTERIOR HORIZONTAL ENCLOSURES			
B3010 Roof Coverings	165,035 sf	15.78 /sf	2,604,350
B3020 Roof Openings & Accessories	165,035 sf	0.52 /sf	85,430
C10 INTERIOR CONSTRUCTION			
C1010 Interior Partitions	165,035 sf	38.91 /sf	6,421,270
C1020 Interior Doors	165,035 sf	8.27 /sf	1,365,400
C1030 Fittings	165,035 sf	13.55 /sf	2,236,985
C20 STAIRS			
C2010 Stair Construction	165,035 sf	3.79 /sf	626,200
C2020 Stair Finishes	165,035 sf	1.79 /sf	295,760
C30 INTERIOR FINISHES			
C3010 Wall Finishes	165,035 sf	10.03 /sf	1,655,541
C3020 Floor Finishes	165,035 sf	16.50 /sf	2,723,244
C3030 Ceiling Finishes	165,035 sf	12.41 /sf	2,048,871
D10 CONVEYING			
D1010 Vertical Conveying Systems	165,035 sf	1.45 /sf	238,500
D20 PLUMBING			
D20 PLUMBING	165,035 sf	21.31 /sf	3,516,468
D30 HVAC			
D30 HVAC	165,035 sf	85.43 /sf	14,098,382
D40 FIRE PROTECTION			
D40 FIRE PROTECTION	165,035 sf	7.67 /sf	1,265,731
D50 ELECTRICAL			
D50 ELECTRICAL	165,035 sf	59.04 /sf	9,743,850
E10 EQUIPMENT			
E1010 Commercial Equipment	165,035 sf	4.85 /sf	800,000
E1060 Residential Equipment	165,035 sf	0.11 /sf	17,500
E1090 Other Equipment	165,035 sf	3.16 /sf	521,150
E20 FURNISHINGS			
E2010 Fixed Furnishings	165,035 sf	17.59 /sf	2,903,675
F20 DEMOLITION			
F20 Demolition & Abatement	165,035 sf	12.12 /sf	2,000,000
G10 SITE WORK			
G10 Site Preparation	165,035 sf	23.71 /sf	3,912,308
G20 Site Improvements	165,035 sf	49.71 /sf	8,203,252
G30 Site Utilities	165,035 sf	15.50 /sf	2,557,563
G40 Site Electrical	165,035 sf	5.60 /sf	924,444
		Total Direct Cost	**$ 102,196,156**
		Design Contingency	$ 10,219,616
		Escalation	$ 7,664,712
		Construction Contingency	$ 1,532,942
		Sub Default Insurance	$ 750,000
		Project Requirements	$ 4,196,169
		GCs & GRs (Price Proposal)	$ 5,733,391
		General Liability Insurance	$ 1,509,454
		Performance Bond	$ 958,055
		Builder Risk Insurance	$ 266,050
		Pollution Insurance	$ 66,168
		CM Fee	$ 2,756,994
		Project Toal	**$ 137,849,707**

3

Item	Description	Takeoff Qty		Total Unit Cost	Amount
A					
A10	**FOUNDATIONS**				
A1010	*Standard Foundations*				
125	Concrete Material - Footings, Piers & FND Walls	1,493.00	cy	125.00 /cy	186,625
125	Concrete Form & Place - Footings, Walls & Piers	34,000.00	sf	20.00 /sf	680,000
125	General Concrete - Winter Conditions	1.00	ls	200,000.000 /ls	200,000
125	Concrete Foundations Coordination	1.00	ls	125,000.00 /ls	125,000
20	2" Rigid Foundation Insulation - Vertical	9,442.00	sf	3.00 /sf	28,326
14	Re-Bar, Footings, Piers, Walls	101.00	tons	2,500.00 /tons	252,500
2	Elevator Pit Waterproofing	1.00	ea	8,500.00 /ea	8,500
2	Foundation Damproofing	24,060.00	sf	4.50 /sf	108,270
10	E&B Footings	2,422.00	lf	161.080 /lf	390,135
10	E&B Column Footings	86.00	ea	268.466 /ea	23,088
10	Dewatering	1.00	ls	30,000.00 /ls	30,000
					2,032,444
	A1010 Standard Foundations			*12.315/sf*	*2,032,444*
	165,035.00 sf				
A1030	*Slab on Grade*				
105	Stage Ramp	1.00	ls	22,000.00 /ls	22,000
12	15 mil Vapor Barrier	76,300.00	sf	1.00 /sf	76,300
120	2" Rigid Insulation Under Slab, Full Coverage	76,300.00	sf	3.00 /sf	228,900
14	Re-Bar, SOG	10.00	tons	2,500.00 /tons	25,000
10	Place & Finish SOG - Included Saw Cuts for CJs and Sealant	76,300.00	sf	11.00 /sf	839,300
10	SOG Concrete	1,178.00	cy	125.00 /cy	147,250
10	Building Excavation				
10	Building Excavation	18,385.00	cy	15.00 /cy	275,775
10	Building Pad Fills	25,150.00	cy	55.00 /cy	1,383,250
10	Sand and Gravel Base Under Slab - 12"	2,978.00	cy	55.00 /cy	163,790
10	Underslab Utility E&B	2,500.00	lf	42.00 /lf	105,000
10	Foundation Perimeter Drains				
10	4" Perforated PVC Pipe	5,415.00	lf	8.591 /lf	46,520
10	4" PVC Fittings	40.00	ea	805.398 /ea	32,216
10	Filter Fabric	5,360.00	sf	6.443 /sf	34,535
10	3/4" Crushed Stone	1,030.00	cy	64.432 /cy	66,365
10	Radon Mitigation				
10	Radon Mitigation	1.00	ls	248,000.00 /ls	248,000
					3,694,201
	A1030 Slab on Grade			*22.384/sf*	*3,694,201*
	165,035.00 sf				

Item		Description	Takeoff Qty		Unit Cost	Total Amount
		A1030 Slab on Grade			*22.384/sf*	*3,694,201*
		165,035.00 sf				
		A10 FOUNDATIONS			**34.700/sf**	**5,726,645**
		165,035.00 sf				
		A SUBSTRUCTURE			***34.700/sf***	***5,726,645***
		165,035.00 sf				

B

B10 SUPERSTRUCTURE

B1010 Floor Construction

	100	Place & Finish - SODs	87,000.00	sf	11.00	/sf	957,000
	100	SOD Concrete	1,776.00	cy	125.00	/cy	222,000
	100	Place & Finish - SODs - House Keeping Pads, Allow	250.00	sf	28.00	/sf	7,000
	100	Building Wrap and Weather Protection - For SOD Heating					
	14	Re-Bar, SOD	22.00	tons	2,500.00	/tons	55,000
a 01		Structural Steel - Floor Structure, 14 PSF	795.00	tn	4,800.00	/tn	3,816,000
a 01		Structural Steel - Braced Frames (HSS 8x8x1/2 Assumed)					
a 01		Structural Steel - Coordination, Floors	1.00	ls	150,000.00	/ls	150,000
a 01		Structural Steel - Floor Structure, Gym 25 PSF	60.00	tn	4,800.00	/tn	288,000
	618	Metal Floor Deck - 5-1/4"	98,770.00	sf	8.00	/sf	790,160
	618	Metal Floor Deck - 3"	22,397.00	sf	6.50	/sf	145,581
	618	Metal Floor Deck - Acoustical	4,925.00	sf	8.00	/sf	39,400
	140	Misc Metals - Floor Construction	165,000.00	sf	1.25	/sf	206,250
							6,676,391
		B1010 Floor Construction			*40.454/sf*		*6,676,391*
		165,035.00 sf					

B1020 Roof Construction

	100	Place & Finish - SOD, RTU Pads	7,000.00	sf	11.00	/sf	77,000
	100	SOD Concrete RTU	114.00	cy	125.00	/cy	14,250
	14	Re-Bar, SOD, RTU Pads	6.00	tons	2,500.00	/tons	15,000

Item		Description	Takeoff Qty		Unit Cost	Total Amount
a 01		Structural Steel - 12' Equipment Screen Wall, Allowance	70.00	tn	4,800.00 /tn	336,000
a 01		Structural Steel - Roof Structure, 25 PSF - Gym	97.00	tn	4,800.00 /tn	465,600
a 01		Structural Steel - Roof Structure, 14 PSF	311.00	tn	4,800.00 /tn	1,492,800
a 01		Structural Steel - Coordination, Roof	1.00	ls	200,000.000 /ls	200,000
	320	Metal Roof Decking -3"	36,690.00	sf	6.50 /sf	238,485
	320	Metal Roof Decking - Acoustic, Gymnasium, Cafeteria	7,590.00	sf	8.00 /sf	60,720
50-11		Glu-Lam 12" x 24"	1,105.00	lf	250.00 /lf	276,250
50-11		Glu-Lam 12" x 30"	175.00	lf	285.00 /lf	49,875
50-11		Glu-Lam Installation	1,280.00	lf	230.00 /lf	294,400
50-11		Glu-Lam Connections Allowance	1.00	ls	25,000.00 /ls	25,000
50-11		Glu-Lam Temp Protection	1.00	ls	20,000.00 /ls	20,000
50-11		Glu-Lam 16" x 16" - Columns	168.00	lf	275.00 /lf	46,200
	2	Fireproofing, Columns, Beams, Floor Decking - 1 Hr.	126,092.00	sf	2.25 /sf	283,707
	2	Fireproofing, Roof Decking - 1 Hr.	44,280.00	sf	2.25 /sf	99,630
	2	Fireproofing, Low -> Medium Density - Premium	170,372.00	sf	0.60 /sf	102,223
	2	Gymnasium, Intumescent Paint - Allowance	1.00	ls	100,000.000 /ls	100,000
	2	Patch Days	10.00	cds	3,200.00 /cds	32,000
	2	Building Wrap and Weather Protection, for Fireproofing Work	1.00	ls	75,000.00 /ls	75,000
						4,304,140
		B1020 Roof Construction			*26.080/sf*	*4,304,140*
		165,035.00 sf				
		B10 SUPERSTRUCTURE			**66.535/sf**	**10,980,531**
		165,035.00 sf				
B20		**EXTERIOR VERTICAL ENCLOSURES**				
B2010		*Exterior Walls*				
	2	Cast Stone Lintels	1,580.00	lf	135.00 /lf	213,300
	2	Cast Stone Banding - Decorative / Stepped, 12"	1,615.00	lf	157.00 /lf	253,555
	2	Cast Stone Banding - 6" Band	105.00	lf	88.00 /lf	9,240
	2	Cast Stone Veneer & Banding	8,500.00	sf	160.00 /sf	1,360,000
	110	Brick Veneer, Type 1 - Glen Gery, Rustic Red Flashed	26,086.00	sf	46.00 /sf	1,199,956
	110	Brick Veneer, Type 2 - Glen Gery, Bermuda Blue Glazed	830.00	sf	48.00 /sf	39,840
	110	Exterior Mock up - Masonry Allowance	1.00	ls	25,000.00 /ls	25,000
	102	CUVM Veneer - Custom Cast Stone, Light Buff	29,364.00	sf	70.00 /sf	2,055,480
	5	Masonry Staging - Exterior	64,000.00	sf	6.25 /sf	400,000
	140	Loose Lintels - Masonry	1,580.00	lf	35.00 /lf	55,300
	140	Misc Metals - Exterior Walls	165,000.00	sf	0.50 /sf	82,500
	2	4" Rigid Cavity Wall Insulation (Masonry)	64,000.00	sf	6.00 /sf	384,000
	2	4" Rigid Cavity Wall Insulation (Panels)	10,094.00	sf	6.00 /sf	60,564

Item		Description	Takeoff Qty		Unit Cost		Total Amount
	10	Air Vapor Barrier, Fluid Applied, Carlise Fire-Resistive Barritech	83,000.00	sf	9.00	/sf	747,000
	2	MCM Composite Panels - Allucabond	6,094.00	sf	70.00	/sf	426,580
	2	MCM Composite Panels @ Roof Edges & Flats	9,681.00	sf	70.00	/sf	677,670
	2	Roof Screen w/Acoustic Metal Panel - 12' Height	14,237.00	sf	100.00	/sf	1,423,700
	2	Linear Metal Ceilings at Canopys	2,235.00	sf	70.00	/sf	156,450
	2	Exterior Joint/Control & Caulking	165,035.00	sf	0.50	/sf	82,518
	100	Exterior Walls					
	100	EXT WALL Back Up, 8" or 6" LGMF, GWB interior Face, Batt Insul	83,000.00	sf	24.50	/sf	2,033,500
	100	Exterior Wall - Densglass Sheathing	83,000.00	sf	6.00	/sf	498,000
	2499	GWB Ceilings, Exterior Canopy Soffits	690.00	sf	15.00	/sf	10,350
							12,194,503
		B2010 Exterior Walls			*73.890/sf*		*12,194,503*
		165,035.00 sf					
B2020		*Exterior Windows*					
	140	Exterior Louvers, Allowance	1.00	ls	85,000.00	/ls	85,000
	2	Window Blocking	7,225.00	lf	15.00	/lf	108,375
	1000	Exterior Aluminum Curtainwall, Triple Glazed	5,100.00	sf	160.00	/sf	816,000
	1000	Exterior Aluminum Storefront Systems, Triple Glazed	225.00	sf	160.00	/sf	36,000
	1000	Exterior Aluminum Windows, Triple Glazed	7,100.00	sf	160.00	/sf	1,136,000
	1000	Exterior Aluminum Windows, Ballistic Rated	0.00	NIC			
	1000	School guard, Curtain wall & Storefront	1,005.00	sf	70.00	/sf	70,350
	1000	School guard, W1 Windows (Not Full Pane)	639.00	sf	70.00	/sf	44,730
	1000	Sunshades	320.00	lf	250.00	/lf	80,000
							2,376,455
		B2020 Exterior Windows			*14.400/sf*		*2,376,455*
		165,035.00 sf					
B2030		*Exterior Doors*					
	220	EXTERIOR DOORS					
	220	Type - FG HM, 6' - 0"x7' - 0" 45 MIN, Full Lite	5.00	pair	1,650.00	/pair	8,250
	220	Type - FG HM, 3' - 0"x7' - 0" 45 MIN, Full Lite	3.00	ea	1,650.00	/ea	4,950
	50	OHD - Overhead Sectional Door 10' x 10'	1.00	ea	15,000.00	/ea	15,000
	10	Transome & Sidelite Glazing - Exterior Doors	120.00	sf	125.00	/sf	15,000
	1000	Exterior Aluminum Doors					
	1000	ALUMINUM, Single Door	1.00	lfs	8,000.00	/lfs	8,000
	1000	ALUMINUM, Double Door	6.00	lfs	8,000.00	/lfs	48,000
	10	Door and Hardware Install - Exterior	13.00	lfs	550.00	/lfs	7,150
	10	Exterior Finish Hardware - Allowance	13.00	lfs	1,500.00	/lfs	19,500
	10	Exterior Finish Hardware - Auto Openers	5.00	lfs	4,500.00	/lfs	22,500
	30	Paint Exterior HM Door Frames	4.00	ea	250.00	/ea	1,000
	30	Paint Exterior HM Doors	8.00	lfs	350.00	/lfs	2,800

Item	Description	Takeoff Qty		Unit Cost	Total Amount
					152,150
	B2030 Exterior Doors			*0.922/sf*	*152,150*
	165,035.00 sf				
	B20 EXTERIOR VERTICAL ENCLOSURES			**89.212/sf**	**14,723,108**
	165,035.00 sf				
B30	**EXTERIOR HORIZONTAL ENCLOSURES**				
B3010	*Roof Coverings*				
2	General Roof Blocking	165,035.00	sf	1.00 /sf	165,035
2	Roof Blocking Perimeter	2,800.00	lf	20.00 /lf	56,000
2	EPDM Roofing, 9" Tapered Insul, Deck Sheathing	76,985.00	sf	27.50 /sf	2,117,088
2	EPDM Roofing, 9" Tapered Insul, Deck Sheathing	9,681.00	sf	27.50 /sf	266,228
					2,604,350
	B3010 Roof Coverings			*15.781/sf*	*2,604,350*
	165,035.00 sf				
B3020	*Roof Openings & Accessories*				
140	Metal Stair Landing and Single Step @ Roof Door	1.00	ea	10,000.00 /ea	10,000
10	Elevator Vents, None Shown	1.00	ea	3,560.83 /ea	3,561
10	Roof Ladders	1.00	ea	7,960.83 /ea	7,961
20	Roof Walkway pads (24" Width)	1,826.00	lf	35.00 /lf	63,910
					85,432
	B3020 Roof Openings & Accessories			*0.518/sf*	*85,432*
	165,035.00 sf				
	B30 EXTERIOR HORIZONTAL ENCLOSURES			**16.298/sf**	**2,689,782**
	165,035.00 sf				
	B SHELL			***172.045/sf***	***28,393,420***
	165,035.00 sf				

Item	Description	Takeoff Qty		Total Unit Cost	Total Amount
	B SHELL			***172.045/sf***	***28,393,420***
	165,035.00 sf				
C					
C10	**INTERIOR CONSTRUCTION**				
C1010	*Interior Partitions*				
102	Interior 12" CMU walls	13,342.00	sf	42.00 /sf	560,364
102	Interior 8" CMU walls - Ground Face	9,800.00	sf	38.00 /sf	372,400
102	Interior 6" CMU walls - Ground Face	854.00	sf	34.00 /sf	29,036
102	Acoustical Masonry Units - Gym 12" - Jandris "Sound Cell"	652.00	sf	65.00 /sf	42,380
5	Masonry Staging - Interior	24,600.00	sf	6.25 /sf	153,750
2	In-Wall Blocking	165,000.00	sf	0.85 /sf	140,250
2	Misc. Blocking	1.00	ls	50,000.00 /ls	50,000
2	Temporary Safety and Railings	1.00	ls	25,000.00 /ls	25,000
002	Misc. Fire Stopping w/ Trades				
40	Misc. Interior Caulking	165,035.00	sf	0.50 /sf	82,518
10	Interior Storefront	225.00	sf	120.00 /sf	27,000
10	Interior Storefront, Ballistic Level 3 Rated - Vestibule 172	1.00	ls	10,000.00 /ls	10,000
10	Interior Storefront, Ballistic Level 3 Rated - Vestibule 101	1.00	ls	5,500.00 /ls	5,500
100	Interior Walls				
100	Typical Interior Partitions	186,992.00	sf	22.00 /sf	4,113,824
100	Fire Rated Partitions	6,827.00	sf	24.00 /sf	163,848
100	Ballistic Fiberglass Panels Level 3 - Office || Vestibule Wall ONLY	180.00	sf	30.00 /sf	5,400
100	FRP - Included in above partitions				
100	Drywall General Conditions				
100	General Carp / Labor	165,000.00	sf	2.00 /sf	330,000
100	Lifts & Staging	1.00	ls	45,000.00 /ls	45,000
100	Mock ups	1.00	ls	20,000.00 /ls	20,000
100	Miscellaneous				
100	Wall and Soffit Coordination	1.00	ls	50,000.00 /ls	50,000
100	Misc. Touchup and Patching Allowance	1.00	ls	50,000.00 /ls	50,000
100	Misc. Engineering & Associated Work	1.00	ls	25,000.00 /ls	25,000
2	Operable Partition - 23' x 8' Height	3.00	ea	30,000.00 /ea	90,000
2	Operable Partition - 12' x 8' Height	2.00	ea	15,000.00 /ea	30,000
					6,421,270
	C1010 Interior Partitions			*38.909/sf*	*6,421,270*
	165,035.00 sf				
C1020	*Interior Doors*				
10	Interior Ballistic Doors 177A	1.00	lfs	25,000.00 /lfs	25,000

Item	Description	Takeoff Qty		Total Unit Cost	Amount
10	Interior Doors				
10	Type - F WOOD, 6' - 0"x7' - 0" 45 MIN	7.00	pair	850.00 /pair	5,950
10	Type - F WOOD, 3' - 0"x7' - 0"	206.00	lfs	850.00 /lfs	175,100
10	Type - F WOOD, 4' - 0"x7' - 0"	5.00	pair	850.00 /pair	4,250
10	Type - F WOOD, 6' - 0"x7' - 0"	22.00	pair	1,500.00 /pair	33,000
10	Type - F WOOD, 3' - 0"x7' - 0" 90 MIN	7.00	lfs	850.00 /lfs	5,950
10	Type - F HM, 3' - 0"x7' - 0"	2.00	lfs	850.00 /lfs	1,700
10	Type - F WOOD, 6' - 0"x7' - 0" 90 MIN	2.00	pair	1,500.00 /pair	3,000
10	Type - F WOOD, 3' - 0"x7' - 0" 45 MIN	1.00	lfs	850.00 /lfs	850
10	Type - FG HM, 6' - 0"x7' - 0", Full Lite	1.00	pair	1,350.00 /pair	1,350
10	Type - FG WOOD, 6' - 0"x7' - 0", Full Lite	8.00	pair	1,350.00 /pair	10,800
10	Type - FG WOOD, 3' - 0"x7' - 0", Full Lite	4.00	lfs	1,350.00 /lfs	5,400
10	Type - G WOOD, 3' - 0"x7' - 0", Half Lite	52.00	lfs	600.00 /lfs	31,200
10	Type - G WOOD, 6' - 0"x7' - 0", Half Lite	6.00	pair	1,200.00 /pair	7,200
10	STC Premium	2.00	lfs	150.00 /lfs	300
10	Fire Rating Premium	27.00	lfs	250.00 /lfs	6,750
100	Interior Frames				
100	Frame Install - Installed w/ GWB				
100	Type -1 HM, 3' - 0Wx7' - 0H	137.00	ea	350.00 /ea	47,950
100	Type -1 HM, 3' - 0Wx7' - 0H 90 MIN	7.00	ea	350.00 /ea	2,450
100	Type -1 HM, 3' - 0Wx7' - 0H 45 Min	1.00	ea	350.00 /ea	350
100	Type -2 HM, 6' - 0Wx7' - 0H	23.00	ea	400.00 /ea	9,200
100	Type -2 HM, 6' - 0Wx7' - 0H 90 Min	2.00	ea	400.00 /ea	800
100	Type -2 HM, 6' - 0Wx7' - 0H 45 min	1.00	ea	400.00 /ea	400
100	Type -2 HM, 4' - 0Wx7' - 0H	5.00	ea	375.00 /ea	1,875
100	Type -3 HM, 3' - 0Wx7' - 0H, Sidelite 17sf Glazing	59.00	ea	450.00 /ea	26,550
100	Type -4 HM, 6' - 0Wx7' - 0H, Transome 6sf Glazing	2.00	ea	450.00 /ea	900
100	Type -5 HM, 3' - 0Wx7' - 0H, Sidelite & Transome 21sf Glazing	2.00	ea	600.00 /ea	1,200
100	Type -1A HM, 3' - 0Wx7' - 0H	1.00	ea	400.00 /ea	400
100	Type -1B HM, 3' - 0Wx7' - 0H	1.00	ea	350.00 /ea	350
100	Type -2A HM, 6' - 0Wx7' - 0H	12.00	ea	400.00 /ea	4,800
100	Type -2A HM, 6' - 0Wx7' - 0H 45 min	10.00	ea	400.00 /ea	4,000
100	Type -3A HM, 3' - 0Wx7' - 0H, Sidelite 8sf Glazing	62.00	ea	450.00 /ea	27,900
100	Fire Rating Premium	21.00	ea	200.00 /ea	4,200
100	Borrowed Lite Frames	10.00	ea	450.00 /ea	4,500
50	OHG - Overhead Coiling Door - 22' x 11'5" - Kitchen	1.00	ea	25,000.00 /ea	25,000
10	PT Mirrors, Allow	1.00	ls	5,000.00 /ls	5,000
10	Transome & Sidelite Glazing	1,494.00	sf	85.00 /sf	126,990
10	Borrowed Lites - BL-2	61.00	sf	85.00 /sf	5,185
10	Borrowed Lites - BL-4	234.00	sf	85.00 /sf	19,890
10	Admin Transaction Window, Ballistic Level 3	1.00	ea	12,500.00 /ea	12,500
1000	Interior Aluminum Doors				
1000	ALUMINUM, Single Door	1.00	lfs	25,000.00 /lfs	25,000
1000	ALUMINUM, Double Door	2.00	lfs	7,000.00 /lfs	14,000
1000	ALUMINUM, Double Door - Ballistic	4.00	lfs	25,000.00 /lfs	100,000
10	Door and Hardware Install	326.00	ea	550.00 /ea	179,300
10	Finish Hardware - Allowance	369.00	lfs	750.00 /lfs	276,750
40	Paint Doors And Frames	392.00	lfs	230.00 /lfs	90,160
40	Painting Sequencing Allowance	1.00	ls	30,000.00 /ls	30,000
					1,365,400
	C1020 Interior Doors			*8.273/sf*	*1,365,400*
	165,035.00 sf				

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
C1030		*Fittings*					
	10	Misc. Metals Allowance	165,000.00	sf	2.00	/sf	330,000
	10	Misc. Metals Coordination	1.00	ls	200,000.000	/ls	200,000
	10	Catwalk, Railings & Ladder Allowance - None Shown - NIC					
	140	Overhead Door supports	2.00	ea	5,000.00	/ea	10,000
	140	Misc. Folding Door Support	5.00	ea	3,500.00	/ea	17,500
	140	Patient Lift Support - Assume Nurses office / PT	2.00	ea	2,500.00	/ea	5,000
	140	Misc Metals - Roof	165,000.00	sf	1.00	/sf	165,000
	140	Misc Metals - Cafe Railing - Resin Panels (LED Lit, Color Changing)	87.00	lf	350.00	/lf	30,450
	140	Unistrut Ceiling Systems - None Shown - NIC					
	2	Stage Front / Proscenium / Trim - Allowance	1.00	ls	25,000.00	/ls	25,000
	2	Admin Office, Custom Desk	1.00	ls	20,000.00	/ls	20,000
	2	Library - Custom Circulation Desk	1.00	ls	20,000.00	/ls	20,000
	2	Custom Mailbox	1.00	ls	12,000.00	/ls	12,000
	2	Custom Teacher Station	1.00	ls	12,000.00	/ls	12,000
	2	Custom Trash / Recycle Stations	21.00	lf	650.00	/lf	13,650
	2	Custom Lego Walls	110.00	sf	120.00	/sf	13,200
	2	Decorative Slat Wall	115.00	sf	50.00	/sf	5,750
	2	Millwork and FF&E Protection	1.00	ls	65,000.00	/ls	65,000
	2	Millwork not yet shown	165,000.00	sf	1.00	/sf	165,000
	2	Window Seating	72.00	lf	450.00	/lf	32,400
	2	Stair built in Seating - Stair 5	1.00	allow	15,000.00	/allow	15,000
	2	Custom Graphic Wall Allowance	165,035.00	sf	0.727	/sf	120,035
	2	Magnetic White Boards 6' x 5'	136.00	ea	1,000.00	/ea	136,000
	2	Tackboards 4'x4'	200.00	ea	480.00	/ea	96,000
	2	Tackboards 4'x6'	9.00	ea	720.00	/ea	6,480
	2	Tackboards 4'x8'	172.00	ea	960.00	/ea	165,120
	2	Tackboards 6'x6'-6"	58.00	ea	1,170.00	/ea	67,860
	2	Wall Hung TV - By Others - NIC					
	110	ADA Classroom / Office / Typ Doors	298.00	ea	85.00	/ea	25,330
	110	LEED Plaques	3.00	ea	850.00	/ea	2,550
	110	10x8 ADA Elevator	3.00	ea	110.00	/ea	330
	110	12x16 Wayfinding	6.00	ea	215.00	/ea	1,290
	110	14x10 Stair Signage	5.00	ea	425.00	/ea	2,125
	110	Time Capsule Plaque	1.00	ea	800.00	/ea	800
	110	36x42 Dedication Plaque	3.00	ea	8,000.00	/ea	24,000
	110	Vinyl Door Numbering	319.00	ea	50.00	/ea	15,950
	110	Misc. Signage	1.00	ls	15,000.00	/ls	15,000
	110	6" Aluminum Lettering	54.00	letter	70.00	/letter	3,780
	110	18" Aluminum Lettering, Face Lit - 'Wilmington Elementary'	20.00	letter	620.00	/letter	12,400
	2	Plastic Toilet Partitions - Standard Height, 55"	23.00	ea	1,200.00	/ea	27,600
	2	Plastic Toilet Partitions - ADA	14.00	ea	1,800.00	/ea	25,200
	2	Urinal Screen	1.00	ea	500.00	/ea	500
	2	Toilet Partition Installation	1.00	ls	45,000.00	/ls	45,000
	2	42" Grab Bars	96.00	ea	100.00	/ea	9,600
	2	Toilet Paper Dispensers	72.00	ea	65.00	/ea	4,680
	2	Paper Towel Dispensers	49.00	ea	100.00	/ea	4,900
	2	18 x 36 Framed Mirrors	77.00	ea	350.00	/ea	26,950
	2	Janitor Mop Racks	8.00	ea	250.00	/ea	2,000
	2	Changing Table - Prek / K Toilets	15.00	ea	850.00	/ea	12,750
	2	PT Dispenser w/Trash - Single Bathrooms	35.00	ea	225.00	/ea	7,875
	2	PT Dispenser w/Trash - Gang Bathrooms	14.00	ea	225.00	/ea	3,150
	2	Sanitary Napkin Disposal, Single Bathrooms	35.00	ea	100.00	/ea	3,500
	2	Hand Dryers	20.00	ea	850.00	/ea	17,000
	2	Toilet Accessories - Installation	1.00	ls	20,000.00	/ls	20,000

Item		Description	Takeoff Qty		Unit Cost		Total Amount
	2	Changing Table - Family Toilets, Allow for 4	4.00	ea	850.00	/ea	3,400
	2	Sharps Container	1.00	ea	250.00	/ea	250
	2	Hand Sanatizer Stations	53.00	ea	80.00	/ea	4,240
	30	Extinguishers & Recessed Cabinets	1.00	allow	30,000.00	/allow	30,000
	30	AED and Cabinet Allowance	1.00	ls	15,000.00	/ls	15,000
	10	Lockers, 12x12 Corridors, Kitchen, Per Narrative	12.00	ea	470.00	/ea	5,640
	10	Lockers, 18x15 Corridors, Custodial, Per Narrative	10.00	ea	550.00	/ea	5,500
	50	Metal Storage Shelving - NIC					
	001	Smart Board & Short Throw Projectors					
	001	Smart Board & Short Throw Projectors - Prek / K Classrooms					
	001	Smart Board & Short Throw Projectors - Classrooms					
	001	Smart Board & Short Throw Projectors - Art Classrooms					
	001	Smart Board & Short Throw Projectors - Music Classrooms					
	001	Smart Board & Short Throw Projectors - Staff					
	001	Smart Board & Short Throw Projectors - Media / Library					
	10	Bookcases	245.00	lf	450.00	/lf	110,250
							2,236,985
		C1030 Fittings			*13.555/sf*		*2,236,985*
		165,035.00 sf					
		C10 INTERIOR CONSTRUCTION			**60.737/sf**		**10,023,655**
		165,035.00 sf					
C20		**STAIRS**					
C2010		*Stair Construction*					
	105	Stairs and Landings	10.00	Flt	4,200.00	/Flt	42,000
	105	Stairs and Landings, Cafeteria Stair	1.00	Flt	4,200.00	/Flt	4,200
	10	Stairs - Feature Stair, Cafeteria	1.00	Flt	75,000.00	/Flt	75,000
	10	Stairs - Egress	7.00	Flt	40,000.00	/Flt	280,000
	10	Stairs - Feature Stair, Stair 4	3.00	Flt	75,000.00	/Flt	225,000
							626,200
		C2010 Stair Construction			*3.794/sf*		*626,200*
		165,035.00 sf					
C2020		*Stair Finishes*					
	2	Terrazzo Treads - Cafeteria Stair	26.00	ea	720.00	/ea	18,720
	2	Terrazzo Treads - Stair 2	72.00	ea	720.00	/ea	51,840
	2	Terrazzo Treads - Stair 4	72.00	ea	900.00	/ea	64,800
	2	Terrazzo Landings	1,300.00	sf	50.00	/sf	65,000

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	2	Rubber Tile Landings & Treads	5.00	flt	4,500.00 /flt	22,500
	2	Custom Graphic Wall Allowance	1,120.00	sf	45.00 /sf	50,400
	30	Paint Pan Stairs & Rails	9.00	Flt	2,500.00 /Flt	22,500
						295,760
		C2020 Stair Finishes			*1.792/sf*	*295,760*
		165,035.00 sf				
		C20 STAIRS			**5.586/sf**	**921,960**
		165,035.00 sf				
C30		**INTERIOR FINISHES**				
C3010		*Wall Finishes*				
	2	Wood Wall Panels	230.00	sf	70.00 /sf	16,100
	50	Wall Tile - Painted Mosaic Tile Mural	360.00	sf	45.00 /sf	16,200
	50	Wall Tile - Restrooms (Assumed 7' Height) 12" x 24"	12,404.00	sf	32.00 /sf	396,928
	50	Wall Tile - Corridors - 4' AFF, 18" x 36"	1,542.00	sf	32.00 /sf	49,344
	50	Wall Tile - Corridors - 4'6" AFF, 18" x 36"	15,152.00	sf	32.00 /sf	484,864
	50	Wall Tile - Kitchen Walls 10' AFF	2,450.00	sf	32.00 /sf	78,400
	50	Wall Tile - Custodial, Allowance	1,040.00	sf	32.00 /sf	33,280
	2	Acoustical Wall Panels, Custom Colors	913.00	sf	75.00 /sf	68,475
	2	Acoustical Wood Wall Panels, Cafeteria	762.00	sf	85.00 /sf	64,770
	2	Tectum Panels w/Custom Images	452.00	sf	65.00 /sf	29,380
	2	Acoustical Wall Panels, Cafeteria	256.00	sf	50.00 /sf	12,800
	2	Acoustical Wall Panels, Allowance for Locations Not Shown	1.00	ls	25,000.00 /ls	25,000
	10	Paint Walls	355,000.00	sf	1.00 /sf	355,000
	10	Paint Touch up Allowance	1.00	ls	25,000.00 /ls	25,000
						1,655,541
		C3010 Wall Finishes			*10.031/sf*	*1,655,541*
		165,035.00 sf				
C3020		*Floor Finishes*				
	10	Ceramic Floor Tile				
	10	Ceramic Floor Tile, 12" x 24"	8,045.00	sf	24.00 /sf	193,080
	10	Waterproofing Membrane / Crack Suppression Membrane	8,045.00	sf	7.50 /sf	60,338
	10	Floor Protection	8,045.00	sf	0.75 /sf	6,034
	2	Terrazzo	17,328.00	sf	45.00 /sf	779,760
	2	Terrazzo inlays, Allowance	1.00	ls	12,000.00 /ls	12,000
	2	Floor Protection	17,328.00	ls	1.50 /ls	25,992
	2	QZT-1 Quartz Tile				
	2	Wax and Seal Quartz Tile				
	2	Floor Protection				

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	2	Floors Moisture Mitigation Testing	10.00	loc	400.00 /loc	4,000
	2	Floors Moisture Mitigation - Epoxy & Gym	12,865.00	sf	5.00 /sf	64,325
	2	Common Work Results for Flooring	165,035.00	sf	0.65 /sf	107,273
	40	Epoxy Flooring (Custodial) - Dur-a-Flex	880.00	sf	25.00 /sf	22,000
	40	Floor Protection	880.00	sf	1.50 /sf	1,320
	145	2-1/2" Wood Athletic Flooring System - Gymnasium	11,985.00	sf	28.00 /sf	335,580
	145	Wood Flooring, Stage, Allowance	1,453.00	sf	27.00 /sf	39,231
	145	Floor Protection	13,438.00	sf	1.50 /sf	20,157
	2	LIN - Linoleum Flooring, BOD = Forbo	82,510.00	sf	8.00 /sf	660,080
	2	Static Dissipative Flooring	360.00	sf	15.00 /sf	5,400
	2	RAF-1 - Rubber Athletic Flooring, 6mm Thick	2,321.00	sf	24.00 /sf	55,704
	2	RSF-1 Resilient Sheet Flooring, BOD = Nora Systems Norament	5,263.00	sf	8.00 /sf	42,104
	2	Resilient Base	20,736.00	lf	3.50 /lf	72,576
	2	Floor Protection	90,455.00	sf	0.75 /sf	67,841
	002	Seal concrete	2,714.00	sf	4.00 /sf	10,856
	002	Floor Protection	2,714.00	sf	0.75 /sf	2,036
	002	Paint Concrete Floors, Epoxy Paint	3,854.00	sf	2.00 /sf	7,708
f 10		Carpet Tile, BOD = Interface, Aerial	1,287.00	sy	69.00 /sy	88,803
f 10		Floor Protection	11,583.00	sf	0.75 /sf	8,687
	20	Metal Grating Frames, Vestibule	690.00	sf	29.00 /sf	20,010
	20	Walk Off Mats	690.00	sf	15.00 /sf	10,350
						2,723,244
		C3020 Floor Finishes			*16.501/sf*	*2,723,244*
		165,035.00 sf				
C3030		*Ceiling Finishes*				
	2499	GWB Ceilings	14,167.00	sf	15.00 /sf	212,505
	2499	GWB Ceilings - Rated	50.00	sf	20.00 /sf	1,000
	2499	GWB Soffiting Allowance	165,035.00	sf	1.50 /sf	247,553
	2499	GWB Ceiling Clouds	2,588.00	sf	25.00 /sf	64,700
	2	ACP-1a - Typical Classrooms, 2x2	72,899.00	sf	8.50 /sf	619,642
	2	ACP-2 - Stairwells 2x4	1,365.00	sf	7.00 /sf	9,555
	2	ACP-2a - Cooridors, 2x2	17,858.00	sf	8.50 /sf	151,793
	2	ACP-4a - Kitchen, 2x2, Washable	2,846.00	sf	8.50 /sf	24,191
	2	ACP-5a - Restrooms, 2x2, Washable	4,808.00	sf	8.00 /sf	38,464
	2	ACP-6a - Music / Art, 2x2, High NRC	1,972.00	sf	9.00 /sf	17,748
	2	Wood Slat Ceiling	4,775.00	sf	60.00 /sf	286,500
	2	Tectum Panels - Ceiling	10,178.00	sf	30.00 /sf	305,340
	20	Paint Exposed Ceilings	19,966.00	sf	3.50 /sf	69,881
						2,048,871
		C3030 Ceiling Finishes			*12.415/sf*	*2,048,871*
		165,035.00 sf				

Item	Description	Takeoff Qty		Unit Cost	Total Amount
	C30 INTERIOR FINISHES			**38.947/sf**	**6,427,656**
	165,035.00 sf				
	C INTERIORS			***105.270/sf***	***17,373,271***
	165,035.00 sf				
D					
D10	**CONVEYING**				
D1010	*Vertical Conveying Systems*				
500	Grout Elevator Sill Angles	3.00	ea	500.00 /ea	1,500
2	Elevator Usage - Operator	1.00	ls	12,000.00 /ls	12,000
2	Elevator, Holeless Hydraulic, 4500lbs	3.00	stop	75,000.00 /stop	225,000
					238,500
	D1010 Vertical Conveying Systems			*1.445/sf*	*238,500*
	165,035.00 sf				
	D10 CONVEYING			**1.445/sf**	**238,500**
	165,035.00 sf				
D20	**PLUMBING**				
D2010	*Plumbing Fixtures*				
1	Plumbing Fixtures				
1	P-1 - Water Closet (Wall Hung)	46.00	ea	1,325.00 /ea	60,950
1	P-1A - ADA Water Closet (Wall Hung)	32.00	ea	1,400.00 /ea	44,800
1	P-1B - ADA Water Closet (Wall Hung)	19.00	ea	1,400.00 /ea	26,600
1	P-2 - Urinal	1.00	ea	1,175.00 /ea	1,175
1	P-2A - Urinal	7.00	ea	1,250.00 /ea	8,750
1	P-3 - Lavatory (Wall Hung)	65.00	ea	1,090.00 /ea	70,850
1	P-3A - ADA Lavatory (Wall Hung)	20.00	ea	1,150.00 /ea	23,000
1	P-3B - ADA Lavatory (Wall Hung)	6.00	ea	1,150.00 /ea	6,900
1	P-5 - Sink (Recessed)	12.00	ea	990.00 /ea	11,880
1	P-5A - ADA Clssroom Sink (Recessed)	119.00	ea	1,100.00 /ea	130,900
1	P-7 - Mop Sink	8.00	ea	1,275.00 /ea	10,200
1	Exam Room Sink	3.00	ea	1,090.00 /ea	3,270
1	Art Room Sink	2.00	ea	1,200.00 /ea	2,400
1	DF-1 - Bi-Level Water Cooler	7.00	ea	2,280.00 /ea	15,960
1	Emergency Shower / Eyewash Station (Kitchen)	1.00	ea	3,650.00 /ea	3,650

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	1	Wall Carrier	190.00	ea	595.00 /ea	113,050
						534,335
		D2010 Plumbing Fixtures			*3.238/sf*	*534,335*
		165,035.00 sf				
D2020		*Domestic Water Distribution*				
	1	Domestic Water Distribution				
	1	4" Domestic Water Pipe - Mains	480.00	lf	215.00 /lf	103,200
	1	3" Domestic Water Pipe - Mains	390.00	lf	49.85 /lf	19,442
	1	2-1/2" Domestic Water Pipe - Mains	420.00	lf	41.40 /lf	17,388
	1	2" Domestic Water Pipe - Mains	1,440.00	lf	31.25 /lf	45,000
	1	1-1/2" Domestic Water Pipe - Mains	980.00	lf	15.75 /lf	15,435
	1	1-1/4" Domestic Water Pipe - Mains	350.00	lf	25.90 /lf	9,065
	1	1" Domestic Water Pipe - Mains	350.00	lf	13.30 /lf	4,655
	1	3/4" Domestic Water Pipe - Mains	880.00	lf	56.60 /lf	49,808
	1	1/2" Domestic Water Pipe - Mains	1,560.00	lf	26.85 /lf	41,886
	1	3/4" Domestic Water Pipe - Branch	4,200.00	lf	56.60 /lf	237,720
	1	1/2" Domestic Water Pipe - Branch (Type "L" Cu.)	13,040.00	lf	26.85 /lf	350,124
	1	Misc. Valves,Tags & Fittings	1.00	ls	134,058.00 /ls	134,058
	1	Pipe Insulation - (1/2" - 1-1/4")	20,380.00	lf	7.65 /lf	155,907
	1	Pipe Insulation - (1-1/2" - 5")	3,710.00	lf	12.90 /lf	47,859
	1	Domestic Water Equipment				
	1	BFP-1 - 4" Backflow Preventer	1.00	ea	5,250.00 /ea	5,250
	1	Triplex Water Booster Pump Station (5 HP /___Gallon)	1.00	ea	36,000.00 /ea	36,000
	1	TM-1 - Thermostatic Mixing Valve	1.00	ea	3,000.00 /ea	3,000
	1	RP-5 - HW Recirculating Pump	1.00	ea	1,650.00 /ea	1,650
	1	RP-4 - Lab HW Recirc Pump	1.00	ea	1,650.00 /ea	1,650
	1	RP-2 - In-Line Recirc Pump (15 GPM / 1/4 HP)	2.00	ea	1,650.00 /ea	3,300
	1	RP-1 - In-Line Recirc Pump (15 GPM / 1/4 HP)	1.00	ea	1,650.00 /ea	1,650
	1	Pre-assembeled Water Temperature Control Station	1.00	ea	2,450.00 /ea	2,450
	1	HB - Hose Bib	16.00	ea	390.00 /ea	6,240
	1	FPHB - Frostproof Hose Bib	14.00	ea	480.00 /ea	6,720
	1	EWH-6 - Mini Electric Water Heater (2.5 Gal / 1.5 KW)	1.00	ea	990.00 /ea	990
	1	EWH-2 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00 /ea	18,200
	1	EWH-1 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00 /ea	18,200
	1	EWH-1 - Electric Water Heater (120 Gallon)	1.00	ea	18,200.00 /ea	18,200
	1	EH-1 - Tankless Electric Water Heater (Locate at P-3A Fixture)	1.00	ea	1,750.00 /ea	1,750
	1	ET-2 - Expansion Tank	1.00	ea	4,800.00 /ea	4,800
	1	Elevator Sump Pump	1.00	ea	1,850.00 /ea	1,850
	1	6" Reverse Backflow Preventer	1.00	ea	12,500.00 /ea	12,500
	1	4" Water Meter	1.00	ea	2,200.00 /ea	2,200
	1	2" RPBP - Reverse Backflow Preventer	2.00	ea	1,250.00 /ea	2,500
						1,380,647
		D2020 Domestic Water Distribution			*8.366/sf*	*1,380,647*
		165,035.00 sf				

Item		Description	Takeoff Qty		Unit Cost	Total Amount
D2030		*Sanitary Waste*				
	1	Sanitary Waste & Vent Piping (Under Ground)				
	1	10" Sanitary Waste & Vent Pipe (U)	280.00	lf	196.25 /lf	54,950
	1	8" Sanitary Waste & Vent Pipe (U)	420.00	lf	148.200 /lf	62,244
	1	6" Sanitary Waste & Vent Pipe (U)	880.00	lf	72.60 /lf	63,888
	1	4" Sanitary Waste & Vent Pipe (U)	1,530.00	lf	46.80 /lf	71,604
	1	4" Kitchen Waste & Vent Pipe (U)	360.00	lf	46.80 /lf	16,848
	1	2" Kitchen Waste & Vent Pipe (U)	200.00	lf	29.60 /lf	5,920
	1	Cleanout	32.00	ea	395.00 /ea	12,640
	1	Sanitary Waste & Vent Piping (Above Ground)				
	1	4" Sanitary Waste & Vent Pipe (A)	4,365.00	lf	46.80 /lf	204,282
	1	3" Sanitary Waste & Vent Pipe (A)	720.00	lf	38.40 /lf	27,648
	1	2" Sanitary Waste & Vent Pipe (A)	1,485.00	lf	29.60 /lf	43,956
	1	1-1/2" Sanitary Waste & Vent Pipe (A)	8,800.00	lf	20.65 /lf	181,720
	1	4" Kitchen Waste & Vent Pipe (A)	240.00	lf	46.80 /lf	11,232
	1	2" Kitchen Waste & Vent Pipe (A)	540.00	lf	29.60 /lf	15,984
	1	1-1/2" Kitchen Waste & Vent Pipe (A)	250.00	lf	20.65 /lf	5,163
	1	Floor / Wall Cleanout	16.00	ea	425.00 /ea	6,800
	1	Sanitary and Vent Equipment				
	1	Recessed Grease Interceptor 150 Lbs. / 75 Gallon)	2.00	ea	8,800.00 /ea	17,600
	1	Oil Interceptor - 50 GPM (Zurn 1186)	1.00	ea	7,600.00 /ea	7,600
	1	FS-1 - Floor Sink	8.00	ea	1,290.00 /ea	10,320
	1	FD1- 2" Floor Drain	18.00	ea	440.00 /ea	7,920
	1	FD1A- 3" Floor Drain	1.00	ea	545.00 /ea	545
	1	FD2- 3" Floor Drain	7.00	ea	545.00 /ea	3,815
	1	Trap Primer	34.00	ea	885.00 /ea	30,090
	1	Neutralization Tank (5 Gallon) - Not Required - NIC				
	1	Solids Interceptor (Art Room Sinks)	2.00	ea	3,225.00 /ea	6,450
	1	SP-1 - Elevator Sump Pump	1.00	ea	2,680.00 /ea	2,680
						871,899
		D2030 Sanitary Waste			*5.283/sf*	*871,899*
		165,035.00 sf				
D2040		*Rain Water Drainage*				
	1	Storm Drainage Piping				
	1	RD-1 - 15" Round Roof Drain / 6" Hub	20.00	ea	1,025.00 /ea	20,500
	1	OD-1 - 15" Round Roof Overflow Drain / 6" Hub	20.00	ea	1,180.00 /ea	23,600
	1	12" Storm Pipe (U)	440.00	lf	92.45 /lf	40,678
	1	10" Storm Pipe (U)	820.00	lf	86.25 /lf	70,725
	1	10" Storm Pipe (A)	180.00	lf	94.60 /lf	17,028
	1	8" Storm Pipe (U)	360.00	lf	73.55 /lf	26,478
	1	8" Storm Pipe (A)	460.00	lf	82.40 /lf	37,904
	1	6" Storm Pipe (U)	680.00	lf	39.62 /lf	26,942
	1	6" Storm Pipe (A)	2,200.00	lf	68.45 /lf	150,590
	1	4" Storm Pipe (A)	1,200.00	lf	52.50 /lf	63,000
	1	Drain Pipe Insulation	4,040.00	lf	12.45 /lf	50,298
						527,743

Item		Description	Takeoff Qty		Unit Cost	Total Amount
		D2040 Rain Water Drainage			*3.198/sf*	*527,743*
		165,035.00 sf				
D2090		*Other Plumbing Systems*				
	1	Kitchen Plumbing Connections				
	1	3-Compartment Sink - C&HW & Indirect Waste Connection Only	1.00	ea	1,210.00 /ea	1,210
	1	Cooks Table w/ Sink - Connection Only	1.00	ea	880.00 /ea	880
	1	Walk-in Cooler Indirect Waste Connection	1.00	ea	450.00 /ea	450
	1	Disposer - CW & Waste Connection Only	1.00	ea	880.00 /ea	880
	1	Fill Faucet - HW Connection Only	2.00	ea	585.00 /ea	1,170
	1	Fill Faucet - HW Connection Only	2.00	ea	585.00 /ea	1,170
	1	Freezer Indirect Waste Connection	1.00	ea	250.00 /ea	250
	1	Hand Sink - Connection Only	4.00	ea	625.00 /ea	2,500
	1	Hand Sprayer - C&HW Connection Only	2.00	ea	950.00 /ea	1,900
	1	Hot Food Well - H&CW & Indirect Waste Connection	2.00	ea	600.00 /ea	1,200
	1	Cold Food Well - H&CW & Indirect Waste Connection	4.00	ea	600.00 /ea	2,400
	1	Prep Table w/ Double Sink - Connection Only	1.00	ea	650.00 /ea	650
	1	Steamer Unit, CW & Indirect Waste Connection	1.00	ea	950.00 /ea	950
	1	Warewasher Conveyor - H&CW & Indirect Waste Connection	1.00	ea	1,400.00 /ea	1,400
	1	Washing Machine Valve Box and Connection	1.00	ea	880.00 /ea	880
	1	Water Filter Assembly (FBO) 3/4" CW Connection	2.00	ea	245.00 /ea	490
	1	Misc. Kitchen Equipment Connections	1.00	ea	10,000.00 /ea	10,000
	1	Radon Mitigation System				
	1	Radon In-Line Exhaust Fan	16.00	ea		
	1	4" PVC (Sched 40) - Perforated Pipe	3,990.00	lf		
	1	4" PVC (Sched 40) - Risers	1,220.00	lf		
	1	Riser Supports	184.00	ea		
	1	Crushed Stone	120.00	cy		
	1	Labeling	1.00	ea		
	1	Fireproof Roof Seal / Boot	16.00	ea		
	1	Electrical Power Feed and Connection (15A)	16.00	ea		
	1	Plumbing General Conditions				
	1	Testing & Disinfection	1.00	ls	18,000.00 /ls	18,000
	1	Coordination & Management	1.00	ls	90,000.00 /ls	90,000
	1	Commissioning	1.00	ls	45,000.00 /ls	45,000
	1	Permits and Fees	1.00	ls	18,000.00 /ls	18,000
	1	Coordination Drawings / BIM	1.00	ls	60,000.00 /ls	60,000
	1	Seismic Restraints / Bracing	1.00	ls	35,000.00 /ls	35,000
	1	Coring & Patching / Firestopping	1.00	ls	22,500.00 /ls	22,500
	1	Hoisting & Rigging / Floor Loading	1.00	ls	15,000.00 /ls	15,000
	1	Equipment start up and inspection	1.00	ls	25,000.00 /ls	25,000
	1	Access Panels - Furnish Only	1.00	ls	10,000.00 /ls	10,000
	1	Market Adjustment	-165,035.00	sf	1.00 /sf	(165,035)
						201,845
		D2090 Other Plumbing Systems			*1.223/sf*	*201,845*
		165,035.00 sf				

Item	Description	Takeoff Qty		Unit Cost	Total Amount
	D20 PLUMBING			**21.307/sf**	**3,516,468**
	165,035.00 sf				
D30	**HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**				
D3030	*Heating and Cooling Systems*				
1	Chilled Water Systems				
1	Air Source Heat Pump - Simultaneous Heat Pump / Chiller (500Tons)	1.00	ls	1,495,000.00 /ls	1,495,000
1	Roof Curb / Pads and Accessories	1.00	ls	15,000.00 /ls	15,000
					1,510,000
	D3030 Heating and Cooling Systems			*9.150/sf*	*1,510,000*
	165,035.00 sf				
D3040	*Distribution Systems*				
1	HVAC Air Distribution				
1	Ductwork Galvanized	180,000.00	lbs	16.75 /lbs	3,015,000
1	Kitchen Grease Duct	1.00	ls	60,000.00 /ls	60,000
1	Kitchen Dishwasher Aluminum Duct	1.00	ls	35,000.00 /ls	35,000
1	RGD's / Low Wall Returns	165,035.00	sf	1.00 /sf	165,035
1	Misc. Ductwork Accessories - Volume Dampers, Fire Dampers, Volume Dampers etc.	165,035.00	sf	3.50 /sf	577,623
1	Refrigerant Piping (Includes Hangers & Supports)				
1	Refrigerant Piping - Insulated Line Set	1,360.00	lf	39.60 /lf	53,856
1	Misc. Valves, Tags & Fitings	1.00	ls	5,385.60 /ls	5,386
1	Condensate Piping				
1	Condensate Drain Pipe (Type "L" Cu.)	165,000.00	sf	0.15 /sf	24,750
1	Hydronic Piping & Pumps (Includes Hangers & Supports)				
1	Hydronic CW/HW Piping - Mains (Blk Stl. Welded)	165,000.00	sf	12.00 /sf	1,980,000
1	Hydronic CW/HW Piping - Branch (Type "L" Cu.)	165,000.00	sf	3.25 /sf	536,250
1	Hydronic Pumps - Primary / Secondary	1.00	ls	85,000.00 /ls	85,000
1	Insulation				
1	Duct wrap insulation	65,000.00	sf	6.85 /sf	445,250
1	Pipe Insulation	165,000.00	sf	3.00 /sf	495,000
1	Exhaust Fans				
1	Exhaust Fans	165,000.00	sf	0.75 /sf	123,750
1	Central Air Handling Equipment				
1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (17,000 Cfm)	2.00	ea	408,000.00 /ea	816,000
1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (3,000 Cfm)	2.00	ea	72,000.00 /ea	144,000
1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (4,000 Cfm)	1.00	ea	96,000.00 /ea	96,000
1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (20,000 Cfm)	1.00	ea	480,000.00 /ea	480,000
1	RTU - Rooftop Unit w/ CW/HW Coils / Energy Recovery (10,000 Cfm)	2.00	ea	240,000.00 /ea	480,000
1	MAU - Kitchen Make-up Air Unit, 4,500 CFM	1.00	ea	55,000.00 /ea	55,000

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	1	Roof Curbs and Dunnage	9.00	ea	4,500.00 /ea	40,500
	1	Sound Attenuation	1.00	ls	75,000.00 /ls	75,000
						9,788,399
		D3040 Distribution Systems			*59.311/sf*	*9,788,399*
		165,035.00 sf				
D3050		*Terminal And Package Units*				
	1	Heating & Cooling Terminal Equipment				
	1	Split A/C (1 Ton) - Indoor Unit	5.00	ea	2,785.00 /ea	13,925
	1	Split A/C (1.Ton) - Condenser Unit	5.00	ea	3,990.00 /ea	19,950
	1	Split A/C (2 Ton) - Indoor Unit	3.00	ea	3,465.00 /ea	10,395
	1	Split A/C (2.Ton) - Condenser Unit	3.00	ea	5,260.00 /ea	15,780
	1	CUH - Electric Cabinet unit Heater	19.00	ea	2,880.00 /ea	54,720
	1	EUH - Electric Unit Heater	15.00	ea	1,990.00 /ea	29,850
	1	Perimeter Heating (Radiant Ceiling Panel / Baseboard)	165,000.00	sf	3.75 /sf	618,750
	1	VAV - Variable Air Volume Box	211.00	ea	1,100.00 /ea	232,100
						995,470
		D3050 Terminal And Package Units			*6.032/sf*	*995,470*
		165,035.00 sf				
D3060		*Controls And Instrumentation*				
	20	Building Management System				
	20	Building Management System	165,035.00	sf	7.50 /sf	1,237,763
						1,237,763
		D3060 Controls And Instrumentation			*7.50 /sf*	*1,237,763*
		165,035.00 sf				
D3070		*Systems Testing And Balancing*				
	1	Testing & Balancing				
	1	Testing & balancing	165,000.00	sf	0.75 /sf	123,750
						123,750
		D3070 Systems Testing And Balancing			*0.750/sf*	*123,750*
		165,035.00 sf				
D3090		*Other HVAC Systems And Equipment*				

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	1	HVAC General Requirements				
	1	Commissioning Support	1.00	ls	45,000.00 /ls	45,000
	1	Coordination & management	1.00	ls	180,000.00 /ls	180,000
	1	Permits and fees	1.00	ls	45,000.00 /ls	45,000
	1	Coordination / BIM	1.00	ls	80,000.00 /ls	80,000
	1	Seismic restraints / bracing	1.00	ls	28,000.00 /ls	28,000
	1	Coring & patching / firestopping	1.00	ls	20,000.00 /ls	20,000
	1	Hoisting & rigging / floor loading	1.00	ls	25,000.00 /ls	25,000
	1	Equipment start up and inspection	1.00	ls	15,000.00 /ls	15,000
	1	Access panels - furnish only	1.00	ls	5,000.00 /ls	5,000
						443,000
		D3090 Other HVAC Systems And Equipment			*2.684/sf*	*443,000*
		165,035.00 sf				
		D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)			**85.427/sf**	**14,098,382**
		165,035.00 sf				
D40		**FIRE PROTECTION**				
D4020		*Fire Suppression Water Supply And Equipment*				
	1	Fire Pump				
	1	8" Fire Sprinkler Pipe - Incoming Service Main	30.00	lf	106.60 /lf	3,198
	1	8" Backflow Preventer	1.00	ea	21,250.00 /ea	21,250
	1	Electric Fire Pump (750 GPM / 40 HP)	1.00	ea	85,000.00 /ea	85,000
	1	Jockey Pump (10 GPM / 2 HP)	1.00	ea	2,900.00 /ea	2,900
	1	Jockey Pump Controller	1.00	ea	2,200.00 /ea	2,200
	1	Fire Pump Controller	1.00	ea	4,500.00 /ea	4,500
						119,048
		D4020 Fire Suppression Water Supply And Equipment			*0.721/sf*	*119,048*
		165,035.00 sf				
D4030		*Standpipe Systems*				
	1	Fire Protection Standpipe				
	1	6" Fire Sprinkler Pipe w/ Fittings & Hangers	520.00	lf	82.25 /lf	42,770
	1	6" Fire Standpipe Riser	200.00	lf	82.25 /lf	16,450
	1	6" Riser Check Valve	4.00	ea	1,980.00 /ea	7,920
	1	4" Sprinkler Horizontal Standpipe w/ Fittings & Hangers	2,115.00	lf	52.50 /lf	111,038
	1	2-1/2" Sprinkler Drain Pipe w/ Fittings & Hangers	330.00	lf	41.10 /lf	13,563
	1	FDC-1 - Fire Department Connection Valve	1.00	ea	3,200.00 /ea	3,200
	1	4" Zone Control Valve Assembly	4.00	ea	3,650.00 /ea	14,600
	1	2-1/2" FDV in Recessed Cabinet	16.00	ea	880.00 /ea	14,080

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	1	2-1/2" FDV - Riser Fire Department Valve	12.00	ea	325.00 /ea	3,900
	1	Fire Hose Cabinet (Stage Area)	1.00	ea	3,000.00 /ea	3,000
	1	Combination Test Connection and Drain Valve	4.00	ea	525.00 /ea	2,100
	1	6" Butterfly Valve w/ Tamper Switch	4.00	ea	1,250.00 /ea	5,000
	1	4" Butterfly Valve w/ Tamper Switch	4.00	ea	1,050.00 /ea	4,200
	1	6" Water alarm check valve	1.00	ea	2,600.00 /ea	2,600
	1	6" OS&Y Gate Valve	4.00	ea	1,085.00 /ea	4,340
	1	4" OS&Y Gate Valve	4.00	ea	775.00 /ea	3,100
	1	4" Check Valve	4.00	ea	1,250.00 /ea	5,000
	1	4"Storz Connection	1.00	ea	560.00 /ea	560
	1	4" PRV Valve	4.00	ea	330.00 /ea	1,320
	1	EB-1 - Electric Bell	1.00	ea	525.00 /ea	525
	1	Tamper Switch	12.00	ea	485.00 /ea	5,820
	1	Flow Switch	12.00	ea	380.00 /ea	4,560
						269,646
		D4030 Standpipe Systems			*1.634/sf*	*269,646*
		165,035.00 sf				
D4040		*Sprinklers*				
	1	Fire Protection Sprinkler System				
	1	6" Sprinkler Main Piping w/ Fittings & Hangers	220.00	lf	78.80 /lf	17,336
	1	Sprinkler Head - Concealed / Upright / Sidewall	1,520.00	ea	80.00 /ea	121,600
	1	4" Sprinkler Main Piping w/ Fittings & Hangers	2,280.00	lf	74.40 /lf	169,632
	1	2-1/2" Sprinkler Pipe	880.00	lf	45.55 /lf	40,084
	1	2" Sprinkler Pipe	4,558.00	lf	41.80 /lf	190,524
	1	1-1/2" Sprinkler Pipe	5,318.00	lf	38.75 /lf	206,073
	1	1-1/4" Sprinkler Pipe	6,077.00	lf	33.65 /lf	204,491
	1	Misc. Valves, Tags & Fittings	1.00	ls	51,250.00 /ls	51,250
						1,000,990
		D4040 Sprinklers			*6.065/sf*	*1,000,990*
		165,035.00 sf				
D4090		*Other Fire Protection Systems*				
	1	Fire Protection General Conditions				
	1	Hydraulic Calculations	1.00	ls	2,600.00 /ls	2,600
	1	Testing & Inspection	1.00	ls	2,200.00 /ls	2,200
	1	Drain & Fill System	1.00	ls	2,800.00 /ls	2,800
	1	Coordination and Management	1.00	ls	26,000.00 /ls	26,000
	1	Commissioning Assistance	1.00	ls	15,000.00 /ls	15,000
	1	Permits and Fees	1.00	ls	8,500.00 /ls	8,500
	1	Coordination Drawings / BIM	1.00	ls	25,000.00 /ls	25,000
	1	Seismic Restraints / Bracing - includes design	1.00	ls	12,000.00 /ls	12,000
	1	Coring & Patching / Firestopping	1.00	ls	4,500.00 /ls	4,500
	1	Hoisting & Rigging / Floor Loading	1.00	ls	25,000.00 /ls	25,000
	1	Market Reduction	-165,035.00	ls	1.50 /ls	(247,553)

Item	Description	Takeoff Qty		Unit Cost	Total Amount
					(123,953)
	D4090 Other Fire Protection Systems			*(0.751)/sf*	*(123,953)*
	165,035.00 sf				
	D40 FIRE PROTECTION			**7.669/sf**	**1,265,731**
	165,035.00 sf				
D50	**ELECTRICAL**				
D5005	*Electrical Demolition*				
2	Disconnect , cut & make safe existing on site electrical utilities	1.00	ls	15,000.00 /ls	15,000
					15,000
	D5005 Electrical Demolition			*0.091/sf*	*15,000*
	165,035.00 sf				
D5010	*Electrical Service And Distribution*				
2	Normal Power and Distribution				
2	Main Switchboard 4000/3000A MCB 277/480v 4-section	1.00	ea	257,195.00 /ea	257,195
2	Panel EV 400A MCB ST 120/208v 42p w/SPD	1.00	ea	7,196.00 /ea	7,196
2	Panel KPP 225A MCB ST 120/208v 84p w/SPD	1.00	ea	9,449.00 /ea	9,449
2	Panel LP1A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00 /ea	4,255
2	Panel LP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
2	Panel LP2A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00 /ea	4,255
2	Panel LP2B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
2	Panel LP2C 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
2	Panel LP3A 150A MLO 277/480v 42p w/SPD	1.00	ea	4,255.00 /ea	4,255
2	Panel LP3B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
2	Panel MHP1A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP1B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP2A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP2B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP2C 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP3A 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MHP3B 400A MLO 277/480v 42p w/SPD	1.00	ea	7,544.00 /ea	7,544
2	Panel MP1A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
2	Panel MP1B 225A MCB 120/208v 84p w/SPD	1.00	ls	9,449.00 /ls	9,449
2	Panel MP2A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ls	9,449.00 /ls	9,449
2	Panel MP2B 225A MCB 120/208v 84p w/SPD	1.00	ea	9,449.00 /ea	9,449
2	Panel MP2C 225A MCB 120/208v 84p w/SPD	1.00	ea	6,873.00 /ea	6,873
2	Panel MP3A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
2	Panel MP3B 150A MCB 120/208v 42p w/SPD	1.00	ea	6,959.00 /ea	6,959

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	2	Panel OLP 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00 /ea	4,199
	2	Panel PP1A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP1B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP1S 150A MCB ST 120/208v 84p w/SPD	1.00	ea	6,873.00 /ea	6,873
	2	Panel PP2A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP2B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP2C 100A MCB ST 120/208v 84p w/SPD	1.00	ea	8,665.00 /ea	8,665
	2	Panel PP3A 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	Panel PP3B 150A MCB 120/208v 84p w/SPD 200% N	1.00	ea	9,449.00 /ea	9,449
	2	T-4 30KVA K13 Transformer 480-120/208v	2.00	ea	5,327.00 /ea	10,654
	2	T-5 45KVA K13 Transformer 480-120/208v	8.00	ea	6,657.00 /ea	53,256
	2	T-6 75KVA K13 Transformer 480-120/208v	5.00	ea	9,969.00 /ea	49,845
	2	T-7 112.5KVA K13 Transformer 480-120/208v	1.00	ea	13,876.00 /ea	13,876
	2	60A 3w Feeder EMT copper	50.00	lf	22.11 /lf	1,106
	2	125A 3w Feeder EMT copper	100.00	lf	60.25 /lf	6,025
	2	150A 3w Feeder EMT copper	150.00	lf	69.31 /lf	10,397
	2	100A Feeder EMT copper	25.00	lf	82.95 /lf	2,074
	2	150A Feeder EMT copper	1,750.00	lf	49.53 /lf	86,678
	2	200A Feeder EMT copper	75.00	lf	91.71 /lf	6,878
	2	225A Feeder EMT copper	100.00	lf	109.39 /lf	10,939
	2	400A Feeder EMT copper	1,450.00	lf	175.30 /lf	254,185
	2	Feeder pri/sec 30KVA K-13 3PH Transformer	2.00	lf	1,055.50 /lf	2,111
	2	Feeder Pri/sec 45KVA K-13 3PH Transformer	8.00	lf	1,366.74 /lf	10,934
	2	Feeder Pri/sec 75KVA K-13 Transformer	5.00	lf	2,242.63 /lf	11,213
	2	Feeder Pri/sec 75KVA K-13 Transformer	1.00	lf	2,242.63 /lf	2,243
	2	PV Systems				
	2	Infrastructure raceway for future PV installation	1.00	ls	10,000.00 /ls	10,000
	2	Machine and Equipment Power				
	2	Mechanical equipment circuits & connections	166,850.00	sf	3.75 /sf	625,688
	2	Emergency Power and Distribution				
	2	600KW Diesel genset sound attenuated weather enclosure unit mounted load bank	1.00	ea	325,000.00 /ea	325,000
	2	Generator cam lock cabinet 125A 3p 480v	1.00	ea	21,133.00 /ea	21,133
	2	ATS-LS 200A 4p ISO-bypass Auto transfer switch life safety				
	2	ATS-OS 1000A 4p Auto transfer switch optional standby				
	2	Dist. Panel NEDP 1000A MLO 277/480v	1.00	ea	23,339.00 /ea	23,339
	2	Panel EHP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00 /ea	4,618
	2	Panel EHP2B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00 /ea	4,618
	2	Panel EHP3B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,618.00 /ea	4,618
	2	Panel ELP1A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel ELP1B 200A MCB 277/480v 42p w/SPD	1.00	ea	4,354.00 /ea	4,354
	2	Panel ELP2A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel ELP2B 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel ELP2C 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel ELP3A 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel ELP3B 100A MCB 277/480v 30p w/SPD	1.00	ea	3,906.00 /ea	3,906
	2	Panel EP1A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00 /ea	3,838
	2	Panel EP1B 225A MCB 120/208v 84p w/SPB 200% N	1.00	ea	7,331.00 /ea	7,331
	2	Panel EP2A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00 /ea	3,838
	2	Panel EP2B 150 MCB 120/208v 30p w/SPD 200% N	1.00	ea	4,398.00 /ea	4,398

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	2	Panel EP2C 225A MCB 120/208v 84p	1.00	ea	6,995.00	/ea	6,995
	2	Panel EP3A 150 MCB 120/208v 30p w/SPD	1.00	ea	3,838.00	/ea	3,838
	2	Panel EP3B 150 MCB 120/208v 30p w/SPD 200% N	1.00	ea	4,062.00	/ea	4,062
	2	Panel KHP 400A MLO 277/480v 84p w/SPD	1.00	ea	11,142.00	/ea	11,142
	2	Panel LP1B 150A MLO 277/480v 42p w/SPD	1.00	ea	4,199.00	/ea	4,199
	2	Panel TEP1A 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	Panel TEP1B 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	Panel TEP3A 100A MCB 120/2080v 30p w/SPD 200% N	1.00	ea	3,770.00	/ea	3,770
	2	T-5 45KVA K13 Transformer 480-120/208v	1.00	ea	6,657.00	/ea	6,657
	2	T-6 75KVA K13 Transformer 480-120/208v	2.00	ea	9,969.00	/ea	19,938
	2	125A 3w Feeder EMT copper	320.00	lf	60.25	/lf	19,280
	2	100A Feeder EMT copper	200.00	lf	82.95	/lf	16,590
	2	150A Feeder EMT copper	1,000.00	lf	49.53	/lf	49,530
	2	200A Feeder EMT copper	25.00	lf	91.71	/lf	2,293
	2	400A Feeder EMT copper	150.00	lf	175.00	/lf	26,250
	2	1000A Feeder EMT copper	29.00	lf	673.35	/lf	19,527
	2	1200A Nipple set w/cable	1.00	lf	4,690.83	/lf	4,691
	2	4/ # 3 MI Feeder w/terminations	1,350.00	lf	152.47	/lf	205,835
	2	Feeder Pri/sec 45KVA K-13 3PH Transformer	1.00	lf	1,366.74	/lf	1,367
	2	Feeder Pri/sec 75KVA K-13 Transformer	2.00	lf	2,242.63	/lf	4,485
	2	Market Reduction	-165,035.00	ls	3.00	/ls	(495,105)
							2,015,221
		D5010 Electrical Service And Distribution			*12.211/sf*		*2,015,221*
		165,035.00 sf					
D5020		*Lighting & Branch Wiring*					
	2	Lighting and Branch					
	2	Lighting fixture budget, Material Only	1.00	ls	1,275,000.00	/ls	1,275,000
	2	Lighting Installation below:					
	2	Type LP2 LED 2' Linear pendant dir/ind	1.00	ea	269.00	/ea	269
	2	Type LP4 LED 4' Linear pendant dir/ind	49.00	ea	332.00	/ea	16,268
	2	Type LP6 LED 6' Linear pendant dir/ind	53.00	ea	360.00	/ea	19,080
	2	Type LP8 LED 8' Linear pendant dir/ind	353.00	ea	360.00	/ea	127,080
	2	Type LP12 LED 12' Linear pendant dir/ind	1.00	ea	374.00	/ea	374
	2	Type LPG LED High-bay lensed	29.00	ea	663.00	/ea	19,227
	2	Type LR2 LED 3" x 2' Linear recessed	25.00	ea	142.00	/ea	3,550
	2	Type LR22 LED 2x2 Recessed troffer	46.00	ea	128.00	/ea	5,888
	2	Type LR4 LED 3" x 4' Linear recessed	203.00	ea	170.00	/ea	34,510
	2	Type LR6 LED 3" x 6' Linear recessed	91.00	ea	211.00	/ea	19,201
	2	Type LR8 LED 3" x 8' Linear recessed	106.00	ea	239.00	/ea	25,334
	2	Type LS2 LED 2' Utility light chain hung	7.00	ea	258.00	/ea	1,806
	2	Type LS4 LED 4' Utility light chain hung	24.00	ea	259.00	/ea	6,216
	2	Type LS6 LED 6' Utility light chain hung	24.00	ea	258.00	/ea	6,192
	2	Type LS8 LED 8' Utility light chain hung	34.00	ea	294.00	/ea	9,996
	2	Type LWS LED 6"x 7' Recessed wall grazer	4.00	ea	670.00	/ea	2,680
	2	Type LWS LED 6"x 8' Recessed wall grazer	7.00	ea	205.00	/ea	1,435
	2	Type LWS LED 6"x9' Recessed wall grazer	37.00	ea	767.00	/ea	28,379
	2	Type LWS LED 6"x14' Recessed wall grazer	14.00	ea	1,295.00	/ea	18,130
	2	Type PC1 LED Architectural pendant	130.00	ea	357.00	/ea	46,410
	2	Type PC2 LED Architectural pendant	63.00	ea	357.00	/ea	22,491

Item		Description	Takeoff Qty		Total Unit Cost	Amount
	2	Type PC3 LED Architectural pendant	96.00	ea	357.00 /ea	34,272
	2	Type RC1 LED 4" Recessed down light	112.00	ea	183.00 /ea	20,496
	2	Type RC2 LED 4" Recessed down light	88.00	ea	183.00 /ea	16,104
	2	Type RC4 LED 6" Recessed down light	12.00	ea	183.00 /ea	2,196
	2	Type SL3 LED 6" Canopy recessed down light	41.00	ea	218.00 /ea	8,938
	2	Type SL4 LED Wall pack	5.00	ea	474.00 /ea	2,370
	2	Type UC LED 3' undercabinet	61.00	ea	166.00 /ea	10,126
	2	Type Exit Edge lit dual face	1.00	ea	189.00 /ea	189
	2	Type Exit Edge lit single face	51.00	ea	189.00 /ea	9,639
	2	3/4" - EMT 7#12	2,000.00	lf	14.52 /lf	29,040
	2	#10/2C MC Cable	11,000.00	lf	7.23 /lf	79,530
	2	Luminary cable MC 12/2 & 14/2 1-10VDC	33,600.00	lf	6.09 /lf	204,624
	2	3/4" - EMT 5#12-2#16 10vdc	800.00	lf	18.09 /lf	14,472
	2	Lighting and Branch Devices				
	2	[DS] Lighting photo control	54.00	ea	191.32 /ea	10,331
	2	[LVD} Wall mount dimming controller	290.00	ea	236.12 /ea	68,475
	2	[OS] Ceiling occupancy senser	429.00	ea	177.43 /ea	76,117
	2	[OSH] High Level Ceiling occupancy senser	21.00	ea	267.74 /ea	5,623
	2	[R] Emergency lighting relay	54.00	ea	505.21 /ea	27,281
	2	[RC] Lighting control room controller	95.00	ea	753.88 /ea	71,619
	2	25' CAT 6 Lighting control cable	915.00	ea	59.06 /ea	54,040
	2	Lighting control wall box	303.00	ea	68.97 /ea	20,898
	2	20A 120-277V S/P Switch , box & plate	13.00	ea	88.08 /ea	1,145
	2	Lighting controls programming	166,850.00	sf	1.50 /sf	250,275
	2	Device Branch				
	2	20A 125V 3W Single recept, box & plate	837.00	ea	95.00 /ea	79,515
	2	20A 125V Duplex receptacle, box & plate	100.00	ea	114.00 /ea	11,400
	2	20A 125V Duplex GFCI receptacle, box & plate	8.00	ea	120.00 /ea	960
	2	20A 125V Duplex GFCI receptacle, box & WP plate	194.00	ea	138.00 /ea	26,772
	2	(2) 20A 125V Duplex receptacle, box & plate	6.00	ea	2,656.00 /ea	15,936
	2	[BKS] Backstop controller , & backstop circuit & connection	4.00	ea	2,130.00 /ea	8,520
	2	[CDC] Curtain controller circuit & connection	5.00	ea	1,765.00 /ea	8,825
	2	[FB1] 12 Gang floor box w/ branch & Telcom raceways	2.00	ea	477.00 /ea	954
	2	60A 250/600V DSN SW NON-FUS - NEMA 1	2.00	ea	237.00 /ea	474
	2	6-50R 250V 4W Kiln receptacle, box & plate	1.00	ea	3,020.00 /ea	3,020
	2	Motorized kitchen roll-up grill	6.00	ea	1,868.00 /ea	11,208
	2	Motorized shade controller circuit & connection	2.00	ea	8,782.00 /ea	17,564
	2	Score board & shot clock circuits & connections	1.00	ea	1,668.00 /ea	1,668
	2	Bleacher controller circuit & connect	2.00	ea	255.00 /ea	510
	2	Hand Dryer connection	20.00	ea	155.00 /ea	3,100
	2	60A 250V DSN SW Fusible -Kiln Disconnect	1.00	ea	578.00 /ea	578
	2	6-50R 250V 4W Kiln receptacle, box & plate	1.00	ea	271.00 /ea	271
	2	Kitchen equipment connections 20A 3w allowance	1.00	allow	30,000.00 /allow	30,000
	2	Projection screen motor circuit & connect	2.00	ea	330.00 /ea	660
	2	Projection screen wall controller	2.00	ea	330.00 /ea	660
	2	Score board & shot clock circuits & connections	2.00	ea	6,414.00 /ea	12,828
	2	Auto flush/faucet valve connection	50.00	ea	202.00 /ea	10,100
	2	Emergency pull switch & light	4.00	ea	923.00 /ea	3,692
	2	Kiln circuit & connect	1.00	ea	1,490.00 /ea	1,490
	2	Kiln EPO shut down	1.00	ea	1,018.00 /ea	1,018
	2	Bleacher controller circuit & connect	2.00	ea	2,230.00 /ea	4,460
	2	Score board & shot clock circuits & connections	2.00	ea	5,927.00 /ea	11,854
	2	3/4" - EMT 3#12	1,500.00	lf	13.26 /lf	19,890
	2	3/4" - EMT 5#10	500.00	lf	16.49 /lf	8,245
	2	3/4" - EMT 5#12	1,000.00	lf	14.43 /lf	14,430
	2	3/4" - EMT 7#10	1,500.00	lf	17.82 /lf	26,730
	2	3/4" - EMT 7#12	4,000.00	lf	14.50 /lf	58,000

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	2	1" - EMT 4#6	300.00	lf	32.00 /lf	9,600
	2	#10/3C MC Cable	3,000.00	lf	6.51 /lf	19,530
	2	#12/3C MC Cable	14,000.00	lf	4.20 /lf	58,800
	2	#12/2C MC Cable	18,000.00	lf	3.35 /lf	60,300
	2	Allowance for unidentified devices & circuits	166,850.00	sf	1.50 /sf	250,275
	2	Theater Lighting				
	2	Cafetorium stage track & lighting w/installation	1.00	allow	45,000.00 /allow	45,000
	2	Cafetorium LED Railing Fixtures	87.00	lf	200.00 /lf	17,400
	2	Theatrical lighting w/installation	1.00	allow	200,000.000 /allow	200,000
						3,763,553
		D5020 Lighting & Branch Wiring			*22.805/sf*	*3,763,553*
		165,035.00 sf				
D5040		*Miscellaneous Electrical Systems*				
	2	Lightning and Power Specialties				
	2	Building & service grounding	1.00	ls	30,000.00 /ls	30,000
	2	Lighting protection	1.00	ls	90,000.00 /ls	90,000
	2	Temporary power and lights	1.00	ls	225,000.00 /ls	225,000
	2	Subcontractor general conditions	1.00	ls	350,000.00 /ls	350,000
	2	BIM Coordination	1.00	ls	45,000.00 /ls	45,000
	2	Testing and commissioning	1.00	ls	50,000.00 /ls	50,000
						790,000
		D5040 Miscellaneous Electrical Systems			*4.787/sf*	*790,000*
		165,035.00 sf				
D5060		*Data Communications System*				
	001	Public Address Systems				
	001	Common spoace sound system	1.00	ea	25,000.00 /ea	25,000
	001	Classroom recall box & sound reinforcement	60.00	ea	3,500.00 /ea	210,000
	001	Public address Systems equipment & installation	1.00	ea	75,000.00 /ea	75,000
	001	Program Clock System				
	001	Equipment & programming allowance	1.00	ls	25,000.00 /ls	25,000
	001	12" Surface wireless clock	80.00	ea	410.00 /ea	32,800
	001	16" Surface wireless clock w/wire guard	2.00	ea	600.00 /ea	1,200
	001	DAS Radio Repeater System				
	001	Radio repeater system allowance	1.00	ls	85,000.00 /ls	85,000
	001	Av System				
	001	AV raceway rough common spaces	1.00	ls	35,000.00 /ls	35,000
	001	AV raceway rough in for classrooms	47.00	ea	1,500.00 /ea	70,500
	001	Digital signs	1.00	ls	25,000.00 /ls	25,000
	001	AV Equipment Cafeteria / Gym F&I	1.00	ls	120,000.00 /ls	120,000
	001	Telephone and Communications Systems				
	001	Telecomm Backbone raceways, cable tray & sleeves	1.00	sf	50,000.00 /sf	50,000
	001	Technology wall/floor sleeves & fire proofing	16.00	ea	344.00 /ea	5,504
	001	Technology cableing & deevics	166,850.00	sf	2.25 /sf	375,413
	001	Technology backbone fiber & copper	166,850.00	sf	0.50 /sf	83,425
	001	IDF closet fit up	6.00	ea	12,000.00 /ea	72,000

Item		Description	Takeoff Qty		Unit Cost	Total Amount
	001	Network Switching	165,035.00	sf	3.00 /sf	495,105
	001	Telephone System	165,035.00	ls	0.515 /ls	85,000
	001	Wireless Access points	116.00	ea	1,000.00 /ea	116,000
						1,986,947
		D5060 Data Communications System			*12.040/sf*	*1,986,947*
		165,035.00 sf				
D5070		*Security and Fire Alarm*				
	10	Security Access Control &CCTV				
	10	Access control & CCTV installation & wiring	166,850.00	sf	2.50 /sf	417,125
	10	Access control & CCTV head end equipment , programming & commissioning	166,850.00	sf	1.50 /sf	250,275
	10	Fire Alarm System				
	10	Equipment ,devices and programming	1.00	ea	145,000.00 /ea	145,000
	10	F/A Control w/voice module	1.00	ea	4,500.00 /ea	4,500
	10	F/A Radio master box	1.00	ea	834.00 /ea	834
	10	F/A Remote annunciator	1.00	ea	556.00 /ea	556
	10	F/A Battery cabinet w/72 hour batteries	1.00	ea	834.00 /ea	834
	10	F/A Terminal cabinet	7.00	ea	556.00 /ea	3,892
	10	F/A Document cabinet	1.00	ea	278.00 /ea	278
	10	F/A Graphic map display panel	1.00	ea	417.00 /ea	417
	10	F/A Knox box	1.00	ea	530.00 /ea	530
	10	F/A Pull station installed w/back box	15.00	ea	217.00 /ea	3,255
	10	F/A Smoke detector installed w/back box	146.00	ea	374.00 /ea	54,604
	10	F/A CO detector installed w/.back box	12.00	ea	197.00 /ea	2,364
	10	F/A Mass Notification Speaker/strobe wall mount installed w/back box	39.00	ea	236.00 /ea	9,204
	10	F/A Mass notification strobe ceiling mount installed w/back box	196.00	ea	220.00 /ea	43,120
	10	F/A Speaker/strobe ceiling mount installed w/back box	177.00	ea	271.00 /ea	47,967
	10	F/A Speaker/strobe wall mount installed w/back box	32.00	ea	236.00 /ea	7,552
	10	F/A Strobe wall mount installed w/back box	29.00	ea	188.00 /ea	5,452
	10	F/A Strobe wall mount installed w/back box	5.00	ea	187.00 /ea	935
	10	F/A Control/ monitor module relay	12.00	ea	334.00 /ea	4,008
	10	F/A SLC/NAC 3/4" EMT & loop circuits	4,200.00	lf	11.14 /lf	46,788
	10	F/A 14/4 FPLP/MC cable	18,000.00	lf	3.98 /lf	71,640
	10	F/A 16/2 FPLP/MC cable	10,000.00	lf	2.95 /lf	29,500
	10	Area of refuge	1.00	ea	22,500.00 /ea	22,500
						1,173,130
		D5070 Security and Fire Alarm			*7.108/sf*	*1,173,130*
		165,035.00 sf				
		D50 ELECTRICAL			**59.041/sf**	**9,743,850**
		165,035.00 sf				

Item	Description	Takeoff Qty		Total Unit Cost	Total Amount
	D SERVICES			***174.890/sf***	***28,862,930***
	165,035.00 sf				
E					
E10	**EQUIPMENT**				
E1010	*Commercial Equipment*				
2	Food Service Equipment - Allowance	1.00	ls	800,000.000 /ls	800,000
					800,000
	E1010 Commercial Equipment			*4.847/sf*	*800,000*
	165,035.00 sf				
E1060	*Residential Equipment*				
80	Nurses Office Refrigerator	1.00	ea	1,500.00 /ea	1,500
80	Staff Room Refrigerator	3.00	ea	2,000.00 /ea	6,000
80	Teacher Collab Refrigerator	4.00	ea	1,500.00 /ea	6,000
100	Front Load Washer	1.00	ea	2,000.00 /ea	2,000
100	Front Load Dryer	1.00	ea	2,000.00 /ea	2,000
					17,500
	E1060 Residential Equipment			*0.106/sf*	*17,500*
	165,035.00 sf				
E1090	*Other Equipment*				
010	Rigging and Curtain System	1.00	allow	75,000.00 /allow	75,000
010	Projector Screens	1.00	ls	20,000.00 /ls	20,000
10	Motorized Basketball Hoops, Winch, Connectors.	6.00	ea	12,500.00 /ea	75,000
10	Motorized Divider Curtain in Gym	1.00	ea	20,000.00 /ea	20,000
10	Volley Ball Equipment - Allowance	1.00	ls	9,000.00 /ls	9,000
10	Pickle Ball Equipment - Allowance	1.00	ls	5,000.00 /ls	5,000
38	Wall Pads - 6' tall x 2' wide, Fire Rated - Gym, Allowance	730.00	sf	35.00 /sf	25,550
38	Interior Scoreboard w/Shot Clock	2.00	ea	20,000.00 /ea	40,000
38	Traverse Wall, climbing Wall - Allowance	580.00	sf	200.00 /sf	116,000
38	Climbing Ropes	6.00	ea	2,000.00 /ea	12,000
38	Adaptive Swings & Hooks - Gym	4.00	ea	4,500.00 /ea	18,000
38	Calming Room Wall Padding - 6' Height, Inc. Doors	1,860.00	sf	40.00 /sf	74,400
38	Pull up bar	1.00	ea	1,200.00 /ea	1,200
38	PT Platform Swing	1.00	ea	5,500.00 /ea	5,500
001	Kiln (Furnish & Install)	2.00	ea	12,000.00 /ea	24,000

Item	Description	Takeoff Qty		Unit Cost	Total Amount
001	Owner Training - Kiln Vendor	1.00	ls	500.00 /ls	500
					521,150
	E1090 Other Equipment			*3.158/sf*	*521,150*
	165,035.00 sf				
	E10 EQUIPMENT			**8.111/sf**	**1,338,650**
	165,035.00 sf				
E20	**FURNISHINGS**				
E2010	*Fixed Furnishings*				
20	Curtains & Track	3.00	ea	3,000.00 /ea	9,000
2	Window Shades - Manual	227.00	ea	400.00 /ea	90,800
10	Manufactured Casework				
10	Base Cabinets w/Tops	2,045.00	lf	500.00 /lf	1,022,500
10	Base Cabinets w/Stainless Tops (Art Room)	40.00	lf	550.00 /lf	22,000
10	Base Cabinets w/Solid Surface Tops (Admin)	42.00	lf	550.00 /lf	23,100
10	Typical Tall Cabinets	614.00	lf	900.00 /lf	552,600
10	Tall Tote Storage Cabinets	195.00	lf	925.00 /lf	180,375
10	Typical Wall Cabinets	616.00	lf	300.00 /lf	184,800
10	Typical Cubbies	620.00	lf	700.00 /lf	434,000
10	Pre-K Cubbies	185.00	lf	700.00 /lf	129,500
001	Instrument & Music Library Storage System, Allowance	1.00	ea	30,000.00 /ea	30,000
10	Telescopic Bleachers - Gym, 84' Length, 600 Seat	1.00	ls	225,000.00 /ls	225,000
					2,903,675
	E2010 Fixed Furnishings			*17.594/sf*	*2,903,675*
	165,035.00 sf				
	3.00 Labor hours				
	E20 FURNISHINGS			**17.594/sf**	**2,903,675**
	165,035.00 sf				
	E EQUIPMENT AND FURNISHINGS			***25.706/sf***	***4,242,325***
	165,035.00 sf				

F

Item	Description	Takeoff Qty		Total Unit Cost	Total Amount
F20	**SELECTIVE BUILDING DEMOLITION**				
F2010	*Building Demolition*				
01	Hazardous Material Abatement	1.00	ls	1,200,000.00 /ls	1,200,000
01	Hazardous Material Abatement - Roofing Assumption	1.00	ls	250,000.00 /ls	250,000
110	Demolition	1.00	ls	450,000.00 /ls	450,000
110	Premium Time	1.00	ls	100,000.000 /ls	100,000
					2,000,000
	F2010 Building Demolition			*12.119/sf*	*2,000,000*
	165,035.00 sf				
	F20 SELECTIVE BUILDING DEMOLITION			**12.119/sf**	**2,000,000**
	165,035.00 sf				
	F SPECIAL CONSTRUCTION AND DEMOLITION			***12.119/sf***	***2,000,000***
	165,035.00 sf				
G					
G10	**SITE PREPARATION**				
G1010	*Site Preparation*				
10	Mobilization	1.00	ls	10,738.64 /ls	10,739
10	Construction Stakeout	1.00	ls	37,585.25 /ls	37,585
10	Saw Cutting	700.00	lf	4.993 /lf	3,495
10	Soil Classification Costs	1.00	ls	50,000.00 /ls	50,000
10	Winter Conditions Allowance Plowing	2.00	seas	35,000.00 /seas	70,000
10	Soil Testing/Classification Costs - By others				
10	EROSION CONTROL				
10	SWPPP Plan & Monitoring	1.00	ls	16,107.97 /ls	16,108
10	Stone Construction Entrance & Drives	3,000.00	sy	64.432 /sy	193,296
10	Silt Fence - Install	2,705.00	lf	2.953 /lf	7,988
10	Erosion Controls - Maintain	32.00	mnth	279.205 /mnth	8,935
10	Erosion Controls - Remove	2,705.00	lf	1.396 /lf	3,776
10	12" Straw Wattle	2,705.00	lf	5.638 /lf	15,250
10	Dust Control	1.00	ls	161,079.62 /ls	161,080
10	Street Sweeping	250.00	hours	204.034 /hours	51,009
10	Misc. Erosion Control Measures	2,705.00	lf	17.182 /lf	46,477
10	Inlet Protection	27.00	ea	104.165 /ea	2,812
10	Site Re-Phasing Allowance	1.00	ls	75,000.00 /ls	75,000
10	Temp Laydown Areas				
10	Temp Access Roads	3,000.00	sy	17.182 /sy	51,545
10	Winter Conditions Allowance Plowing	2.00	seas	50,000.00 /seas	100,000

Item		Description	Takeoff Qty		Total Unit Cost	Total Amount
	20	Remove & Salvage				
	20	Benches	1.00	ea	107.38 /ea	107
	20	Soccer Plaque	1.00	ea	268.470 /ea	268
	20	Playground Memorial Plaque	1.00	ea	268.470 /ea	268
	20	Remove & Dispose				
	20	Existing Fence	980.00	lf	12.886 /lf	12,629
	20	Existing Curb	1,482.00	lf	13.960 /lf	20,689
	20	Concrete Walks	6,152.00	sf	4.295 /sf	26,426
	20	Remove & Dispose Exisitng Asphalt	7,997.00	sy	2.148 /sy	17,175
	20	Irrigation Systems & Pump House	1.00	ls	5,369.32 /ls	5,369
	10	Export Topsoil	7,560.00	cy	30.00 /cy	226,800
						1,214,827
		G1010 Site Preparation			*7.361/sf*	*1,214,827*
		165,035.00 sf				
G1020		*Site Demolition & Relocations*				
	10	Site Demolition	1.00	ls	536,932.10 /ls	536,932
		** unassigned **				*536,932*
		G1020 Site Demolition & Relocations			*3.253/sf*	*536,932*
		165,035.00 sf				
G1030		*Site Earthwork*				
	10	Site Grading				
	10	Site Cut to Fill	3,881.00	cy	20.00 /cy	77,620
	10	Site Fill - Building Excavation Material	18,766.00	cy	15.00 /cy	281,490
	10	Subgrading & Compaction	47,240.00	sy	3.222 /sy	152,188
	10	Stockpile on site	8,425.00	cy	16.108 /cy	135,710
	10	Truck and Dispose - Assumed Clean / Unrestricted	23,500.00	ton	15.00 /ton	352,500
	10	Load and Truck - 3,000 CY Arsenic Allowance	3,000.00	cy	10.00 /cy	30,000
	10	Dispose - Allowance, Assume Arsenic	23,500.00	ton	40.00 /ton	940,000
	10	Transport and Place Topsoil	11,860.00	cy	16.108 /cy	191,040
						2,160,548
		G1030 Site Earthwork			*13.091/sf*	*2,160,548*
		165,035.00 sf				
		G10 SITE PREPARATION			**23.706/sf**	**3,912,308**
		165,035.00 sf				
G20		**SITE IMPROVEMENTS**				

Item	Description	Takeoff Qty		Unit Cost	Total Amount
G2020	*Parking Lots*				
10	Gravel Base Below Paving	5,983.00	cy	50.00 /cy	299,150
10	Gravel Base Below Basketball Court/Play Surface	1,546.00	cy	50.00 /cy	77,300
10	Gravel Base Below Sidewalk/Pavers/Conc Pads/Loading Dock	2,663.00	cy	50.00 /cy	133,150
10	Gravel Base Below Turf Field	740.00	sy	15.034 /sy	11,125
25	Grade Basketball Court/Play Surface	1,546.00	sy	8.054 /sy	12,451
25	Grade Sidewalk/Pavers/Conc Pads/Loading Dock	2,663.00	sf	1.289 /sf	3,432
25	HMA, Parking and Drives	15,895.00	sy	25.773 /sy	409,658
25	Fine Grading - Driveway/Parking	15,895.00	sy	1.289 /sy	20,483
25	HMA, Basketball Court	600.00	sy	25.773 /sy	15,464
25	Fine Grading - Basketball	600.00	sy	1.289 /sy	773
2	Vertical Granite Curb	4,886.00	lf	107.386 /lf	524,690
2	Precast Concrete Curbing	2,215.00	lf	53.693 /lf	118,930
6	Line Painting	1.00	ls	32,215.93 /ls	32,216
6	Painted Courts	2.00	ea	27,276.15 /ea	54,552
6	Painted 4-Square	3.00	ea	2,416.193 /ea	7,249
6	Temp Line Striping	1.00	ls	15,000.00 /ls	15,000
					1,735,623
	G2020 Parking Lots			*10.517/sf*	*1,735,623*
	165,035.00 sf				
G2040	*Site Developement*				
10	Bollards	20.00	ea	1,600.00 /ea	32,000
10	Bollards - Light Type	20.00	ea	2,500.00 /ea	50,000
6	Site Concrete, Flatwork	60,733.00	sf	19.00 /sf	1,153,927
6	Site Concrete, Foundations	3,250.00	sf	40.00 /sf	130,000
001	Exterior Score Board Allowance				
001	Basketball Goals	4.00	ea	7,565.00 /ea	30,260
001	Soccer Goals	2.00	ea	8,400.00 /ea	16,800
001	Player Benches	8.00	ea	1,290.00 /ea	10,320
20	Synthetic Lawn Areas - Gathering Area	5,093.00	sf	20.00 /sf	101,860
20	Rubber Play Surfacing @ Playground	27,000.00	sf	36.90 /sf	996,300
001	Traffic Signs, Allow	1.00	ls	10,738.64 /ls	10,739
001	Entry Signs, Allow	1.00	ea	16,107.97 /ea	16,108
001	Basket Ball Hoops	4.00	ea	9,127.845 /ea	36,511
001	Trash receptacles	8.00	ea	5,000.00 /ea	40,000
001	Flagpole - 40' Ht.	2.00	ea	15,000.00 /ea	30,000
001	Bike racks	16.00	ea	977.00 /ea	15,632
001	Shade Structure Footing E&B	3.00	ea	8,053.98 /ea	24,162
001	Granite Benches	130.00	lf	1,877.00 /lf	244,010
001	Radial Benches	12.00	ea	5,975.00 /ea	71,700
001	Tables & Chairs	8.00	ea	7,725.00 /ea	61,800
001	Free Form Bench	4.00	ea	7,425.00 /ea	29,700
001	Sculpture Bench	3.00	ea	13,275.00 /ea	39,825
001	Shade Sails	3.00	ea	48,767.00 /ea	146,301
001	Garden Beds	6.00	ea	1,835.00 /ea	11,010
001	Storage Shed	1.00	ea	25,000.00 /ea	25,000
001	Playground Equipment Remove & Relocate Existing Allowance	1.00	allow	200,000.000 /allow	200,000
001	Playground Equipment - Pre-K	1.00	allow	283,500.00 /allow	283,500
001	Playground Equipment - K -> 2nd	1.00	allow	331,380.00 /allow	331,380

Item		Description	Takeoff Qty		Total Unit Cost		Total Amount
	001	Playground Equipment - 3 -> 5	1.00	allow	409,500.00	/allow	409,500
	001	Playground Underdrainage	1.00	ls	100,000.000	/ls	100,000
	20	4' Ht - Crash Rated Fence	630.00	lf	390.00	/lf	245,700
	20	4' Ht - Chain link fence	610.00	lf	63.00	/lf	38,430
	20	10' Ht - Chain link fence	585.00	lf	120.00	/lf	70,200
	20	6' Ht - Wood Fence	315.00	lf	135.00	/lf	42,525
	20	4' single gate - Crash Rated	2.00	ea	2,100.00	/ea	4,200
	20	4' double swing gate	1.00	ea	1,200.00	/ea	1,200
	20	10' Double Swing Gate	2.00	ea	3,000.00	/ea	6,000
	20	42" x 24' Vehicular Gate	3.00	ea	12,000.00	/ea	36,000
	20	8' Ht Mtl. Louvered Fencing	170.00	lf	1,350.00	/lf	229,500
	20	Louvered Single Gate	1.00	ea	4,500.00	/ea	4,500
	20	Louvered Double Gate	3.00	ea	7,500.00	/ea	22,500
	30	Concrete Block Walls	692.00	sf	80.540	/sf	55,734
	30	Cast in Place Curved Concrete Walls, Allowance	86.00	lf	650.00	/lf	55,900
							5,460,733
		G2040 Site Developement			*33.088/sf*		*5,460,733*
		165,035.00 sf					
G2050		*Landscaping*					
	2	Irrigation Systems - Temp irrigation, Establishment, allowance	1.00	ls	30,000.00	/ls	30,000
	2	Drip Strips at Plantings	1,200.00	sf	25.00	/sf	30,000
	2	Irrigation Systems - U-8 Fields only	32,601.00	sf	2.75	/sf	89,653
	25	Mulching	45.00	cy	165.00	/cy	7,425
	10	Strip & Stockpile Topsoil	11,860.00	cy	10.00	/cy	118,600
	10	Screen Topsoil	11,860.00	cy	10.00	/cy	118,600
	10	Planting Soil - 18"	325.00	cy	85.00	/cy	27,625
	10	Place Screened Topsoil - Lawn Areas	4,575.00	cy	15.00	/cy	68,625
	5	Lawn and Planting Maintenance	1.00	ls	15,000.00	/ls	15,000
	5	Fine Rake And Seed	193,000.00	sf	0.45	/sf	86,850
	5	Seed or Sod Allow @ Learning Area and U-8 Field	14,707.00	sf	2.50	/sf	36,768
	120	Deciduous Tree 3" Caliper	90.00	ea	2,000.00	/ea	180,000
	120	Evergreen Trees - 8'-10'	45.00	ea	2,100.00	/ea	94,500
	120	Evergreen Trees - 10'-15'	17.00	ea	3,250.00	/ea	55,250
	120	Shrubs - Allowance	3,200.00	sf	10.00	/sf	32,000
	120	Perennials - Allowance	3,200.00	sf	5.00	/sf	16,000
							1,006,895
		G2050 Landscaping			*6.101/sf*		*1,006,895*
		165,035.00 sf					
		G20 SITE IMPROVEMENTS			**49.706/sf**		**8,203,252**
		165,035.00 sf					
G30		**SITE MECHANICAL UTILITIES**					
G3010		*Water Supply*					

Item		Description	Takeoff Qty		Unit Cost	Total Amount
c 4		6" DIP Water	135.00	lf	207.00 /lf	27,945
c 4		8" DIP Water	2,363.00	lf	127.00 /lf	300,101
c 4		Connect to Existing Water Mains	1.00	ls	25,772.74 /ls	25,773
c 4		Hydrants & Tees	4.00	ea	10,094.323 /ea	40,377
c 4		6" Valves & Fittings	1.00	ls	10,000.00 /ls	10,000
c 4		8" Valves & Fittings	1.00	ls	25,000.00 /ls	25,000
c 4		Water Main Testing - Air	2,500.00	lf	1.50 /lf	3,750
c 4		Water Main Flushing	2,500.00	lf	1.25 /lf	3,125
c 4		Water Main Clorination	2,500.00	lf	1.25 /lf	3,125
						439,196
		G3010 Water Supply			*2.661/sf*	*439,196*
		165,035.00 sf				
G3020		*Sanitary Sewer*				
8		8" SDR-35	1,287.00	lf	94.00 /lf	120,978
8		Connect to Existing Sewer Manhole	1.00	ea	6,121.03 /ea	6,121
8		Sewer Manhole	12.00	ea	4,000.00 /ea	48,000
8		Grease Trap & Acid Waste Tank	1.00	ea	12,886.38 /ea	12,886
8		Set Frame & Cover	12.00	ea	1,035.205 /ea	12,422
8		Brick Invert	12.00	ea	536.932 /ea	6,443
8		Sewer Main Testing - Air	1,287.00	lf	3.222 /lf	4,146
8		Sewer Main Testing - Mandrel	1,287.00	lf	2.685 /lf	3,455
8		Manhole Testing - Air	12.00	ea	268.466 /ea	3,222
						217,674
		G3020 Sanitary Sewer			*1.319/sf*	*217,674*
		165,035.00 sf				
G3030		*Storm Drainage System*				
12		12" HDPE	2,828.00	lf	78.00 /lf	220,584
12		15" HDPE	9.00	lf	156.00 /lf	1,404
12		Infiltration System Cultec R330XLHD	514.00	ea	1,170.00 /ea	601,380
12		4' Diameter Catch Basin	27.00	ea	4,630.00 /ea	125,010
12		Drain Manholes	35.00	ea	3,800.00 /ea	133,000
12		Set Frame & Grate Cover	62.00	ea	1,396.023 /ea	86,553
12		Brick Invert	62.00	ea	300.682 /ea	18,642
12		Infiltration System - 36" HDPE	1,260.00	lf	268.466 /lf	338,267
12		Infiltration System - 36" HDPE	1,400.00	lf	268.466 /lf	375,852
12		Water quality Monitors - NIC				
						1,900,693
		G3030 Storm Drainage System			*11.517/sf*	*1,900,693*
		165,035.00 sf				

Item	Description	Takeoff Qty		Unit Cost	Total Amount
	G30 SITE MECHANICAL UTILITIES			**15.497/sf**	**2,557,563**
	165,035.00 sf				
G40	**SITE ELECTRICAL UTILITIES**				
G4010	*Site Electrical Utilities*				
001	Electrical Site Distribution - Electrical Contractor				
001	Primary service pole riser 5" GRC	1.00	ea	4,145.00 /ea	4,145
001	Primary service duct bank 2x5" PVC	660.00	lf	115.00 /lf	75,900
001	Transformer pad grounding	1.00	ea	2,192.00 /ea	2,192
001	Primary service 3- #4/0-1C 15KV SHLD 133%	700.00	ea	78.92 /ea	55,244
001	#4/0 15KV Load break elbows	3.00	ea	908.00 /ea	2,724
001	#4/0 15KV Termonations	3.00	ea	838.00 /ea	2,514
001	Secondary service 3000A (8) 4" PVC 1-Spare	130.00	lf	900.45 /lf	117,059
001	6'x 12'x 6' Tutility manhole	1.00	ea	111.52 /ea	112
001	Manhole racks & grounding	1.00	ea	5,840.00 /ea	5,840
001	Generator pad grounding	1.00	ea	3,226.00 /ea	3,226
001	1200A Generator feeder (3) 4" PVC copper	175.00	lf	390.57 /lf	68,350
001	125A Generator feeder 2" PVC copper	175.00	lf	28.26 /lf	4,946
001	125A Generator feeder 2" PVC copper	175.00	lf	28.26 /lf	4,946
001	Generator aux circuits 2" PVC	175.00	lf	96.09 /lf	16,816
001	2500KVA 15KV loop feed pad transformer	1.00	ls	198,138.00 /ls	198,138
					562,150
	G4010 Site Electrical Utilities			*3.406/sf*	*562,150*
	165,035.00 sf				
G4020	*Site Lighting*				
008	Electrical Site Lighting - Excavation - Site Contractor Scope Below:				
008	UG Electric Duct Bank 2-2.5"	950.00	lf	12.886 /lf	12,242
008	Site Lighting Conduit Trench	3,535.00	lf	12.886 /lf	45,553
008	Light Pole Bases	50.00	ea	354.375 /ea	17,719
008	Electrical Manhole	3.00	ea	1,288.637 /ea	3,866
008	Transformer Pad, Precast	1.00	ea	2,684.66 /ea	2,685
008	E&B for Generator Pads	1.00	ls	5,369.32 /ls	5,369
001	Electrical Site Distribution - Electrical Contractor				
001	Type SL1/3 LED Single head luminaire on 12.5' pole	30.00	ea	4,500.00 /ea	135,000
001	18" x 6' Precast concrete pole base	30.00	ea	1,095.00 /ea	32,850
001	1" PVC 4 #8	3,000.00	ea	10.40 /ea	31,200
001	Quazite ingrade pull box 17" x 30" x24"	10.00	ea	1,136.00 /ea	11,360
					297,844
	G4020 Site Lighting			*1.805/sf*	*297,844*
	165,035.00 sf				

Item	Description	Takeoff Qty		Unit Cost	Total Amount
G4030	*Site Communications And Security Systems*				
001	Site Communications - Electrical Contractor				
001	Telcom service pole riser	1.00	ea	5,267.00 /ea	5,267
001	Telcom service duct bank 4x 4" PVC	780.00	ea	58.05 /ea	45,279
001	6'x 12'x 6' Tutility manhole	2.00	ea	1,112.00 /ea	2,224
001	Manhole racks & grounding	2.00	ea	5,840.00 /ea	11,680
					64,450
	G4030 Site Communications And Security Systems			*0.391/sf*	*64,450*
	165,035.00 sf				
	G40 SITE ELECTRICAL UTILITIES			**5.602/sf**	**924,444**
	165,035.00 sf				
	G SITEWORK			***94.511/sf***	***15,597,566***
	165,035.00 sf				

Estimate Totals

Description	Amount	Totals	Rate
Direct Cost	**102,196,156**	**102,196,156**	
Design Contingency	10,219,616		10.000 %
Escalation	7,664,712		7.500 %
Construction Contingency	1,532,942		1.500 %
Subtotal	**19,417,270**	**121,613,426**	
Sub Default Insurance	750,000		
Project Requirements	4,196,169		
GCs & GRs (Price Proposal)	5,733,391		
Preconstruction			
General Liability Insurance	1,509,454		1.095 %
Performance Bond	958,055		0.695 %
Builder Risk Insurance	266,050		0.193 %
Pollution Insurance	66,168		0.048 %
	13,479,287	**135,092,713**	
		135,092,713	
General Building Permit - Waived			
Subtotal		**135,092,713**	
CM Fee	2,756,994		2.000 %
Subtotal	**2,756,994**	**137,849,707**	
Project GSF 165,035			
Total		**137,849,707**	

FONTAINE BROS.

Project Name:	**Wilmington Elementary School**
Document Name:	**Value Engineering Log**
Project Phase:	**Schematic Design**
Review Date:	**Mar-25**

Item #	Category/ Discipline	Item	Recommendations and Values	Accepted	Alternates	Deferred/Rejected	Notes
1	Arch	Change corridor terrazzo to porcelain tile or other more cost effective material	$ 64,368				Terrazzo @ $45/sf - Floor Tile = $31.5 w/ Membrane; Savings of 13.5/sf
2	Arch	Change cafeteria terrazzo to porcelain tile or other more cost effective material (Includes Quiet Cafe's)	$ 115,466				Terrazzo @ $45/sf - Floor Tile = $31.5 w/ Membrane; Savings of 13.5/sf
3	Arch	Change flex classroom/storage from terrazzo to Linoleum	$ 37,370				Terrazzo @ $45/sf - Linoleum = $8/sf; Savings of $37/sf
4	Arch	Change stair 2 and 4 from terrazzo to rubber stair tread	$ 156,640				$181,640 as Terrazzo -> $25K as Rubber
5	Landscape	Reduction 10% in trees	$ 32,900				Trees = 329k
6	Landscape	Reduction 10% in plantings	$ 4,800				Plantings = 48k
7	Landscape/Civil	Consider changing granite curbing to bituminous curb	$ 73,290				4886 Linear Feet. Assume $15/LF savings
8	Landscape/Civil	Consider substituting 6" granite curb for 5" granite curb	$ 24,430				Assuming $5/lf savings.
9	Landscape/Civil	Consider replacing approx. 600 LF of 6' wide sidewalk on south side of main parking lot with grass.	$ 67,680				Approx. 3600 SF at $19/SF of concrete and approx. 60CY of gravel at $50/CY with general fill/topsoil at $35/CY and grass back at $0.45/SF
10	Arch	Reduce Toilet Room wall tile to wet wall only	$ 230,214				4,856 SF at wet walls @ 8' AFF; Reduce 7,548 SF @ $32/per SF put back paint at $1.5/sf
11	Arch	Eliminate LED light strip at stair rails	$ 17,400				Allowance Carried, $17,400
12	Arch	Reduce size of digital graphics in stair 4 - 20%	$ 10,080				1,120 SF @ $45/Per SF
13	Arch	Change Custodial epoxy flooring to sealed concrete	$ 18,480				880 SF @ $25/sf -> Savings of $21/SF
14	Arch	Replace Cafeteria Tectum Ceiling Panels with more cost effective product					$305k Carried for Tectum Ceilings; $30/SF
15	Arch	Replace Tile in custodial with FRP	$ 17,680				1,040 SF @ $32/SF with FRP @ $15/SF
16		**Total:**	**$ 870,798**				

PROJECT DIRECTORY

The Project Directory, dated February 20, 2025, is attached and has been updated since the Preferred Schematic Report submission in October 2024. The update includes the addition of the Construction Manager at Risk, Fontaine Bros., Inc. Fontaine Bros. was selected by the Construction Manager at Risk Prequalification and Selection Working Group, after interviewing four shortlisted firms on February 11, 2025 and February 12, 2025. The Construction Manager at Risk Prequalification and Selection Working Group made its recommendation to the School Building Committee at its meeting on February 13, 2025 and it was voted and approved unanimously. The District's Application for Construction Manager at Risk Construction Method was approved by the Inspector General, dated January 20, 2025.

The School Building Committee Composition letter is also made a part of this section for record as it was in its original state when submitted as a part of the Preferred Schematic Report for record.

TOWN OF WILMINGTON
WILMINGTON ELEMENTARY SCHOOL
FORMERLY WILDWOOD EARLY CHILDHOOD CENTER
PROJECT DIRECTORY
SMMA NO. 22127
Date: February 20, 2025

WILMINGTON PUBLIC SCHOOLS

smma

	Contact Name and Address	Contact Phone Number
SCHOOL BUILDING COMMITTEE	**Dr. Glenn Brand**, *School Superintendent Committee Chair* glenn.brand@wpsk12.com	978-694-6000, Option 4
	Vivian Varbedian, *Parent Committee Vice-Chair* vvarbedian@gmail.com	
	Paul Ruggiero, *Assistant Superintendent of Administration & Finance* paul.ruggiero@wpsk12.com	978-694-6000
	R. Eric Slagle, *Town Manager* eslagle@wilmingtonma.gov	978-658-3311 Phone 978-658-3334 Fax
	Judith L. O'Connell, *Assistant Town Manager* joconnell@wilmingtonma.gov	
	Gregory B. Bendel, *Chair, Board of Selectmen* gbendel@wilmingtonma.gov	781-953-4780
	Kevin A. Caira, *Board of Selectmen* kcaira@wilmingtonma.gov / kevincaira57@gmail.com	978-657-7734
	David A. Ragsdale, *School Committee Member* david.ragsdale@wpsk12.com	
	Nicholas Golden, *School Committee Member* nicholas.golden@wpsk12.com	
	Stephen Turner, *School Committee Secretary* stephen.turner@wpsk12.com	
	Kate Bissell, *School Principal, Wildwood School* kate.bissell@wpsk12.com	
	Christine Holleran, *Teacher, Wildwood School* christine.holleran@wpsk12.com	
	Stacey Scott, *School Principal, Woburn Street* stacey.scott@wpsk12.com	
	Christine Murray, *Interim Director, Student Support Services* christine.murray@wpsk12.com	
	Dennis Kelley, MCPPO *Public Buildings Superintendent* dkelley@wilmingtonma.gov	
	Diane M. Allan, *Permanent Building Committee* gdallan@comcast.net	978-658-8576
	John C. Holloway, *Permanent Building Committee* j.hollowayjr@verizon.net	978-657-8685
	Paul J. Melaragni, *Permanent Building Committee* paul.melaragni@state.ma.us	978-658-0264
	Marianne Gallezzo, *Finance Committee* mgallezzo@wilmingtonma.gov	978-658-7405
	Michael Camoscio, *North Side Parent, Mechanical Engineer* michael.camoscio@stvinc.com	
	Justin Cusce, *North Side Parent* jcusce17@gmail.com	

TOWN OF WILMINGTON
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	Contact Name and Address	Contact Phone Number
	Christine Prendergast, *North Side Parent* chrissy521@gmail.com **Craig Miner,** *West Side Parent, Civil Engineer* cminer76@hotmail.com	
MASSACHUSETTS SCHOOL BUILDING AUTHORITY (MSBA)	40 Broad Street, Suite 500 Boston, Massachusetts 02109 **Mary Pichetti,** *MSBA Executive Director* mary.pichetti@massschoolbuildings.org **Deborah Goldberg,** *State Treasurer and MSBA Chair* **James A. MacDonald,** *MSBA Chief Executive Officer* james.macdonald@massschoolbuildings.org **Veatriki Dagkalakou,** *Project Manager* veatriki.dagkalakou@massschoolbuildings.org **Sarah Przybylowicz,** *Senior Project Coordinator* sarah.przybylowicz@massschoolbuildings.org	617-720-4466 main 617-720-5260 fax 617-960-3009 *Direct*
SCHOOL COMMITTEE	**Jesse Fennelly**, *Chair* jesse.fennelly@wpsk12.com **Jennifer Bryson**, *Vice Chair* jennifer.bryson@wpsk12.com **Nicholas Golden,** *Member* nicholas.golden@wpsk12.com **David Ragsdale**, *Member* david.ragsdale@wpsk12.com **Michael Mercaldi,** *Member* michael.mercaldi@wpsk12.com **Jay Samaha**, *Member* jay.samaha@wpsk12.com **Stephen Turner**, *Member* stephen.turner@wpsk12.com	
BUILDING DEPARTMENT **Hours:** M-F 8:30am to 4:30pm	**Town Hall** 121 Glen Road, Room 5 Wilmington, Massachusetts 01887 **Al Spaulding,** *Building Inspector* **Kelly Malatesta,** *Senior Clerk* **Fred Sutter,** *Wiring Inspector* **Shawn Inman,** *Plumbing Inspector*	**Phone:** (978) 658-4531 **Fax:** (978) 694-2045
PUBLIC SAFETY	**Police Department** Wilmington Memorial Public Safety Building 1 Adelaide Street Wilmington, Massachusetts 01887 **Chief Joseph Desmond** *Police Chief* ***Deputy Chief Brian Pupa*** *Deputy Chief*	**Business Line:** (978) 658-5071 **Emergency:** (978) 658-3331 **Fax:** (978) 658-0035

TOWN OF WILMINGTON
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	Contact Name and Address	Contact Phone Number
PUBLIC SAFETY	**Fire Department** Wilmington Memorial Public Safety Building 1 Adelaide Street Wilmington, Massachusetts 01887 **William F. Cavanaugh** *Fire Chief* **Christopher Pozzi** *Deputy Chief* **Lt. Ryan Quigley** *Fire Prevention Captain* **Lauren Parisi** *Part Time Fire Prevention Clerk* **Lt. Thomas Ceres** *Operations/Training*	**Business Line:** (978) 658-3346 **Fax:** (978) 988-9181 978-658-3346 x210 978-658-3346 x209 978-658-3346 x274 978-658-3346 x207 978-658-3346 x273
OWNER'S PROJECT MANAGER	**SMMA** 1000 Massachusetts Avenue Cambridge, Massachusetts 02138 **Julie A. Leduc, CS, MCPPO** *Director of OPM Services* *jleduc@smma.com* **Robert Guarino, CS** *OnSite Project Manager/Representative* rguarino@smma.com **Sarah Traniello, MCPPO** *Assistant Project Manager | Reports Manager* straniello@smma.com	617-547-5400 617-520-9431(d) 781-910-2793(c) 978-303-7764(c) 617-520-9240 (d) 617-548-6382 (c)
COMMISSIONING AGENT	*TBD*	
Testing & Inspections Consultant	*TBD*	

TOWN OF WILMINGTON
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	Contact Name and Address	Contact Phone Number
DESIGNER/ARCHITECT DORE + WHITTIER Architecture · Project Management	**Dore+Whittier Architects** 260 Merrimac Street, Building 7, 2nd Floor, Newburyport, Massachusetts 01950	978-499-2999
Architecture	Donald M. Walter AIA, NCARB *CEO & Principal in Charge* dwalter@doreandwhittier.com Bryce Taft, Assoc. AIA *Project Architect* btaft@doreandwhittier.com	
DORE + WHITTIER Architecture · Project Management	**Dore+Whittier Architects** 212 Battery Street Burlington, Vermont 05401	802-863-1428
Architecture	Lee P. Dore Associate AIA, LEED AP® *President & Principal, Project Executive* lpdore@doreandwhittier.com David Mentzer AIA, NCARB, CDT, LEED AP® *Senior Associate | Architect* dmentzer@doreandwhittier.com	
Project Management for Study and Design	Rani Philip Associate AIA, CDT, LEED AP® *Project Manager* rphilip@doreandwhittier.com	
Interior Design	Giovanna Chaisson NCIDQ, LEED AP® *Associate* gchaisson@doreandwhittier.com	
Educational Planner	Jason Boone Associate AIA, ALEP *Senior Associate* jboone@doreandwhittier.com	
Laboratory	Giovanna Chaisson NCIDQ, LEED AP® *Associate* gchaisson@doreandwhittier.com	
Specifications	Marjorie Dickstein AIA, LEED AP® BD+C, NCARB, CCS *Senior Associate* mdickstein@doreandwhittier.com	
Library/Media	Ron Lamarre, AIA, ALEP, ALA, LEED AP®, WELL AP *Architect* rlamarre@doreandwhittier.com	
Code	David Mentzer AIA, NCARB, CDT, LEED AP® *Associate* dmentzer@doreandwhittier.com	
Accessibility	David Mentzer AIA, NCARB, CDT, LEED AP® *Associate* dmentzer@doreandwhittier.com	

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		Contact Name and Address	Contact Phone Number
	FF&E	Giovanna Chaisson NCIDQ, LEED AP® *Associate* gchaisson@doreandwhittier.com	
	Security	Michele Barbaro-Rogers AIA, NCARB, CPTED *Senior Associate* mrogers@doreandwhittier.com	
WBE	**Civil Engineering**	**CDW Consultants, Inc.** 4 California Avenue, Suite 301 Framingham, Massachusetts 01701 Kathleen Campbell, PE, LSP, LEED AP, ENV SP *President & CEO, Principal-In-Charge* *Civil Engineering & Environmental Permitting* kcampbell@cdwconsultants.com Eric Wilhelmsen, PE *Associate Principal* ewilhelmsen@cdwconsultants.com	508-875-2657 info@ cdwconsultants.com
	Environmental Permitting	**Marian Rambelle** Senior Environmental Engineer *Principal-In-Charge* *Civil Engineering & Environmental Permitting* mrambelle@cdwconsultants.com	
WBE	**Landscape Architecture**	**TerraInk, Incorporated** 7 Central Street, Suite 150 Arlington, Massachusetts 02476 Jade Cummings, PLA, LEED AP *Co-Owner and President* *Principal Landscape Architect of Design* jcummings@terraink.com Kellie Anne Connelly, PLA *Co-Owner and Treasurer/Secretary* *Principal Landscape Architect of Construction | Project Manager* kconnelly@terraink.com	781-316-1595 info@ terraink.com
MBE	**Structural Engineering**	**Engineers Design Group, Inc.** 389 Main Street, Suite 401 Malden, Massachusetts 02148 Mehul Dhruv, PE *Principal* *Structural Engineer* mdhruv@edginc.com	781-396-9007 Ext. 0013

TOWN OF WILMINGTON
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WILMINGTON PUBLIC SCHOOLS

smma

	Contact Name and Address	Contact Phone Number
Fire Protection Engineer **MBE**	**AKAL Engineering, Inc.** 44 Central Street, Suite 300 Berlin, Massachusetts 01503 Anup S. Khatra, PE, LEED AP *Principal* *Fire Protection Engineer*	508-869-0403 ask@ akalengineering.com
Plumbing Engineer **MBE**	Anthony K. Gray, PE, LEED AP *Senior Project Manager* *Plumbing Engineer*	
HVAC Engineer	**GGD Consulting Engineers, Inc.** 375 Faunce Corner Road, Suite D Dartmouth, Massachusetts 02747 Dominick Puniello, PE, CEM *Principal | Mechanical Engineer* dom_puniello@g-g-d.com	508-998-5700 info@g-g-d.com
Electrical / Lighting	David M. Pereira, PE *Principal | Electrical Engineer* david_pereira@g-g-d.com	
Data/Communications	**Edvance Technology Design, Inc.** 300 Brickstone Square Andover, Massachusetts 01880 Scott Goodrich *Principal and Co-Founder* sgoodrich@edvancetech.com Douglas Faria *Principal and Co-Founder* dfaria@edvancetech.com	978-256-9900 rfaria@ edvancetech.com
Environmental Permitting **WBE**	**CDW Consultants, Inc.** 4 California Avenue, Suite 301 Framingham, Massachusetts 01701 **Marian Rambelle** *Senior Environmental Engineer* *Principal-In-Charge* *Civil Engineering & Environmental Permitting*	508-875-2657 info@ cdwconsultants.com
Geotechnical Engineering **MBE**	**Lahlaf Geotechnical Consulting Inc.** 100 Chelmsford Road, Suite 100 Billerica, Massachusetts 01862 Abdelmadjid M. Lahlaf, Ph.D., PE, Principal Engineer *Geotechnical Engineer | Project Manager* madjid@lgcinc.net	978-330-5912 lgci@lgcinc.net

	Contact Name and Address	Contact Phone Number
	Nicholas Proulx *Geotechnical Engineer*	
Geoenvironmental Engineering **MBE/WBE**	**PEER Consultants, P.C.** 25 Mall Road, Suite 206 Burlington, Massachusetts 01803 67 South Bedford Street Suite 400 West Burlington, Massachusetts 01803 David Gorden, CPSS, CWS *Board Certified Environmental Scientist* gordend@peercpc.com	**781-238-8880** **781-238-8884**
Hazardous Materials Consultant	**Universal Environmental Consultants** 12 Brewster Road Framingham, Massachusetts 01702 Ammar Dieb *President | Principal* adieb@uec-env.com	508-628-5486
Cost Estimating Consultant	**Project Management & Cost, LLC (PM&C LLC)** 20 Downer Avenue, Suite 5 Hingham, Massachusetts 02043 Peter Bradley, LEED AP *Principal, BSc Quantity Surveying* peterbradley@pmc-ma.com Maria McKenna *Project Manager* mariamckenna@pmc-ma.com	781-740-8007
Kitchen / Food Service Consultant	**Crabtree McGrath Associates** 161 West Main Street Georgetown, Massachusetts 01833 John Sousa, Jr. *Principal* jsousa@crabtree-mcgrath.com	978-352-8500
Acoustical Consultant	**Acentech, Inc.** 33 Moulton Street Cambridge, Massachusetts 02138 Nicole Cuf, PE, LEED AP BD+C *Principal Consultant* ncuf@acentech.com	617-499-8000
Technology/AV Consultant	**Edvance Technology Design, Inc.** 300 Brickstone Square, Unit 201 Andover, Massachusetts 01810 Scott Goodrich *Principal and Co-Founder* sgoodrich@edvancetech.com	978-256-9900

	Contact Name and Address	Contact Phone Number
	Douglas Faria *Principal and Co-Founder* dfaria@edvancetech.com	
Theatrical Consultant	**Scheu Consulting Services, Inc.** 13 Woodberry Lane Fayetteville, New York 13066 Peter Sceu, ASTC *President and Principal Consultant* peter@scheuconsulting.com	315-214-4564
Sustainable / Green Design/ Renewable Energy	**The Green Engineer, Inc.** 23 Bradford Street, First Floor Concord, Massachusetts 01742 Chris Schaffner, PE, LEED Fellow, WELL AP *Principal-In-Charge (Sustainable / Green Design/ Renewable Energy/ NZE Consultant)* chris@greenengineer.com Carrie Havey, LEED Fellow, SITES AP *Senior Project Manager* *(Sustainable Design Consultant)* carrie@greenengineer.com Peter Levy, LEED AP, CPHC, BEMP *Senior Project Manager (Sustainable Design Consultant)* *Building Performance Analyst* peter@greenengineer.com	978-369-8978 info@ greenengineer.com
Security Consultant	**Edvance Technology Design, Inc.** 300 Brickstone Square, Unit 201 Andover, Massachusetts 01810 Scott Goodrich *Principal and Co-Founder* sgoodrich@edvancetech.com Douglas Faria *Principal and Co-Founder* dfaria@edvancetech.com	978-256-9900 rfaria@ edvancetech.com
Traffic Consultant	**Nitsch Engineering Inc.** 2 Center Plaza, Suite 430 Boston, Massachusetts 02108 Bryan Zimolka, PE *Senior Project Manager* *Transportation Engineering Project Manager* bzimolka@nitscheng.com	617-338-0063 info@nitscheng.com
Site Surveying Consultant	**Nitsch Engineering Inc.** 2 Center Plaza, Suite 430 Boston, Massachusetts 02108 Denis R. Seguin, PLS *Vice President | Director of Land Surveying*	617-338-0063 info@nitscheng.com

	Contact Name and Address	Contact Phone Number
	Land Surveying Project Manager dseguin@nitscheng.com	
CONSTRUCTION MANAGEMENT FIRM	**Fontaine Bros. Inc. (FBI)**	
	Springfield Office 510 Cottage Street Springfield, Massachusetts 01104	413.781.2020 413.734.1881 fax
	Worcester Office 12 East Worcester Street, Suite 2A Worcester, Massachusetts 01604	508.796.5133
	David Fontaine Sr. *President*	T: 413.781.2020 F: 413.734.1881
	David Fontaine Jr. *Chief Executive Officer* djr@fontainebros.com	C: 413.244.3463 T: 413.781.2020 | F: 413.734.1881
	Robert Day *Project Executive* *rday@fontainebros.com*	C: 508.735.8887 | T: 413.781.2020 | F: 413.734.1881
	Chelsey Mutrie *Vice President of Preconstruction Services* *cmutrie@fontainebros.com*	C: 508-975-3483 T: 413.781.2020 F: 413.734.1881
	Mark Abdella *Vice President of CM Services* *mabdella@fontainebros.com*	C: 617.413.6801 T: 413.781.2020
	Shane Sampson *Senior Project Manager* *ssampson@fontainebros.com*	C: 508-728-6651 T: 413.781.2020 F: 413.734.1881
	Chad L'Ecuyer *Project Manager* *clecuyer@fontainebros.com*	C: 508.340.2577 T: 413.781.2020 F: 413.734.1881
	Alex Omar *Senior Project Superintendent* *aomar@fontainebros.com*	C: 617.594.6774 T: 413.781.2020 F: 413.734.1881

[PLEASE PRINT ON CITY, TOWN, OR DISTRICT LETTERHEAD]

July 24, 2024
Updated September 12, 2024

Sarah Przybylowicz, MSBA Project Coordinator
Sarah.Przybylowicz@massschoolbuildings.org
Massachusetts School Building Authority
40 Broad Street, Fifth Floor
Boston, Massachusetts 02109

Dear Ms. Przybylowicz:

In accordance with 963 CMR 2.00, attached for your review and approval is the membership of the School Building Committee for the Wildwood Elementary School located in the Town of Wilmington. The Committee was formed in accordance with the provisions of all applicable statutes, local charters, by-laws and agreements of the Town of Wilmington. Committee Members include the following:

Designation	Name and Title	Address	Email Address and Phone Number	Voting Member?
SBC member who is MCPPO certified*	Dennis Kelley, Superintendent Public Buildings Department	30 Church Street, Wilmington	dkelley@wilmingtonma.gov 978-658-3017	Yes
Local Chief Executive Officer	Gregory B. Bendel, Chair Board of Selectmen	121 Glen Road, Wilmington	gbendel@wilmingtonma.gov 781-953-4780	Yes
Administrator or Manager**	R. Eric Slagel, Town Manager	121 Glen Road, Wilmington	eslagle@wilmingtonma.gov 978-658-3311	Yes
School Committee Member (minimum of one)	David A. Ragsdale, School Committee Member	161 Church Street, Wilmington	david.ragsdale@wpsk12.com	Yes
	Nicholas Golden, School Committee Member	161 Church Street, Wilmington	nicholas.golden@wpsk12.com	Yes
	Stephen Turner, School Committee Member	59 Washington Avenue, Wilmington	stephen.turner@wpsk12.com	Yes
Superintendent of Schools	**Dr. Glenn Brand Chair, School Building Committee**	**161 Church Street, Wilmington**	**glenn.brand@wpsk12.com 978-694-6000, Option 4**	**Yes**
Local Official responsible for Building Maintenance	Dennis Kelley, Superintendent, Public Buildings Department	30 Church Street, Wilmington	dkelley@wilmingtonma.gov 978-658-3017	Yes
Representative of Office authorized by law to construct school buildings	R. Eric Slagel, Town Manager	121 Glen Road, Wilmington	eslagle@wilmingtonma.gov (978) 658-3311	Yes
	Judith L. O'Connell, Assistant Town Manager	121 Glen Road, Wilmington	joconnell@wilmingtonma.gov (978) 658-3311	Yes
School Principal	Kate Bissell, Principal Wildwood School	25 Carter Lane, Wilmington	kate.bissell@wpsk12.com	Yes

Designation	Name and Title	Address	Email Address and Phone Number	Voting Member?
	Stacey Scott, Principal Woburn Street School	227 Woburn Street, Wilmington	stacey.scott@wpsk12.com	Yes
Member knowledgeable in educational mission and function of facility	Paul Ruggiero, Assistant Superintendent of Administration and Finance	161 Church Street, Wilmington	Paul.Ruggiero@wpsk12.com	Yes
Local budget official or member of local finance Committee	Marianne Gallezzo Finance Committee	30 Roosevelt Road, Wilmington	mgallezzo@wilmingtonma.gov 978-658-7405	Yes
Members of community with architecture, engineering and/or construction experience	Michael Camoscio, *Mechanical Engineer*	19 Dorothy Avenue, Wilmington	michael.camoscio@stvinc.com	Yes
	Craig P. Miner *Civil Engineer*	215 Burlington Avenue, Wilmington	cminer76@hotmail.com	Yes
	Vivian Varbedian, *Project Management*	39 Marion Street, Wilmington	v.varbedian@gmail.com	Yes
Other: Please provide brief background info/expertise				
Permanent Building Committee:	Dennis Kelley	30 Church Street Wilmington	dkelley@wilmingtonma.gov 978-658-3017	Yes
	Diane M. Allan	7 Stonehedge Drive Wilmington	gdallan@comcast.net 978-658-8576	Yes
	John C. Holloway	2 Winston Avenue Wilmington	j.hollowayjr@verizon.net 978-657-8685	Yes
	Paul J. Melaragni	176 Middlesex Avenue Wilmington	paul.melaragni@state.ma.us 978-658-0264	Yes
Board of Selectmen:	Kevin A. Caira	251 Woburn Street, Wilmington	kcaira@wilmingtonma.gov kevincaira57@gmail.com 978-657-7734	Yes
School Principal:	Stacey Scott Woburn Street School	227 Woburn Street, Wilmington	stacey.scott@wpsk12.com	Yes
Wildwood School Teacher:	Christine Holleran	25 Carter Lane, Wilmington	christine.holleran@wpsk12.com	Yes
Community Members / Parents:	Justin Cusce, *North Side Parent*	12 Senaca Lane, Wilmington	jcusce17@gmail.com	Yes
	Christine Prendergast, *North Side Parent*	7 Pinewood Road, Wilmington	chrissy521@gmail.com	Yes
	Craig Miner, *West Side Parent and Civil Engineer*	215 Burlington Avenue, Wilmington	cminer76@hotmail.com	Yes
	Michael Camoscio, *North Side Parent and Mechanical Engineer*	19 Dorothy Avenue, Wilmington	michael.camoscio@stvinc.com	Yes
	Vivian Varbedian, *Parent and Vice Chair of the School Building Committee*	39 Marion Street, Wilmington	v.varbedian@gmail.com	Yes

Listed below is the past performance of the school building committee, the building committee (temporary or permanent), or any other committee responsible for oversight, management, or

administration of the construction of public buildings and its individual members:

Following approval at the May 1, 2010 Annual Town Meeting to appropriate $1,125,000 to conduct a feasibility study for the Wilmington High School, the School Building Committee guided the completion of that study which led to a December 10, 2011 Special Town Meeting approval of $81,563,115 for construction of a new high school on the existing location. Through the efforts of the School Building Committee to monitor design and construction progress and with financial and technical assistance from the Massachusetts School Building Authority (MSBA) the new high school opened on February 16, 2015.

In 2015, the Facilities Master Plan Committee began work with Harriman Architects (formerly the Cecil Group) to evaluate the condition of school and municipal buildings. The report, issued in January 2018, noted the multiple undersized elementary school buildings, the age and condition of those buildings and advised the Town to consider consolidation of elementary schools and replacement or upgrades.

After approval of this committee by the Authority, the Town will notify the Authority in writing within 20 calendar days of any changes to the membership or the duties of said committee.

Sincerely,

R. Eric Slagle
Town Manager
Town of Wilmington

_____
Approved by MSBA Date

* Please attach the certification from the Office of the Inspector General demonstrating completion of the MCPPO Program.
** "Administrator or Manager" refers to a Town Administrator, Town Manager, or to an equivalent position.

ROLES AND RESPONSIBILITIES

The team's organizational chart (Town of Wilmington, SMMA, Dore+Whittier Architects and Fontaine Bros.) has been included to outline the Roles and Responsibilities of each team member.

Wilmington Elementary School Project
Responsibility Matrix
March 9, 2025

	L=Lead S=Support R=Review/Input	Designer	OPM	Cx	Contractor	Owner	MSBA
MODULE 1: ELIGIBILITY PERIOD							
a	Statement of Interest					L	R
b	Initial Compliance Certification					L	R
c	Form School Building Committee					L	R
d	Existing Maintenance Practices					L	R
e	Certification of Design Enrollment					S	L
f	District Funding Authorization					L	R
g	Feasibility Study Agreement					S	L
MODULE 2: FORMING THE PROJECT TEAM							
a	Prepare OPM Request For Services (RFS)					L	S
b	Review Proposals & Interview OPMs; Select Preferred OPM					L	S
c	MBSA OPM Review Panel Approval					S	L
d	Procure OPM		S			L	R
e	Establish OPM Contract		S			L	R
DESIGNER SELECTION							
a	Prepare Designer Request for Services (RFS)		L			R	R
b	Review Proposals, Check References & Rank		L			S	R
c	MSBA Designer Review Panel Selects Preferred Firm		S			S	L
d	Negotiate Designer Fee & Establish Designer Contract		L			R	R
MODULE 3: FEASIBILITY STUDY							
a	Preliminary Design Program (PDP) Report	L	S			R	S
b	MSBA Review of PDP	S	S			S	L
c	Preferred Schematic Report	L	S			R	S
d	Facilities Assessment Subcommittee Review	S	S			S	L
e	MSBA Board of Directors' Approval of Preferred Schematic						L
MODULE 4: SCHEMATIC DESIGN							
a	Schematic Design (SD) Submission	L	S		S	S	R
b	MSBA Staff Review of SD Submission	S	S			S	L
c	Project Scope & Budget Conference	S	S			S	L
d	MSBA Board of Directors' Approval of Project Scope & Budget						L
MODULE 5: FUNDING THE PROJECT							
a	Project Scope & Budget Agreement		S			R	L
b	Local Funding Authorization	S	S		S	L	R
c	Project Funding Agreement	S	S			R	L
MODULE 6: DETAILED DESIGN							
DESIGN DEVELOPMENT							
a	Establish Final OPM Contract		S			L	R
b	Establish Final Designer Contract	S	L			S	R
c	Assign Commissioning Agent						L
d	Design Development Submission	L	S	S	S	S	
e	MSBA Staff Review		S			S	L
CONSTRUCTION DOCUMENTS							
a	60% Construction Documents Submission	L	S	S	S	S	
b	MSBA Staff Review		S			S	L
c	90% Construction Documents Submission	L	S	S	S	S	
d	MSBA Staff Review		S			S	L
e	100% Construction Documents Submission	L	S	S	S	S	L

Wilmington Elementary School Project
Responsibility Matrix
March 9, 2025

	L=Lead S=Support R=Review/Input	Designer	OPM	Cx	Contractor	Owner	MSBA
BIDDING							
a	Bidder Prequalification Process	S	L		S	S	
b	Pre-Bid Meeting & Site Visit	S	L		S	S	
c	Issuance of Addenda	L	R		S	R	
d	Response to Technical Inquiries	L	S	S	S		
e	Bid Tabulation & Evaluation & Recommendation	S	L		S	R	
f	Award Construction Contract	S	S		S	L	R
g	Execution of Construction Contract		L			S	R
MODULE 7: CONSTRUCTION							
Meetings							
a	Pre-Construction Conference	S	L	S	S	S	
b	Progress Meetings (School Building Committee)	S	L			S	
Project Controls							
a	Scheduling/Work Plan/SOV/Coordination	R	R		L	R	R
b	Construction Meetings (weekly)	S	S		L	S	
c	Cost Estimates/Budgeting/Cash flows	R	L		S	R	R
d	Site Observation - Daily Log	R	L			R	R
e	Weekly Progress Reports (Field Reports)	L	R	S		R	
Record Drawings							
a	As-Built Drawings	R	R		L		
b	Record Drawing Approval	L	S			R	
Construction Contract Administration							
a	MBE/WBE Monitoring Compliance	S	L		S	R	R
b	Contractor Payment Requisitions	L	S		S	S	
c	Contractor Evaluations - 50%	S	L		S	S	
d	Change Order Processing	S	S		L	R	
e	Change Order Review and Approval	L	S		S	R	R
f	Claims Processing	S	L		S	R	
Document Interpretation/Submittals							
a	Specification for Submittals	L	S	S	S		
Testing & Commissioning							
a	Procure Testing Agency		L			R	
b	Develop Testing Specifications	L	R	S			
c	Functional Test Performance	R	S	S	L		
d	In-Shop Test Witnessing	L	S	S	S		
e	Operation & Maintenance Manual Review	L	S	R	S	R	
f	Commissioning	S	S	L	S	R	
MODULE 8: COMPLETING THE PROJECT							
a	Punch List Establishment	L	S	S	S	S	
b	Punch List Completion	R	R	S	L		
c	Certificate of Occupancy	R	R		L	R	
d	Contractor Evaluations - Final	S	L		S	S	
e	Warranty Consultation	L	S	S	S	S	
f	Designer Evaluation		L			S	
g	OPM Evaluation					L	S
h	Record Set for Owner	L	S	R	S		

	L=Lead S=Support R=Review/Input	Designer	OPM	Cx	Contractor	Owner	MSBA
OTHER							
a	Project Controls – Total Project Cost		**L**			**R**	**R**
b	Meetings with Owner, MSBA and Community	**S**	**L**		**S**	**R**	**S**
c	OPM Progress Reports (monthly)		**L**			**R**	**R**
d	Document Control	**S**	**L**		**S**	**R**	**R**
e	Review Project Invoices	**S**	**L**			**S**	**R**
f	Review Designer's Contract Compliance		**L**			**S**	**R**
g	Submit ProPay Application		**S**			**L**	**R**

COMMUNICATION AND DOCUMENT CONTROL PROCEDURES

Since the outset of this project in 2023, as the Wildwood Early Childhood Center Building Project, in the eligibility phase with the Massachusetts School Building Authority (MSBA), the District's funding partner with the Commonwealth of Massachusetts, it was competing with two (2) Town-wide projects, namely the new Senior Citizen Center Building Project and the new Town Hall / School Administration Building Project. The Wildwood School Building Committee was initially the following individuals for the Wildwood Early Childhood Center:

- Dr. Glenn Brand, *School Superintendent, School Building Committee Chair*
- Diane M. Allan, *Permanent Building Committee*
- Gregory B. Bendel, *Board of Selectmen*
- Kate Bissell, *School Principal*
- Dr. Jennifer Bryson, *School Committee Chair*
- Mary Jane Byrnes, *School Committee Alternate*
- Kevin A. Caira, *Board of Selectmen Alternate*
- Marianne Gallezzo, *Finance Committee Member*
- John C. Holloway, *Permanent Building Committee*
- George W. Hooper II, *Public Buildings Superintendent*
- Jeffrey M. Hull, *Town Manager*
- Theresa M. Manganelli, *Finance Committee*
- Paul J. Melaragni, *Permanent Building Committee*
- Bryan T. Perry, *Finance Director/Town Accountant*
- Melissa D. Plowman, *School Committee Alternate*
- David A. Ragsdale, *School Committee Vice Chair*
- Paul Ruggiero, *Assistant Superintendent of Administration & Finance*
- Kristen Walsh, *School Principal Alternate*

The Wildwood School Building Committee was comprised of fourteen (14) full members and four (4) alternates representing the School Committee, Select Board, and School Principals. Full members of the School Building Committee had voting rights and alternates did not. Alternates were able to exercise the vote of the member of their respective Committee to which they mutually belonged and could only exercise the vote of the voting member if unable to be present representing their Board or Committee. Many of the voting members and alternates were spread across the three building projects in addition to their originating board or committee which left few availabilities to have a continuous flow of information to update the Boards/Committees, gain consensus for a mutually meeting time across all stakeholders and challenged the ability to obtain a quorum to have the Committee vote on important subjects to progress with the Wilmington/ Wildwood Elementary School Building Project.

A number of Wilmington citizens with interest were participating in the School Building Committee Meetings and attending the School Building Committee meetings as audience participants and held potential of more involvement, namely:

- Susan Inman, *Human Resources Director & Assistant Town Manager*
- Christine Holloran, *Teacher, Wildwood*
- Michael Camoscio, *Commissioner, Wilmington Water & Sewer Department*
- Jessica Bourgeois, *Parent & WHS School Advisory Council Member*
- Vivian Varbedian, *Wilmington Community Member*
- Jennifer Binelli, *Wilmington Community Member*
- Alicia Kaylor, *Wilmington Community Member*
- Stephen Turner, *School Committee Member*
- Darcie Martin, *Parent*

There was interest in expanding the School Building Committee membership to involve more diversity of representation within the Wilmington community offering involvement from parents, working professionals, grandparents, guardians and citizens from many professional backgrounds with interest in being involved in the School Building Project and contributing their input and feedback while volunteering their time, experience, and expertise.

The opportunity for the Town of Wilmington for a school building project that is being partially funded by the MSBA is a valuable one for the youngest learners of the Town of Wilmington. It is an opportunity to assist in the improvement of the environment in which curriculum is provided and learning is acquired on a daily basis. The mission of improvement of the school building(s) to provide educational programming that further benefits the students for many years to come is an important one as it will give educational and curriculum parity with other schools in local districts with programs that are not currently offered in Wilmington. With the great number of stakeholders on the project from each of the Town Boards and/or Committees also involved in the other Town-wide projects, the Wildwood Early Childhood Center Building Project needed to get traction for regular meetings with stakeholders that were equally invested from meeting to meeting throughout the entire building project. There were changes in the leadership of the Town that started to evolve, and these changes involved making sure that all members were up to speed with the project information. The School Building Committee added members of the Wilmington community together with Principals and Teachers from the Wildwood Early Childhood School, Woburn Street School and North Intermediate School bringing the members to twenty-three member voting members of the School Building Committee and all members have voting rights and no member had alternate status any longer.

The School Building Committee membership currently has twenty-three (23) voting members as follows:

- Diane M. Allan
- Gregory B. Bendel
- Kate Bissell
- Dr. Glenn Brand, Chair
- Kevin A. Caira
- Michael Camoscio
- Justin Cusce
- Marianne Gallezzo
- Nicholas Golden
- Christine Holloran
- John C. Holloway
- Dennis Kelley
- Craig Miner
- Christine Murray
- Judith O'Connell
- Christine Prendergast
- Paul J. Melaragni
- David A. Ragsdale
- Paul Ruggiero
- Stacey Scott
- R. Eric Slagel
- Stephen Turner
- Vivian Varbedian, Vice Chair

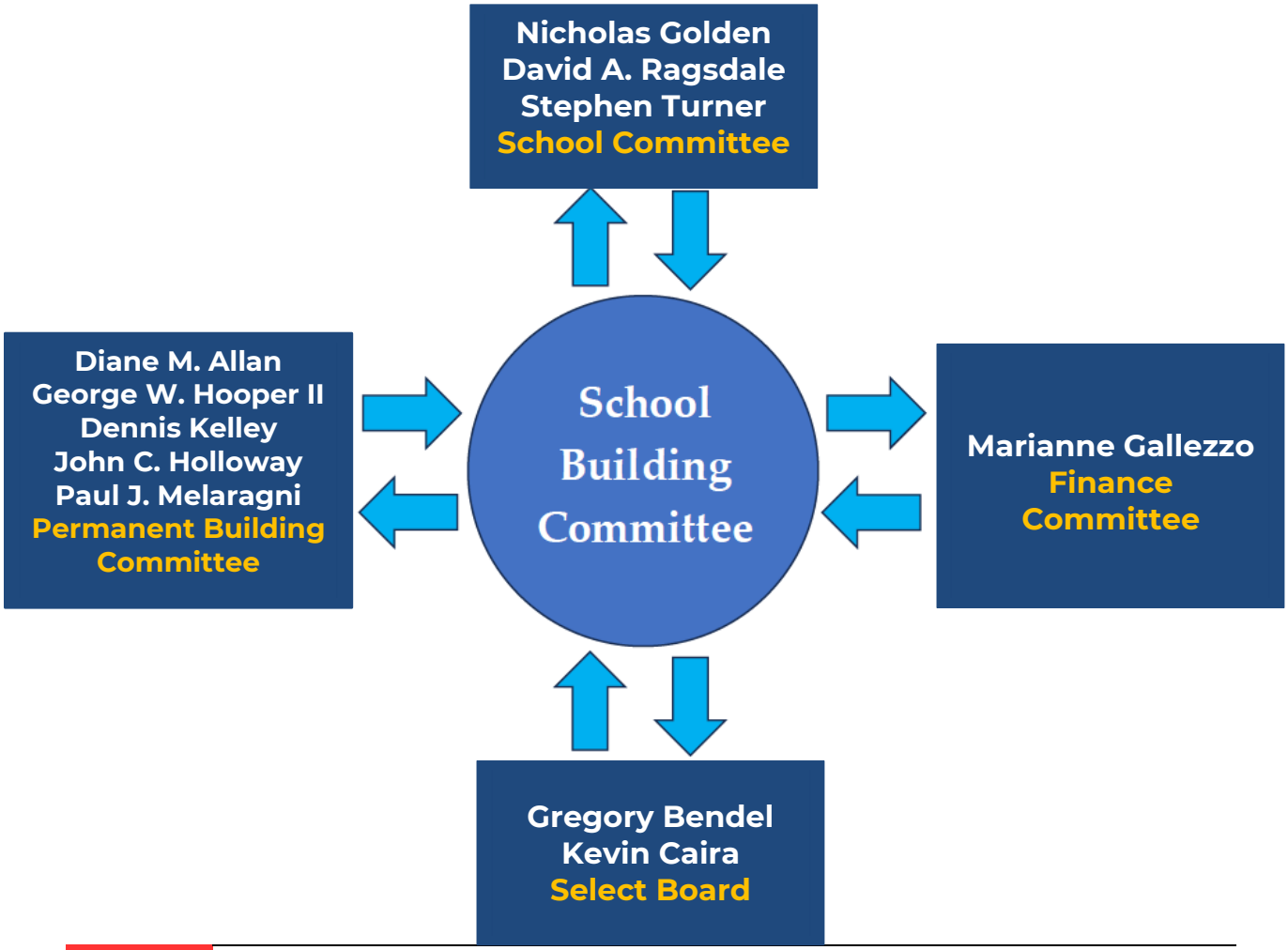
In order to ensure the flow of communication and information was consistent, efficient and effective, a Communication and Document Control Procedure was distributed to all of the members of the School Building Committee. This communication workflow would be in effect and transition through the phases of Eligibility, Feasibility Design, Schematic Design, Design Development and Construction Documents and remain in place as the project is Bid for Construction and proceeds through Construction Administration until the end of Closeout and Audit for the project.

COMMUNICATION WORKFLOW

Within the School Building Committee, it is the responsibility of the members of each of the Town Committee(s) and/or Boards, to share the information provided by the OPM, Designer and Construction Manager at Risk and ensure the correct information is communicated.

The Town of Wilmington is led by its Town Manager and Assistant Town Manager and the leadership boards within the Town that are responsible for the efficient running and effectiveness of the decisions made on its behalf. There is the Finance Committee, Permanent Building Committee, School Committee, Select Board, Municipal Building Department and Public School Department to name a few that are integrally involved in this project.

The Leadership Working Group of the School Building Committee includes Glenn Brand, EdD, Chair of the School Building Committee and Superintendent of Schools for the Town of Wilmington, Vivian Varbedian, Vice Chair, Paul Ruggiero, Assistant Superintendent of Administration and Finance for Wilmington Public Schools, Jeffrey Hull, Town Manager and Susan Inman, Assistant Town Manager, Bryan Perry, Town Accountant and Finance Director, and George W. Hooper II, Superintendent of Public Buildings.



The School Building Committee has undergone changes in leadership since the outset of this school building project starting with the retirement of Town Manager Jeff Hull on October 31, 2023.

- Town Manager Jeffrey Hull retired from the Town of Wilmington after 36 years of service and the Select Board appointed Louis Cimaglia to serve as an Interim Town Manager and transition the role until the new Town Manager, R. Eric Slagle was selected in May/June 2024.
- Assistant Town Manager Susan Inman transitioned her position to Judith O'Connell as Assistant Town Manager in May 2024.
- George W. Hooper II as a member of the original School Building Committee, Permanent Building Committee, and Wildwood Leadership Working Group also had the role as Chair of the Senior Center Building Project and the New Town Hall and School Administration Building Project. Mr. Hooper transitioned his role as Superintendent of Public Buildings, Leadership Working Group and Wildwood School Building Committee to Dennis Kelley as Mr. Hooper continued to hold his Chair positions when he retired from his role with the Town of Wilmington.
- Wilmington's Town Accountant and Finance Director Bryan Perry left the District and the interim replacements did not take on his role outside of Town Finance.

During these transitions, SMMA OPM and Dore+Whittier Architects guided the leadership through the Feasibility Phase with the Preliminary Design Program (PDP) and the Preferred Schematic Report (PSR) submissions made with the MSBA as the project moved into Schematic Design Phase.

The Inspector General Application to utilize the Construction Management at Risk Construction Method for this project was drafted and approved by the Owner's Project Manager in coordination with the Town of Wilmington. After the Notice to Proceed with the Construction Management at Risk Construction Method, the Construction Manager at Risk was solicited, prequalified, procured and contracted for the project through the efforts of the OPM and Designer and the Town's Procurement Coordinator. This was facilitated during the Schematic Design Phase to perform cost estimating services in conjunction with the Designer's cost estimator of record, PM&C, to move towards gaining the project budget information needed for the Wilmington community.

CORRESPONDENCE

- All correspondence shall be by email as original correspondence. Any official documents will also be sent via first class mail.
- All correspondence between the MSBA and the Town shall be copied to the OPM. All correspondence between the MSBA and the OPM shall be copied to the Town.
- All correspondence between the Town, Designer and Construction Manager at Risk shall be through the OPM.
- All correspondence between the MSBA, Designer and Construction Manager at Risk shall be through the OPM.
- All correspondence to the Designer's Consultants shall be through the Designer.
- All correspondence to the Construction Manager at Risk's consultants and subcontractors shall be through the Construction Manager at Risk and OPM.
- Reports submitted to the MSBA shall be by the OPM with copy to the Town. The Designer and

Construction Manager at Risk will provide to the OPM necessary documents supporting all reports for inclusion.

DOCUMENT CONTROL

- The OPM will be responsible for ensuring that the Town has a copy of all executed contracts and amendments.
- The OPM will be responsible for ensuring the MSBA has a copy of all executed contracts and amendments.
- The OPM will prepare agendas for and attend School Building Committee (SBC) meetings in collaboration with the Leadership Team, which includes the Town Manager, the Assistant Town Manager, the School's Superintendent and Chair of the School Building Committee, the Vice Chair of the School Building Committee, the Public Buildings Superintendent , the Designer and the Construction Manager at Risk. The OPM will take minutes and promptly distribute minutes of these meetings to the Owner within 3 business days. All minutes will be distributed to the SBC through the Superintendent's office.
- The OPM attends meetings with other representatives of the Owner, municipal administration, the school department, and neighborhood meetings relating to the Project, take minutes and promptly distribute minutes of these meetings to the Owner. All minutes will be distributed to the SBC through the Superintendent's office. All minutes relating to programming or Designer led meetings will be provided to the Owner within 3 business days by the Designer.
- The OPM will be responsible for ensuring all relevant correspondence i.e. MSBA submissions, project schedules, project budgets, SBC meeting minutes, are provided to the Town through the Superintendent's office for posting on the project and Town's websites. Meeting minutes of the SBC meetings are provided to the Town Clerk for record, electronically or in printed format by the OPM.
- All materials provided by the Designer and Construction Manager at Risk for SBC meetings and community presentations will be submitted to the OPM by noon 3 business days before any public meeting for review.
- All materials for presentations to the SBC or other project-related meetings will be provided by the OPM to the Superintendent's office for distribution 2 business days in advance.
- All materials provided by the Designer and Construction Manager at Risk for MSBA submissions will be submitted to the OPM by noon 3 business days before submission due date for review and comments.

Implementation of this communication and document control workflow procedures streamlined the flow of communication of all parties involved in the project and important to maintain with the emphasis on transparency.

smma

all together. different.

09/20/2024

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Wilmington
School Building
Committee

MSBA Wilmington Wildwood Early Childhood Center

Communication and Document Control Plan: Feasibility Study / Schematic Design

This memorandum outlines the project communications and document control procedures for the project. It is meant to be a guideline for all parties to follow throughout the life of the project and will be updated at each phase.

Parties

Town: wilmingtonma.gov

Wilmington School Building Committee

Town Administrator

Superintendent of Schools

MSBA: massschoolbuildings.org

Massachusetts School Building Authority

OPM: smma.com

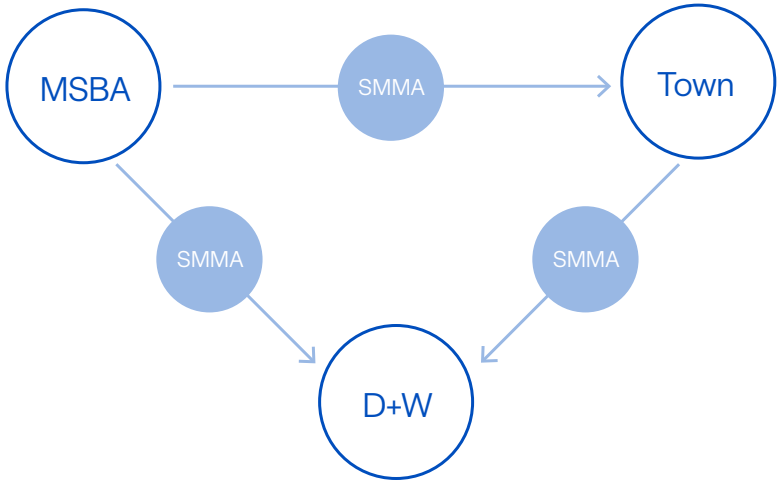
SMMA

Designer: doreandwhittier.com

Dore + Whittier Architects (D+W)

Correspondence

- All correspondence shall be by email as original correspondence. Any official documents will also be sent via first class mail.
- All correspondence between the MSBA and the Town shall be copied to the OPM. All correspondence between the MSBA and the OPM shall be copied to the Town.
- All correspondence between the Town and the Designer shall be through the OPM.
- All correspondence between the MSBA and the Designer shall be through the OPM.
- All correspondence to the Designer's Consultants shall be through the Designer.
- Reports submitted to the MSBA shall be by the OPM with copy to the Town. The Designer will provide to the OPM necessary documents supporting all reports for inclusion.



Document Control

- The OPM will be responsible for ensuring that the Town has a copy of all executed contracts and amendments.
- The OPM will be responsible for ensuring the MSBA has a copy of all executed contracts and amendments.
- The OPM will prepare agendas for and attend School Building Committee (SBC) meetings in collaboration with the Leadership Team, which includes the Town Manager, the Assistant Town Manager, the school's Superintendent and Chair of the School Building Committee, the Vice Chair of the School Building Committee, the Public Buildings Superintendent , and the Designer. The OPM will take minutes and promptly distribute minutes of these meetings to the Owner within 3 business days. All minutes will be distributed to the SBC through the Superintendent's office.
- The OPM attends meetings with other representatives of the Owner, municipal administration, the school department, and neighborhood meetings relating to the Project, take minutes and promptly distribute minutes of these meetings to the Owner. All minutes will be distributed to the SBC through the Superintendent's office. All minutes relating to programming or Designer led meetings will be provided to the Owner within 3 business days by the Designer.–
- The OPM will be responsible for ensuring all relevant correspondence i.e. MSBA submissions, project schedules, project budgets, SBC meeting minutes, are provided to the Town through the Superintendent's office for posting on the project and Town's websites. Meeting minutes of the SBC meetings are provided to the Town Clerk for record, electronically or in printed format by the OPM.
- All materials provided by the Designer for SBC meetings and community presentations will be submitted to the OPM by noon 3 business days before any public meeting for review.
- All materials for presentations to the SBC or other project-related meetings will be provided by the OPM to the Superintendent's office for distribution 2 business days in advance.
- All materials provided by the Designer for MSBA submissions will be submitted to the OPM by noon 3 business days before submission due date for review and comments.

smma

all together. different.

Wilmington Wildwood ECC Public Communications Strategy Plan

01 Purpose
02 Project Overview
03 Audience
04 Channels
05 Timeline
06 Responsibility Matrix

Purpose

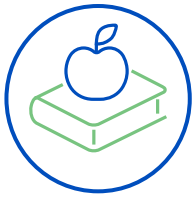
Create and execute a strategy to keep the voters and community informed about this project, its impact on the Town, and the future of its children.

Project Overview

The Wildwood Early Childhood Center has reached the end of its useful life. Now is the time for the Town of Wilmington to provide its children with an elementary school building that will prepare them for the 21st century. The MSBA has partnered with the Town of Wilmington on this project and has included the opportunity to consolidate the Wildwood School (130+ Pre-K students) with the Woburn Street (510+ Pre-K students) or the Woburn Street and the North Intermediate Schools (755+ Pre-K students).

Audience

Government Leadership



School Personnel

Parents

Future Parents

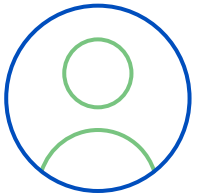
Real Estate Professionals

Empty Nesters

Senior Citizens

Recent Graduates

Local Businesses



Other Voters

Channels

There are many opportunities in the Wilmington community for outreach.

Board Meetings

- Select Board
- Permanent Building Committee
- School Committee
- Finance Committee
- Planning Board

Community Meetings

- Community Forums
- Town-wide Meetings
- Senior Citizen Center Meetings
- Wilmington Memorial Library Meetings
- Neighborhood Meetings
- Civic Associations i.e. Knights of Columbus, Angelo Giuseppe Roncalli Lodge, Kiwanis Club, Chamber of Commerce

Community Organizations

- Council on Aging / Senior Citizen Center
- Chamber of Commerce – wilmingtonMAchamber.com / email: wilmingtonchamber@verizon.net
- Wilmington Knights of Columbus – wilmingtonkofc.com
- PTOs at Wildwood School, Woburn Street Elementary, North Intermediate, Boutwell School, West Intermediate, Shawsheen Elementary, Middle School, etc.
- Kiwanis Club of Wilmington
- YMCA and Boys' and Girls' Club – facebook.com/BurbankYMCA/
- Others: Wilmington Community Fund, Angelo Giuseppe Roncalli Lodge, Shriner's for Children, Chamber of Commerce.

Community Activities

- Youth Sporting Events i.e. Recreation Department Programs for Hockey, Football, Soccer, Lacrosse, Volleyball, Basketball, etc.
- Community Events i.e. Fun on the Fourth, Fall Fest / Race, Art Exhibits, Concerts and Dramatic Performances, Holiday Events i.e. Tree Lighting Events, etc.

Email Groups

- Visioning Group Contact List
- Town-wide Listing
- School Contacts List
- Personal Contact Networks

Channels

Project Website

— www.wpsk12.com/our_district/facilities/school_building_projects/wildwood_building_project

Facebook Pages

News Outlet Pages

— Wilmington Apple – facebook.com/WilmingtonApple

— Wilmington Town Crier

— Wilmington Patch – facebook.com/WilmingtonPatch

Wilmington Town Community Pages

— Wilmington, MA Town Hall – facebook.com/WilmingtonMass

— Wilmington Recreation Department – facebook.com/WilmingtonMARecreation

Wilmington Community Service Organization Pages

— Wilmington Buzzell Senior Citizen Center – facebook.com/BuzzellSeniorCenter

— Wilmington Rotary Club – facebook.com/RotaryWilmingtonMA

— Wilmington Kiwanis Club – facebook.com/KiwanisClubofWilmingtonMA

— Wilmington Knights of Columbus #4982 – facebook.com/kofc4982

— Wilmington Community Fund – facebook.com/commfund

— Wilmington MA Chamber of Commerce – facebook.com/WilmingtonTewksburyChamber

— Wilmington MA Business & Community – facebook.com/groups/1113732212565669/

— Angelo Roncalli Lodge Order of the Sons and Daughters of Italy – facebook.com/p/Angelo-Roncalli-Lodge-Order-Sons-Of-Italy-100064543848098

Wilmington Community Discussion Pages

— Wilmington MA Community – facebook.com/groups/2718874598436621

— Wilmington MA Residents – facebook.com/groups/459316525165471/posts/1114024769694640

— Wilmington, MA Forum – facebook.com/groups/210249502446846

— Eaves Wilmington and Wilmington West Neighbors – facebook.com/groups/eaveswilmingtonneighbors

— Wilmington, MA Community WALL – facebook.com/groups/1636740453505725/posts/1897868507392917

— Wilmington, MA - Community HUB – facebook.com/Wilmington.Hub

— Wilmington MA – Town Politics Board – facebook.com/photo/?fbid=981457492536043&set=p.981457492536043

— Wilmington MA – Official Community Board – facebook.com/groups/1257695957940205 / facebook.com/groups/318196395050060

— The “Unofficial” Wilmington High School Community Page – facebook.com/groups/328812377208195/

— Wilmington MA Topics (uncensored!) – facebook.com/groups/356885254722054/

— You Know You’re from Wilmington, MA If... – facebook.com/groups/2212211949/

— I’m Lucky I Grew Up in Wilmington – facebook.com/groups/115402538822/

— You might be from North Wilmington if: 01887 was your...– facebook.com/groups/60220393875/

Wilmington Parent and Guardian Group Pages

— Wilmington, MA Moms – facebook.com/groups/654464951286060/

— Mom’s Club of Wilmington, MA – facebook.com/momsclubwilmington/

— Wilmington High School Parents Advisory Council – facebook.com/groups/whs-parents-advisory-council-wilmington-ma-508032580903457/

— Parent and Guardian Advocates for Wilmington – facebook.com/groups/wilmington.paws

— Wilmington, MA New Mom’s Group Babies & Toddlers – facebook.com/groups/1434270423411645

Channels

- Wilmington Middle School PAC – facebook.com/groups/1322212678181177
- Wilmington, MA SEPAC – facebook.com/story.php/?story_fbid=915985667197999&id=100063597234900

Twitter Pages or X Pages for Wilmington Schools

- Town of Wilmington, MA – twitter.com/townwilmma
- Dr. Glenn Brand, Superintendent of Schools – twitter.com/superwps
- Wildwood School – twitter.com/wildwoodcares
- Boutwell School – twitter.com/boutwell36
- Ryan Gendron, Principal, Wilmington High School – x.com/whsgendron
- Wilmington High School – twitter.com/whscane?lang=en
- Wildcat Baseball – witter.com/whs_baseball978?lang=en
- Wilmington Apple – twitter.com/wilmingtonapple?lang=en
- Lisa King, Shawsheen School – twitter.com/shawsheenschool

Surveys

- Community-wide Surveys via Google Docs and/or SurveyMonkey
- Community-wide Surveys via Menti.com

Flyers/Posters

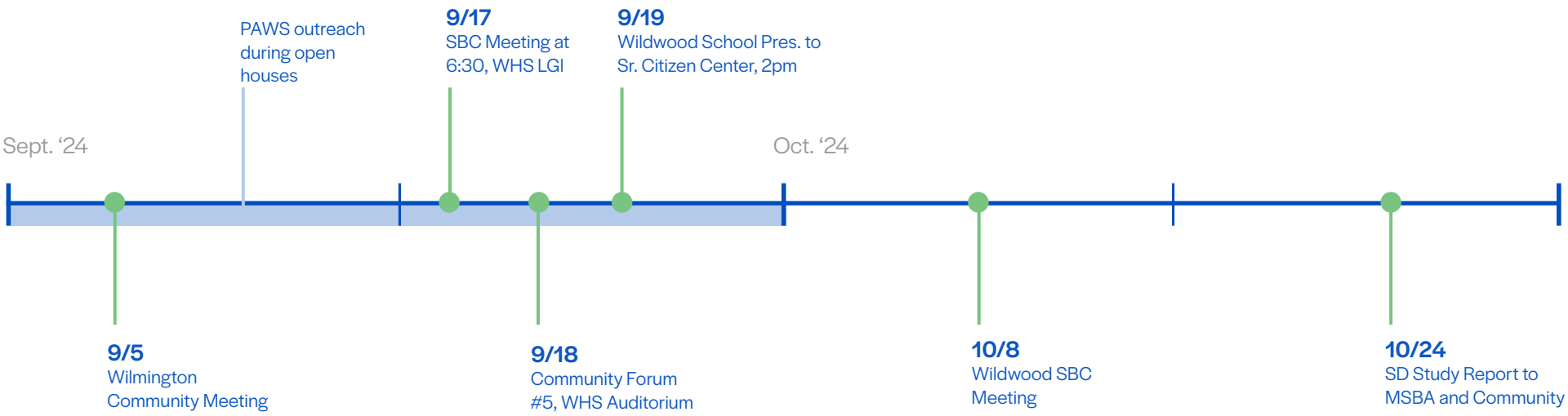
- Electronic Backpack Flyers
- Mailers
- Posters in key Town and School Buildings
- Flyers in key Town and School Buildings

Press / News Media

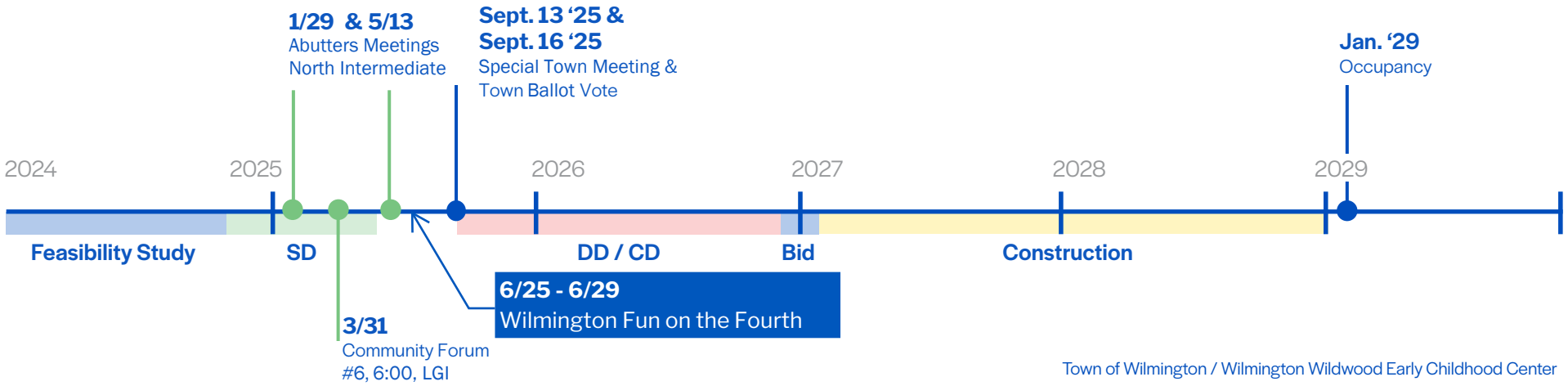
- Press Releases to Newspapers
- Wilmington Apple – wilmingtonapple@gmail.com
- Wilmington Town Crier – news@gotowncrier.com
- Patch – patch.com/massachusetts/wilmington
- WilmingtonTV - WCTV
- Local Radio Stations

Timeline to Schematic Design Submission

Short Term Timeline



Project Timeline

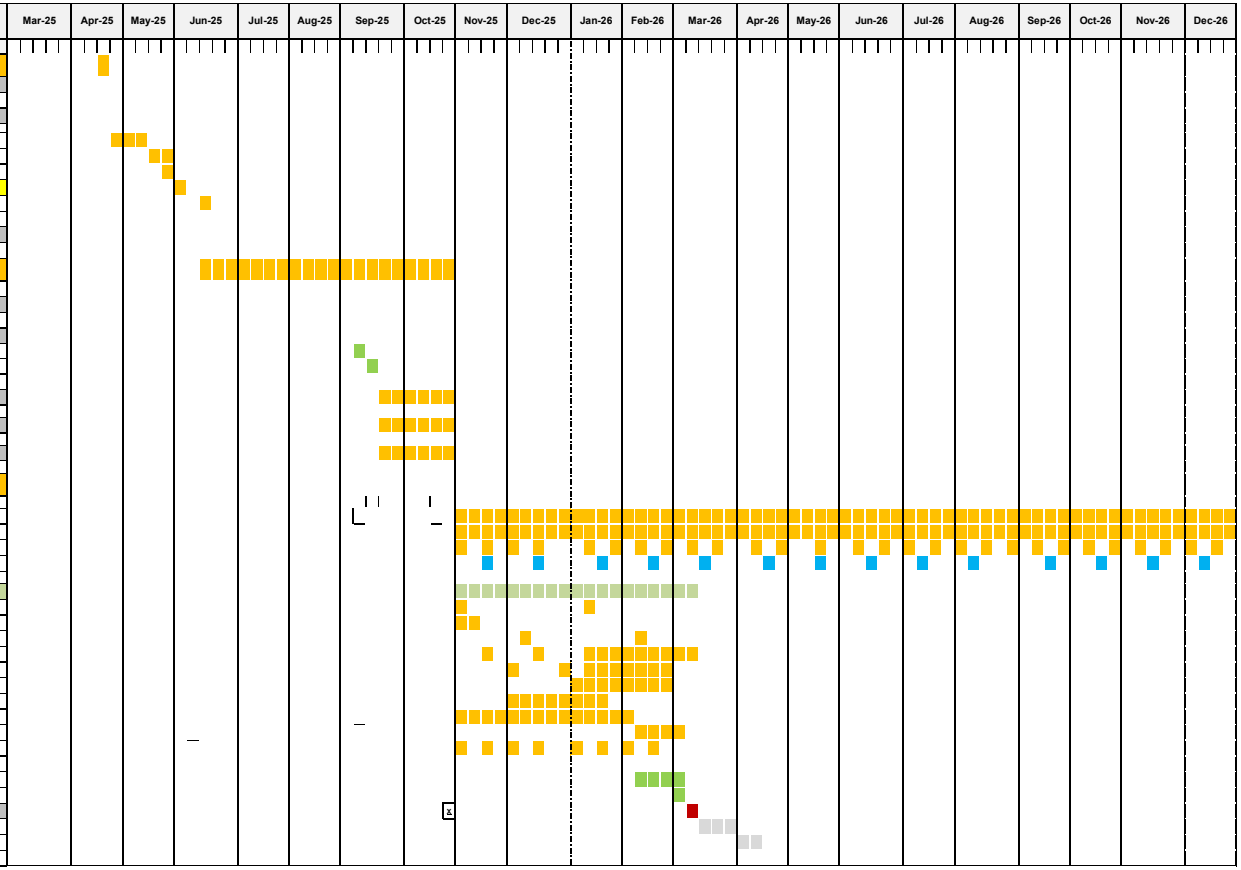


Responsibility Matrix

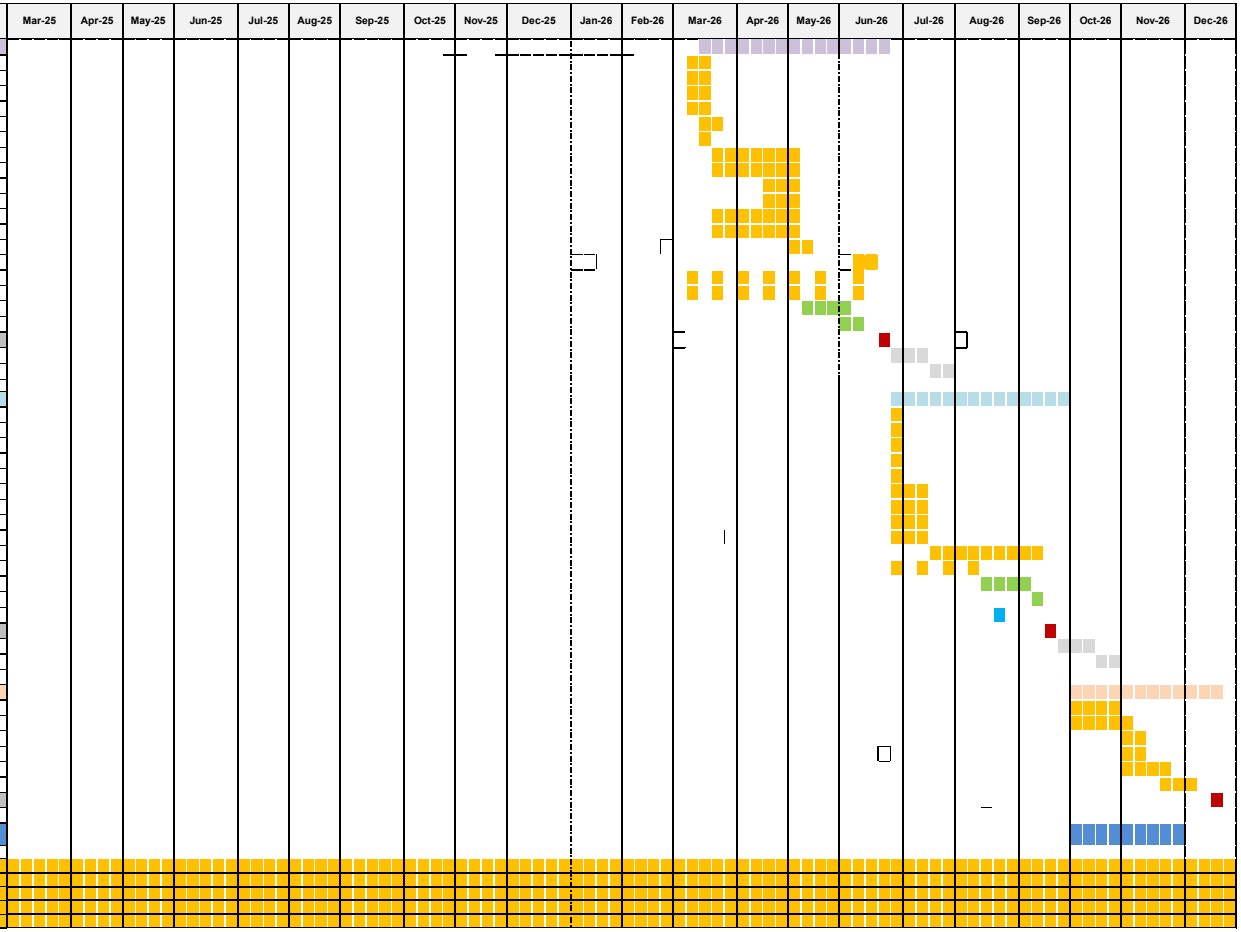
		Town Manager / Assistant Manager	Superintendent of Schools	School Building Committee	Public Relations Working Group	Project Manager	Assistant Project Manager	Principal	Project Manager
Deliverable	Status	Town of Wilmington				OPM		Design Team	
Presentations									
SBC Meetings		C	C	I	C	D	S	A	R
Community Forums		C	C	I	C	D	S	A	R
Additional Community Groups		C	C	I	C	D	S	A	R
Posters									
Content		A	A	I	C	S	S	D	R
Production		A	A	I	I	I	I	D	R
Mailers									
Content		A	A	C		S	S	D	R
Production		D	D	I	R	S	S	S	S
Flyers									
Content		A	A	C		S	S	D	R
Production		D	D	I	R	S	S	S	S
Website Postings									
Content		A	R	I	C	C	C	C	C
Distribution		A	R	I	I	S	S	I	I
Press Release to Media									
Content		A	A	C	D	R	R	C	C
Distribution		A	S	S	R	I	I	I	I
Social Media									
Content		A	A	I	S	S	S	D	R
Distribution		A	S	S	R	I	I	I	I

D / Driver R / Responsible A / Accountable S / Support C / Consulted I / Informed

WILMINGTON WILDWOOD ELEMENTARY SCHOOL BUILDING PROJECT				Completion
Schematic Design				4/24/2025
4.1 Schematic Design Submittal				4/24/2025
4.2 Review and Approval of SD Submittal				
	4.2.1	MSBA Staff review		5/15/2025
		Response to MSBA SD Comments		5/30/2025
	4.2.2	Facilities Assessment Subcommittee Review - if required		5/28/2025
	4.2.3	Project Scope and Budget Conference		6/4/2025
	4.2.4	MSBA Board Approval		6/18/2025
4.3 Conclusion of Module 4				
Project Funding				
5.1	Project Scope and Budget Agreement			
5.2	Local Authorization and Financial Support (120 days)			
	5.1.1	Special Town Meeting Election		9/13/2025
	5.1.2	Debt Exclusion Election		9/16/2025
5.3	Project Funding Agreement			10/29/2025
5.4	ProPay System Budget Update			10/29/2025
5.5	Conclusion of Module 5			10/29/2025
Detailed Design & Construction Documents				
	Document Development			on-going
	Team Meetings (weekly)			on-going
	Working Group Meetings (biweekly +/-)			on-going
	SBC Meetings (monthly +/-)			on-going
6.1	Design Development Documents			3/11/2026
	Coordination with AHJs		Fire, Police, Building AHJ	2 mtgs
	User Group Meetings			TBD
	Community Meetings			2 mtgs
	Local Permitting Process		Planning, Wetlands/ConCom	
			Water, Sewer, Layout - DPW reviews	
	State Permitting Process		Notice of Intent (NOI)	
	Opt-In Energy Code/ LEED compliance documentation (DRAFT)			
	Project Design & Specifications (DD Pricing Set)			2/6/2026
	Project Design & Specifications (MSBA DD Set)			3/6/2026
	Consultant Coordination			biweekly
	List of Proprietary Items			TBD
	Cost Estimating			2/27/2026
	Reconciliation/ Value Engineering			3/3/2026
	DD MSBA Submission			3/11/2026
	MSBA DD Review			4/1/2026
	Comment Response			4/15/2026



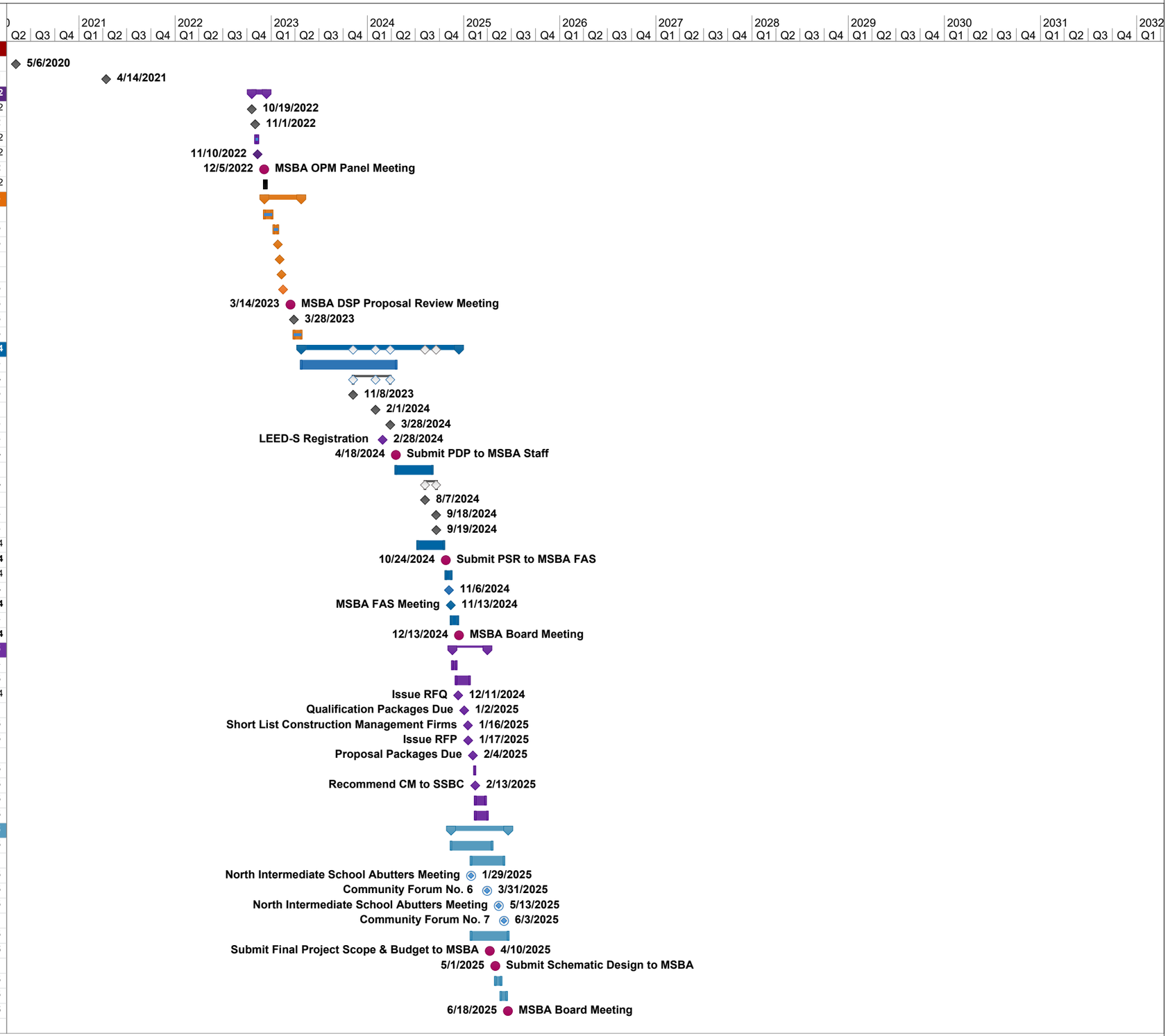
WILMINGTON WILDWOOD ELEMENTARY SCHOOL BUILDING PROJECT			Completion
6.2	60% Construction Documents		6/22/2026
	Budget Management Incorporation		3/11/2026
	Project Budget Update		3/18/2026
	Project Schedule Update		3/18/2026
	Work Plan Update		3/18/2026
	Permitting Assessment		3/25/2026
	Updated Space Summary		3/18/2026
	Design Narratives		5/6/2026
	Interior Color Board		5/6/2026
	Interior Elevations		5/6/2026
	Updated Code Analysis		5/6/2026
	Opt-In Energy Code/ LEED compliance documentation (90%)		5/6/2026
	Updated Specifications		5/8/2026
	Updated Design Documents (all trades - CD60 Pricing Set)		5/15/2026
	Updated Design Documents (all trades - CD60 MSBA set)		6/15/2026
	Consultant Coordination		biweekly
	ERP #1 (Site/Civil/Soil)		5/22/2026
	Cost Estimating		6/4/2026
	Reconciliation/ VE as required		6/11/2026
	60% CD MSBA Submission		6/22/2026
	MSBA 60% CD Review		7/13/2026
	Comment Response		7/27/2026
6.3	90% Construction Documents		9/25/2026
	Budget Management Incorporation		6/29/2026
	Updated Work Plan		6/29/2026
	Updated Permitting Schedules		6/29/2026
	Project Schedule Update		6/29/2026
	Updated Space Summary		6/29/2026
	Structural & Energy Calculations		7/13/2026
	Updated Code Analysis		7/13/2026
	Updated Specifications		7/13/2026
	Updated Design Documents (all trades - CD90 Pricing Set)		7/13/2026
	Updated Design Documents (all trades - CD90 MSBA Set)		9/21/2026
	Consultant Coordination		biweekly
	Cost Estimating		9/3/2026
	Reconciliation		9/10/2026
	ERP #2 (Foundations/Dampproofing/Structural/Elevator)		8/21/2026
	90% CD MSBA Submission		9/25/2026
	MSBA 90% CD Review		10/16/2026
	Comment Response		10/30/2026
6.4	100% Construction Documents		12/18/2026
	Final Bid Specifications		10/28/2026
	Final Bid Documents		10/30/2026
	Filed Sub Bids		12/1/2026
	GMP		12/15/2026
	Opt-In Energy Code/ LEED compliance documentation (FINAL)		11/19/2026
	LEED Design Credits Submission to GBCI		12/3/2026
	100% CD MSBA Submission (with addenda)		12/18/2026
6.5	Bidding & Procurement		12/15/2026
7	Construction	Schedule beyond dates shown - Ph 1	5/31/2028
		Demo and Sitework Phase 2 A	7/31/2028
		Sitework Phase 2 B	6/15/2029
		Final Completion	7/1/2029
		Closeout	8/1/2029



November 4, 2022
Updated: April 6, 2025

Town of Wilmington
Wildwood PreK-5 Elementary School Project
Schematic Design Report | Preliminary Project Schedule
Construction Management at Risk Construction Delivery Method

ID	Task Name	Duration	Start	Finish
1	**MSBA PREREQUISITES**	**241 days**	**5/6/2020**	**4/14/2021**
2	Statement of Interest	0 days	5/6/2020	5/6/2020
3	MSBA Invite into Feasibility	0 days	4/14/2021	4/14/2021
4	**RETAIN OPM**	**39 days**	**10/19/2022**	**12/13/2022**
5	Submit OPM Proposals	0 days	10/19/2022	10/19/2022
6	OPM Interview	0 days	11/1/2022	11/1/2022
7	Negotiate OPM Contract	6 days	11/3/2022	11/10/2022
8	Submit Documents to MSBA OPM Panel	0 days	11/10/2022	11/10/2022
9	**MSBA OPM Panel Meeting**	**0 days**	**12/5/2022**	**12/5/2022**
10	Execution of OPM Agreement	6 days	12/6/2022	12/13/2022
11	**RETAIN DESIGNER**	**100 days**	**12/6/2022**	**4/24/2023**
12	Draft Designer RFS and Submit to MSBA	21 days	12/6/2022	1/3/2023
13	MSBA Approve Draft RFS	11 days	1/11/2023	1/25/2023
14	Submit to Central Register	0 days	1/26/2023	1/26/2023
15	Notice in Central Register	0 days	2/1/2023	2/1/2023
16	Briefing Session	0 days	2/8/2023	2/8/2023
17	Submit Designer Proposals	0 days	2/14/2023	2/14/2023
18	**MSBA DSP Proposal Review Meeting**	**0 days**	**3/14/2023**	**3/14/2023**
19	**MSBA DSP Interview Meeting**	**0 days**	**3/28/2023**	**3/28/2023**
20	Negotiate Designer Contract	20 days	3/28/2023	4/24/2023
21	**FEASIBILITY STUDY (FS)**	**417 days**	**4/25/2023**	**12/13/2024**
22	Develop Preliminary Design Program	253 days	4/25/2023	4/19/2024
23	Community Presentations	**97 days**	**11/8/2023**	**3/28/2024**
24	Community Forum No. 1	0 days	11/8/2023	11/8/2023
25	Community Forum No. 2	0 days	2/1/2024	2/1/2024
26	Community Forum No. 3	0 days	3/28/2024	3/28/2024
27	LEED-S Registration	0 days	2/28/2024	2/28/2024
28	**Submit PDP to MSBA Staff**	**0 days**	**4/18/2024**	**4/18/2024**
29	Develop Preferred Schematic Report (PSR)	95 days	4/18/2024	9/3/2024
30	Community Presentations	**30 days**	**8/7/2024**	**9/19/2024**
31	Community Forum No. 4	0 days	8/7/2024	8/7/2024
32	Community Forum No. 5	0 days	9/18/2024	9/18/2024
33	Senior Center Informational Session	0 days	9/19/2024	9/19/2024
34	Select Board, Town Meeting & School Committee Presentations	70 days	7/10/2024	10/17/2024
35	**Submit PSR to MSBA FAS**	**0 days**	**10/24/2024**	**10/24/2024**
36	MSBA Comments	15 days	10/25/2024	11/14/2024
37	**MSBA FAS Meeting**	**0 days**	**11/6/2024**	**11/6/2024**
38	**MSBA FAS Meeting**	**0 days**	**11/13/2024**	**11/13/2024**
39	Respond to MSBA Comments	17 days	11/14/2024	12/9/2024
40	**MSBA Board Meeting**	**0 days**	**12/13/2024**	**12/13/2024**
41	**CONSTRUCTION MANAGER (CM)**	**90 days**	**11/19/2024**	**3/31/2025**
42	Develop and Submit Inspector General (IG) Application	10 days	11/19/2024	12/3/2024
43	IG Application and Approval	34 days	12/3/2024	1/22/2025
44	Issue RFQ	0 days	12/11/2024	12/11/2024
45	Qualification Packages Due	0 days	1/2/2025	1/2/2025
46	Short List Construction Management Firms	0 days	1/16/2025	1/16/2025
47	Issue RFP	0 days	1/17/2025	1/17/2025
48	Proposal Packages Due	0 days	2/4/2025	2/4/2025
49	Interview Prospective Construction Management Firms	2 days	2/11/2025	2/12/2025
50	Recommend CM to SSBC	0 days	2/13/2025	2/13/2025
51	Issue Notice to Proceed to Construction Management Firm	26 days	2/14/2025	3/24/2025
52	Negotiate CM Contract	31 days	2/14/2025	3/31/2025
53	**SCHEMATIC DESIGN (SD)**	**149 days**	**11/14/2024**	**6/18/2025**
54	Develop Schematic Design	107 days	11/14/2024	4/18/2025
55	**Community Presentations**	87 days	1/29/2025	6/3/2025
56	North Intermediate School Abutters Meeting	0 days	1/29/2025	1/29/2025
57	Community Forum No. 6	0 days	3/31/2025	3/31/2025
58	North Intermediate School Abutters Meeting	0 days	5/13/2025	5/13/2025
59	Community Forum No. 7	0 days	6/3/2025	6/3/2025
60	Select Board, Town Meeting & School Committee Presentations	99 days	1/29/2025	6/18/2025
61	**Submit Final Project Scope & Budget to MSBA**	**0 days**	**4/10/2025**	**4/10/2025**
62	**Submit Schematic Design to MSBA**	**0 days**	**5/1/2025**	**5/1/2025**
63	MSBA Comments	16 days	5/1/2025	5/22/2025
64	Respond to MSBA Comments	15 days	5/22/2025	6/12/2025
65	**MSBA Board Meeting**	**0 days**	**6/18/2025**	**6/18/2025**
66				



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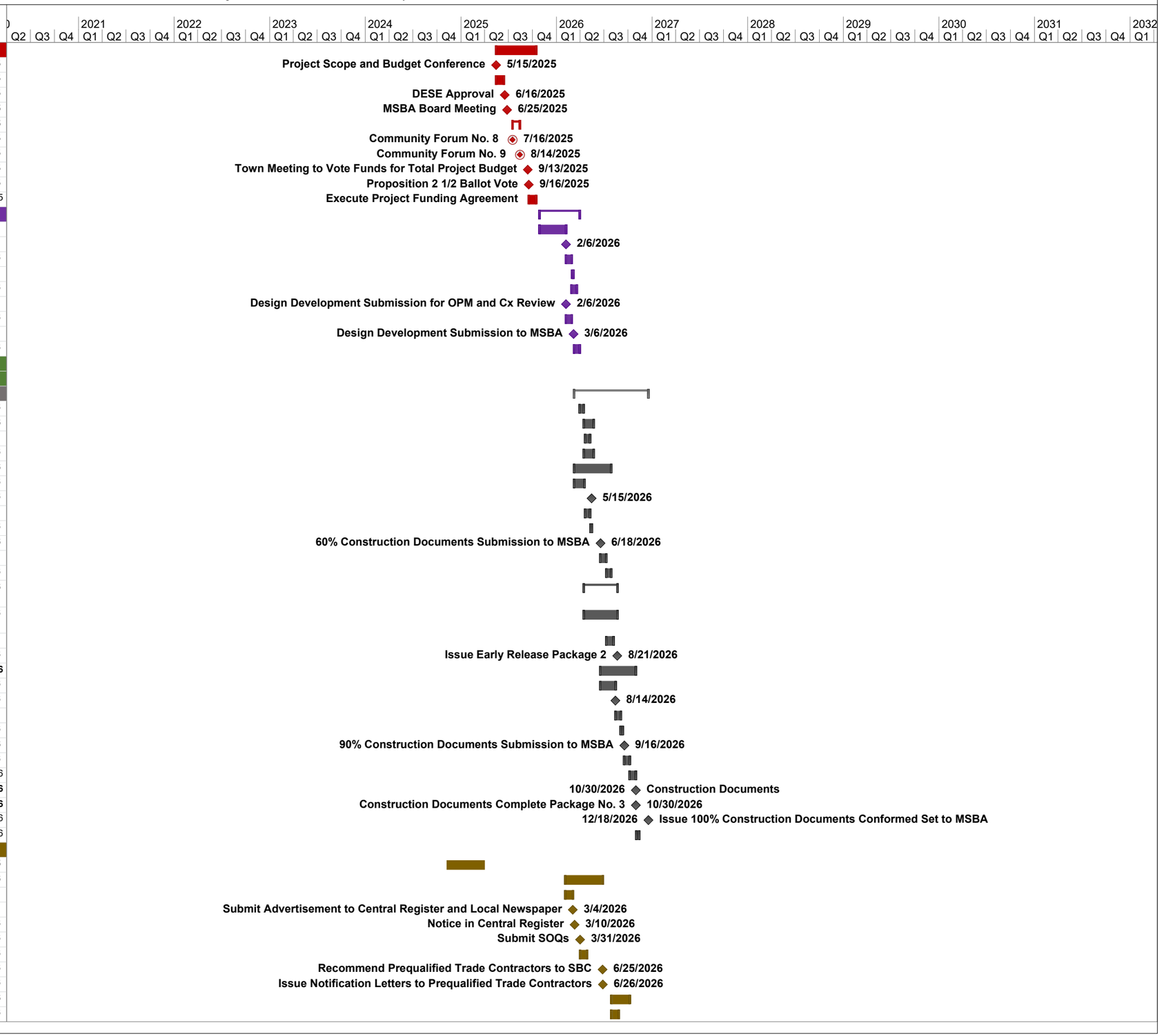
Updated: April 6, 2025

Town of Wilmington
Wildwood PreK-5 Elementary School Project
Schematic Design Report | Preliminary Project Schedule
Construction Management at Risk Construction Delivery Method

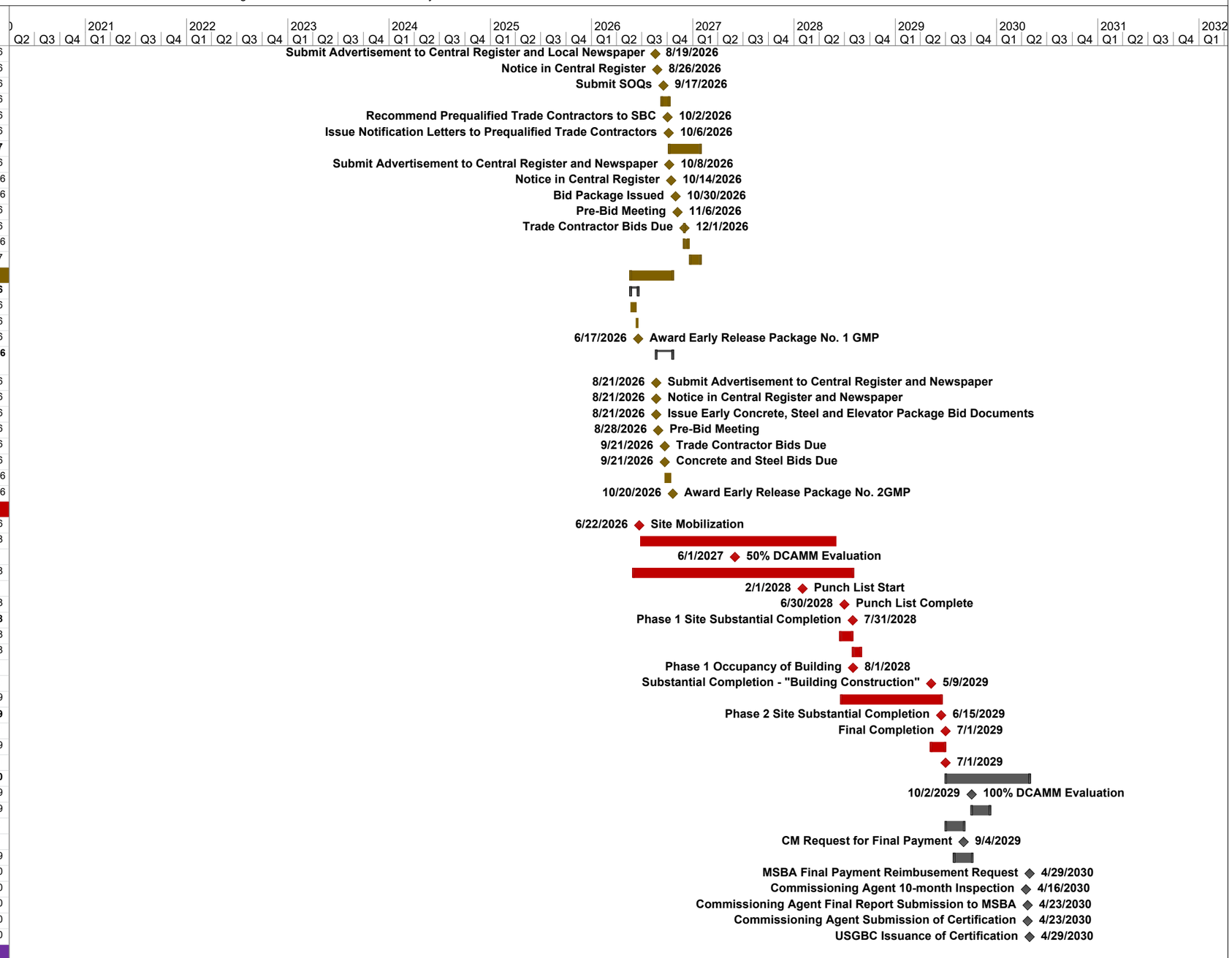
ID	Task Name	Duration	Start	Finish
67	**PROJECT SCOPE AND BUDGET**			
68	Project Scope and Budget Conference	0 days	5/15/2025	5/15/2025
69	Execute Scope and Budget Agreement	21 days	5/15/2025	6/13/2025
70	DESE Approval	0 days	6/16/2025	6/16/2025
71	**MSBA Board Meeting**	**0 days**	**6/25/2025**	**6/25/2025**
72	**Community Presentations**	**20 days**	**7/16/2025**	**8/14/2025**
73	Community Forum No. 8	0 days	7/16/2025	7/16/2025
74	Community Forum No. 9	0 days	8/14/2025	8/14/2025
75	Town Meeting to Vote Funds for Total Project Budget	0 days	9/13/2025	9/13/2025
76	Proposition 2 1/2 Ballot Vote	0 days	9/16/2025	9/16/2025
77	Execute Project Funding Agreement	21 days	9/17/2025	10/14/2025
78	**DESIGN DEVELOPMENT**			
79	Develop Design Development Documents	70 days	10/28/2025	2/6/2026
80	Issue Design Development Pricing Set	0 days	2/6/2026	2/6/2026
81	Design Development Cost Estimating	15 days	2/6/2026	2/27/2026
82	Design Development Cost Estimate Reconciliation	5 days	3/2/2026	3/6/2026
83	Value Engineering	15 days	2/27/2026	3/19/2026
84	Design Development Submission for OPM and Cx Review	0 days	2/6/2026	2/6/2026
85	OPM and Cx Review	15 days	2/6/2026	2/27/2026
86	**Design Development Submission to MSBA**	**0 days**	**3/6/2026**	**3/6/2026**
87	MSBA Comments	16 days	3/9/2026	3/30/2026
88	**SITE PERMITTING**			
144	**BUILDING PERMITTING**			
149	**CONSTRUCTION DOCUMENTS**			
150	Incorporate MSBA DD Comments	12 days	3/30/2026	4/14/2026
151	**Early Release Package 1: Site Preparation [Site, Civil, Soil]**	**28 days**	**4/15/2026**	**5/22/2026**
152	OPM and Cx Review	15 days	4/20/2026	5/8/2026
153	Early Release Package 1: Site Preparation [Site, Civil, Soil]	28 days	4/15/2026	5/22/2026
154	**60% Construction Documents**	**100 days**	**3/9/2026**	**7/28/2026**
155	Develop 60% Contract Documents	30 days	3/9/2026	4/17/2026
156	60% Construction Documents to Cost Estimator	0 days	5/15/2026	5/15/2026
157	60% Construction Documents Cost Estimating	15 days	4/20/2026	5/8/2026
158	60% Construction Documents Cost Estimate Reconciliation	5 days	5/11/2026	5/15/2026
159	**60% Construction Documents Submission to MSBA**	**0 days**	**6/18/2026**	**6/18/2026**
160	MSBA Review of 60% CD Submission	16 days	6/17/2026	7/9/2026
161	Incorporate MSBA 60% CD Comments	13 days	7/10/2026	7/28/2026
162	**Early Release Package 2: Foundation and Structural [Foundation, Dampproofing, Structural, Elevator]**	**91 days**	**4/15/2026**	**8/21/2026**
163	Early Release Package 2: Foundation and Structural [Foundation, Dampproofing, Structural, Elevator]	91 days	4/15/2026	8/21/2026
164	Structural Peer Review of Early Foundation and Structural Package	20 days	7/10/2026	8/6/2026
165	Issue Early Release Package 2	0 days	8/21/2026	8/21/2026
166	**90% Construction Documents**	**95 days**	**6/17/2026**	**10/30/2026**
167	Develop 90% Contract Documents	42 days	6/17/2026	8/14/2026
168	90% Construction Documents to Cost Estimator	0 days	8/14/2026	8/14/2026
169	90% Construction Documents Cost Estimating	15 days	8/14/2026	9/3/2026
170	90% Construction Documents Cost Estimate Reconciliation	5 days	9/3/2026	9/10/2026
171	**90% Construction Documents Submission to MSBA**	**0 days**	**9/16/2026**	**9/16/2026**
172	MSBA Review of 90% CD Submission	16 days	9/16/2026	10/7/2026
173	Incorporate MSBA 90% CD Comments	17 days	10/7/2026	10/30/2026
174	**Construction Documents**	**0 days**	**10/30/2026**	**10/30/2026**
175	**Construction Documents Complete Package No. 3**	**0 days**	**10/30/2026**	**10/30/2026**
176	Issue 100% Construction Documents Conformed Set to MSBA	0 days	12/18/2026	12/18/2026
177	LEED-S Design Submission	9 days	11/2/2026	11/12/2026
178	**PROCUREMENT**			
179	**CM Selection**	**97 days**	**11/8/2024**	**3/31/2025**
180	**Prequalification - Package No. 2 Trade Contractors**	**101 days**	**2/3/2026**	**6/26/2026**
181	Develop Draft RFQs	21 days	2/3/2026	3/4/2026
182	Submit Advertisement to Central Register and Local Newspaper	0 days	3/4/2026	3/4/2026
183	Notice in Central Register	0 days	3/10/2026	3/10/2026
184	Submit SOQs	0 days	3/31/2026	3/31/2026
185	Review SOQs	19 days	4/1/2026	4/27/2026
186	Recommend Prequalified Trade Contractors to SBC	0 days	6/25/2026	6/25/2026
187	Issue Notification Letters to Prequalified Trade Contractors	0 days	6/26/2026	6/26/2026
188	**Prequalification - Package No. 3 Trade Contractors**	**50 days**	**7/29/2026**	**10/7/2026**
189	Develop Draft RFQs	21 days	7/29/2026	8/26/2026



November 4, 2022
Updated: April 6, 2025

Town of Wilmington
Wildwood PreK-5 Elementary School Project
Schematic Design Report | Preliminary Project Schedule
Construction Management at Risk Construction Delivery Method

ID	Task Name	Duration	Start	Finish
190	Submit Advertisement to Central Register and Local Newspaper	0 days	8/19/2026	8/19/2026
191	Notice in Central Register	0 days	8/26/2026	8/26/2026
192	Submit SOQs	0 days	9/17/2026	9/17/2026
193	Review SOQs	19 days	9/11/2026	10/7/2026
194	Recommend Prequalified Trade Contractors to SBC	0 days	10/2/2026	10/2/2026
195	Issue Notification Letters to Prequalified Trade Contractors	0 days	10/6/2026	10/6/2026
196	**100% Construction Documents - Package No. 3**	**76 days**	**10/8/2026**	**1/28/2027**
197	Submit Advertisement to Central Register and Newspaper	0 days	10/8/2026	10/8/2026
198	Notice in Central Register	0 days	10/14/2026	10/14/2026
199	Bid Package Issued	0 days	10/30/2026	10/30/2026
200	Pre-Bid Meeting	0 days	11/6/2026	11/6/2026
201	Trade Contractor Bids Due	0 days	12/1/2026	12/1/2026
202	CM Develop GMP	11 days	12/1/2026	12/15/2026
203	GMP Approval	24 days	12/23/2026	1/28/2027
204	**EARLY PACKAGES PROCUREMENT**			
205	**Early Release Package No. 1 [Site, Civil, Soil]**	**18 days**	**5/22/2026**	**6/17/2026**
206	CM Bid Early Site Preparation Package	13 days	5/22/2026	6/10/2026
207	Develop Early Site Preparation Package GMP	6 days	6/10/2026	6/17/2026
208	Award Early Release Package No. 1 GMP	0 days	6/17/2026	6/17/2026
209	**Early Release Package No. 2 [Foundation, Dampproofing, Structural and Elevator]**	**40 days**	**8/21/2026**	**10/20/2026**
210	Submit Advertisement to Central Register and Newspaper	0 days	8/21/2026	8/21/2026
211	Notice in Central Register and Newspaper	0 days	8/21/2026	8/21/2026
212	Issue Early Concrete, Steel and Elevator Package Bid Documents	0 days	8/21/2026	8/21/2026
213	Pre-Bid Meeting	0 days	8/28/2026	8/28/2026
214	Trade Contractor Bids Due	0 days	9/21/2026	9/21/2026
215	Concrete and Steel Bids Due	0 days	9/21/2026	9/21/2026
216	Descoping and Development of GMP Amendment	15 days	9/22/2026	10/13/2026
217	Award Early Release Package No. 2GMP	0 days	10/20/2026	10/20/2026
218	**CONSTRUCTION**	**779 days**	**6/1/2026**	**7/1/2029**
219	Site Mobilization	0 days	6/22/2026	6/22/2026
220	Construction of Building	490 days	6/26/2026	5/31/2028
221	50% DCAMM Evaluation	0 days	6/1/2027	6/1/2027
222	FFE/Technology Installation	549 days	6/1/2026	7/31/2028
223	Punch List Start	0 days	2/1/2028	2/1/2028
224	Punch List Complete	0 days	6/30/2028	6/30/2028
225	**Phase 1 Site Substantial Completion**	**0 days**	**7/31/2028**	**7/31/2028**
226	Demolish Existing North Intermediate School	29 days	6/16/2028	7/28/2028
227	Teacher/Staff Move-In	20 days	8/1/2028	8/28/2028
228	**Phase 1 Occupancy of Building**	**0 days**	**8/1/2028**	**8/1/2028**
229	**Substantial Completion - "Building Construction"**	**0 days**	**5/9/2029**	**5/9/2029**
230	Site Amenities Construction Including Parking Lot & Playfields	250 days	6/20/2028	6/15/2029
231	**Phase 2 Site Substantial Completion**	**0 days**	**6/15/2029**	**6/15/2029**
232	**Final Completion**	**0 days**	**7/1/2029**	**7/1/2029**
233	Final Completion, Closeout and Commissioning	34 days	5/10/2029	6/28/2029
234	**Final Completion**	**0 days**	**7/1/2029**	**7/1/2029**
235	**Closeout**	**208 days**	**7/2/2029**	**4/29/2030**
236	100% DCAMM Evaluation	0 days	10/2/2029	10/2/2029
237	LEED-S Construction Submission	46 days	10/3/2029	12/7/2029
238	Final Completion	46 days	7/2/2029	9/5/2029
239	CM Request for Final Payment	0 days	9/4/2029	9/4/2029
240	Closeout	46 days	8/1/2029	10/4/2029
241	MSBA Final Payment Reimbusement Request	0 days	4/29/2030	4/29/2030
242	Commissioning Agent 10-month Inspection	0 days	4/16/2030	4/16/2030
243	Commissioning Agent Final Report Submission to MSBA	0 days	4/23/2030	4/23/2030
244	Commissioning Agent Submission of Certification	0 days	4/23/2030	4/23/2030
245	USGBC Issuance of Certification	0 days	4/29/2030	4/29/2030
246	**MOVE-IN MANAGEMENT**			



Glenn Brand, Ed.D.
Superintendent of Schools

Christine Elliott
Assistant Superintendent for
Curriculum & Staff Development

Paul Ruggiero
Assistant Superintendent of

Christine Murray
Interim Director of Student Support Services

Andrea Stern Armstrong
Director of Human Resources

Kenneth Lord
Director of Technology &
Digital Learning

WILMINGTON PUBLIC SCHOOLS

161 Church Street | Wilmington, MA 01887
Tel: (978) 694-6000 Fax: (978) 694-6005

A school and community partnership that provides an inclusive, respectful, and collaborative learning environment where all stakeholders are engaged in the development of the whole child.

May 1, 2025

Mr. Michael McGurl
Director of Capital Planning
40 Broad Street, Suite 500
Boston, Massachusetts 02109

Dear Mr. McGurl:

The Town of Wilmington Wildwood School Building Committee ("SBC") has completed review of the Schematic Design Submittal for the Wildwood Early Childhood Center | Wilmington Elementary School project and voted to approve and authorize the OPM to submit the Schematic Design related submittals to the MSBA for consideration on April 15, 2025. A certified copy of the SBC meeting minutes, which includes the specific language of the vote and the number of votes in favor, opposed and abstained, are attached.

The SBC held ten (10) meetings regarding the Wildwood Early Childhood Center | Wilmington Elementary School project since the MSBA Board of Directors approved the District to proceed into Schematic Design on December 13, 2024.

- *December 17, 2024, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *January 14, 2025, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *January 29, 2025, 7:00 PM, hybrid @ North Intermediate School Cafetorium, 320 Salem Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *February 5, 2025, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *February 13, 2025, Remote Participation via ZOOM, see Meeting Minutes attached.*
- *March 5, 2025, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *March 25, 2025, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *March 31, 2025, 7:00 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*
- *April 3, 2025, 6:00 PM, hybrid @ Town Hall, 121 Glen Road, Room 9, Wilmington, MA, see Meeting Minutes attached.*
- *April 15, 2025, 6:30 PM, hybrid @ Wilmington High School Large Group Instruction Room, 159 Church Street, Wilmington, MA, and Remote Participation via ZOOM, see Meeting Minutes attached.*

Notice of Non-Discrimination
All educational and non-academic programs, activities and employment opportunities at Wilmington Public Schools are offered without regard to race, color, sex, religion, national origin, ethnicity, sexual orientation, gender identity, homelessness, age and/or disability, and any other class or characteristic protected by law.

The meeting minutes are attached and outline any information shared or votes taken. The presentation materials for each meeting, meeting minutes, and summary materials related to the Project are available locally for public review and are posted on the Wilmington Public Schools website with a link to the Wildwood Early Childhood Center Project website: Archived Meeting Agendas & Minutes - Wilmington Public Schools (wpsk12.com).

In addition to the SBC meetings listed above, the District held two (2) public meetings, which were posted in compliance with the Open Meeting Law, at which the Wildwood Early Childhood Center | Wilmington Elementary project was discussed.

- January 29, 2025 @ 6:00 PM, Abutter's Meeting, In Person @ North Intermediate School Cafetorium, 320 Salem Street, Wilmington with broadcast on WCTV, *see PowerPoint presentation attached.*
- March 31, 2025 @ 6:30 PM, Community Forum No. 6, Hybrid @ Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, MA with broadcast on WCTV, *see PowerPoint presentation attached.*

The meeting presentation materials, meeting minutes and summary materials as they relate to the Wildwood Early Childhood Center | Wilmington Elementary project are available locally for public review at **Wilmington Public Schools – Wildwood Building Project** [https://www.wpsk12.com/our_district/facilities/school_building_projects/wildwood_building_project/]

To the best of my knowledge the meetings listed above comply with the requirements of the Open Meeting Law, M.G.L. c. 30A, §§18-25 and 940 CMR 29.00: Open Meetings.

The District has named the **Dr. Glenn Brand, Superintendent of Wilmington Public Schools,** as the local point of contact to receive questions at 978.694.6000 and/or glenn.brand@wpsk12.com. In addition, **Judith O'Connell, Assistant Town Manager,** has been also accepting questions through the Town of Wilmington Town Manager's Office at 978.658.3311 and/or joconnell@wilmingtonma.gov.

By signing this Local Action Certification, I hereby certify that, to the best of my knowledge and belief, that the information supplied by the District is true, complete and accurate.

By: R. Eric Slagle
Chief Executive Officer

Date: 4/16/2025

By signing this Local Action Certification, I hereby certify that, to the best of my knowledge and belief, that the information supplied by the District is true, complete and accurate.

By: Glenn Brand, EdD
Superintendent of Schools

Date: 4/16/2025

By signing this Local Action Certification, I hereby certify that, to the best of my knowledge and belief, that the information supplied by the District is true, complete and accurate.

By: Jesse Fennelly
Chair, School Committee

Date: 4/16/2025

SBC MEETING MINUTES X.01

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	12/17/2024
Prepared by:	Sarah A. Traniello	Meeting No:	24
Location:	Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Present*	Dennis Kelley	*Present*
Gregory B. Bendel	*Absent*	Craig Miner	*Present*
Kate Bissell	*Present*	Christine Murray	*Present*
Dr. Glenn Brand, *Chair*	*Present*	*Judith O'Connell*	*Absent*
Kevin A. Caira	*Absent*	Christine Prendergast	*Present*
Michael Camoscio	*Present*	Paul J. Melaragni	*Present*
Justin Cusce	*Present*	David A. Ragsdale	*Present*
Marianne Gallezzo	*Remote*	Paul Ruggiero	*Present*
Nicholas Golden	*Present*	Stacey Scott	*Present*
Christine Holloran	*Remote*	R. Eric Slagel	*Present*
John C. Holloway	*Absent*	Stephen Turner	*Present*
		Vivian Varbedian, *Vice Chair*	*Present*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager
Sarah Traniello, Assistant Project Manager

Dore+Whittier Architects

Lee P. Dore, Principal, Designer
Rani Philip, Project Manager

Item No.	Action	Discussion
24.01	Record	Chair, Glenn Brand, called the meeting to order at 6:35 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
24.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the December 3, 2024 School Building Committee Meeting were distributed for review and approval. – **P. Melaragni motioned to approve the revised meeting minutes from the December 3, 2024 School Building Committee meeting, with a second motion by N. Golden.**

Item No.	Action	Discussion
		– **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. M. Gallezzo abstained due to absence from meeting.**
24.03	Record	**Approval of Invoices** J. Leduc advised that there are two Warrants for approval, Warrant 19A in the amount of $3,750 for SMMA's Basic OPM Services and Warrant 19B in the amount of $95,232.58 for Dore+Whittier Architect's Architectural Design Services. – **P. Ruggiero motioned to approve both Warrants on behalf of the Finance Working Group having met prior to the meeting to review these invoices. Motion seconded by C. Prendergast.** – **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously.**
24.04	Record	**Design Update** – R. Philip provided update to the School Building Committee relating the updates that came forth from the meetings with the User Groups. – Biggest changes were prioritized with Teacher Collaboration Spaces located more centrally to serve the more than 40 staff on 1 level where 2 rooms were needed per level. – Art and Music flex class space towards Music of 1,000 sf. – MSBA asked to see the potential could be seen if living short in space could be lived within. It was determined that it did not work well. Spaces were needed for staff and services and Admin was place with Admin Staff location that allows supervision on each floor. – PreK entry use with parents bringing students into the school meeting staff at the Main Entry. – 35,000 sf portion is reimbursable with the delta of SPED being covered. 9,950 sf with potential for Art after the floor plan review with staff of what works what does not. – Medical Suite changes will be implemented. – Pink are extended learning spaces. 2 offices by the PreK entry. Art is right above the suite. – Teacher Collaboration Space, Toilet Rooms, etc. were added near the Cafeteria with 1 elevator bank (central in building). I Elevator is up to code. This was updated this morning since the release of the teacher Collaboration Spaces with specialists near Admin team and classroom wing. Second floor second Art classroom with closer STEM access to

Item No.	Action	Discussion
		stem areas as desired. Admin is on the right and the Math tutor (200 sf) to meet in space. – Third Floor had greatest changes implemented with no program that needed to go back. There will be 18-22 classrooms on the third floor with 12-14 classrooms on the second and ground floors. – ***How many classrooms, by school building, does this compare to currently?*** – Small group rooms are on all floors between classrooms. There are extended learning spaces with acoustical partitions with small group in classroom areas enabling flexibility. – Areas are fitted with whiteboards in each of the spaces. – Is there a price difference between materials and aesthetics? – What are the majority desiring or envisioning? This knowledge will be helpful in the due diligence that can be performed to price in the estimates. – Dore+Whittier is interpreting and displaying based on the feedback from the SBC with the colored dots provided on the precedent images. – This effort is to assist in narrowing down the overall feeling that is trying to be achieved in the teaching environment i.e. progressive or traditional style. Currently, heading down the road of practical and utilitarian spaces is the direction that is being sought and importantly cost effective. o P. Melaragni advised that Wilmington is not looking for the Taj Mahal. but natural light in places is preferred, natural colorings yet with some playfulness and continuity throughout the spaces in the school. – Landscape is preferred to be softer versus harder with landscape area for movement. – Shading aspect is important on hot sunny days. – Solar canopies vs. panels on roof? – Plaza entries vs. plazas? What is the sentiment? – Hallways with durable wall block with painted surfaces do not make sense. – ***Idea:*** *Neighborhood aesthetic on each floor gets named by school i.e. North, Woburn, Wildwood them classification*
24.05	Record	**Site Investigation** – Traffic Studies have been performed at the North Intermediate site in the morning and afternoon periods observing passenger vehicles and buses with all vehicles accommodated on the site itself

Item No.	Action	Discussion
		and queuing lanes onsite. Graphic showing part of the study with circulation with new PreK-5 and new bus drop-off and some recommendations were made with some operational changes at Middlesex intersection. Middlesex and Salem will be for further study. A signal is recommended at High Street and there is a recommendation for the retiming of some of the signals. Intersection changes could improve these conditions. Currently, 11 buses go to Wildwood, North Intermediate and Woburn Street. With more efficiencies, saving 5+ minutes instead of 2 stops it could be just 1 stop. – M. Gallezzo asked about intersections with traffic studies? E. Slagle will look into seeing if there is info that can be provided about intersections that have had traffic studies performed to date.
24.06	Record	**Working Group Updates** • **Public Relations Working Group** finalized the mailers after approval by the Leadership Working Group and it has gone to Shawsheen Valley Tech for printing. o **M. Gallezzo asked that a copy of the water bill flyer be sent to the SBC after the meeting.** • **Sustainability Working Group –** Life Cost Analysis will be on the horizon for the next topic of conversation for this working group for boilers and building systems. • **Site and Landscape Working Group –** Will be meeting in January
24.07	Record	**Public Comments** – None
24.08	Record	**Discussion and Committee Questions** – MSBA Board of Directors Meeting of December 13, 2024 approved the Wildwood School project to move forward into Schematic Design. – Community Forum and/or Abutters Meeting is going to be planned for January 2025 which will be important to listen to the surrounding community and their concerns and thoughts regarding the new school.
24.09	Record	**Correspondence** – None
24.10	Record	**Next Meeting:** January 14, 2024 at 6:30pm Wilmington High School, Large Group

Item No.	Action	Discussion
		Instruction Room and Remote Participation via Zoom
24.11	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **P. Melaragni motioned to adjourn. K. Bissell seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	December 17, 2024
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting:	Meeting No.	25
	Wilmington High School **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – December 3, 2024
3. Approval of Invoices
   - Warrant No. 19A and Warrant No. 19B
4. Design Update *(Votes May Be Taken)*
   - Project Aesthetics Visioning:
     - Recap of Exterior and Landscape Imagery
     - Interior Imagery Exercise
   - User Group Update
     - Space Summary Update *(Vote Required)*
   - Floor Plan Options
   - Site Investigation Outcomes
   - Building Systems
5. Working Group Updates
   - Public Relations Working Group
   - Sustainability / Green Design Working Group *(Members Needed)*
   - Site and Landscape Working Group *(Members Needed)*
6. Discussion/Correspondence/New Items
   - MSBA Board of Directors Meeting Recap
7. Committee Questions
8. Public Comments
9. Next Meeting: **Tuesday, January 14, 2024**
10. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	12/17/2024
Prepared by:	Sarah A. Traniello	Meeting No:	25
Location:	Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	Dennis Kelley	*Present*
Gregory B. Bendel	*Absent*	Craig Miner	*Present*
Kate Bissell	*Present*	*Christine Murray*	*Absent*
Dr. Glenn Brand, *Chair*	*Present*	Judith O'Connell	*Absent*
Kevin A. Caira	*Absent*	Christine Prendergast	*Present*
Michael Camoscio	*Remote*	Paul J. Melaragni	*Present*
Justin Cusce	*Present*	David A. Ragsdale	*Present*
Marianne Gallezzo	*Present*	Paul Ruggiero	*Present*
Nicholas Golden	*Present*	Stacey Scott	*Present*
Christine Holloran	*Remote*	R. Eric Slagel	*Present*
John C. Holloway	*Absent*	Stephen Turner	*Present*
		Vivian Varbedian, Vice Chair	*Remote*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager
Sarah Traniello, Assistant Project Manager

Dore+Whittier Architects

Lee P. Dore, Principal, Designer
Rani Philip, Project Manager

Item No.	Action	Discussion
25.01	Record	Chair, Glenn Brand, called the meeting to order at 6:34 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
25.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the December 17, 2024 School Building Committee Meeting were distributed for review and approval. – **D. Allan advised that she was not present for the December 17, 2024 School Building Committee Meeting, minutes will be corrected. V. Varbedian motioned to approve the revised meeting minutes from the December 17, 2024 School Building**

Item No.	Action	Discussion
		Committee meeting, with a second motion by S. Turner. – **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. D. Allan, J. O'Connell and D. Ragsdale abstained due to absence from meeting.**
25.03	Record	**Approval of Invoices** J. Leduc advised that there are two Warrants for approval, Warrant 20A in the amount of $3,750 for SMMA's Basic OPM Services - Schematic Design and Warrant 20B for the total of $95,054.50 that includes invoices for Dore+Whittier Architect's Architectural Design Services – Schematic Design in the amount of $53,900, Site Survey Services under Designer Amendment No. 3 in the amount of $5,087.50, Geotechnical Engineering Services under Designer Amendment No. 3 in the amount of $22,242.00 and Traffic Study Services under Designer Amendment No. 3 in the amount of $13,200 and Reimbursement to Michael Camoscio for Payment of Printing, Cutting and Shrink Wrapped Flyers for the Water Bill Inserts which was approved by the Town Leadership for distribution and produced in color by Shawsheen Valley Technical High School for $625.00. – **D. Kelley motioned to approve both Warrant 20A and Warrant 20B on behalf of the Finance Working Group having met prior to the meeting to review these invoices. Motion seconded by S. Turner.** – **P. Melaragni noted that he was not comfortable with this payment being made by a Committee Member to Shawsheen Valley Technical High School as a check should have been cut from another entity to issue payment.** – **Approval of Invoices Roll Call Vote: Affirmatively responded, passed unanimously.**
25.04	Record	**Design Update** R. Philip provided Floor Plan update to the School Building Committee relating Teacher Collaboration Spaces moving to a centralized location on each floor for larger space while moving art classroom to third floor. 2 Staff additions in literacy and administrative coordination. Reduction of wellness rooms to 1 per floor due to their being non-reimbursable by the MSBA. – Floor plan and some changes to center corridor with teacher collaboration spaces and flexible art classroom near STEM classroom so Health classroom was moved adjacent to the stair. Still are making smaller changes. – D. Allan asked about staffing at Town Hall that are not moving from Town Hall to the schools. They are staying the same.

Item No.	Action	Discussion
		– R. Philip walked through the Design Aesthetics and the inspiration being to connect back to the Wilmington community through the Baldwin Apple Tree which dates back to 1740 with its sprawling branches providing shelter and shade. – **Aesthetics = Stages of Growth** o Roots = Strong Foundation o Trunk = Pillar of Learning o Branches = Canopy of Growth o Leaves = Individual Potential o Shade = A place for all to experience shad, light and unity – R. Philip walked through the massing of the building including the large gathering places for students to gather. Displayed the precedent images that were opined upon by the SBC during prior sessions reviewing the interior and exterior precedents for characteristics that appealed and were desired for the new school. o D. Kelley mentioned Wilmington has a more classic look and the wood did not strike as what represents Wilmington and asked Dore+Whittier if the wood will stand the test of time since the District keeps its schools for more than 50 years. L. Dore advised that the wood that has been used on prior school projects is designed to weather over time. Others mentioned that the wood appeared like construction staging. There are concerns about the wood and longevity and P. Melaragni has concerns about potential vandalism where the wood can be carved into and ruin the design intent. D. Allan does not like the wood columns. Looks too modern. A uniform brick along both is preferred with some random blue with a ribbon along the top which is the Wildcats color. o C. Prendergast advised that Team Timber enjoys that natural material of the wood in the portico, canopy and its very functional but also is aware of the maintenance. The canopy aesthetics and on the façade of the building it needs to look like an elementary school and not like a high school or higher. o Canopies lowered reduces the amount of light that is brought into the school. Area over the lobby is the library which will be opened up for more use. The height of the canopy will be

Item No.	Action	Discussion
		modified so it feels like a smaller building to the students coming in. ○ N. Golden advised that the design appears comforting. – *S. Turner likes the overhands to be added with materials holding up the overhang/canopy.*
25.05	Record	**Construction Management at Risk** Virtual walkthrough of the project was conducted with the Construction Management firms that were planning on submitting their qualifications. – There were 7 submissions from the firms of Commodore Builders, Consigli Construction, Dimeo Construction, Fontaine Bros., Gilbane Building Company, Shawmut Design & Construction, and W.T. Rich Company. The CM Prequalification and Selection Working Group reviewed their qualifications to formulate the shortlist that will be invited to submit proposals and interview. – Interviews will be conducted the week of February 10, 2025. ○ The shortlist has been made: Consigli Construction, Fontaine Bros., Shawmut Design & Construction, and W.T. Rich Company. This committee appreciates all of the firms and their efforts that made their firms credentials stand out. The Procurement Officer can distribute the qualifications to the SBC as requested when they are available. – Feedback will be provided and recommended to the SBC at the meeting that will be schedule virtually for February 13, 2025. – The interviews are recorded and not open to the public. E. Slagle will consult with Town Counsel if the interviews must be a posted meeting of the SBC. A transparent process is desired. The SBC vote will be conducted and recorded by WCTV. – Videos of the interviews occurring will be provided to the SBC members for their review and reference to assist in their providing a vote. These will be shared on February 12, 2025. – The CM interviews will be conducted in Town Hall, Room 9. This CM decision is an important one as the CM needs to be onboard to understand and have knowledge of the assumed materials that will be utilized on the project to help set the budget, set in motion any advance procurement that needs to occur and ensure they get the most amount of information to this Committee, MSBA and the Town of Wilmington to set the budget for the project that will be what the Town will vote upon at Town Meeting and Ballot Vote in September 2025.

Item No.	Action	Discussion
		– **N. Golden made motion to approve the 4 Construction Managers that were recommended as the shortlisted firms by the Construction Manager at Risk Prequalification and Selection Working Group and D. Ragsdale seconded the motion.** – **C. Miner abstained from voting. S. Turner had left the meeting and did not participate in roll call.** – **Approval of CM Firm Shortlist Roll Call Vote: Affirmatively responded, passed unanimously.**
24.06	Record	**Working Group Updates** • **Public Relations Working Group** Flyer water bill mailers went to the Town for distribution, after approval by the Leadership Working Group. Shawsheen Valley Tech for produced, see invoice in Warrant 20B. Flyer will be further shared with outreach to school and community groups. Outreach will be initiated with PAWS and PAC to provide information and other activities to provide informational updates on the project. ○ **M. Gallezzo asked that a copy of the water bill flyer be sent to the SBC after the meeting.** *This was sent on 12/18/2025 by S. Traniello and resent by V. Varbedian during the meeting to refresh in email.* • **Sustainability Working Group –** Life Cost Analysis will be ready within the next 2 week and will be explained in greater detail in a conversation for this working group for boilers and building systems. D. Kelley would like to hear more and have more explained to the SBC about the options with respect to Geothermal so there is a better understanding of how it compares with the others and what will best benefit this school and the community once it is built and be able to be maintained by the Town. A lot of decisions are being made in this SD phase and within the next 4 weeks heating and cooling system will need to be selected or get closer to being nailed down once there is a greater understanding. ○ Geothermal System is most expensive and being priced to cover all systems right now as of the 4 options it costs the most. Pricing for each of the systems in the SD phase will be compared back to the pricing obtained in the PSR phase. ○ Picking the system is important. ○ How much cost upfront and how much is the Return on Investment (ROI)?

Item No.	Action	Discussion
		• **Site and Landscape Working Group –** Went through discussion points for the site plans and working through ideas.
25.07	Record	**Public Comments** – Haley Stewart attended the meeting and encouraged having childcare at Town Meeting as it would be ideal so parents can participate fully without distraction. Lots of great ideas to share and enthusiasm in support of the project and would like to join in outreach to the community. G. Brand will connect H. Stewart with the appropriate people she will need to connect with.
25.08	Record	**Discussion and Committee Questions** – PreConstruction Services: the CMs are going to get the estimating for the systems based on the fee set. In the interim, they will use the most expensive of the 4 heating/cooling systems as the placeholder for the cost. – PSR estimate had geothermal in it. – Abutters Meeting will be at North Intermediate School on January 29, 2025 at 6pm immediately before the SBC Meeting at 7pm in the Cafeteria and will be important to listen to the surrounding community and their concerns and thoughts regarding the new school. Mailing will be distributed to abutters inviting them to the Abutters Meeting. – Town Meeting will be held on Saturday, September 13, 2025 – Ballot Vote will be Tuesday, September 16, 2025.
25.09	Record	**Correspondence** – None
25.10	Record	**Next Meeting:** January 29, 2024 at 7:00pm North Intermediate School Cafeteria and Remote Participation via Zoom
25.11	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **N. Golden motioned to adjourn. C. Prendergast seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	January 14, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting: **Wilmington High School** **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**	Meeting No.	25
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – December 17, 2024
3. Approval of Invoices
   - Warrant No. 20A and Warrant No. 20B
4. Design Update (*Votes May Be Taken*)
   - Floor Plan Update
   - Project Aesthetics
5. CM at Risk Update (*Votes May Be Taken*)
6. Working Group Updates
   - Public Relations Working Group
   - Sustainability / Green Design Working Group
   - Site and Landscape Working Group
7. Community Outreach
   - Abutters Meeting, January 29, 2025 at 6pm
8. Discussion/Correspondence/New Items
9. Committee Questions
10. Public Comments
11. Next Meeting: **Wednesday, January 29, 2025**
12. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	1/29/2024
Prepared by:	Sarah A. Traniello	Meeting No:	26
Location:	Hybrid: In Person at North Intermediate School, Cafeteria, 320 Salem Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	Dennis Kelley	*Present*
Gregory B. Bendel	*Absent*	Craig Miner	*Present*
Kate Bissell	*Present*	Christine Murray	*Present*
Dr. Glenn Brand, *Chair*	*Present*	Judith O'Connell	*Present*
Kevin A. Caira	*Remote*	*Christine Prendergast*	*Remote*
Michael Camoscio	*Present*	Paul J. Melaragni	*Present*
Justin Cusce	*Present*	David A. Ragsdale	*Present*
Marianne Gallezzo	*Remote*	Paul Ruggiero	*Present*
Nicholas Golden	*Present*	*Stacey Scott*	*Remote*
Christine Holloran	*Present*	R. Eric Slagel	*Present*
John C. Holloway	*Absent*	Stephen Turner	*Present*
		Vivian Varbedian, Vice Chair	*Remote*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager	*Remote*
John Cutler, Project Manager	*Present*
Sarah Traniello, Assistant Project Manager	*Present*

Dore+Whittier Architects

Lee P. Dore, Principal, Designer	*Present*
Rani Philip, Project Manager	*Present*
Bryce Taft, Designer	*Present*

Item No.	Action	Discussion
26.01	Record	Chair, Glenn Brand, called the meeting to order at 7:10 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
26.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the January 14, 2025 School Building Committee Meeting were distributed for review and approval. – **N. Golden motioned to approve the revised meeting minutes from the January 14, 2025 School Building Committee meeting, with a second motion by M. Camoscio.** – **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. K. Bissell abstained due to absence from meeting.**

Item No.	Action	Discussion
26.03	Record	**Design Update** R. Philip provided Site Plan update to the School Building Committee outlining the specific areas of the Bus Loop, Parent Drop-Off and Pickup, Accessible Path/Walking Path, Open Play Areas, Active Playground, Raised Garden Beds, Sensory Garden Instruction, Outdoor Classroom, Outdoor Discovery Lab and Dining areas that have been designed to work with the staff and student needs including but not limited to the U-8 playfields and parking that is provided onsite. • With the feedback provided in the Abutters' Meeting immediately prior to this meeting there will be transitional space with turnarounds to be further developed to take into consideration the concerns of the abutters. • Particular attention will be paid at the property lines to take in the effect the acoustics of children playing on the playground or fields, school building adjacency, etc. taking into consideration where screening may need to be trees and/or fencing. • There will be some updates made to the playground space and the fields usage to make the most of the placement of the playgrounds, open field space on the site. • It is important the U-8 soccer field space is going to be utilized space. The size is geared towards the age of the school building occupants for their use. Dore+Whittier advised that with taking some of the schools offline it is important to the community to replace in kind as much as possible. Dore+Whittier is meeting with the Recreation Department to ensure the needs of the students and the community are being met and U-8 fields fit. There is potential to squeeze in another U-8 field where the tennis/pickleball courts were and this will be explored further. • K. Caira advised that there is concern by the Athletic Director about the loss of the soccer and baseball fields at North Intermediate. This feedback has come to him about these specific needs. Dore+Whittier will take this information under advisement and reach out to the Athletic Director and the Recreation Department for further discussions and input. • In addition, L. Dore acknowledges that there are some dedicated items on the North Intermediate School site that have been set in place for period of time. L. Dore advised the school project and its OPM and Design consultants will also be taking into account that within the Town there are important memorials and memorial items that have been put in place in remembrance of significant people in the community. There will be provisions put in place to make sure that these items are taken into consideration for placement and integration into the design. ○ Strategic placement of fields, dedications and monuments will be kept as a permanent part of the project.

Item No.	Action	Discussion
		○ Memorial Items and Historical Items for the Project will be taken into consideration and this listing will be shared with the members of the SBC, etc. • S. Turner advised that the Wildwood School site would be a good location for soccer and baseball fields due to its close proximity to all of the schools. In the loss of 2 fields there will be discussion for a future disposition. R. Philip advised that Dore+Whittier is working with faculty re: what needs to happen in the building with the Administrative Suite, Conference Rooms and Conference Space, Teacher Collaboration Space. The Teacher Collaboration Space went from 6 spaces to 3 spaces. Teaching staff will come in and use the collaboration space when meetings are not being conducted within the space. There is space in the center of the Teacher Collaboration Space for staff to gather around the table and conduct meetings. • **PreK Wing** is space with great sight lines throughout incorporating visuals with seating and planning for the instructional wall. • Questions and concerns raised about shades on door sidelites and windows for security. • **Extended Learning Areas** will have transparency and screening through sidelites and it is important the sightlines are present for staff to see what is going on in the classroom areas. Within the Extended Learning Areas there are different zones, i.e. lunch space, play area, spaces with furniture on casters for flexibility to move and be convertible for an ever changing and flexible space for students to learn in. • **Media Center / Library** will have bookshelves in a central location and a lot of conversations will be taking share with Dore+Whittier to get these spaces to where they are envisioned to suit the students. • *S. Turner likes the diagrams and how it creates identities in how they are interpreted. Teacher's Work Room and Meeting Room is open and fluid. It is a place for teachers to go and do their copying and filing.* **Project Aesthetics** Interior and exterior spaces include common themes of color with natural materials including warm tones, wood tones, green tones and blue tones as part of the theme to be used in the building and included in the wayfinding. It is important to use the color schemes/tones so that students are provided with a feeling of home. Colors associate everything for kids and allows for the perception of wayfinding and helps them know their spaces well. P. Melaragni asked if these would be part of the color palette and if there would be many tones. L.Dore advised P. Melaragni he could join the Color Committee and assist in the choices. • Cafeteria tables shown are placeholders as they are to provide a sense of what the space will look like with furniture in it. Cafeteria tables and furnishings have not been chosen yet.

Item No.	Action	Discussion
		• One of the aspects that is important is to bring the outside inside with the light provided from the floor to ceiling windows, the fixtures included in the space and there are quiet rooms off of the Cafeteria where the STRIDE students will be able to enjoy their lunch and K. Bissell advised that this will be important in the PreK-5 school as there are 30+ students that will need to use these quiet rooms as the larger spaces of the Cafeteria are intimidating to these students. Currently, lunch bunches are held 4-5 days a week. CARES can also use these spaces as shared spaces as well. Never enough meeting rooms so if there ever is a need these spaces can be used when not in use by STRIDE or CARES students. • Overhands and solar studies on the elevations will be coming. Cafeteria is facing Ballardvale abutters. Energy Code and more windows with more sun that comes in may perhaps need work done for sun shading. • View of the Library contained wood beams and reading nook under the stair and bringing the outside inside to the library. • Cafeteria Art Wall and wrap around – good real estate choices and opportunity as well above the kitchen space on the wall. • Lighting Fixtures and Attic Stock – D. Kelley asked that it be taken into consideration that lighting fixtures that are chosen are those that will have longevity and accessibility for the long run. The District keeps its schools for a long time and it would be beneficial to have the lighting fixtures be easily maintained with supplies that will be easily purchase over the long term. • Exciting preference for Terrazzo in circulation space including stairways where it can be made into different shades of color to mimic a waterfall or river on the stairway. Terrazzo is durable and a long lasting material. P. Melaragni and D. Kelley were happy with and love terrazzo. • In specification, everything specified and chosen needs to have 3 equals. Design materials need to be vetted, tested and time tested. Once these choices are made, the specifications start to get formulated from here. • Academic Wing will have sustainable material that is products that are durable, or same color theme throughout – lineoleum in more features and themes to suit the students environment and their needs. • Clear Circulation Paths provided with linoleum in themes assists in wayfinding and also it does not need to be waxed and stripped and is a renewable resource. • Images of the Extended Learning Area show construction of wall seating, zones for teaching and a view towards the North and a view looking back to Extended Learning Area. ○ Window seats, LEGO Wall, Teaching Walls, Play Zones and Extended Learning will be present in the ELA PreK Area.

Item No.	Action	Discussion
		• There are 50 years of terrazzo in school buildings – lots of longevity. **Exterior Update** **Project Inspiration: The Baldwin Apple Tree** *The school would be designed to emulate the tree's essence, where every child could feel rooted and free to grow. Here's how the Baldwin tree is a metaphor for the architectural vision:* • **Roots: A Strong Foundation** The school would be grounded in the values of curiosity and community. The foundation, like the tree's roots, would spread wide and deep, symbolizing the knowledge and support systems that anchor children as they begin their educational journey. • **Trunk: The Pillar of Learning** Central, multi-purpose core: Cafeteria and Gymnasium gathering spaces are the "trunk" of the school. These spaces, tall and strong, are the core where children, teachers, and families can gather for assemblies, cultural events, and celebrations. It represents strength, stability, and shared purpose. • **Branches: A Canopy of Growth** The classrooms wings extend like branches from the central core. Each classroom is designed to be modular and adaptive, filled with natural light and airflow. Extended learning areas and small group rooms foster an environment that encourages exploration and interaction. • **Leaves: Individual Potential** The leaves, ever-changing yet integral to the tree's life, symbolize the children themselves. Outdoor learning spaces, art walls, and play areas are created to nurture each child's unique creativity and curiosity. Each child can grow and flourish, much like the leaves transforming under the sun. • **Shade: A Place for All** Like the Baldwin Tree, the school would offer shelter and inclusion. The design features communal spaces for the Town, ensuring the school is not just for children but a space for everyone to come together—celebrating life, knowledge, and unity. • Baldwin Apple Tree communicated and made into versions as cornice accents in blue. • Several SBC Members were not enthusiastic about the metal panels and requested it be looked at for a more traditional, classic look of brick or stone. This was an interpretation of 3 separate options of varying use of a blue accent color on the metal panel. Concern about the blue color fading over time and the Town keeping its schools a long time it may show its wear. • *N. Golden wanted to know where Dore+Whittier is coming from for the metal panel, what its cost and longevity is as a material. Likes the concept of the Baldwin Apple Tree and understands what the color will be viewed like from Salem Street and color is what kids will home into as it is age*

Item No.	Action	Discussion
		appropriate. Inquired about there being accent colors of brick that might be suitable to explore more options. Thinks the idea of a full tree with branches and what you get as the sun hits the tree is a cool idea. • *S. Turner advised that this school is an elementary school and this concept as shown has even less blue on it than the Middle School currently does and it is important for kids to want to be there at the school and that it is an inviting place to be. Color brought into it may make this what they need. Members advised that the fading of blue shows age but if it is brick, it is viewed as ageless.* • Transitions and types will be further explored as this is a first pass with expressing color into the exterior of the building. • *D. Kelley advised that he sees the metal panel as more maintenance as it is not as resilient to age and damage as a brick or stone product.* • *M. Gallezzo is not a fan of the floor to ceiling windows and wants another material on the walls. Concern about the cost to replace the window(s) if it breaks is a concern.* • *M. Gallezzo, D. Allan and D. Kelley are not fans of the metal panel and see the windows as potentially being more maintenance with fingerprints for custodians, etc.* • *P. Melaragni is not a fan of the "ponderosa" wood beams that are displayed on the exterior of the building. J. O'Connell advised they appear as scaffolding or staging.* • *C. Prendergast loves the design and the warmth and appreciates the attempt to find a happy medium and definitely explore options.* • *It was proposed that the glass start at 4 feet off of the ground as daylighting is likely to be incorporated.* • *S. Turner advised that he would be open to seeing examples of window walls similar to the proposed being used in school buildings and working well with PreK-5. L. Dore advised that Dore+Whittier would provide examples.* • *D. Ragsdale likes the brick vs. metal panel and loves the floor to ceiling windows in the Cafeteria as he likes the light for the students. Enjoys the tree connection to education but concerned about the tree connection to the building working.* • *J. O'Connell is struggling with the blue on the exterior of the building, concerned about the with the safety of the glass in the Cafeteria and the temperature that a window wall might cause in the Cafeteria in addition the potential injury student(s) could sustain if they walk or run into glass curtainwall in an elementary school space.* There will be an analysis of glass for a full wall and partial wall vs. brick.

Item No.	Action	Discussion
		Landscape has a seating wall for students outside of the Cafeteria, bollards will also be present there and there will be security treatment as well. This will be presented with options at upcoming meeting.
24.04	Record	**Building Systems Update** M. Woodward of Garcia Galuska DeSousa (GGD) presented the HVAC System Options and Life Cycle Cost Analysis (LCCA) Summary. The Goals of the LCCA are: • The goal of the mechanical lifecycle engineering economic analysis is to assess the performance of various mechanical system options in comparison to a baseline mechanical system. • Each option is compared to the baseline system over a 50-year cycle to determine the most advantageous system considering utility costs, maintenance costs, replacement costs, and initial construction costs. • By comparison of each option to the baseline system, the option with the greatest total life-cycle savings is generally recommended. LCCA takes into account Energy Simulation of weather data, building occupancy and usage, system operating characteristics and utility rates and how these factors correlate to Energy Economics with Operating Costs, Installation Costs, Maintenance Costs, and Incentives and Tax Credits (if available) resulting in the Life Cycle Cost Analysis. There are specific Proposed Design Criteria Temperature Conditions that are taken into account: Design Outdoor Temperature Data Per ASHRAE Tables for Weather Station – Hanscom AFB: Heating 99.6% @ 2.6°F Heating & Cooling 0.4% @ 91°F db, 74°F wb Classrooms, Office, Cafeteria, Auditorium, Gym are proposed for all options to provide: **Heating, Ventilation @ 70 °F db +/- 2°F** **Air Conditioning : 75°F db +/- 2°F** with 55% RH +/- 5%RH Storage & Utility Room: Heating and Ventilation Only @ **70°F db** for heating Unoccupied temperature setback of **55°F db Heating** and **85°F db Cooling** is provided for **all options**. All of the HVAC options are based on fossil fuel free, electrified heating systems that will be compared to a Massachusetts Opt-In Code Compliant Building and HVAC System. All of the options shall meet or

Item No.	Action	Discussion
		exceed MSBA Requirement for Additional Reimbursement, LEED Requirements, MA Opt-in Stretch Energy Code Requirements. All of the proposed systems include air conditioning. • **BASELINE:** Air Source Heat Pump Plant - Mixed-Air Overhead VAV System and High Efficiency Air- Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free) • **OPTION 1:** Air-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Air Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free) • **OPTION 2:** Geothermal Water-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Water-Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free) • **OPTION 3:** Air Source Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free) • **OPTION 4:** Geothermal Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and Geothermal Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free) The Sustainable Design Working Group after thoughtful consideration has been weighing the options and are leaning towards Option 1 and 3 with Options 2 and 4 not being viable to provide sufficient return on investment for the Town. All of are fossil fuel free systems and over an electrified heating grid that complies with Municipal Buildings in Massachusetts for reimbursement. All of the options shall meet or exceed the MSBA requirement for additional reimbursement as they are incentified, LEED requirements, and MA Opt-in Stretch Energy Code Requirements. • *D. Kelley asked M. Woodward about the systems maintaining 70 degrees in Summer and Winter extreme temperatures. Extreme temperatures in Summer of 90 degrees and Winter of 0 degrees will make the heating and cooling systems struggle a little and work a little harder to maintain the 70 degree temperatures in Summer and Winter which would result in the 2 degree differential that is seen in the above chart.* • *N. Golden asked about whether with climate change if there will need to be provisions or adjustments to the heating and*

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		cooling systems 30 years in the future when the temperatures may be different. M. Woodward advised that there are adjustments that can be made to the systems and the systems have an average 30 year life cycle where by 30 years from now most of the equipment will be aged out. So with that life cycle in 30 years the system may need to be replaced.
		
		All of the proposed options have heating and cooling options built into them.
		
		The Sustainable Design Working Group evaluated the ground source versus air source of the Heating and Cooling Systems proposed.
		
		• It was found there were more benefits to those that are being considered in Options 1 and 3.
		  ○ Option 1 is an Air-Source VRF which is very similar to a residential heating and cooling system with Dedicated Outdoor Air Systems with Air Source Heat Pump and Option 3 being similar to what is existing currently in school buildings with an Air Source Heat Pump with VAV Displacement System with Passive Radiant Cooling/Heating Panels and High Efficiency Air Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating of Hot Water.
		  ○ Option 3 is a system that involves moving water throughout the system compared to Option 1 which is moving refrigerant fluid throughout the system.
		  ○ Options 2 and 4 involve similar systems but instead are using ground sourced well fields similar in nature to Geothermal (Option 4) utilizing the ground temperature to regulate the system by pumping water through the system utilizing the differential in the ground compared to that of the air temperature to the advantage and pulling heat and rejecting heat to those well fields.
		  ○ LCCA Study Options without Federal Tax Credits was presented by M. Woodward of G-G-D showing the costs, data and what would potentially be the Town's return on investment for each of the options that could potentially be chosen for the new elementary school.
		  ▪ Followed by the Federal Tax Credits available as part of the Inflation Reduction Act (IRA) through the use of Geothermal in comparison to the other options available. The cost of drilling wells is very expensive and is an upfront cost to the project and it is necessary for a geothermal system.

Item No.	Action	Discussion
		○ There is a preference at this time for the Town not wanting to rely on federal tax credits due to the uncertainty of the credits existence when pursuing due to governmental changes that are currently occurring that might result in a system like geothermal incentives of tax credits that may or may not be viable or come to fruition after a considerable upfront investment by the Town. • Without Federal Tax Credits, the only options of Options 1 through 4 are Options 1 and 3. If the project is going to invest more on the Federal Tax Credits, then Options 2 and 4 make more sense for the project. • Option 3 without tax credits is Displacement Ventilation with an Air Source Heat Pump Plant and has the lowest life cycle cost of the system options studied as it yields approximately $5.6M savings over the 50 year study period with an instant payback by having a lower capital investment than the baseline system. • Option 4 has the advantages of a geothermal system is that it yields an approximate $8.7M savings over the 50 year study period with an instant payback, has the second lowest EUI of all the options, its system longevity, reduced maintenance, reduced downtime and improved controllability of equipment and the best acoustics as it does not require exterior mounted condensing equipment. • C. Prendergast asked what the lock-in point to be able to take advantage of the Utility Federal Tax Credit. M. Woodward advised that it is a very good question and it is very much in flux right now and it is something the SBC should discuss relating to their comfort with the direction of the Federal government currently and how it may impact the availability of the Federal Tax Credits. R. Philip advised that that portion of the incentive is not something the Town will see when the new elementary school project is completed as the return on the investment. ○ E. Slagle advised that the Town and the Project either go forward with the geothermal system because it is felt to be a better product and pay more for it and take the windfall later on when or if the Federal Tax Credit is available or the Town and Community goes forward with Option 3 which balances the efficient system with the return on investment. ○ N. Golden advised that he agrees with Town Manager, E. Slagle, as it seems that the Federal picture is too hard to predict at this time. It may be very difficult to state the words geothermal at Town Meeting and be able to convince the community of

Item No.	Action	Discussion
		the Federal Credit incentive when the Option 3 provides the benefits needed for the school project and the Town. ○ *D. Allan advised that Wilmington should not rely upon Federal Tax Credits and advised that the heating and cooling system is the most expensive and important components of the school building and it needs to be the right decision. This information should be digested a little bit more and wait until the next meeting on February 5, 2025 before pursuing a vote on the choice of system with the full SBC to take a vote on the system to pursue. D. Kelley will have this on his shoulders in the future and his input is valuable as to what will be successfully maintained by the Town going forward.* • S. Turner asked how it is reconciled that there is the $1M to $2M delta between the options when the life cycle is less than half of the building especially when it is almost one-third of the duration the Town keeps its schools active. ○ How was that evaluated by the Working Group? ○ How do we evaluate less maintenance time and how does it translate to salary cost for maintaining the system? • *D. Kelley advised that the Sustainability Working Group met today and is not taking into account the amount of site costs that would be incurred also as a result of the geothermal in the need to drill the wells which is potentially a high cost that the project may not get back.* ○ *In comparison to Option 3 which does not need such invasive site costs as it is moving water through the system, there is a greater amount of flexibility and the current maintenance staff and mechanical contractors have more experience with than with geothermal systems.* ○ *D. Kelley advised that the Working Group wanted to see Options 1 and 3 side by side so that an educated decision could be made as to which option is the best Option for this project by seeing the pros and cons of each option side-by-side.* ○ *D. Kelley advised that geothermal does not seem to be the option. M. Camoscio advised that the maintenance costs for Options 3 is nearly as much as Option 4. With Option 4, the investment of $4M more per year would yield more electric savings by going ground source. M. Camoscio advised that with every year, the technology is improving and you can see with the electricity savings being a lot closer

Item No.	Action	Discussion
		than it used to be. M. Camoscio further advised that without the Federal Tax Credit, the benefits of the ground source option of geothermal does not seem like the best path to pursue considering Option 3 is more flexible with the movement of water through the system and is a bit more certain with realizing the benefits of the system. ○ *C. Prendergast asked if any of the options provide more LEED points than others? M. Woodward advised that Option 1 is projected to get 11 LEED points; Options 3 is projected to be worth 16 LEED points as are Options 2 and 4 both each 16 LEED points.* ○ S. Turner advised that the matrix states that Option 3 says that it has the highest outdoor noise. Is it possible to make sure that the system is far away from any of the abutters? *L. Dore advised that there are several ways that can be used to mitigate the outdoor noise that will be produced by the system and the project will work with the abutters to make sure their concerns are heard and mitigate the amount of disruption that could be potentially present with location, acoustical treatments, etc.* ○ *D. Kelley advised that sound attenuation fences and tree screening were discussed at the Abutters Meeting held earlier at 6pm and this is something can be further discussed with the Abutters and the SBC.* • The Sustainable Design Working Group is leaning towards Option 3 as the most advantageous LCCA and interested in more input from others at the February 5, 2025 meeting before making a decision on a system. **This Option will be further reviewed for a decision at the February 5, 2025 School Building Committee Meeting.**
26.05	Record	**Public Comments** – None
26.06	Record	**Discussion and Committee Questions** • **PR Working Group** has met twice and discussions have been discussing scheduling of community outreach opportunities, approach to get out the vote and coordinate for babysitting for the Town Meeting in September, 2025. ○ **Town Meeting: Saturday, September 13, 2025** ○ **Ballot Vote: Tuesday, September 16, 2025**.
26.07	Record	**Correspondence** – None

Item No.	Action	Discussion
26.08	Record	**Next Meeting:** **Wednesday, February 5, 2024** at **6:30pm** **Wilmington High School** Large Group Instruction Room
26.09	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **D. Ragsdale motioned to adjourn. V. Varbedian seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	January 29, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting:	Meeting No.	26
	North Intermediate School Cafeteria **320 Salem Street, Wilmington, Massachusetts** **Cafeteria** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – January 14, 2025
3. Design Update (*Votes May Be Taken*)
   - Site Plan
   - Floor Plans
   - Project Aesthetics
   - Building Systems Update
4. Construction Manager at Risk Update
5. Working Group Updates
   - Public Relations Working Group
   - Sustainability / Green Design Working Group
   - Site and Landscape Working Group
6. Discussion/Correspondence/New Items
7. Committee Questions
8. Public Comments
9. Next Meeting: **Wednesday, February 5, 2024**
10. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	2/05/2025
Prepared by:	Sarah A. Traniello	Meeting No:	27
Location:	Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	Dennis Kelley	*Present*
Gregory B. Bendel	*Present*	*Craig Miner*	*Remote*
Kate Bissell	*Present*	*Christine Murray*	*Absent*
Dr. Glenn Brand, *Chair*	*Present*	Judith O'Connell	*Remote*
Kevin A. Caira	*Remote*	*Christine Prendergast*	*Remote*
Michael Camoscio	*Remote*	Paul J. Melaragni	*Present*
Justin Cusce	*Present*	David A. Ragsdale	*Present*
Marianne Gallezzo	*Remote*	Paul Ruggiero	*Present*
Nicholas Golden	*Absent*	*Stacey Scott*	*Absent*
Christine Holloran	*Remote*	R. Eric Slagel	*Present*
John C. Holloway	*Absent*	Stephen Turner	*Present*
		Vivian Varbedian, *Vice Chair*	*Present*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager *Present*
Sarah Traniello, Assistant Project Manager *Present*

Dore+Whittier Architects

Lee P. Dore, Principal, Designer *Present*
Rani Philip, Project Manager *Present*
Bryce Taft, Designer *Present*

Item No.	Action	Discussion
27.01	Record	Chair, Glenn Brand, called the meeting to order at 6:30 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
27.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the January 29, 2025 School Building Committee Meeting were distributed for review and approval. – **E. Slagle motioned to approve the revised meeting minutes from the January 29, 2025 School Building Committee meeting, with a second motion by D. Ragsdale.** – **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously.**

Item No.	Action	Discussion
27.03	Record	**Approval of Invoices** P. Ruggiero advised of the invoices reviewed by the Finance Working Group namely Warrant No. 21A and Warrant 21B. Warrant No. 21A for SMMA in the amount of $3,750 and Warrant No. 21B for Dore+Whittier Architects in the amount of $59,504.50. Warrant Nos. 21A and 21B were distributed for review and approval. – **D. Kelley motioned to approve Warrant No. 21A based on the Finance Working Group's recommendation. C. Prendergast seconded the motion.** ○ **Approval of Warrant 21A Roll Call Vote: Affirmatively responded, passed unanimously.** – **D. Kelley motioned to approve Warrant No. 21B based on the Finance Working Group's recommendation. M. Gallezzo seconded the motion.** ○ **Approval of Warrant No. 21B Roll Call Vote: Affirmatively responded, passed unanimously.**
27.03	Record	**Design Update** R. Philip provided Site Plan update to the School Building Committee incorporating the feedback provided from the Site and Landscape Working Group in their recent meetings as well as the Abutter's Meeting of January 29, 2025. There have been buffer improvements made on the site plans, playgrounds have been moved to the locations where the U-8 soccer fields were before. Staff and Principals' concern for security and safety is being taken seriously and factors are being investigated more closely. Open Green Spaces: Trees and acoustical separation is being looked at closely for the abutters to have protection, screening, and setting boundaries. • K-2 playground moved to where green space was previously to ensure that the property lines are not too close. • There will be meetings with Public Safety including Wilmington Police next Tuesday, February 11, 2025 and it has been confirmed. • The K-2 concern over crossing the bus loop lane is a concern. With the Gates in place and implemented during school hours to block traffic, K-2 students should have the protection needed to block traffic. There are 2 gates just past the delivery/loading dock and these 2 gates are what will restrict vehicles from entering the areas where students will be playing and interacting with their outdoor surroundings. • Parents visiting would use the Main Entrance and Nurse's Suite to access the school as there is a door from the Nurse's Suite to the outside where parents would be able to pick up their child from school. • Dore+Whittier and their consultants are exploring a fence with security around the playground areas as well to determine if they are needed in some or all cases. • All trucks accessing the site would access through the bus look and back into the loading dock and then drive out of the

Item No.	Action	Discussion
		loading dock. Loading/Delivery Dock will be used to deliver kitchen, food and paper products. Deliveries would need to be made before school hours start. • The bus loop is 20-feet wide and has a sidewalk. There will be a turning radius survey performed. There will be studies of the turnarounds and parking for the food service and the custodial staff as well. • The shifting of the building south adds more circulation space on that side of the building. • D. Ingram, High School Athletic Director and B. Sawin of the Recreation Department met with Dore+Whittier Architects and shared their current use of the fields that exist at the North Intermediate School and provided their input relating to those that were in the initial draft of the fields for the shared fields and indicated that the U-8 size soccer fields work well. Dore+Whittier Architects will continue to share with them and garner their input through the process. The High School soccer field would need to locate the District's soccer program. The building is near property lines. • The goal of the locations of the playgrounds on the site was to place the playgrounds in close proximity to the grades that each one of the playgrounds serves. Some have proposed placing all of the playgrounds for all of the grades together however PreK- students may need to be closest to the building in order to run to rest rooms. In addition, all of the students on the playground at one time could be 300 students and need help to monitor the students easily. • The site plan does not show mechanical units outside of the building. Where would they be located? *Condensing units would be located on the roof as the units would not be installed on the ground.* • How long are the periods of recess and lunch for the students and how many are there? *Recess is 15-20 minutes and lunches are 30 minutes. There are usually 3 sets of each covering 3 hours of time with the lunches staggered. In total, it equals 1 hour of recess and 2 hours of lunch.* The SBC appreciated Dore+Whittier Architect's responsiveness to the concerns of the neighbors abutting the North Intermediate School in providing as many appropriate revisions that were possible in the short time frame between the last meeting on January 29, 2025 with the Abutters. Performance Space has been adjusted so that the curtain and stage lighting are squared off the stage to help provide accessibility. Dore+Whittier Architects is meeting with the Director of Music next week and will confirm the seat counts for assembly in the Performance Space/Cafetorium. What kind of bathrooms will the students have in this new school? *Boys and girls will have a split entry with a wet wall as boys and girls stay in their individual rooms respectively. PreKindergarten and Kindergarten students are brought to the rest rooms / bathroom by staff members.*

Item No.	Action	Discussion
		• *D. Carreiro said that they will uniformly use rooms once instructed to use which room. There are concerns about there being playtime in the restrooms causing maintenance and custodial issues for resolution.* ○ *G. Bendel advised preference for doors on both boys' and girls' room and D. Allan is in agreement.* • Single stall toilet for adult or student who wants or needs? *Adult stall toilet is provided but student one can be put in.* • Outside groups using bathrooms as well so the bathroom amenities need to be looked at a bit closer as to what is suited for those populations. • What is the feeling on same sex restrooms as a community? Is there a status? Gender neutral in one stall bathroom. Dore+Whittier Architects met with M. Palen from Food Service related to the layout of the School Servery and Kitchen. • M. Palen advised that one distinctive change requested is that there be an increase from 4 serving lines from 3 serving lines to make the best use of the space provided possible to get the most students in for lunch and out for recess in the time allotted. • Kitchen staff existing door was changed so that service could be provided through Servery area by a door that goes around wall to the other side of the counter to service the floor.
27.04	Record	**Project Aesthetics** The project aesthetics were shared showing the view to the South with the Administration on the Lower Level and views towards the stage and tables that have been selected that are easily convertible from luncheon tables to bench seating making for an ease of set up for the custodial staff transforming the cafeteria into an auditorium for an assembly. View to look back towards curtainwall and curtains will be used to shade during performances. B. Taft advised that he went to the drawing table to incorporate the overall aesthetic and came up with a different iteration of the design for introduction of masonry stone block and cast stone and precast concrete. • Brick veneer is red and in similar perspectives to what has been seen before previously. Classroom Wing side to PreK, Grades 1 and 2 and then Grades 4, 5 on the top level. **Option 4** has lighter beige color to the second floor of the classroom wing to the brick stone. Cast stone to cap off to the roof. Stair shafts have the special pop of color to break up the rhythm. South perspective and columns from blown laminate to canopy. More east with double high areas with stone block and gesture of precast column above curtainwall entry. • South Perspective, with classrooms have 3 windows per classroom and this first pass of the design left Committee wanting more outside light into the classrooms. • L. Dore advised that there will be daylighting done on the building and classrooms with larger windows being a

Item No.	Action	Discussion
		possibility. The Southeast perspective has the canopy itself with additional cover and the overhang has been brought down halfway making the canopy not as tall as the prior options had presented like "scaffolding." • Operable windows? How much public safety with operable windows? Operable windows can change and/or break the whole climate of the building. *There are LEED points that are associated with the operable windows or no operable windows so it is something that will definitely need to be looked at. During one of the school visits last October, the Boardwalk School in Acton-Boxborough, the discussion of operable windows arose and it was advised that opening one set of windows could throw off the entire mechanical system making it malfunction and/or work harder and result in condensation in areas that would not be preferrable as it throws off the humidity of the building with windows being opened.* • D. Allan likes the design with the lowered canopy and pillars with precast on the bottom and brick. E. Slagle agreed that he too also likes and approves the canopy drop lowers the profile of the building making it appear more suitable for the age range of the students attending. It is more in sync and makes a world of difference. • Can the middle column be cantilevered to look like a Main Entry presence? *B. Taft advised that this can be done and it will be incorporated.* • B. Taft brings in the color of blue, in **Option 5**, using proportion and accent color with the precast stone or brick with purpose. V. Varbedian likes the punch of color. Dore+Whittier Architects will work to get the right color of blue incorporated into the concept with the right kind of material that will be agreeable to the goals of the project. • D. Allan likes Option 4 as she is not sold on the blue. D. Allan advised that Option 4 does not single the school out as an elementary school and Option 4 blends in with the other schools in Wilmington. • C. Prendergast like the blue and the pillars with the traditional red brick. D. Ragsdale also likes the addition of the blue as well. D. Ragsdale advised that in looking for continuity for classroom space and entries, it would be nice to have connecting canopies/overhangs by carrying the treatment around from the 2 points for cars and the bus drop-off. • North Intermediate Site is flat and missing site elements to highlight the entries and guide the buses and the passenger vehicles around the site. • The blue accent color is intended to be glazed brick, precast panels and there are many varieties of metal panel options that can be selected from. Shown is a precast with pebbles accenting in the precast with a subtle bit of color and

Item No.	Action	Discussion
		additional options for a glazed brick and different shades that can be introduced depending on what is selected. • D. Kelley likes the color that is a combination of both materials. • G. Bendel likes the blue and believes that B. Taft of Dore+Whittier Architects has another version in him to get more blue that aligns with what the SBC is learning towards. B. Taft will change the material in the next iteration. • P. Melaragni likes Option 4 and would like the blue with a lessened blue i.e. the speckled blue (subtle blue accent in precast) or brick blue with more natural, subtle muted colors. E. Slagle appreciates the design concept updates that were provided having had less than a week to turn around and respond to the feedback provided and the results are great. • M. Gallezzo reiterates E. Slagle's statement and advised that L. Dore knows that the design is appreciated as the Design Team is finding the right balance and headed in the right direction. • D. Ragsdale advised that Option 5A would be great with a few different renderings and a feel of viable options so that the SBC could potentially entertain a vote on options at an upcoming meeting. Heading in the right direction through Schematic Design. • How much or how little between Options 4 and 5? Floor to ceiling windows have been brought up and the shortened canopy. • There should be an Abutters Meeting / Community Forum at the end of March as the community input is important.
27.05	Record	**Building Systems Update** The Sustainable Design Working Group after thoughtful consideration has been weighing the options are leaning towards Option 1 and 3 with Options 2 and 4 not being viable to provide sufficient return on investment for the Town. All of the proposed systems include air conditioning. • **BASELINE:** Air Source Heat Pump Plant - Mixed-Air Overhead VAV System and High Efficiency Air- Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free) • **OPTION 1:** Air-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Air Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free) • **OPTION 3:** Air Source Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

Item No.	Action	Discussion
		○ Option 1's maintenance of filters would be in all spaces vs. Option 3's maintenance is on roof and mechanical space. ○ Acoustical treatment to balance the noise would need to be implemented for Option 3 and Option 3 has $435k additional cost however it also has a $5.6M additional life cycle savings and you are married to all systems for parts maintenance. ○ D. Kelley advised that the Working Group is learning toward Option 3 and staff is comfortable and familiar with the system in Option 3. The type of VRF system in Option 1 is for a building sized 50,000 sf or less and is not as efficient as the displacement air system of Option 3. There are an additional 5-points benefit if operable windows are used. Water-based systems works well vs. refrigerant. • **D. Kelley makes motion for selection of Option 3: Air Source Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free).** • **E. Slagle seconds the motion. Roll call vote, affirmatively unanimous.** • **Approval of Building Systems Roll Call Vote: Affirmatively responded, passed unanimously.**
27.06	Record	**Construction Manager at Risk Procurement Update** • Interviews with 4 shortlisted Construction Management Firms will be conducted on Tuesday, February 11 and Wednesday, February 12, 2025. • **Tuesday, February 11, 2025** ○ **5pm Consigi Construction Co.** ○ **6pm W.T. Rich Company Inc.** • **Wednesday, February 12, 2025** ○ **5pm Shawmut Design & Construction** ○ **6pm Fontaine Bros., Inc.** • Interview video replays will be shared with the School Building Committee each evening after the 2 hours of interviews have concluded. • School Building Committee Meeting will be held on Thursday, February 13, 2025 at 6pm to approve the recommendation of the CM-R Selection Working Group. This will be a virtually held meeting over Zoom. K. Lord will send the login information for the meeting.
27.07	Record	**Public Comments** – None

Item No.	Action	Discussion

27.08	Record	**Discussion and Committee Questions**
		• **Project Renaming** to **Wilmington Elementary School**: V. Varbedian asked about the renaming of the Wildwood School Project to the Wilmington Elementary School project for the sake of marketing with the PR Working Group.
		  ○ ***This will be an agenda item for the next meeting for a vote. It ultimately sets the tone also for the next project for the Town.***
		  ○ *It will be needed for the Fun on the Fourth signage.*
		  ○ ***It will be unifying the Town as a whole instead of pitting sides against one another.***
		  ○ *D. Ragsdale advised that it is a good idea and all ideas for the new project name should be sent to E. Slagle and J. O'Connell.*
		  ○ ***Needs to be generic enough so people do not confuse it with the actual name of the school.***
		  ○ *D. Allan advised that this should be clarified for a vote for a name on March 5, 2025.*
		• **PR Working Group** having discussions with list of events to track community outreach for 2025 building up to the September Town Meeting and Ballot Vote.
		• **Upcoming Community Forum will be scheduled and targeting March 31, 2025** before the School Building Committee Meeting.
		• **Notification that there is creation of a new "Yes for Wilmington Schools" Committee** in Town and application has been submitted. PR Working Group will be responsible for providing updates on an ongoing basis to this group of the factual and informational content that is ongoing for the project for sharing with the public.
		• **Upcoming Events in Wilmington provided to the PR Working Group for 2025 to initiate with the coverage across Town.**
		• **Senior Center: February 14, 2025** – Important to initiate presentations about the project to Seniors population and get the momentum going for the project.
		• Discussing **scheduling of community outreach opportunities**, approach to get out the vote and coordinate for babysitting for the Town Meeting in September, 2025.
		  ○ **Town Meeting: Saturday, September 13, 2025**
		  ○ **Ballot Vote: Tuesday, September 16, 2025**.

27.07	Record	**Correspondence** – **Abutters Meeting Questions / FAQs** – Placed into matrix by S. Traniello of SMMA and will be incorporated with email by another abutter's questions and then distributed for answering into an updated version of the **Frequently Asked Questions (FAQs)**

Item No.	Action	Discussion
		– **Additional Questions submitted to School Department by email will also be made into FAQs for responses as well. Distributed to the SBC through T. Ingersoll from WPS.**
27.08	Record	**Next Meeting: Thursday, February 13, 2025** at **6:00pm Virtual Remote Participation Only via Zoom Webinar**
27.09	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **V. Varbedian motioned to adjourn. D. Kelley seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

https://smma365.sharepoint.com/sites/22127/22127_ProjectDocs/A ADMINSTRATION/A4 OWNER, SMMA MEETINGS & AGENDAS/A4-01 Client/A4-01.1 SBC/2025/2025_02_05 SBC Meeting/Wilmington Minutes_5February2025.docx

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	February 5, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting:	Meeting No.	27
	Wilmington High School **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – January 29, 2025
3. Approval of Invoices
   - Warrant No. 21A and Warrant No. 21B
4. Design Update (*Votes May Be Taken*)
   - Review of Interior, Exterior, Landscape, and Building Systems
5. Construction Manager at Risk Update
6. Working Group Updates
   - Public Relations Working Group
   - Sustainability / Green Design Working Group
   - Site and Landscape Working Group
7. Discussion/Correspondence/New Items
8. Committee Questions
9. Public Comments
   - Next Meeting: **Thursday, February 13, 2025 Fully Virtual Meeting at 6:00PM**
     and
     Wednesday, March 5, 2025 at 6:30PM
10. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
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Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	2/13/2025
Prepared by:	Sarah A. Traniello	Meeting No:	28
Location:	Virtual Remote Participation Meeting via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	*Dennis Kelley*	*Remote*
Gregory B. Bendel	*Remote*	*Craig Miner*	*Remote*
Kate Bissell	*Absent*	*Christine Murray*	*Absent*
Dr. Glenn Brand, Chair	*Remote*	Judith O'Connell	*Absent*
Kevin A. Caira	*Remote*	*Christine Prendergast*	*Remote*
		Paul J. Melaragni	*Remote*
Michael Camoscio	*Remote*	*David A. Ragsdale*	*Remote*
Justin Cusce	*Remote*	Paul Ruggiero	*Remote*
Marianne Gallezzo	*Remote*	*Stacey Scott*	*Absent*
Nicholas Golden	*Remote*	R. Eric Slagel	*Remote*
Christine Holloran	*Remote*	Stephen Turner	*Remote*
John C. Holloway	*Absent*	Vivian Varbedian, *Vice Chair*	*Remote*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager *Remote*
Sarah Traniello, Assistant Project Manager *Remote*

Dore+Whittier Architects

Lee P. Dore, Principal, Designer *Remote*
Rani Philip, Project Manager *Remote*
Bryce Taft, Designer *Remote*

Item No.	Action	Discussion
28.01	Record	Chair, Glenn Brand, called the meeting to order at 6:00 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Present and those Absent were not. Remote and absent members are noted above.
28.02	Record	**Construction Manager at Risk Procurement Update** The Construction Manager at Risk Selection Working Group conducted Interviews with 4 shortlisted Construction Management Firms on Tuesday, February 11 and Wednesday, February 12, 2025. • Tuesday, February 11, 2025: Consigi Construction Co. and W.T. Rich Company Inc. • Wednesday, February 12, 2025 Shawmut Design & Construction and Fontaine Bros., Inc. E. Slagle advised that all 4 Construction Management Firms presented the qualifications, experience and capabilities very well. The members unanimously felt that Fontaine Bros. was the best fit for the project

Item No.	Action	Discussion
		based on their presentation with the important points raised that resonated with each of the members of the working group, scores and feedback, and their proposals. After thoughtful consideration and review of each of their proposals, shared with the School Building Committee, the Construction Manager at Risk Selection Working Group recommends the approval of Fontaine Bros. for the Wilmington Elementary School project. The interview videos were shared with the School Building Committee members each evening at the conclusion of the 2 interviews. • School Building Committee Members shared their feedback with the Working Group. • Some of the things that Fontaine Bros. provided in their presentation was a comfort level that the team knew the scope of the operation with hyperfocus on what the Town of Wilmington needed and what the project needed to be successful. • All of the Fontaine Bros. Principals are going to be active on the project on the day-to-day activities. • This kind of project is all Fontaine Bros. Construction does, this is their market and their specialty, everything is about getting it right in their marketplace. • Fontaine Bros. team focus is with their full team • Showed up with the phasing schedule mocked up, arranging the bidding process in such a way to cut down the costs to the Town by eliminating the layers of markup that can be incurred, arrangements made for cueing off-site deliveries nearby to the site to avoid traffic congestion issues that might plague the abutters and neighbors during parent pick-up and drop-off and working through the differences of the 2028 delivery of the new school with adjusted turnover allowing for opening earlier. • Fontaine Bros. record of being on time and on budget is excellent. • D. Ragsdale advised that Fontaine Bros. gave the most detail of their deep dive of getting to a Yes Vote with their knowledge of the project and the Town from their research. • **V. Varbedian made a motion to approve the Construction Manager at Risk Selection Working Group's recommendation of Fontaine Bros. to execute a Notice to Proceed and C. Prendergast seconded the motion.** ○ **Roll call vote, motion carried by unanimous vote.** ***C. Miner abstained from voting.*** • There were a lot of great ideas that were proposed by each of the other Construction Management at Risk firms i.e. billboard on the edge of Rt. 93 advertising the project, Cx Agent on the project from earlier in the project, hiring a PR consultant when necessary to help get out the vote, etc.
28.03	Record	**Public Comments** – None

Item No.	Action	Discussion
28.04	Record	**Discussion and Committee Questions** – None.
28.05	Record	**Correspondence** – Questions submitted to the Wilmington Public Schools and/or Town Manager's office are shared with the SBC and will be incorporated into upcoming Frequently Asked Questions.
28.06	Record	**Next Meeting: Wednesday, March 5, 2025** at **6:30pm** **Wilmington High School,** **Large Group Instruction Room**
28.07	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **P. Melaragni motioned to adjourn. G. Bendel seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

https://smma365.sharepoint.com/sites/22127/22127_ProjectDocs/A ADMINSTRATION/A4 OWNER, SMMA MEETINGS & AGENDAS/A4-01 Client/A4-01.1 SBC/2025/2025_02_13 SBC Meeting/Wilmington Minutes_13February2025.docx

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	February 13, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:00 PM
Location:	Virtual Meeting:	Meeting No.	28
	Zoom Webinar: **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		

Distribution: School Building Committee Members

1. Call to Order
2. Construction Manager at Risk Update
   - Discuss Construction Management Firm Interviews
   - Vote for Award to Selected Construction Management Firm
3. Discussion/Correspondence/New Items
4. Committee Questions
5. Public Comments
   - Next Meeting: **Wednesday, March 5, 2025 at 6:30PM**
6. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	03/05/2025
Prepared by:	Sarah A. Traniello	Meeting No:	30
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	*Dennis Kelley*	Present
Gregory B. Bendel	*Remote*	*Craig Miner*	Present
Kate Bissell	*Absent*	*Christine Murray*	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	*Remote*	*Christine Prendergast*	Present
Michael Camoscio	*Remote*	*Paul J. Melaragni*	Present
Justin Cusce	Present	*David A. Ragsdale*	Present
Marianne Gallezzo	*Remote*	Paul Ruggiero	Present
Nicholas Golden	Present	*Stacey Scott*	*Remote*
Christine Holloran	*Remote*	R. Eric Slagel	Present
John C. Holloway	*Absent*	Stephen Turner	Present
		Vivian Varbedian, *Vice Chair*	Present

SMMA OPM

Julie Leduc, Director, OPM Services & Project Manager	Present
Sarah Traniello, Assistant Project Manager	Present

Dore+Whittier Architects

Lee P. Dore, Principal, Designer	Absent
Rani Philip, Project Manager	Present
Bryce Taft, Designer	Absent

Fontaine Bros.

David Fontaine, Jr., CEO	Present
Rob Day, Project Executive	Present
Mark Abdella, VP of CM Services	Present

Item No.	Action	Discussion
30.01	Record	Chair, Glenn Brand, called the meeting to order at 6:00 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person.
30.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the February 5, 2025 and the February 13, 2025 School Building Committee Meeting were distributed for review and approval.

Item No.	Action	Discussion
		• **V. Varbedian made a motion to approve the minutes of the February 5, 2025 meeting, motion was second by P. Melaragni.** • **Approval of Minutes Roll Call vote: Affirmatively responded, passed unanimously. C. Murray and S. Turner abstained.** • **V. Varbedian made a motion to approve the minutes of the February 13, 2025 meeting, motion was seconded by P. Melaragni.** • **Approval of Minutes Roll Call vote: Affirmatively responded, passed unanimously. M. Camoscio, C. Murray, S. Scott abstained.**
30.03	Record	**Approval of Invoices** P. Ruggiero advised of the invoices reviewed by the Finance Working Group, namely Warrant No. 22A and Warrant No. 22B. Warrant No. 22A for SMMA in the amount of $3,750 for OPM Services during Schematic Design and Warrant No. 22B for Dore+Whittier Architects in the amount of $53,900 for Architectural Basic Services for Schematic Design Phase and $445.50 for Site Survey Services under Designer Amendment No. 3. • **P. Ruggiero made a motion to approve Warrant No. 22A in the amount of $3,750 for SMMA, motion was second by C. Prendergast.** • **Approval of Warrant No. 22A Roll Call vote: Affirmatively responded, passed unanimously. K. Caira abstained.** ○ **V. Varbedian asked how much remained of the OPM Contract?** *J. Leduc advised $0.00.* • **P. Ruggiero made a motion to approve Warrant No. 22B in the amount of $54,345.50 for Dore+Whittier Architects, motion was second by C. Prendergast.** • **Approval of Warrant 22B Roll Call vote: Affirmatively responded, passed unanimously.**
30.04	Record	**Construction Manager at Risk Procurement Update** Fontaine Bros., was the Construction Manager at Risk awarded the project entering into PreConstruction with Dore+Whittier Architects and SMMA OPM in the Schematic Design Phase to conduct Cost Estimates for the upcoming reports to be submitted to the MSBA and used for the Project Scope and Budget. David Fontaine Jr., Rob Day, Project Executive, and Mark Abdella, Vice President of CM Services, joined the SBC to share with the SBC their credentials and what tools and skills they would bring to the project in addition to their highly qualified team chosen by the Construction Manager at Risk Selection Working Group as a part of their 2-phase procurement process involving qualifications, proposals of non-price and price, and interviews. D. Fontaine discussed Fontaine Bros. Construction and its history of being in its 4th generation after having started in 1933. They have demonstrated their efficiencies in CM lump sum method of bidding with an accelerated schedule capability. Fontaine's eye for bringing value and proactive approach with cost management having built 130 public schools in Massachusetts and it is its only market Fontaine performs work in and specializes in. Fontaine Bros.

Item No.	Action	Discussion
		is geared towards PreConstruction currently to work with Dore+Whittier Architects and SMMA OPM on the upcoming Cost Estimate for Schematic Design. There will be a Cost Reconciliation Meeting in mid-March for Fontaine and Dore+Whittier Architects' estimator, PM&C, to check their estimates against one another in preparation for the MSBA Schematic Design deliverable at the end of April. • Fontaine Bros. has worked before with Dore+Whittier Architects and SMMA OPM on Northbridge Elementary School in Whitinsville, Massachusetts. As school builders there is a strong familiarity with building on active campuses shared with students, teachers and community members. Fontaine's team strives to lessen the impact of noise to the kids learning within the existing school building while managing to make it safe, secure, uphold respect for black-out times and ensuring that construction deliveries and traffic patterns of circulation are planned, communicated and utilized to ensure that students, teacher and staff, community and abutters have a minimized impact during essential times. • M. Abdella of Fontaine Bros. advised that he will start attending the Public Relations Working Group meetings and work together with the working group to help get the information delivery to the Wilmington community to learn more about the project. M. Abdella will plug-in and add ideas to what already seems like a very well-organized working group. M. Abdella advised that it would be great to have student engagement and district engagement as they take ownership of the project and the school through the duration of the construction process with the mapping of curriculum ideas to incorporate the building functions including job fairs. M. Abdella expressed Fontaine's eagerness to work to facilitate community awareness for the project and wanted to know what had been done successfully for prior projects. Advised that Fontaine has had good luck engaging social media pages and spring, summer and fall sports, community and family activities will bring captive audiences. M. Abdella wanted to know who has already been doing these activities and advised that one can never post enough. • There is an interest in seeing how to engage the marketplace with the quotes and estimates through the project with material increases and tariffs and how interest rates will be impacted and Fontaine will put forward the most economical estimate that is no overly conservative and work to get accuracy with cost savings. • P. Melaragni advised that with the Town of Wilmington with its Vocational Tech School and Fire Substation to be built there are a lot of eyes on costs to value engineer. D. Allan echoed P. Melaragni's sentiments advising further that there are a large number of senior citizens within the Wilmington community that are struggling as a population and will need to see that this project is not a lot of fluff and it is conservative.

Item No.	Action	Discussion
		• Reimbursement rate is based on MSBA driven factors and will be explored by MSBA and is hard to define as it is based on a multitude of average based community factors. There will be equity for the Wilmington schools with a PreK-5 school built for the other side of the Town projected for 2055, once this project is completed and finalized. It is important to stay factual in responses
30.05		**Design Update** **Site Plan Update** R. Philip presented the latest updates in the site plan working with their consultants to move the playgrounds so that the students do not have to cross the road in order to access the playgrounds and also respecting all of the side property line buffers with respect to abutters property lines and roadways, sidewalks, and the buffers go all around the site. There are 2 vehicular gates that will block any trucks and vehicles from accessing portions of the circulation driveway during the school day when school is in session and acts as a security access point blocking access in and out. It is intended for emergencies vehicle use only and allows for the playgrounds to remain secure behind the building as well as where the bus loop exists. • There were changes made to the turnaround in response to abutters concerns and outside of one of the playgrounds on Playground 2B there is an annotation of 10'5" from the drive to the property line over the berm and above it there is 16'-10" from the driveway over the berm with trees to the property line as noted by Town Manager E. Slagle to highlight it is highlighting the area of concern for the abutter where also there is another annotation for 34'-9" from the roadway to the property line over the berm as well. It was asked if Dore+Whittier could look at swinging the playgrounds into the courtyard further and R. Philip advised that it would be looked at further and will need to consult with Public Safety as they will want to gain access into the Courtyard space and the design has remained flexible to accommodate entry. One of the concerns is that these are the youngest learners in the building that are utilizing these playgrounds and their safety and security is important to keep them close to the building as possible for bathroom use as there also will be a large number of students on the playgrounds at one time. • K. Caira asked if both baseball fields were being lost at the North Intermediate School. *R. Philip advised that the baseball diamonds have not been able to be fit back onto the site as the focus has been on the playgrounds and playfields amenities for the PreK-5 students.* K. Caira asked if even a Little League diamond would fit on the site? *R. Philip advised the baseball fields were not able to be placed onto the site and there was no demand for the PreK-5 for a Little League diamond, even in the upper quadrant of the site. The baseball and softball fields were going to need to be relocated to another location within Wilmington. E. Slagle advised that he has had conversations*

Item No.	Action	Discussion
		with J. Magaldi and P. Alunni regarding the loss of the full-size soccer fields and it appears that those will be able to replicated at the Textron fields. Meetings with J. Magaldi are happening this week. • The School Building is 70' away from the property lines. Abutters will be able to see what the school view will be from their property. L. Dore advised at the Abutter's Meeting that he will be able to meet with the Abutters individually and show them what it will be like for them and work with them so that it can be a conversation and working together. • Soccer field is a U-8 at this site due to the age of the students. **Traffic Study Update** Option A Circulation from Salem Street will be able to have 24 vehicles enter in from Salem Street onto the site into the queueing line for parent drop-off/ pick-up and buses will be able to fit 15 from Ballardvale Street which will come in and line up to drop off and pick up students. • There is possibility of using the parking lot to make more queuing space with more cars to fit onto the site during times when it is needed. • There may be a need to be a switch between the car and the bus loops as an alternative and it has been designed to work as such as a back up alternative. • Currently there are about 155 Pickup / Dropoff by family. Grandparents show up earlier. • HC Spaces are by the curb cuts by the entries to PreK and the Main Entrance allowing for the acceptable paths into the school. In Option B Kids would enter where they choose. Ballardvale queueing and ripple effect with the Rt. 93 highway corridor. How will it be impacted? Traffic Consultant from Nitsch is on the phone and will provide more insight. • **Net increase in trips = 3 cars/minute. Net significant backup?** • **24 walking trips vs. 24 bus trips vs. 243 car trips** • **How many participate in CARES? 50% to CARES this number is important to know so that it is known how much space will be used.** • Numbers seem underestimated. Middle school is a 200 with 600 by comparison to what will be present with 855 students plus CARES and includes staff and present dropoff. • **Need to know: % of students will journey by car vs. bus?** • Can we remove one playground to alleviate the queue? *No.* • E. Slagle advised that he is in conversation with Google / Waze.com to have the algorithm altered so that Salem Street and Ballardvale are no longer used as a cut through for others using the Rt. 93 corridor to get to other locations they are trying to reach in adjacent communities. This is one of the stressors that bring a great amount of the traffic to these

Item No.	Action	Discussion
		roadways in Wilmington that result in added stress to the roadways leading to the schools. • 2 Major Intersections: – How do we rate these intersections and take a look at pre-existing efficiencies to combine 3 schools? ○ **Goal: Accelerate engineering the intersections with lines, timing of lights, etc. Mitigation at the beginning and on the radar.** ▪ *P. Melaragni advised that there is a historical house that is likely protected under the Preservation Act at one of the intersections that awareness should be brought to as it would not be able to be adjusted without a lot of red tape.* **Interiors Update** R. Philip discussed updates to the cafeteria, auditorium, gymnasium, library, classroom and corridor spaces that are comfortable, versatile and flexible for student programs and learning with wayfinding and materials like linoleum (low maintenance for D. Kelley's crew.) • It was asked if there would be air curtains in place for the entries? Particularly at the Cafeteria and the Main Entry door? These will be needed with nearly 800 kids going into school at one time.
30.06		**Working Group Updates** – **Public Relations Working Group** has signed up for the Fun on the Fourth event in June. The School Building Committee is able to be present providing the Design Concept Development updates and latest Schematic Design information from the MSBA to the Wilmington community. The School Building Committee is able to be present for this event as it will be providing an unbiased, fact based and information only perspective on the project. ○ **Water Bill** – will be drafted by Dore+Whittier Architect as a 1 page document of facts that will be provided to the be distributed to through Shawsheen Tech printing, cutting and packaging and providing to the Town to be placed into the water bill mailing. ▪ ****D. Allan and M. Gallezzo requested that the School Building Committee get a copy of the water bill before it goes out to provide any feedback that may be necessary.**** ▪ **J. O'Connell advised that she will handle the water bill and billing with Shawsheen Tech with coordination with Dore+Whittier Architects on the content for the water bill itself.** – The 'Vote Yes for Wilmington Schools' is completely separate entity from the School Building Committee. The School Building Committee supplies factual information through the

Item No.	Action	Discussion
		PR Working Group to the Wilmington public. Any material that is generated by the Vote Yes for Wilmington Schools should be vetted for accuracy before information is released and in cases where information needs to be referenced it should be obtained from the Wildwood School Project site, question asked of the Town Manager, or the Wilmington Superintendent's Office.
30.05	Record	**Public Comments** – None
30.06	Record	**Discussion and Committee Questions** – **D. Allan asked that an agenda item be placed on the March 25, 2025 meeting to "Reorganize the Committee's Chair".** – **Revised Meeting Dates were provided for review by the SBC for consideration and approval for future meetings. Once approved they will be placed into everyone's calendar with meeting invitations.** – **Cost Estimate updates will be provided at the meeting on March 25, 2025.** – **There is a meeting on March 31, 2025 as there will be a need to populate the Project Scope and Budget for approval by the School Building Committee on March 31, 2025 that will be submitted for approval by the MSBA.**
30.07	Record	**Correspondence** – Questions submitted to the Wilmington Public Schools and/or Town Manager's office are shared with the SBC and will be incorporated into upcoming Frequently Asked Questions.
30.08	Record	**Next Meeting: Tuesday, March 25, 2025** at **6:30pm** **Wilmington High School,** **Large Group Instruction Room**
30.09	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **N. Golden motioned to adjourn. D. Kelley seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

smma

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TOWN OF WILMINGTON, MA

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	March 05, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting:	Meeting No.	29
	Wilmington High School 159 Church Street, Wilmington, Massachusetts 01887 Large Group Instruction Room **and** **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. Construction Manager at Risk Team Introductions
5. Design Update
   - Site Plan Update
   - Interiors Update
   - Traffic Study Update
6. Working Group Updates
7. Discussion/Correspondence/New Items
   - School Project Naming for Outreach Initiatives
8. Committee Questions
9. Public Comments
   - Next Meeting: **Wednesday, March 25, 2025 at 6:30PM**
10. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	03/25/2025
Prepared by:	Sarah A. Traniello	Meeting No:	31
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	*Dennis Kelley*	Present
Gregory B. Bendel	*Present*	*Craig Miner*	Present
Kate Bissell	*Present*	*Christine Murray*	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	*Late Arr.*	*Christine Prendergast*	*Absent*
Michael Camoscio	*Present*	*Paul J. Melaragni*	*Absent*
Justin Cusce	Present	*David A. Ragsdale*	Present
Marianne Gallezzo	*Remote*	Paul Ruggiero	Present
Nicholas Golden	Absent	*Stacey Scott*	*Remote*
Christine Holloran	*Remote*	R. Eric Slagel	Present
John C. Holloway	Present	Stephen Turner	Present
		Vivian Varbedian, *Vice Chair*	*Remote*

SMMA OPM

Julie Leduc, Director, OPM Services & Project Manager	Present
Sarah Traniello, Assistant Project Manager	*Absent*

Dore+Whittier Architects

Donald Walter, Principal-In Charge	Remote
Lee P. Dore, Principal, Designer	Present
Rani Philip, Project Manager	Present
Bryce Taft, Designer	Remote

Fontaine Bros.

David Fontaine, Jr., CEO	Absent
Rob Day, Project Executive	Present
Mark Abdella, VP of CM Services	Remote
Chelsea Mutrie, VP of PreConstruction	Remote
Chad L'Ecuyer, Project Manager	Present

Item No.	Action	Discussion
31.01	Record	Chair, Glenn Brand, called the meeting to order at 6:30 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person. K. Caira and N. Golden were not present during roll call.

Item No.	Action	Discussion
31.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the March 5, 2025 School Building Committee Meeting were distributed for review and approval. Minutes are to be corrected showing that *K. Bissell* was late to the meeting but was present. • **D. Ragsdale made a motion to approve the minutes of the March 5, 2025 meeting, motion was second by V. Varbedian.** • **Approval of Minutes Roll Call vote: Affirmatively responded, passed unanimously. C. Miner and J. Holloway abstained.**
31.03	Record	**Design Update** **Updated Site Plan: Circulation Routes.** In listening to the feedback from the community and members of the SBC and the educations, Dore+Whittier Architects are going to use Option B as the primary circulation route calculating for the project. Option B is the option where there will be 88 +/- vehicle onsite queuing space, 12 +/- bus onsite queueing space and 193 onsite parking spaces. Cars will access the North Intermediate Site from Ballardvale Street and travelling towards the building using the turnaround and exiting back out onto Ballardvale. Buses will access the North Intermediate Site and loop around and exit back to Salem Street. The CARES Program is a well-attended program for the District. Dore+Whittier Architects will work with the District to learn the number of vehicles that will be impacted and identified for queuing purposes. It will be something that will continue to be worked on with the District. For the 3 schools identified for consolidating, there are approximately 200+ families that are involved in that program. This is a significant number and impact. The due diligence will continue to be developed. Dore+Whittier is working to glean how many days of activities would be needed and learned that a good number of days in the year are impacted. CARES offers every day but 3 days of the school year which is a significant number and an impact that should be considered. The CARES program would not be departing the school during the peak flow departure times in the afternoon and would spread the peak traffic flow demand out further and Dore+Whittier are working to obtain more data to share. **Project Imagery: Exterior** R. Philip shared the exterior rendering imagery of the parking, playfield, playground, driveway circulation with the building to give the School Building Committee an idea of what it will look like as it is laid out in the plans. The playground equipment will be selected at a later date but there is playground equipment shown in the rendering as a sampling to know what the space will be used for. Please note that all of the playground and playfield spaces are surrounded by crash resistant fencing and wall structures for the students protection while spending time in the playfields and on the playground structures. D. Ragsdale asked about the basketball courts and their placement on the site and how the school needed them for not only student recreation but also community use. Wanted to know if there was any flexibility in the placement of these courts on the site. *R. Philip advised that when speaking with D. Carriero the Principal of the North Intermediate School*

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		regarding the Site and Landscaping around the schools, she advised that one of the things that there was a real need for more basketball courts as there did not seem to be enough to satisfy the students in their use outside. It was important these courts be incorporated into the amenities for the students outside of the school. L. Dore advised that based on the consolidation and the need to increase the number of outdoor program to 2 basketball courts to accommodate. • D. Kelley asked about the previous option showing this as the drop-off for PreK from this side with the Main Entry instead of the bus loop. Does this new option provide good access into the school? *R. Philip advised that Dore+Whittier will continue to study that with swapping the location of the vehicular circulation and the bus circulation around the site, with the PreK parking being next to the PreK entry there would need to be work done to allow cars to come in using traffic signage for only PreK student drop-off.* • J. O'Connell asked R. Philip and L. Dore if they are taking into account the time and distance it will take for the teaching staff and aids to take the students from the school building to the playgrounds and playfields during the day? Also are you taking into account with what lighting package that you are going to be selecting for the space that you are accounting for the basketball courts. *R. Philip advised that the lower grade recess playgrounds are planned for as close as possible to the building in areas that offer easier access back into the school when needed. Arranging the upper grade playgrounds in locations that are better situated for their age group like as seen with the basketball court that are further from the academic wing but closest to their Cafeteria. While the lower grades have play areas in closer proximity to their academic areas to allow for more outside breaks more frequently if needed. The proximity to the school for these play areas is as close as crossing the driveway and is much closer compared to where you would find the soccer field a bit if a distance from the Woburn Street School. For lighting, lighting is included and typically all downlighting and meeting any of the needed LEED requirements. There will be a lighting study performed in the next phase to allow for the understanding of where the lights are and that the light is being contained on the property and looking at any possibility of glare that could possibly overflow into abutters yards or properties. L. Dore advised that lighting the basketball courts is not anticipated in the program due to the proximity of the abutters and the primary program use is during the day for school use. Certainly the community can access that as the District desires after the fact and the rest of the site lighting, some of which is in the form of security bollards, that block cards from the pedestrian way, every other bollard is a lit bollard and there are wall packs of lights on the building and as R. Philip advised earlier there is also downlighting at various points to get the right lumens that are required.*

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		• J. O'Connell advised that she did not want to get ahead of the leadership to the Town but we are starting to get requests for illuminated basketball services in town that do have lighting that would be able to use these outdoor spaces, summer user and all of that. So there may be mixed groups wanting to use this space and only so many people can be on a limited court at the same time. These requests are coming into the Recreation Department. So in particular for this age, this is something the Town should do as there are not many illuminated court spaces at night. This becomes more of a topic of discussion during the summer when more of the kids are on vacation. *D. Kelley advised that the three basketball courts that are presently onsite are busy and with the warm weather that has been experienced already, lights have already been turned on so that the courts could be used as the courts have been packed. E. Slagle advised that given that this basketball court is right adjacent to one of the abutters' back yards, it probably should not be lit however the basketball in the center of the parking lot area may be fine to illuminate as the proximity to abutter residences and yards is much greater. D. Kelley advised that with the LED lights these days you can have lighting and redirect the light.* J. O'Connell advised that she brought it up to check the box that it has appeared as a Wilmington community need. *R. Philip advised that a note was made to address the subject with the Recreation Department.* J. O'Connell advised that it was also brought up because there is also concern about the parking as there did not seem to be enough parking at Yentile. S. Turner addressed the Option B site plan asking about the top end of the parking lot of Ballardvale is 32 feet and on the other end it is 38 feet of extra square foot space along the basketball court on the playground side of that parking lot. Is there a reason why it is so much further from the road and the other end seems like there is an opportunity for more placement of recreation space? *L. Dore advised that a lot of different setbacks exist on this same site versus Ballardvale but with the parking lot, the setbacks are the same. There is some topographic deviation on there. One of the answers is right along the whole side of the basketball court, as there is actually a retaining wall to be able to split that trying to cover the distance a little bit and fit in the right amount of parking spots between all of them.* • S. Turner advised that he was not suggesting to change the number but was interested in shifting closer to the road to allow more room like there would be 15 feet from the basketball court to the parking lot and the playground could be a bigger parking lot, playground or could be whatever instead of bleachers. There should be a little bit more room to play there and it would be preferable to have space next to the school available to the school for whatever is desired. For instance, having a little bit of trees and greenery along that side of the parking lot by the street is important. It is about 15-20 feet of space which is a decent amount of space.

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		• D. Ragsdale also addressed the point that with the lighting of the basketball courts, how late do we as a community want people to be able to play basketball on these courts that are so close to the abutters' homes and backyards in the evening from a noise perspective. R. Philip displayed the image of the playgrounds for the PreK and K-2 with the 3-story academic wing in the background with its courtyard space in between the playgrounds and the start of amenities for outdoor classrooms, garden boxes, four-square on the ground and crash rated fencing around the playground and courtyard space perimeters. • S. Turner advised that when you look from this perspective at these academic wings of the building, it can be seen the similarity this design has to the other school buildings that Wilmington has in town which was one of the wishes of the collective voice relating the design in removing the blue stripes. It leads to wonder about the interior space for the school and how it will be suited for the kids of the age groups that it will be serving. There should be something on the interior space of this elementary school that is a bit brighter and more colorful, where it is not road facing and disrupting the view. When we talk about elementary kids and thinking about a kindergartner or first grader, if there is a place for color besides the interior of the building, would there be a place that would not disrupt the exterior view, be an affordable option and also be something that can be appreciated to bring more vibrancy to that Courtyard area where there might be playing a fair amount of time. *K. Bissell advised that the play structures do bring a fair amount of color and does add to the vibrancy of the building and perhaps the outdoor classroom space and garden space could be an opportunity to bring more vibrancy to the Courtyard.* • D. Kelley advised that if there are students in those classrooms while students are in the Courtyard the voices in the Courtyard space would likely echo and potentially disrupt students in the classrooms as it is assumed that the Courtyard area is all concrete. D. Kelley advised that if it is concrete then it will be good to know the material as there are a lot of ice melts that cannot be used on concrete during the winter season with snow and ice. Is it asphalt in there, or concrete? *R. Philip advised that it is mixed as it is definitely for play and intended for the students. There is some turf on the sides where there will be a decent amount of sun.* D. Kelley advised that during the winter months with snow and ice being removed from those areas there really is not much place to move the snow to get it out of the way of the students and off of the turf and it is something to keep in mind. If Maintenance is desired to get these areas cleared of snow earlier, it will be important to know how access will be gained and where the snow will be relocated to allow students full use of this space.

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		Project Imagery: Interior R. Philip continued into the interior displaying pictures of the main entry with students, the cafeteria space with the stage and gymnasium on the other side of the stage in the background. R. Philip showed images of D. Kelley on scissor lift with the ability to check out the acoustical leaves hanging from the ceiling and changing the light fixtures, when and if needed. Images of the gymnasium space and a view of the gymnasium space that has the stage in the background and cafeteria on the other side. There will be partitions in the gymnasium to break up the gymnasium space into the smaller spaces for the gym activities that are needed to be conducted within them. The center divider in the ceiling shows the partition hanger that it will be utilized to break the 12,000 sf gymnasium into 6,000 sf gymnasium. K. Caira shared concern for the young students having the sun in their eyes from the Cafeteria windows while trying to perform on the stage during their plays. *L. Dore advised that there will be a canopy, sunshade and fins that will be in effect and reducing any glare that would be present. Similar to other locations indoors where there would be blackout shades, similar can be utilized so that if a movie project were shown in the room, there would be no concern for additional sunlight interference.* R. Philip shared the Library Media Center imagery showing the layout of the bookshelves with tables and students with the ability to have 2 classes in the library at one time. Different types of seating were shown to all for students to enjoy the library experience in the manner of their choice for engagement. • Typical classroom space with the casework, surfaces for teaching use, student use, tables and means of engagement with the extended learning areas as well. Structured seating, cubbies and nooks are provided as well. • Grades 3-5 Extended Learning Areas differ slightly in how they are laid out but along the same likes as those for the younger students designed for the student engagement and use for learning purposes. • K. Caira asked if there is an elevator? *R. Philip and L. Dore advised that it is right in between the 2 academic wings. L. Dore advised that the number of elevators is something that is expensive to build initially, and more critically, to maintain, so there is a concerted effort to limit the number in a facility.*
31.04	Record	**Cost Estimate Update** Dore+Whittier Architects engaged PM&C to perform a cost estimate based on their Schematic Design drawings and Fontaine Bros. Construction has conducted their cost estimate on the same. Both estimates were reconciled and found there to be a delta of about $500,000 between the 2 estimates. Dore+Whittier Architects, SMMA and Fontaine Bros. together with their estimators spent 7 hours together reconciling the 2 estimates going line by line. The SBC received copies of the PM&C Reconciled Cost Estimate to ensure the right amount of scope was covered in both with similar pricing and get an understanding if certain items were coming in higher than others.

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		• In previous phases, it has always been an estimated Construction Cost Range. In Preliminary Design Program (PDP), it was $149.3M to $165M for the Estimated Construction Cost Range which is $936 per square foot. This includes the soft costs as well which is the design fees, permitting, fixed furnishings and equipment that would be outside of the scope of the MSBA budget. The 3011 form is underway to work through the project costs for the project and the Construction Cost will be shown when we return for our next meeting as the information is more defined. • In Preferred Schematic Report phase, the Estimated Construction Cost was $136.4M to $150.7M which is $878 per square foot. • Now in the third estimate that has been done for the Schematic Report, the Estimated Construction Cost is $137,743,666 which is $835 per square foot. On Budget! • With each phase, the risk of the unknowns are removed and everything gets more defined with a fine Sharpie. More information is known and definition of the drawings will start to happen so that the picture becomes clearer as the number comes down and the images of what the new proposed school will look like come into perspective. The full project cost will be known next week with the 3011 being fully completed. • D. Allan asked how the $835 per square foot information at Schematic Design compares with the information that is provided by the MSBA on their website for projects of similar scope and nature? *R. Philip shows the information provided by the MSBA with the average being $827 per square foot with the MSBA with 9 Elementary Projects with cost estimates in the range of $673-907 per square foot and displayed where Wilmington's Elementary School comes in at $835 per square foot by comparison on the graph. There is the factor of the unknown tariffs in the marketplace currently that will need to be worked out, planned for and provide contingencies which will be further discussed.* • S. Turner asked a question about amounts being different between the CSI and the Uniformat estimates provided. L. Dore explained that these are 2 different ways of categorizing the estimates and some categories have more items that fall under it that might have fallen under it in the other format thus explaining why there may be the appearance of slightly different numbers for each category but in the end the estimated amounts are the same for the project. It is written in both estimate formats of CSI and Uniformat at the request of the MSBA as it is their preference its delivered in both. • L. Dore explained that currently the project is at about 10-12% design which is a lot of information. Once the project is approved it still moves forward with another 9 months of development in the detailed design process to go. These estimates are a much finer point and the team is much more

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		comfortable at this level with the investigation that has been done from where we were before. There are still some unknowns so there is the carrying of some contingencies i.e. design contingency of 10%, escalation contingency of 7.5%. The escalation contingency is 7.5% is a little higher that what normally would be carried but with concern related to the market and our number that is being prepared is for construction to start a year from now. With everything that is going on right now, the best that can be done as a group right now is to risk protect this project as best we can. The ask to the voters is only going to be done once and then the project is going to live within that for a long time. How do we put some of that risk mitigation into the project without spreading it out throughout all the line items. If things turn back the other way and things become more favorable how do we go back and find that risk that we put in to protect the project. So those are captured in those 2 line items, design contingency and escalation contingency. This way the amount of risk is known and measured and it can be monitored to keep a watchful eye on it as time goes. This helps a budget get set as has been talked about before which is really important and we are trying to make sure all of the scope has been captured. There are 2 pieces to that and it is: the scope that has been heard from the educations and the SBC and also the scope that the MSBA requires. There also are strings that are attached to lead and the fact that this cost estimate represents the project getting 4 extra points of reimbursement because of the energy efficiencies Dore+Whittier Architects has designed into the project. The decisions that have been made in material selection, placement of the building, etc. are all connected to hitting those 4 points and 4 points on this project is a lot of money. The SBC has been very clear with its direction on aesthetic and what is sought for a building that holds its value with where the money is being spent in the building. The SBC is looking for a very utility friendly building that is also maintenance friendly for the long term and that is very supportive of the educational program. The budget that has been put together is very representative of that and value engineering as a subject and when is the appropriate time to start talking about that subject. The team has put together a list of items that the MSBA requires as part of the submission of what has been put together for ideas. If in a budget pinch, what are some of the items that can be easily identified to be taken out of the scope of the project that would not effect square footage, the LEED points that are identified to attain. Dore+Whittier put that list together and it is about $890,000 of items that have been identified. It is not intended to be used today but it is a budget control piece, value engineering is a tool to use to stay on budget. A list of items have been developed that are out there. The budget is something to be maintained once it is approved and these items are a tool to work with.

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		Dore+Whittier worked to be very conservative in view of putting stuff in and working with risk management all will be reviewed tomorrow with E. Slagle explaining where all of those things are. If there is money that is in the budget that doesn't need to get spent in the budget, it stays in the budget and is turned back over to the Town to decide what to do with it. However, it cannot be gotten back and received again. It has been a very thoughtful process to set this project up for risk mitigation. R. Day advised that a lot of it actually is going to be a year and a half because the project is a year and a half and the desire is to be transparent across the project of how the risk is being covered with hundreds of items estimated and carried in contingencies as the documents are further defined. The Consultant team reduces that from price which may go up as details make local status. As stated earlier, the project is 12% designed so these continue to be watched for things that we cannot control such as the tariffs. For instance, the cost of steel was carried there may be premiums of what may go up and details made local status. Fontaine's estimate was based upon amounts that were provided from historical data as well as working with subcontractors to learn of their pricing in the marketplace to provide an estimate that was within 1% of PM&C when reconciled at the end. With $137 million coming that close it was a concerted effort of both teams providing at the end of the day a number that will be protected as the budget for the project. This is at the low end of where the Town wanted to be on the budget, maintain and keep the budget and see where it falls on bid day. S. Turner advised of the appreciation for the level of work that was taken to bring the estimate and budget to the level it is currently. • S. Turner asked if that is enough risk and escalation to be taking into account at this point in time? It would be disappointing to realized that 10% was needed instead of 7.5% at the end of the day and this would bring forward value engineering. Are there any other projects that are in a similar phase to this project where the price escalation and contingency is much different from these percentages we are carrying? Should we put more in there to protect ourselves more? It is known that this is a big number but is it right? *L. Dore advised that we are trying to find that middle ground and there are many other communities sitting around similar to you and deciding upon what that right number is with the public and all are consistently approaching it the same way. Isolating those costs 4% above what would be ordinarily carried above the bubble we are carrying between the design contingency and the escalation costs. 4% on $137 Million. There is a construction cost index that we all pay attention to the Turner Construction Index how much will be the worst in the narrative and will that hit your project is somewhere between 2% and 3%, so with 4% going in is a reasonable number and where there are potential buckets of*

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		allowance that could be put in there to cover more risk and is completely at the Town's discretion. • D. Kelley advised that at some point when you go into bid alternates that when bids come in low you go with the more expensive alternate but if the bids come in low, you add back a value engineer alternate i.e. slate on the Town Hall Building which was less maintenance but a more expensive alternate. *L. Dore advised that once the budget is set and the project is going through design, the project will continue to be priced at the 30%, 60% and 90% and those are the truth tests for the project based on the time and where the market sits. If at 60% the estimate comes back and there is a substantial change from what is being discussed today, the discussion will be had before issuance of the bid documents to make decisions based on what could potentially be deducted change orders. There is still time to be able to look at it with a lot of people and it all depends on what is happening on the street. It is important to know the budget number that we are going in with and how comfortable we are with it and how to maintain that number through the next year and a half through value engineering and deductive alternates used as tools to maintain the budget alignment. We are not carrying deduct alternates going into the budget and we make sure that everything that has been asked for is covered for risk escalation and using our tools to maintain the budget* • D. Allan asked the $137,743,666 is just construction costs, correct? Next week we will see it with the OPM and Dore+Whittier final design and construction administration fees? *L. Dore advised that there will be another 20% of cost, that will be allocated by line item and scope description. The SBC will know what each of those categories are i.e. OPM Fees, Designer fees, loose furnishings, and consultants we need to carry through the Construction Administration period for testing of hazardous materials, etc. and those items will be delineated for the SBC by this Friday for a discussion on it on Monday, March 31, 2025.* D. Allan asked if the SBC will know what is eligible and ineligible from MSBA? L. Dore advised that it will not be known until the MSBA Board Meeting in June 2025.*. Dore+Whittier will have a preliminary idea of what will be eligible and ineligible like it was understood and could be a subject of negotiation with MSBA about caps, ineligible potential spaces with their formula. It will also be provided with the local share of that will be and subject to the negotiations and agreement with the MSBA on the full project budget R. Philip advised that similar to those in the last phase in the MSBA comments, their commentary will indicate that certain spaces were considered ineligible i.e. 6,000 sf of gymnasium but at the end of the day, will be the final number and that will not be known until the MSBA votes on it. June is when they vote on it, June 25, 2025 and it is when the MSBA will approve the project budget and scope agreement. The MSBA will approve*

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		the full project cost, the Town's reimbursement rate, and the maximum share from the State will be • J. O'Connell advised that the next meeting of the SBC will be July 22, 2025 based on the meeting schedule in the packet. How will the SBC be communicating this information decided by the MSBA to the Wilmington community? The Fun on the Fourth event starts on June 25, 2025 which is the same day as the MSBA meeting with the decision regarding this project. *J. Leduc advised that the plan for communicating the update to the public was to have the SBC meeting on June 25, 2025 to present the information regarding the project costs. It was learned that the Fun on the Fourth was having its kickoff that evening of June 25, 2025. During said meeting that will be virtual and in person will be provided to allow the committee to absorb the information provided by MSBA and Dore+Whittier so that it also can be shared with the Wilmington community as well at Fun on the Fourth. E. Slagle advised that the SBC and leadership will have a good idea of what the numbers will be before we get to the June 25, 2025 meeting due to the information shared back and forth and the leadership being privy to. The Town leadership will know maybe not to the penny of where these budget numbers will fall but a fairly good idea of the direction in which they will be moving will be known before getting to the June 25, 2025 MSBA Board Meeting. L. Dore advised that the project will be very close with its calculations but what the maximum share will be for the MSBA but it will not be definite until the MSBA Board vote.* • M. Gallezzo advised that it is not known if we want to start communicating to the public until it is known what the Town of Wilmington is going to put in also. Is that something we want to communicate what the MSBA reimbursement is? Communicate what the Town is going to put towards the project as a whole? *E. Slagle advised that what will happen once the Town gets into that ballpark, that will drive the Town Manager's meetings with the Select Board and the Finance Committee about how the Town is going to get to that ballpark, give or take a couple million dollars and whether or not the Town is going to use some or most of the Capital Stabilization Fund and how the Town will program and structure the debt and by June 25, 2025 that should already be in place. It does not need to wait until the summer and it can be worked on between now and June 2025 but it is important to have a consistent message from June through September 2025 with regards to how the Town plans to pay for it. The tax number should be able to be worked out that day and once that number is received it should be known how the Town is going to use any free cash or spend any Capital Stabilization Fund.*
31.05		**Working Group Updates** **Public Relations Working Group** J. Cusce advised that the SBC and the PR Working Group have secured a table at the Fun on the Fourth event on June 25 through June 29, 2025.

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		There is a Signup Genius updated by M. Camoscio where members of the SBC can sign up for timeslots to staff the table and update the community about the latest developments of the project. There is some fine tuning on the time slots and it will be distributed soon in order to get coverage for the Fun on the Fourth event starting on June 25, 2025. Saturday and Sunday are the busiest days so it would be good to get the most help possible from the SBC after the PR Working Group has had a chance to review further. • J. Leduc asked if the Water Bill should be discussed now and asked if J. O'Connell wanted to discuss its status. There are physical copies of the Water Bill flyer that are available to the SBC in the room and J. O'Connell has received some feedback from a few people on the draft suggested putting a perimeter border around the picture and asked R. Philip to convey her concern about how the border line around the perimeter border. ○ R. Philip advised that it was suggested to place the outline of perimeter of the existing building on the plan and the concern is the outline will appear very small on the plan and may add confusion to those seeing it as to the purpose of the perimeter lines. If there is an overwhelming response, the outline would be placed onto something a little larger but not on the flyer. *D. Kelley advised that it would be helpful to have it perhaps on the location where the QR code will bring you to for the plan if it is not included on the flyer. This way it will be more visible as needed for those who choose to see it.* • J. O'Connell advised that it was requested that "proposed" be placed on the flyer as well so that the Wilmington community know that this project is not a "done deal" and that there are specific actions required in terms of Special Town Meeting and Ballot Vote in addition to the discussion later on this evening about a potential name change for the project. If there were a decision to make a name change this evening, then the name change would take effect and be reflected on this water bill flyer. J. O'Connell advised that there was some concern over the statement "Help Shape the Future of Wilmington Elementary Schools" and whether or not we are over promising in that message that people can come in and talk about anything and everything about the project and potentially get a change. For example, the SBC has already voted for what the preferred option is so it does not want to be misleading that people can change it to the Woburn Street or the Wildwood Street School site(s). However, as heard in this meeting and in the Leadership Meeting earlier in the day, it has been stated and clearly conveyed that not everything in this program is locked down as the project is at 12% of design. This project is locked down and that people still have the ability to help shape the future of this school and encouraged to come to the forums that we will be talking about later. The illustrations shown tonight are not

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		100% voted in and locked in by the Committee. There is still time for community engagement for people to bring their ideas, thoughts and opinions. Another piece of feedback is that it should be conveyed to the Wilmington community that there is a tax in that it will be eye-catching to residents and perhaps incentivize them to come out and speak to something if they knew there was going to be a tax impact. *D. Kelley advised that he is constantly talking with people in the community and is always shocked at a meeting like this one that there is not more public present to participate and be involved in the conversation. We are talking to dollar amounts and with all that is able to be read on Facebook we do not get a lot of community related discussion on the Wilmington Apple. There may be a lot of people online right now and watching at home and it is always a surprise.* • J. O'Connell advised that the finalization of the Water Bill flyer needs to be moved on as soon as tomorrow. If anyone from the SBC feels impassioned to share something that just does not sit well with them, it would need to be addressed now to move forward drawing a line in the sand and move forward. The intent of this in simple fashion is to convey the dates since we do not have a dollar amount at this time and what actions is required to get out there as there is a Special Town Meeting Vote in September 2025 and then a Ballot Vote shortly thereafter. We will have other opportunities to convey public messaging and J. O'Connell's thought process is that if we try and do too much with every publication, the potential of missing the mark increases. Between now and September 13 and 16, the most compelling story that the project right now are those dates and we know the dollar amounts are coming. Another opportunity to convey these dollar amounts will be available when the numbers are more accurate. The QR code shows where the project is at 12% design and the community's vote does matter and with the name change feedback, it can be included as well. It is very small and a snapshot in time with the deadline being April 1, 2025. *D. Allan advised that it was her suggestion as to the placement of the perimeter of the existing North Intermediate School on the plan and it would be included on the website. The Seniors may have difficulty accessing this item via the QR code as it is challenging to access for them on their devices.* • M. Gallezzo asked if there would be a different cost if the flyer were a full sheet of paper instead of a half or ¼ sheet of paper? Is this something that would have to be folded and given to the printer? *J. O'Connell advised that the Town uses a third party and in this instance it would have an impact because the Town has another insert going into the Water Bill coming from the DPW talking about the water restriction usage and it is important that the items would need to be weighed in order to make sure the postage was not tripped for an increased cost to*

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		the Town. J. O'Connell advised that in this instance it would potentially change in cost if it was a full page. • M. Gallezzo asked when the next Water Bill goes out? M. Gallezzo advised July for August 2025 and advised that perhaps it is something that could be done in July for the August quarterly mailing for a full sheet to be placed into the Water Bill. *J. O'Connell advised that anything is possible.* • Community Forum No. 6 has been made virtual as well as in person on March 31, 2025 at 6:00 PM in the Large Group Instruction Room at the Wilmington High School and followed by the School Building Committee Meeting at 7:00 PM. The flyer is in the packets and will be distributed through Tracy Ingersoll with the updated Zoom Meeting link. • Abutter Meeting will be held in May 2025 as advised by J. O'Connell. It may be something that you will want to reconsider location and technology for the May Abutters meeting due to the acoustical issues that were experienced at the North Intermediate School during the last meeting. K. Lord may be able to assist with these arrangements and accommodations. More details to follow. **Sustainability Working Group** The Sustainability Working Group has met twice. • During PSR phase the project was tracking LEED-Schools v4 "Silver" + 4% additional reimbursement with the tracking of 55 points out of a 50 point minimum. • In Schematic Design, the project is currently tracking LEED-Schools v4 "Gold" + 4% additional reimbursement while tracking 64 points with a 50 point minimum. • Once developed more design information, the project is tracking 64 points which is LEED-Schools Gold. • There are a lot of decisions that go into this to get it finalized for the upcoming submission. This is just a brief recap. • The baseline for LEED-Schools v4 is "Silver" and the project was tracking Silver + 4% additional reimbursement through PSR but during the Schematic Design process and reviewing the number of Yes and No in the LEED Matrix it was discovered that the project actually was carrying 64 points which is equal to LEED-Schools v4 "Gold" which is even better. *L. Dore advised that MSBA will tell you to be a part of our program your baseline will need to be LEED-Silver which is 50 points but if the project is looking for more, there are 4 extra points available, 3 of which come from hitting the Massachusetts Stretch Energy Code with the HVAC decisions, 5 of 7 points out of the indoor air quality category which through this process are moved forward and Dore+Whittier are comfortable hitting both of those measures to be considered capturing those whole points that are available.*

Item No.	Action	Discussion
31.06	Record	**Public Comments** – None
31.07	Record	**Discussion and Committee Questions** – **Reorganization of the School Building Committee Chairperson** ○ E. Slagle appreciates all that G. Brand has done for this project and there is an opportunity to maintain the momentum of the project. ○ **E. Slagle made a motion to vote Judy O'Connell as the Chair of the Wildwood School Building Committee effective May 5, 2025. Motion seconded by D. Kelley.** ○ **Roll Call Vote Taken: Unanimous vote. S. Scott did not respond. *K. Caira announced his presence at the SBC Meeting.*** ▪ S. Turner asked for clarification that assuming that in terms of Superintendent of Schools or whatever term they served and the following Permanent Superintendent of Schools, would both by members of this Committee and the Leadership Committee even if they are not the Chair, correct? *G. Brand understood that the Chair could be any member of the School Building Committee and was not specific to the role of Superintendent of Schools or School Committee as there is representation of these Committees on this School Building Committee. It was in conversation with the previous town management to have the Superintendent of Schools as the Chair. E. Slagle advised that it is a kind of ex-officio position so if the interim Superintendent of Schools and the permanent School Superintendent were intended to be members of this and that role would be on that Committee and then the Leadership on the Leadership. Once there is no longer an interim Superintendent, then the Permanent Superintendent of Schools will be all that is needed once the transition occurs.* ○ **J. O'Connell accepted the Chair role for the School Building Committee.** ▪ D. Ragsdale commends V. Varbedian's role as Vice Chair of the School Building Committee as she has done considerable work with the Leadership Team and he feels equally confident in her taking charge of the Committee as she has done at times in Dr. Brand's absence.

Item No.	Action	Discussion
		▪ M. Gallezzo advised that originally the Finance Director was a part of this Committee and welcomes E. Slagle and J. O'Connell to put some policy in place to backfill some of these positions that were not filled with those who have replaced. When the Finance Director left that position was not filled and it should be. There seems to be a kind of drop off and not fill them that has occurred. This committee is very large and it should not be this large. It would be beneficial if going forward there was some sort of policy to balance out the Committee. – **Renaming the Project** was voted upon and rescinded with discussion on 2 occasions during the meeting. Of the 4 shortlisted names, two contained North Elementary or Northside Elementary and these names were contrary to sentiments of the Town leadership at the outset of this project. The desire is to unify the Town not divide it so it was not chosen to move forward with North within its name. There was no decision to choose one of the names and the project will stay the course with Wilmington Elementary School. The project will continue to be Wilmington Wildwood School project with regards to all filings with the MSBA. None of these would end up being the name of the school after it is built. *[Some of the discussion is captured below and more can be found on the video starting at 1:36:00 until 2:22:00.]* ○ E. Slagle advised that when the consolidated project in October had an opportunity to change its name, there was no decision to change the project name. That was nearly 6 months ago and this decision is still perhaps not the best one with 6 months left before the appropriation vote and ballot vote. Wilmington Elementary Consolidation Project or Wilmington PreK-5 Consolidation Project were the 2 options that were not associated with the sides of the Town of Wilmington and spoke to the nature of the project for the Town. M. Gallezzo advised that she agreed with E. Slagle that changing the name of the project at this time would only cause more confusion for the Wilmington community and could result in there being an assumption that there are 2 projects going on when there is only 1 just with a change of names. ○ S. Turner advised that despite the name of the project, we need to go back to the meeting that was at the Shriners Auditorium and put some of the materials on consolidation together with material to build up to the September vote to remind people of what the nature of this project was supposed to be. Those stating that this was only supposed to be the Wildwood Project and it was changed, the project did

Item No.	Action	Discussion
		not change as from that day at Shriners Auditorium and forward this project has been about consolidation regardless of what the project is called. Should this name reflect that it is more than Wildwood? As it started out as a consolidation of 6 schools and now it is at a consolidation of 3 schools. o V. Varbedian advised that the biggest push will be the last 6 months of the project before the vote. If the name is going to change, now is the time. – **J. O'Connell made a motion for the project to continue to be called the Wilmington Elementary School project. Motion seconded by V. Varbedian. M. Gallezzo amended the motion to take no action.** **Schedule Updates** – **Abutters Meeting** – sometime in May 2025 – **School Building Committee** - Merging the May 20, 2025 and the June 2, 2025. – Take no action on this schedule until April 15, 2025 SBC Meeting.
31.08	Record	**Correspondence** – Questions submitted to the Wilmington Public Schools and/or Town Manager's office are shared with the SBC and will be incorporated into upcoming Frequently Asked Questions.
31.09	Record	**Next Meeting:** Following the **Community Forum** at **6:00 PM Monday, March 31, 2025** at **7:00pm Wilmington High School, Large Group Instruction Room**
31.10	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **E. Slagle motioned to adjourn. V. Varbedian seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	March 25, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting: **Wilmington High School** **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**	Meeting No.	31
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – March 5, 2025
3. Design Update (*Votes May Be Taken*)
   - Cost Estimate Update
4. Working Group Updates
   - Public Relations Working Group
     - Community Forum
5. Discussion/Correspondence/New Items
   - Reorganize the School Building Committee's Chair Person (*Votes May Be Taken*)
   - Review and Approve Project Name (*Votes May Be Taken*)
   - Review and Approve Schedule Updates (*Votes May Be Taken*)
6. Committee Questions
7. Public Comments
8. Next Meeting: **Monday, March 31, 2025**
9. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

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Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	March 31, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	7:00 PM
Location:	Hybrid Meeting:	Meeting No.	32
	Wilmington High School **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**		
Distribution:	School Building Committee Members		

1. Call to Order
2. Approval of Minutes – March 25, 2025
3. Discussion and Approval of Project Scope & Budget Documentation (*Votes May Be Taken*)
4. Design Update (*Votes May Be Taken*)
5. Discussion/Correspondence/New Items
6. Committee Questions
7. Public Comments
   - Next Meeting: **Tuesday, April 15, 2025**
8. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	03/31/2025
Prepared by:	Sarah A. Traniello	Meeting No:	31
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	*Dennis Kelley*	Present
Gregory B. Bendel	*Remote*	*Craig Miner*	Present
Kate Bissell	*Present*	*Christine Murray*	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	*Absent*	*Christine Prendergast*	Present
Michael Camoscio	*Present*	*Paul J. Melaragni*	Present
Justin Cusce	Present	*David A. Ragsdale*	Present
Marianne Gallezzo	*Remote*	Paul Ruggiero	Present
Nicholas Golden	Present	*Stacey Scott*	*Absent*
Christine Holloran	Present	R. Eric Slagel	Present
John C. Holloway	Absent	Stephen Turner	Present
		Vivian Varbedian, *Vice Chair*	Present

SMMA OPM

Julie Leduc, Director, OPM Services & Project Manager	Present
Sarah Traniello, Assistant Project Manager	*Absent*

Dore+Whittier Architects

Donald Walter, Principal-In Charge	Remote
Lee P. Dore, Principal, Designer	Present
Rani Philip, Project Manager	Present
Bryce Taft, Designer	Present

Fontaine Bros.

David Fontaine, Jr., CEO	Absent
Rob Day, Project Executive	Present
Mark Abdella, VP of CM Services	Present
Chelsea Mutrie, VP of PreConstruction	Remote
Chad L'Ecuyer, Project Manager	Present

Item No.	Action	Discussion
32.01	Record	Chair, Glenn Brand, called the meeting to order following Community Forum No. 6. Roll Call of the School Building Committee was performed by V. Varbedian to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person. K. Caira and S. Scott did not announce their presence during roll call.

Item No.	Action	Discussion
32.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the March 25, 2025 School Building Committee Meeting would be presented at the April 15, 2025 meeting as they were not ready for approval due to the close proximity of this meeting.
32.03	Record	**Approval of Project Scope and Budget** L. Dore reviewed the Project Scope and Budget history with the Preliminary Design Program having and estimated project cost range of $194M to 214.5M which equates to $1,156 to $1,278 per square foot of school. The Schematic Design Construction Cost Estimate came in at $137.7M and Dore+Whittier has been working with the Town Manager, SMMA and Fontaine Bros. over the last week on the 3011 Form to come up with the full project cost. This includes the construction costs plus all of the soft costs that include furnishings, technology, design, management fees and contingencies. Estimating is being done out until the start of construction which is about 18 months. As a group, it was important to make sure that the project was risk protected as there is only one bite at the apple to go out to the Wilmington community in order to have the project approved at Town Meeting for appropriation and Ballot Vote to support this school project and this budget. We had looked from the PDP phase which became $177.6M to $196.3M by the Preferred Schematic Report phase which is $1,086 to $1,200 per square foot and currently at the completion of Schematic Design the Estimated Project budget is $173,250,626 which is $1,037 per square foot and this is for a construction cost of approximately 18 months from now. The project is on budget and a concerted effort has been made to keep the project on budget as the project design moved through the phases while incorporating decisions of the SBC during the course of the its development. The project is on the very low end of range of the pricing and it is a good place to be for the school project. It is felt that enough contingency has been added to take care of enough of the unknowns from a design perspective. There is Design Contingency in place to cover the items that Fontaine Bros. has not seen as Dore+Whittier has not drawn them yet at this stage in the design. A good idea of what goes into the design for what is needed to complete the building but there are some unknowns that this contingency will cover. Fontaine also carries contingency within their cost estimating for that same reason. Outside of construction on the owner's side of soft cost contingency there are Owner costs that have been talked about with construction contingency which is hard cost contingency which is 5% of the project cost and there is another soft cost contingency for those parts of the project that could not be expected at this time in the project. It is important to know that money can be moved from one line item to another if it is not being spent as there is risk protection in place. If the risk does not show itself, then the money can be moved within the budget to accommodate. If budget is not expended by the end of the project, the money would go back to the Owner. • E. Slagle advised that the time with L. Dore and J. Leduc spend on this 3011 form this week was appreciated in addition to the resource of information pulled down from the MSBA about the soft costs and hard costs have been historically for other

Item No.	Action	Discussion
		elementary school projects in the pipeline since 2014 to have an idea of what should be planned for this project. Analysis of the percentages for these costs and comparing with the project's costs shows that the costs that are captured in this project are reasonable as there is an extra buffer that can help plan for what is in question currently with the tariff issue and other costs that are outside of the control of the project that have the potential to impact. It is good to see that it is all baked into the number and still the project cost is coming in under the range that was projected, is a good place to be on this project. These include the OPM and Designer fees that will be consistent with what other projects that have been done since 2014. • C. Prendergast confirmed that the $173M amount is the amount before the reimbursement from the MSBA and there will be a portion that the MSBA is reimbursing the District for and the Wilmington community will be responsible for its portion. N. Golden advised that the $173M amount also includes all of the furnishings, fixtures and equipment and an estimated reimbursement rate that is included. N. Golden asked what this reimbursement rate is based upon? L. Dore explained *the Construction Cost will be based upon everything that is in Fontaine Bros. contract and Project Costs are those that are outside of that so it is all of the new furnishings for the new school, the new technology that will go into the new building, Design Fees, OPM Fees, insurance costs and many layers of contingencies make up the difference. The reimbursement rate in this 3011 form is based upon formulas that make up the reimbursement rate that is in fine print that is baked into this workbook that represents incentives, caps, and in there also includes their base reimbursement rate for Wilmington. There is 1 incentive point for Maintenance because the District has done a good job maintaining these buildings over time. The direction of this Committee is that there is a desire for a sustainable building and 4 points were a reasonable cost to collect all 4 available Sustainable Green points. There are 5 extra incentive points in addition to the base rate and MSBA needs to review and come back to agree with these calculations in order to state what the reimbursement rate will be for this project. The MSBA grant will be looked at to see how the cost to the District can be brought down as a local share.* • M. Gallezzo asked about the contingencies that are in the amount? *L. Dore advised that there is 12% inside of the Construction Cost plus an additional 6.5% outside which is 5% for Owner's Construction Contingency and 1.5% for the Owner's Service contingencies and those that are expended with these Owner Contingencies have decisions that rest with the School Building Committee for the project. J. Leduc advised that there is a hard cost contingency which is where the Change Order decisions approved by the SBC for the construction and purchases for the project will come out of and the Soft Cost*

Item No.	Action	Discussion
		Contingencies where consultant service costs that are approved by the SBC will be covered. Both of these contingencies, hard and soft cost, are only exercised through approval decisions made through the School Building Committee. • S. Turner asked if 18.5% is enough contingency that is needed so that the children and educational program is not impacted in their needs for the new school. *P. Melaragni advised that it is estimated that the reimbursement would be approximately 52.84% for the District* which would add up to a $50M reimbursement which would be a cost of approximately $113M for Wilmington and it could potentially go even lower with some creative ideas on the Town side. V. Varbedian advised that there will be a portion of the items that will be deemed eligible and ineligible of the costs as also seen on the 3011 form by the MSBA so it will not be an exact 52.84% as it will be on a case-by-case basis. • D. Allan asked where the reimbursement rate was derived from? *J. Leduc advised that the MSBA has Wilmington's reimbursement rate listed on its website as 47.84% plus the five (5) incentive points would bring the reimbursement rate to 52.84%.* D. Allan asked if the 18% contingency takes into account inflation? L. Dore advised that it is an attempt to account for future escalations so that contingencies are built into the project. E. Slagle further advised that the reason why there is no specific reimbursement rate that can be confirmed at this time is because the Schematic Design Report together with the 3011 and the Project Scope and Budget need to be reviewed by the MSBA and confirmed that these are all in agreement and within their scope relating to eligible and ineligible spaces. If these are not in agreement, there will be conversations had to review and work with the MSBA so everyone is on the same page with the goals, needs, and scope for this project. • K. Bissell noted that there was a higher than the limit for FFE that is within the 3011 form and acknowledged that it would be based upon the 755 enrollment rate but it does not include the PreK-K population that would be part of that number. Does this additional amount over the cap account for the additional student population that would be the PreK-K? *L. Dore advised that yes it does and that is why the number is higher than the cap and it will need to be taken into consideration due to the enrollment being higher to include the PreK-K students population. The budget line item is account for $2,200 per student for 755 students and the FFE needs over and above that is in line with those that are being seen in the marketplace for PreK-K spaces currently in the process. D. Kelley advised that there is the potential of lowering the cost of FFE as well in the process of the choices of items i.e. lighting. L. Dore advised that Basis of Design products have been chosen for the project that come within the budget that has been set to date and*

Item No.	Action	Discussion
		Massachusetts Public Procurement requires the Designer to have 3 equals for every product and that is what Fontaine has based their pricing upon as well. This is the bar that the design has been started with and it is not an extravagant one and a lot of time has gone into this project to determine what these materials and products are as the SBC has been very clear with the priorities to keep this project not extravagant and keep it within the budget cost and watch to make sure that these prices are not fluctuating. This will be done with 3 more estimates performed after the appropriation vote and this will be the check to ensure that the project is still falling within range of the budgeted amount and see how it is going as the design is further developed. This will assist in determining whether there needs to be a change in course for material selection and reprioritize as needed. It is not desired to cut budget that is set out for the educational program • D. Allan asked if the fees of the Designer and OPM are standard for the project? *E. Slagle advised that the OPM and Designer fees are in alignment with those that are for projects of this type and size in the Commonwealth of Massachusetts. Having reviewed the data on the MSBA site from the last 10 years has been performed to confirm for elementary schools.* **V. Varbedian made a motion to submit the Project Scope and Budget to the MSBA as written. N. Golden seconded the motion. Roll call vote resulted in a unanimous vote, motion passes.**
32.04	Record	**Public Comments** – None
32.05	Record	**Discussion and Committee Questions** – None
32.06	Record	**Correspondence** – None
32.07	Record	**Next Meeting: Tuesday, April 15, 2025**
32.08	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **E. Slagle motioned to adjourn. C. Prendergast seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

Town of Wilmington
Wilmington School Building Committee
121 Glen Road Wilmington, 01887

Meeting Minutes
Thursday, April 3, 2025

Dr. Glenn Brand called the meeting to order at 6:00 PM.

Ms. Vivian Varbedian proceeded to make a roll call of attendance.

Present: Diane Allan, Greg Bendel, Glenn Brand, Kevin Caira, Michael Camoscio, Maryanne Gallezzo, Nicholas Golden, Dennis Kelley, Paul Melaragni, Greg Minor, Judy O'Connell, Paul Ruggiero, and Eric Slagle.

Absent: Kate Bissel, Justin Cusce, Christine Holloran, John Holloway, Christine Murray, Christine Prendergast, David Ragsdale, Stephen Turner, and Stacey Scott.

DISCUSSION OF CONSULTANT CONTRACTS

Dr. Brand turned the room over to Mr. Slagle. Mr. Slagle made committee members and viewers at home that the contract for OPM and Design Services are structured by MSBA to expire at the end of Schematic Design Phase. For purposes of the OPM contract, after multiple meetings with the Leadership Teams, SMMA, MSBA, Town Counsel, and various Committee Members, it has been determined that the Town will not be moving forward with SMMA acting as the OPM for the construction phase of the project. Mr. Slagle added that the town had chosen not to exercise the option to make a change in key personnel, rather SMMA has indicated that they would amicably part ways.

Mr. Slagle explained that the town would need to go out to bid for OPM services and that MSBA has provided an outline of how that process would look. A request for services will need to be submitted by April 17th, 2025. Mr. Slagle provided an overview of the required advertising requirements and timeline, resulting in the approval of a new OPM in early July. Mr. Slagle clarified that the Schematic Design Phase would not end on May 1st in conjunction with the submission of the Schematic Design but would end after the June 25th MSBA hearing; SMMA would be assigned to the project until then.

Mr. Slagle explained that Dore and Whittier, as well as the Construction Manager At-Risk firm, Fontaine Bros., Inc., had been notified of the Towns standpoint. Mr. Slagle added that despite parting ways with SMMA, the town still has two excellent firms assigned to the project. Mr. Slagle added that the two firms would be responsible for establishing preliminary estimates, and that SMMA offered $35,000 from their contract for Fontaine Bros., Inc., and Dore and Whittier to do so.

Mr. Slagle informed the Committee that the new OPM will be hired within the budget that was submitted with the 30-11 form. Mr. Slagle explained that most OPMs are aware of similar situations happening, and that he was aware of multiple firms looking forward to bidding on this project.

Mr. Slagle stated that he is fully prepared to execute an amendment with Dore and Whittier for them to continue their services through the construction phase of the project. From his perspective, he was impressed with their flexibility and ability to listen to what the town is saying and bring the design closer to what the town wants. Mr. Ruggiero agreed with Mr. Slagle. Mr. Golden expressed that he was impressed with how they handled the abutters meeting. Mr. Bendel stated that he had been impressed with Rani Phillips of Dore and Whittier, specifically her thoroughness and ability to answer questions. Dr. Brand added that behind the scenes communication has been excellent, and that they have been wonderful to work with. Ms. Allan agreed, stating that she was pleased with their performance so far.

Dr. Brand asked Mr. Slagle if the committee would need to take any action at tonight's meeting with respect to either contract. Mr. Slagle clarified that the committee would be voting on an extension of the Dore and Whittier contract later in the summer.

Ms. O'Connell stated that Mr. Slagle had taken a very methodical approach as a new manager, not rushing any decisions, reaching major milestones in the process, and reaching a collective decision. Ms. O'Connell also added that MSBA had reassured the town that changing OPMs would not negatively affect the project. Mr. Bendel added that the Yentile Farm Project had seen a change in management, and the project had turned out quite well.

VOTE TO ESTABLISH AN OPM REVIEW COMMITTEE (VOTES MAY BE TAKEN)

Mr. Slagle noted that he had asked folks to participate as members of the OPM Review Committee, and that the committee will have a window of May 21st through June 11th, to shortlist firms, interview, have a meeting to select an OPM and to prepare a selection package to provide MSBA. Mr. Slagle stated it would be beneficial to have Mr. Kelley on the Committee, along with Paul Melaragni, Paul Ruggiero, and Judy O'Connell; given their experience and involvement with the project. Mr. Slagle stated that one more member is needed. Ms. Allan volunteered, explaining that she had been involved in a similar process for the Senior Center.

Mr. Slagle made a motion to appoint Mr. Kelley, Paul Melaragni, Paul Ruggiero, Judy O'Connell, and Diane Allan to the OPM Review Committee, seconded by Craig Minor and voted unanimously:

VOTED: To appoint Mr. Kelley, Paul Melaragni, Paul Ruggiero, Judy O'Connell, and Diane Allan to the OPM Review Committee.

DISCUSSION/NEW ITEMS

Ms. O'Connell advised that the water bill inserts had been completed by Shawsheen Tech, and had come out great. These will be delivered to the Treasurer/Collector's Office by April 17th. Ms. O'Connell thanked Mr. Camoscio for establishing a working relationship with Shawsheen Tech, as he had handled the prior water bill insert order. Dr. Brand also thanked Mr. Camoscio for bringing up the Fourth of July Celebration and how to incorporate advertisement materials into the event.

ADJOURNMENT

At the conclusion of the discussion, being no further business, a motion was made by Ms. Varbedian for the Wilmington School Building Committee to adjourn, seconded by Mr. Craig and voted unanimously:

VOTED: That the Wilmington School Building Committee adjourn.

The meeting adjourned at 6:27 pm.

Respectfully submitted,

_____

Thomas F. Donahue

AGENDA FOR WILDWOOD SCHOOL BUILDING COMMITTEE MEETING

April 3, 2025 @ 6:00 p.m.

Town Hall, Room 9, 121 Glen Road, Wilmington

Hybrid Meeting for Committee Members

1. **Call to Order**

2. **Discussion of Consultant Contracts** (votes may be taken)
   a. OPM Contract
   b. Designer/Architect Contract

3. **Vote to Establish an OPM Review Committee** (votes may be taken)

4. **Discussion/New Items**

5. **Adjournment**

RECEIVED
TOWN CLERK
2025 APR -1 PM 4:48
TOWN OF WILMINGTON, MA

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Agenda

Project Name:	Wilmington Wildwood School Project	Project Number:	22127
RE:	School Building Committee	Meeting Date:	April 15, 2025
Prepared by:	Julie Leduc and Sarah Traniello	Meeting Time:	6:30 PM
Location:	Hybrid Meeting: **Wilmington High School** **159 Church Street, Wilmington, Massachusetts** **Large Group Instruction Room** and **Zoom Webinar:** **https://wpsk12.zoom.us/j/83577025187?pwd=cAMl4Rs4iYaPdh4DoHQTNSnWq5XMom.1**	Meeting No.	33
Distribution:	School Building Committee Members		

1. Call to Order
   - Approval of Minutes – March 25, 2025, March 31, 2025 and April 3, 2025
2. Approval of Invoices
   - Warrant No. 23
3. Design Update *(Votes May Be Taken)*
   - Cost Update
   - Schematic Design Report
   - Approval of Schematic Design Report Submission to MSBA
4. Working Group Updates
   - Public Relations Working Group
5. Discussion/Correspondence/New Items
   - Upcoming Meeting Schedule
     - Abutters Meeting: Tuesday, May 13, 2025 @ 6:00 PM *(Tentative)*
       North Intermediate School Cafetorium
6. Committee Questions
7. Public Comments
   - Next Meeting: **Tuesday, June 3, 2025**
8. Adjourn

The items listed are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items may in fact be discussed and other items not anticipated may also be brought up for discussion to the extent permitted by law.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	04/15/2025
Prepared by:	Sarah A. Traniello	Meeting No:	32
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan	*Remote*	*Dennis Kelley*	Present
Gregory B. Bendel	*Present*	*Craig Miner*	Present
Kate Bissell	*Present*	*Christine Murray*	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	*Remote*	*Christine Prendergast*	*Remote*
Michael Camoscio	*Remote*	*Paul J. Melaragni*	Present
Justin Cusce	Present	*David A. Ragsdale*	Present
Marianne Gallezzo	Absent	Paul Ruggiero	Present
Nicholas Golden	Absent	*Stacey Scott*	*Remote*
Christine Holloran	Present	R. Eric Slagel	Present
John C. Holloway	Absent	Stephen Turner	Present
		Vivian Varbedian, *Vice Chair*	*Remote*

SMMA OPM

Julie Leduc, Director, OPM Services & Project Manager	*Remote*
Sarah Traniello, Assistant Project Manager	*Absent*

Dore+Whittier Architects

Donald Walter, Principal-In Charge	Remote
Lee P. Dore, Principal, Designer	Absent
Rani Philip, Project Manager	Present
Bryce Taft, Designer	Absent

Fontaine Bros.

David Fontaine, Jr., CEO	Absent
Rob Day, Project Executive	Present
Mark Abdella, VP of CM Services	Present
Chelsea Mutrie, VP of PreConstruction	Remote
Chad L'Ecuyer, Project Manager	Present

Item No.	Action	Discussion
32.01	Record	Chair, Glenn Brand, called the meeting to order at 6:30 PM. Roll Call of the School Building Committee was performed by J. Leduc to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person. **During roll call to open meeting M. Gallezzo, N. Golden, J. Holloway, C. Prendergast and V. Varbedian did not respond. M. Gallezzo, N. Golden,**

Item No.	Action	Discussion
		and J. Holloway did not announce their presence during the meeting and were absent for the entire meeting however C. Prendergast and V. Varbedian arrived via remote participation after roll call was conducted. All other members were present in person or through remote participation.
32.02	Record	**Approval of Minutes** G. Brand advised that there are 3 sets of draft minutes for approval with the March 25, 2025 School Building Committee Meeting, March 31, 2025 School Building Committee Meeting and the April 3, 2025 School Building Committee. • **G. Bendel made the motion to approval all 3 sets of meeting minutes with E. Slagle seconding the motion to approve.** S. Turner asked the question about whether or not it is possible to vote for the approval of the minutes is viable if member was not present for one of the meetings the minutes were drafted for. *P. Melaragni advised that a member can vote for the minutes if not present for one of the meetings.* • **J. Leduc conducted a roll call for the approval of all 3 sets of meeting minutes was conducted. C. Prendergast joined the meeting just prior. All present remotely and in person approved the meeting minutes and it was accepted unanimously.**
32.03	Record	**Approval of Invoices** G. Brand advised Warrant No. 23 has been submitted for approval that includes Dore+Whittier Architects' invoice of March 31, 2025 for approval in the amount of $69, 589.30. • **D. Kelley on behalf of the Finance Working Group recommends approval for this invoice in the amount of $69,589.30 with a second motion of made by G. Bendel to approve.** P. Melargani asked why there is a 10 percent charge on these invoices from Nitsch Engineering. R. Philip answered that it is because there is a 10 percent as Nitch Engineering is a subconsultant to Dore+Whittier. P. Melaragni asked if the Traffic Survey was completed and L. Dore advised that the Traffic Survey has been completed and the Town has a copy of the traffic survey for its use and reference. • **J. Leduc conducted a roll call for the approval of Warrant No. 23 was conducted. All present remotely and in person approved the meeting minutes and it was accepted unanimously.** • **C. Prendergast and V. Varbedian were both present and voted in the affirmative. C. Miner abstained from voting.**
32.04	Record	**Project Scope and Budget Update** R. Philip reviewed the correction of the record for the Schematic Design pricing that is $1,050 per square foot for the $173,250,626 Estimated Project Cost as well as on the 3011 Form for the MSBA where the square footage that was used originally was for the Preferred Schematic Report Phase as the square footage increased for the Schematic Design Phase

Item No.	Action	Discussion
		and it is indicated within the area circled in red. The square footage was updated in SD and the number has been incorporated into this Project Scope and Budget document. It did not have any impact on the project cost or construction cost because those amounts were based on the Schematic Design square footage. However, it did impact the soft costs because it made more of the soft costs available for reimbursement which works in favor for the District. The impact was about $57,000 more that will be eligible for reimbursement that was shown initially. It did not change the bottom line as it was just an adjustment for what is eligible and ineligible. There is a meeting on Thursday to review this form to review this document and an update will come forth from that meeting. P. Melaragni asked what the original square footage was for record. R. Philip advised of the square footage and advised that the amount of square footage was a couple thousand square feet and with the Art Room being added back into the program plus 2 office spaces. These spaces were in the plan but during the transfer of information it was account for as 2 offices but the actual need was 4 offices and there was a reduction from 6 to 3 of wellness rooms that were associated with the teacher collaboration spaces. It was a few thousand square feet. P. Melaragni advised that it was a difference of 1,472 square feet.
32.05	Record	**Schematic Design Package** R. Philip reviewed the Schematic Design Package that was sent out to the School Building Committee for their perusal with the contents that will be submitted to the MSBA updated them on where the Project stands in this process. There are 4 part of this submission with the first part being a submission of what was submitted to the Department of Education and gives idea of what has been prepared for Special Education. DESE will need to approve this as a part of this process. This will come back from DESE with their approval before the Schematic Design can be approved by the MSBA. The second part of the submission is the Schematic Design Binder with any design changes that have happened with the cost and approvals to date. Also included will the Schematic Design Project Manual containing the outline specifications and the Schematic Design Drawings containing the Site/Civil, Building Floor Plans, Roof Plans and the Interior and Exterior Elevations. These will show all of the materials and systems that go into the new building and it is what the recent cost estimate was based upon. • J. O'Connell asked what the hot spots are within the Schematic Design Submission that the SBC members should be reading and/or reviewing first as it has been broken out into components for ease of reviewing instead of as 1 large volume like the PSR was distributed for their digestion. *R. Philip advised that it will need to be reviewed at the user group level. It is broken out into sections so that it can easily be reviewed piece by piece. For example, the Sustainability Working Group might be more interested in specific sections vs. sections the Public Relations Working Group might be interested in reviewing or the Site/Landscape Working Group might be interested in reviewing, etc. Feel free to start with the Introduction and then*

Item No.	Action	Discussion
		continue to sections of interest. The report contains information that has been reviewed with the Committee by Dore+Whittier and SMMA prior to the submission. • D. Allan asked if the Schematic Design Report contains the cost of the 12,000 sf gymnasium? D. Allan further asked where the estimate for the cost of the 12,000 sf gymnasium vs, the 6,000 sf gymnasium can be found in the Schematic Design report? *R. Philip advised that a cost estimate for the 6,000 sf gymnasium would not be found in the Schematic Design Report. It would not be found in the report since the School Building Committee elected to proceed with the 12,000 sf gymnasium before entering into Schematic Design phase. Therefore, the 12,000 sf gymnasium was what Schematic Design cost estimate pricing was based upon.* • D. Allan asked how much exactly will the 12,000 sf gymnasium cost? *L. Dore advised that just before the School Building Committee decided to move forward with the 12,000 sf gymnasium, an estimate was generated to show the local share for what it would cost and it was around $8Million. Once that was established, the gymnasium placement, its design and the cost estimate, were based upon that decision. L. Dore advised that the Preferred Schematic Report would need to be referred back to see what the final verdict would be on the MSBA side of things related to reimbursement. The reimbursement discussion will come this Thursday when we meet with the MSBA and have a conversation related to reimbursement.* • S. Turner mentioned having attended a Yes for Wilmington Schools event on Sunday. He advised that there is an item within the DESE section, in the first document, that was felt to be very helpful not just for this subject but also for the PR Working Group. It showed the lower grades in the building in pink, the upper grades in purple, and public spaces in green. It was a very simple view but good visualization of how the building functions. It is something to have available when speaking with the community about how the building operates and it was a unique and different view from anything that had been put together before. When we were doing the space planning for the programming, there were areas that were really tiny but this view would be really helpful to those who need something tactile to visualize how the building will function.
32.06	Record	**Next Steps** R. Philip reviewed the Schematic Design next steps once the School Building Committee approves the Schematic Design submission that has been under review with the hyperlink provided to the documents. There will be a Project Scope and Budget Review with the MSBA, MSBA Review Comments from the Schematic Design Report submission will come forth. • Dore+Whittier and SMMA will continue to work with the Leadership Working Group on the responses to said MSBA SD Comments in preparation for the MSBA Board of Directors

Item No.	Action	Discussion
		meeting on June 18, 2025. *[Note: MSBA Board Meeting was moved from June 25, 2025 to June 18, 2025.]* ○ Particular attention will be made to provide the appropriate responses to the items that the MSBA requested to be incorporated in the Schematic Design report to ensure there is a full and thorough report and response. • There are 3 votes that need to happen in order for this project to move forward: ○ MSBA Board Vote of Schematic Design: June 18, 2025 ○ Special Town Meeting: September 13, 2025 ○ Debt Exclusion Ballot Vote: September 16, 2025 After these have been successful, the project will move on to finalize the Project Scope and Budget Agreement with the MSBA. Once this happens, the project will be moving into Design Development, 60% CDs, 90% CDs. There will be cost estimates performed again in the Fall working up to the Special Town Meeting and Ballot Vote by the Town of Wilmington. • P. Melaragni asked what happens if there is a huge disparity in the estimates at that time that are influenced by the tariffs that have been set in place by the Federal Government? *R. Philip advised that the dollar amount approved at Town Meeting and the Cost Estimates may have a larger delta than expected as a result. This will be something that is reviewed during the Project Scope and Budget Agreement processing with the MSBA. As discussed on March 31, 2025 within the Project Budget there are contingencies that have been set in place where a certain percentage has been held with the anticipation that there may be tariffs involved. The School Building Committee would be approving that Project Budget and the Project is going into the process with the knowledge that there is the potential for tariffs to be in place and contingencies have been put in place to cover a reasonable amount of tariffs should they be impacting the project. These are some of the unknowns that may be coming in the future and the project is trying to anticipate these unforeseen items that may influence the project budget. The contingencies have been put into place within a reasonable amount so that the project budget is inflated so much that there is a great amount of excess that we are trying to figure out. Discussions were had with L. Dore of Dore+Whittier Architect, J. Leduc of SMMA and the Town Manager, E. Slagle to see what the comfortable amount would be to move forward with and that is what has been included and as a Project we will continue to monitor it as time passes. We also have Fontaine Bros. at the table to help provide additional insight into the estimated amount that are coming in and set some real world perspective with outreach to trades. The function of the interim estimates throughout the process is to ensure that the project is still continuing to stay within budget as set out and enabling the project to look at any potential value*

Item No.	Action	Discussion
		engineering (VE) that may need to occur to stay within budget. Value engineering is the function of modifying or eliminating items within the project scope that might bring the project back into alignment with the budget as needed. L. Dore further expounded upon R. Philips description of the process where PM&C will perform an estimate for Dore+Whittier and Fontaine Bros. will do an estimate and then the estimates will be reconciled at each step along the way as the project gets more refined. As this goes along, there will be some check ins with the SBC if the budget costs are going off course and there is a need to do some strategic value engineering. In the early phases, there is the ability to reel it back in but as it is getting more developed there are less opportunities and there have been several items for Value Engineering to be used for in order to bring the budget back inline. It is not desired to go there but it is a possibility that it may be needed and it is built in as a part of that process. The contingencies and the unknowns for the tariffs are being built in to build enough of a safety net to cover the unknowns the are unable to be foreseen in advance. A balance has been achieved. • D. Allan asked when it will be known exactly how much reimbursement the District will get from the MSBA? It is understood that Dore+Whittier will be working with them constantly and going back and forth regarding all of these items justifying whether or not is being included in the project or not. When will the SBC get a good handle on that number? *J. Leduc advised that the MSBA Board Meeting is on June 18, 2025 and this is when the Board of Directors will be approving the project and approve the final number. We will have a ballpark number beforehand as we will be working with the MSBA but there are a lot of negotiations that go on with the form that is submitted to the MSBA relating to ineligible costs and eligible costs that we will be working with them on. For the public, a specific number will be able to be provided on June 18, 2025.* • G. Brand asked if is customary to have a 2 month period of time between the MSBA Board Meeting and the Special Town Meeting and Ballot Vote. For instance, Wilmington's MSBA Board Meeting is at the end of June and the Special Town Meeting is scheduled for September 13, 2025 and Ballot Vote on September 16, 2025. Is this customarily done like this on other projects you have worked on? *L. Dore advised that the Town of Wilmington has a lot of runway between the June MSBA Board of Directors Meeting and the Town Meeting and Ballot Vote to get word out to the community about the elementary school project. L. Dore advised that on another project that is underway the District opted to have the Town Meeting and the Ballot Vote before the MSBA Board Meeting and it is contingent upon the MSBA approval of the project. In the case of this project, we have some of June and through the summer to get the word out to the Wilmington community before bringing it before the Special Town Meeting and to*

Item No.	Action	Discussion
		Ballot Vote. To have a definitive number of what the MSBA will be providing for reimbursement and being able to communicate that to the Town is important. • The MSBA Board of Directors meeting is June 18, 2025 instead of June 25, 2025 as it was updated by the MSBA not long ago. • M. Camoscio asked whether or not there was a preferred method to respond to the documents that are being reviewed by the SBC. Is it preferred to place the comments in a Excel spreadsheet, Word document, or email and who should they be sent to and how should they be tracked. *J. Leduc advised that the responses or questions could be sent to Dore+Whittier Architects and they will be reviewed for integration into the submission as deemed appropriate before submitting to the MSBA for the Schematic Design.* • **Approval of Schematic Design Authorize SMMA and Dore+Whittier Architects to submit the Schematic Design Report to the MSBA on behalf of the School Building Committee and the Town.** ○ **Motion made by J. O'Connell and seconded by G. Bendel. Motion passed unanimously with Roll Call vote.**
32.04	Record	**Public Comments** – None
32.05	Record	**Discussion and Committee Questions** – Upcoming Meeting Schedule ○ Tuesday, May 13, 2025 Abutters Meeting to be held at 6pm at the North Intermediate School Cafetorium. Important to meet with the Abutters to work with them with respect to their feedback especially those whose properties are immediately in contact with the North Intermediate Site including but not limited to those within the neighborhood surrounding the school. ○ P. Melaragni advised that it would be nice to see some of the people invited to be from across Salem Street with the net for Abutter outreach to be a little bit further for this round so that more are included to provide their input. *S. Turner advised that the initial set of abutters have not had a chance to see the changes that have come forth in response to their feedback at their last abutters meeting is important to keep in mind. E. Slagle advised that the invitations for this Abutters Meeting will be those attending the first Abutters Meeting and another meeting will be scheduled afterward to broaden the invitation range of households to provide additional input. It is important for those immediately abutting the North Intermediate School site to be able to see first hand what their input resulted in for changes impacting the project so they are aware their input was listened to, amendments to the plan were made and these are the*

Item No.	Action	Discussion
		results as the project stands today as we move forward after submitting the Schematic Design Report. P. Melaragni advised that he is ok with this happening as long as a larger pool of abutters are invited with the next abutters meeting to garner their input as well. P. Melaragni advised that it would be unfortunate for people to come forth before the Town Meeting advising that they were abutters and their voice was not heard and they were not invited to the meeting(s) to learn about the project and give their thoughts and concerns. J. O'Connell advised that it is a listing of abutters that comes out from K. Rasche that is put out and signed off by the assessor. The intention is not to belittle any of the intentions set forth by P. Melaragni with his concerns. However, one of the abutters that would be part of the larger net would be the Avalon Apartment rentals that the quantity of people from the development along could potentially overtake those that are direct abutters. The Town is printing, mailing and distributing these through its mail house for these abutter mailings which takes time and funds to get done. It is ultimately the decision of this body to make it happen and there are also Community Forums in addition to the very public process that the abutters to participate in. D. Ragsdale advised that time is limited before the summer months are upon us and it is essential to take advantage of as many means of outreach that are possible and keep in mind the events that people will be able to attend. S, Turner advised that there are a few small streets off of Salem Street that have only 2 or 3 houses on them and are near the building and they should be included in the mailing as they would have some input on the project being so close but maybe outside of the range being reached to for Abutters. S. Turner advised P. Melaragni is on the right path with his thoughts and it is important to keep in mind the expense of these additional steps. J. O'Connell advised that if the outreach gets too large then it does not become the intimate working group that it was intended to be at the start. D. Allan advised that she would be interested in hearing from those who live across from the North Intermediate School site and give their input as well and understand the perspectives of P. Melaragni and J. O'Connell regarding the outreach and quantities of people participating and the objectives of the meetings being established. A lot of these neighbors are going to be interested in the traffic study and seeing how the bus circulation and vehicle circulation will be in and around the site.

Item No.	Action	Discussion
		○ J. Leduc reminded the remaining meeting dates need to be approved for the School Building Committee. With the Meeting of June 18, 2025 which replaced June 25, 2025, July 22, 2025, August 19, 2025 and September 23, 2025 need to be approved. ○ J. O'Connell clarified that the June 3, 2025, June 17, 2025 and the June 18, 2025 meeting are still on the calendar with the June 17th as a TBD. J. Leduc advised that the TBD is in case anything needs to be discussed or reviewed prior to the MSBA Board Meeting on June 18, 2025 meeting. ▪ **P. Melaragni made the motion to approved these meetings and E. Slagle seconded the motion. Passed unanimously.** – **PR Working Group** ○ G. Bendel advised that during the Working Group discussion he was going to add that it would be helpful to put some of the boards with the dates for the Special Town Meeting in September and the Ballot Vote in September at the Senior Center so that they will be there as reminders of these important dates for the Fall when they need to go to vote and provide their input. It is important to get these things in front of them as soon as possible so that they can be remembered to keep them updated throughout the outreach process. There is a lot of traffic at the Senior Center so G. Bendel would be happy to help with getting that done. J. O'Connell advised about reaching out to DPW to get the electronic messaging boards put into action to remind about the upcoming town meeting and ballot vote and additional information. ○ M. Camoscio advised that the water bill was successfully distributed through J. O'Connell and J. Cusce advised that last year at Town Meeting M. Camoscio and he were outside in the lobby with the boards advertising the project willing to answer any questions and handout any flyers needed to garner information about the project with the public attending that were interested in learning more. It would be helpful to have representation again this year. In addition M. Camoscio advised that there is a need for getting the Fun on the Fourth signup done with SignUpGenius as right now there are only 4 slots that have been filled and for the most part it is for Wednesday, June 25, 2025 and there are several additional slots available to get others to be involved in the outreach for the project. M. Camoscio advised that the Fun on the Fourth event had a lot of people who staffed the table least year that will not be present this year due to being away and participation

Item No.	Action	Discussion
		from members of the Committee will be very helpful and needed to make the event a successful one for outreach on the project. ○ J. O'Connell advised that most everything related to the Town Meeting and Town Elections goes through Beth Lawrenson, Town Clerk, and the Moderator. Anything that is displayed during Town Meeting would need to have their approval so that there is no uncomfortable moments about the contents of poster boards, The same goes for the polling locations as long as it is neutral in nature and not choosing one side over another. ○ G. Brand advised that he will be providing an update at the Town Meeting for the project in addition to scheduled meetings over the next 6 or 7 weeks with all of the PTO Groups for the students at all of the schools. All of the back to school nights have been scheduled for the beginning of school in preparation for the town meeting and ballot vote there will be an opportunity to meet with and discuss for learning about the project during those sessions. ○ The Woburn Street and North Intermediate School will be opened for people to tour and see the status of those schools for themselves. P. Melaragni advised that perhaps for the June 3, 2025 Community Forum it should be held at one of the schools to give the community an idea of the condition of these 2 schools currently so they can see for themselves.
32.06	Record	**Correspondence** – None
32.07	Record	**Next Meeting: Tuesday, June 3, 2025**
32.08	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **P. Melaragni motioned to adjourn. E. Slagle seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #25

December 17, 2024

smma

DORE + WHITTIER

Massachusetts School Building Authority

Agenda

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. Design Update
    - Project Aesthetics Visioning
    - User Group Update
    - Floor Plan Options
    - Site Investigation Outcomes
    - Building Systems
5. Working Group Updates
    - Public Relations WG
    - Sustainability WG
    - Site and Landscape Working Group
6. Discussion/Correspondence/New Items
7. Committee Questions
8. Public Comments
9. Next Meeting: Jan 14, 2024
10. Adjourn

Approval of Minutes

FOR APPROVAL

smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	12/3/2024
Prepared by:	Sarah A. Traniello	Meeting No:	24
Location:	Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee

Diane M. Allan
Gregory B. Bendel — Absent
Kate Bissell — Remote
Dr. Glenn Brand, *Chair*
Kevin A. Caira — Absent
Michael Camoscio — Remote
Justin Cusce
Marianne Gallezzo — Absent
Nicholas Golden
Christine Holloran — Remote
John C. Holloway — Absent
Dennis Kelley
Craig Miner — Remote
Christine Murray
Judith O'Connell
Christine Prendergast
Paul J. Melaragni
David A. Ragsdale
Paul Ruggiero
Stacey Scott — Remote
R. Eric Slagel
Stephen Turner
Vivian Varbedian, *Vice Chair*

SMMA OPM

Julie Leduc, Director, OPM Services and Project Manager
Sarah Traniello, Assistant Project Manager

Dore+Whittier Architects

Donald Walter, Principal-In-Charge
Lee P. Dore, Principal, Designer
Rani Philip, Project Manager

Item No.	Action	Discussion
24.01	Record	Chair, Glenn Brand, called the meeting to order at 6:30 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
24.02	Record	**Approval of Minutes** An edit was made to the draft meeting minutes where it was noted that P. Melaragni instead of S. Turner with reference to outreach and communications to abutters in the near future be made. – **J. O'Connell motioned to approve the revised meeting minutes from the November 19, 2024 School Building Committee meeting, with a second motion by V. Varbedian.**

smma

Item No.	Action	Discussion
		– **Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. C. Murray abstained due to absence from meeting.**
24.03	Record	**Approval of Invoices** None.
24.04	Record	**Design Update** – R. Philip provided update to the School Building Committee relating to the District's Responses to the MSBA's Comments to the **Preferred Schematic Report** Submission of October 24, 2024. These responses will be submission to the MSBA on December 4, 2024. – **Project Aesthetic Visioning:** Exterior and Landscape Imagery Boards distributed throughout the meeting room for meeting participants to interact with colored Post-Its and dots in **ORANGE**, **YELLOW** and **GREEN** to make notes about what they like, dislike, and features or styles that appeal to them in the precedent boards presented. – Electronic version of the Project Aesthetic Visioning Boards for Exterior and Landscape Imagery will be shared with the entire School Building Committee electronically before the next SBC meeting to engage with and provide further feedback and return to Dore+Whittier Architects.
24.04	Record	**School Building Committee Meeting Calendar** *(vote required)* – J. Leduc presented the School Building Committee Meeting Calendar that takes into consideration the schedules of other boards that members are also members to avoid any meeting conflicts, if possible. – **J. O'Connell made a recommendation for a motion to approve the schedule as it is presented with a second from E. Slagle. Roll call vote, motion passes unanimously.**
24.05	Record	**Construction Manager at Risk Committee Formation** *(vote required)* – J. Leduc updated the School Building Committee that the Application to the Inspector General had been submitted via email to the Inspector General that afternoon by SMMA and confirmed received. In the next sequence of events, SMMA is working with the Town Manager and Town Counsel to draft the Request for Qualifications for the Construction Manager at Risk. Once finalized, the RFQ will hit the street on December 11, 2024 and a Working Group needs to be established to qualify and select the Construction Manager at Risk for the project.

smma

Item No.	Action	Discussion
		– **The Construction Manager at Risk Working Group Members are: P. Ruggiero, M. Gallezzo, and E. Slagle from the School Building Committee together with its consultants, L. Dore of Dore+Whittier Architects and J. Leduc of SMMA.** – **J. O'Connell made a motion to approve P. Ruggiero, M. Gallezzo, E. Slagle, L. Dore of Dore+Whittier Architects and J. Leduc of SMMA as the Construction Manager at Risk Working Group Members. P. Melaragni seconded the motion. Roll call vote was taken and passed.**
24.06	Record	**Working Group Updates** • **Public Relations Working Group** update by J. Cusce that meeting every other week and looking at opportunities like the tree lightings and other outreach opportunities to take advantage of this weekend to distribute flyers and put up the posters to keep everyone aware of the project updates. Upcoming boards and flyers will be distributed again soon and working towards getting something for the February water bill and working with Shawsheen Tech to produce the end product for the first or second week. It has been requested that J. O'Connell be reached to coordinate with water bill as there are some transitions in place that are being worked through. Boards are being provided for Teacher/Parent conferences at t he schools. • **Sustainability Working Group –** There is a Working Group Meeting on Wednesday, December 11, 2024 at 10am to review the LEED goals and requirements including the cost impact and incentive points. • **Site and Landscape Working Group –** R. Philip reviewed the upcoming need for membership of the Site and Landscape Working Group and requests consideration of those interested in joining and becoming involved. D. Kelley advised that Jamie Magaldi of DPW would want to be involved as he is the Tree Warden and Arborist. Principals Kate Bissell, Diane Carreiro and Stacey Scott to start the Working Group with hope of others joining.
24.07	Record	**Public Comments** – None
24.08	Record	**Discussion and Committee Questions** – D. Kelley advised of the interesting concept of the benefits of Geothermal with the potential of concrete maintenance and upkeeping areas that are prone to snow and ice using steam loops

smma

Item No.	Action	Discussion
		underneath asphalt to help thaw those areas instead of chemicals that deteriorate the concrete. – Abutters Meeting will be held in January 2025 for the initial meeting with the immediate neighbors and then there will be a second Abutter Meeting shortly thereafter to reach a broader audience beyond the immediate abutters. This will include property abutters and direct abutters, Avalon complex and will be held in the Cafetorium on a Saturday in North Intermediate School. – Surveys will be performed to document properties and place markers to ensure that there are no encroachments of property lines and any spill overs are able to be caught early.
24.09	Record	**Correspondence** – None
24.10	Record	**Next Meeting:** December 17, 2024 at 6:30pm Wilmington High School, Large Group Instruction Room and Remote Participation via Zoom
24.11	Record	**Adjourn** G. Brand thanked the committee for their efforts and invited a motion to adjourn. – **P. Melaragni motioned to adjourn. K. Bissell seconded the motion. Roll call vote, motion carried by unanimous vote.**

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

Approval of Invoices

FOR APPROVAL

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 19 A

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 12/17/2024
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date		Invoice Amount	ProPay Code	Balance After Invoice
SMMA	62364	11/29/2024		$ 3,750.00	0001-0000	$ 11,250.00
OPM Basic Services - Feasibility Study						
			Total	$ 3,750.00		

Activities for the Month of November 2024

1. Weekly Leadership Working Group meetings to review progress
2. Participate in PR Working Group meetings
3. Participate in User Group Meetings over 4 days with Designer and District.
4. Working with Designer and Leadership Working Group to finalize details for the FAS presentation final
5. FAS Subcommittee Prep call on November 7, 2024
6. MSBA FAS Subcommittee Presentation Meeting on November 13, 2024
7. Refinement of Project Schedules under DBB and CMR pending decision by District.
8. Prepare meeting minutes of the October 21, 2024 School Building Committee Meeting for review and approval at the November 19, 2024 SBC Meeting.
9. Prepare presentation and participate in School Building Committee Meeting November 19, 2024
10. Prepare response and documentation in response to MSBA's PSR Comments for District's Response Submission
11. Preparation of the Inspector General Application to Proceed with Construction Management at Risk Construction Delivery Method upon District's decision.
12. Draft, review and refinement of the Request for Qualifications from Construction Managers at Risk.
13. Preparation of CM Procument Schedule for CM Procurement and Selection Working Groups knowledge of upcoming milestone activities.
14. Preparation of Meeting Minutes of the November 19, 2024 School Building Committee Meeting for the December 3, 2024 School Building Committee Meeting.
15. Collaborating with District Office and Town Meeting Calendar to provide the upcoming 6 month of SBC Meetings to encourage the most amount of participation through avoiding meeting conflicts where possible.
16. Finalizing edits requested by MSBA and updating submission to MSBA in hard copy and electronic versions.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 19 B

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 12/17/2024
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date			Invoice Amount	ProPay Code	Balance After Invoice
Dore+Whittier Architects	18	11/25/2024			$ 53,900.00	0002-0000	$292,600.00
Architectural Basic Services - Schematic Design							
Dore+Whittier Architects	18	11/25/2024	*AM-3*		$ 33,412.50	0003-0000	$ 11,137.50
Site Services - Designer Amendment No. 3							
Site Survey							
Dore+Whittier Architects	18	11/25/2024	*AM-3*		$ 7,920.00	0003-0000	$ 25,080.00
Site Services - Designer Amendment No. 3							
Traffic Study							
				Total	$ 95,232.50		

Activities for the Month of November 2024

1. Weekly Leadership Working Group meetings to review progress
2. Participate in PR Working Group meetings
3. User Group Meetings (over 4 days)
4. Finalize FAS presentation
5. FAS Subcommittee prep call on Nov 7th
6. FAS Subcommittee presentation meeting on Nov. 13th
7. Attend Westwood – geothermal event hosted by MSBA on Nov. 15th
8. Consultant SD Kick-off Meetings
9. Prepare presentation and participate in School Building Committee Meeting November 19th
10. Prepare response to PSR Comments
11. Continue investigation (Traffic Study, Site Survey, Geotech, Geoenvironmental) of preferred site.
12. Floor plan refinement
13. Prepare for exterior, interior and landscape visioning

Design Update

User Group Meeting Update

User Group Update: Program Variations

	PSR	SD	MSBA Guidelines	Difference
Core Academic	45,700	45,700	35,250	10,450
Special Education	19,010	19,010	9,060	9,950
Art & Music	4,040	5,075	5,075	0
Health & PE	12,300	12,300	6,300	6,000
Media Center	4,068	4,068	4,068	0
Dining & Food Services	9,458	9,458	9,458	0
Medical	710	710	710	0
Administration + Guidance	5,308	5,308	2,890	2,418
Custodial & Maintenance	2,355	2,355	2,355	0
Other	6,100	6,100	0	6,100
Total Building NFA	**109,049**	**110,084**	**75,165**	**34,918**
Total Building GFA	**163,573**	**165,125**	**109,475**	**55,650**

Feedback

Core Academic

- Teacher Collab. locate centrally
- No change in Square Footage

Art & Music

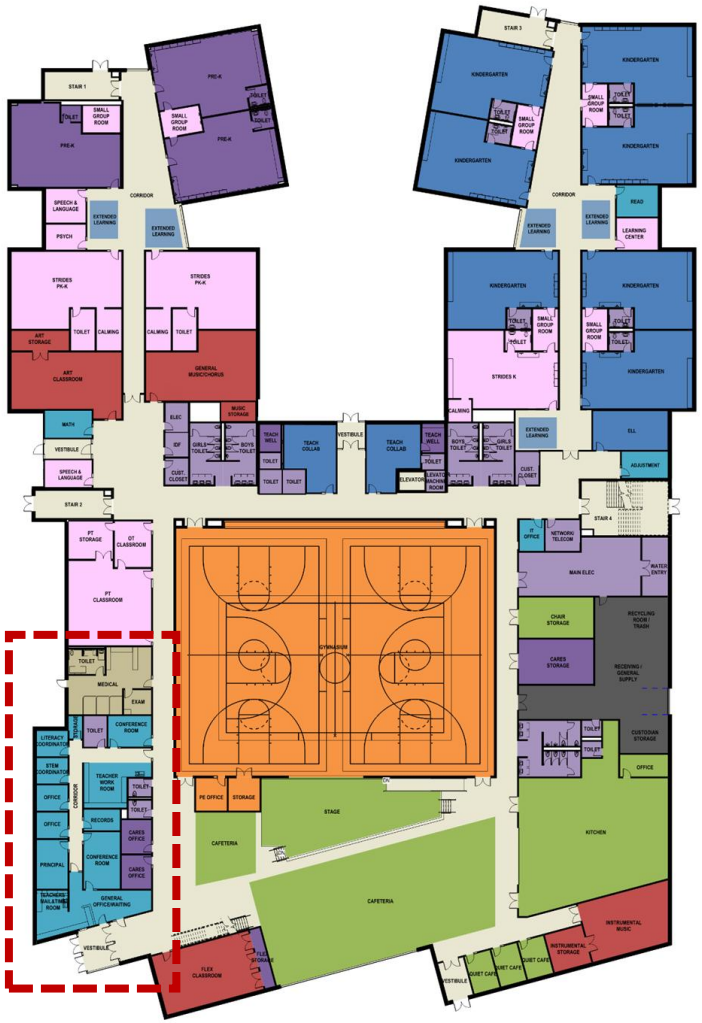
- Concerns on a shared Flex space were expressed by users
- Issues for setup and storage needs
- Resulted in an additional Art classroom
- Change in overall Square Footage

Admin & Guidance

- Locating Assistant Principal on second level
- No change in Square Footage

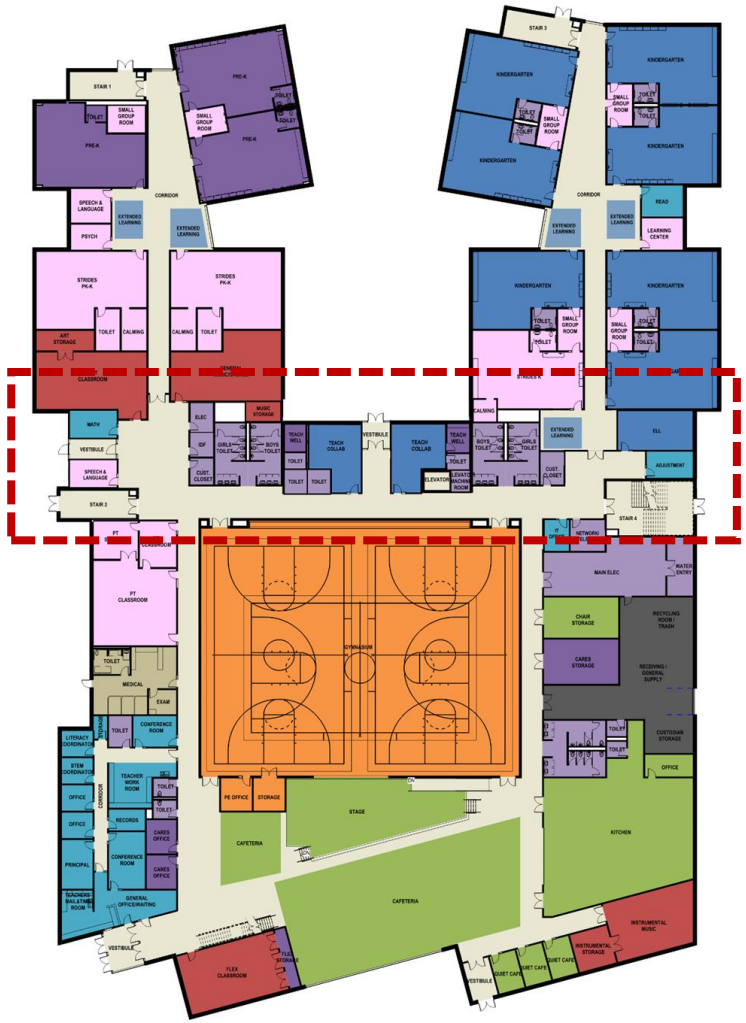
Floor Plan Update

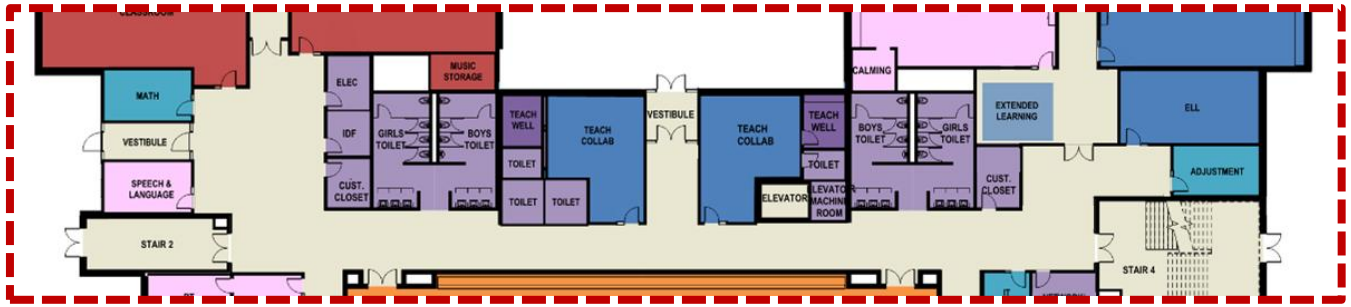
Floor Plan Review: Admin & Guidance



First Floor

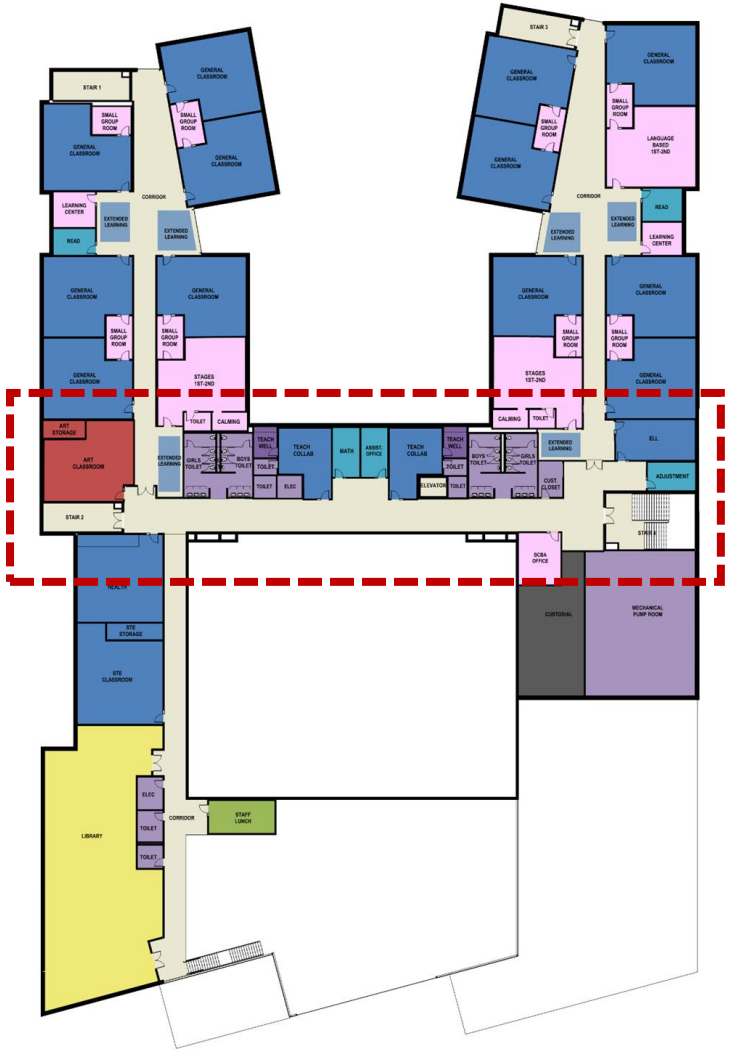
Floor Plan Review: Teacher Collaboration

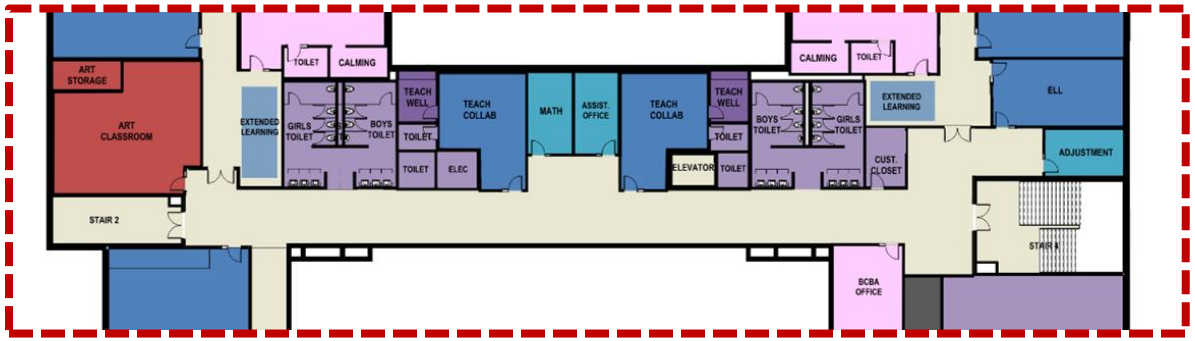




First Floor

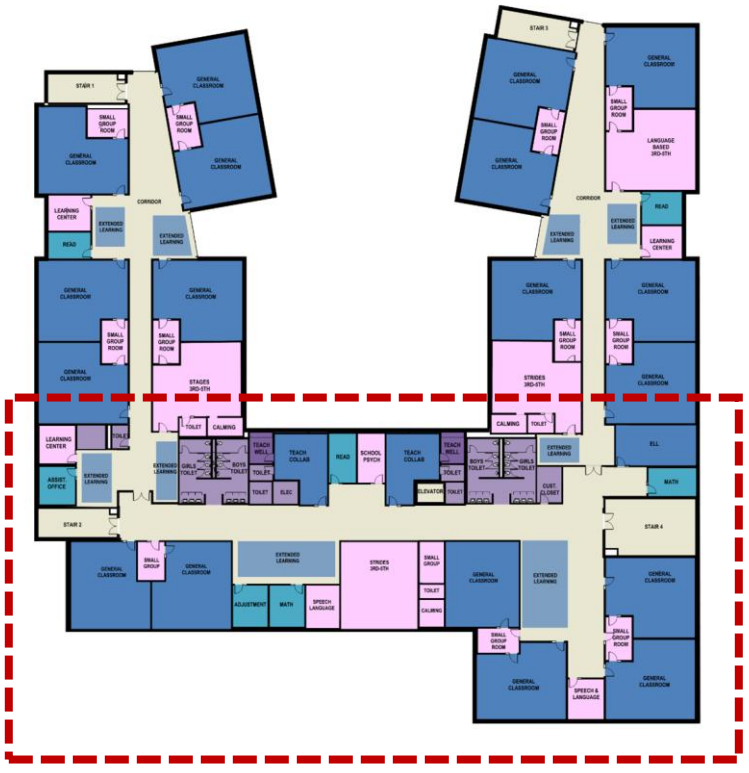
Floor Plan Review: Art and Teacher Collaboration





Second Floor

Floor Plan Review: Teacher Collaboration



Third Floor

Aesthetic Imagery Visioning:

Exterior Landscape

Common Themes:

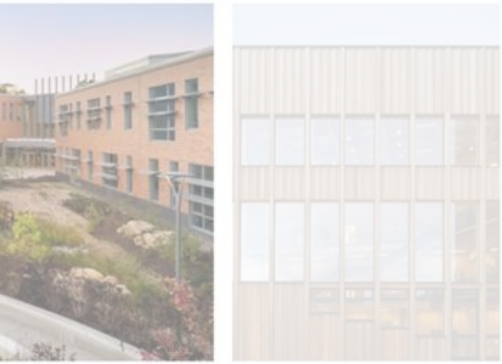
Aesthetic Imagery Visioning:

Exterior

Aesthetic Imagery Visioning:

Exterior

Common Themes:



Aesthetic Imagery Visioning:

Exterior

Common Themes:

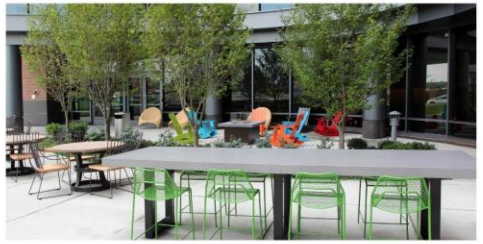
Common Themes:

Aesthetic Imagery Visioning:

Landscape

Aesthetic Imagery Visioning: Landscape

Common Themes:



Aesthetic Imagery Visioning: Interiors

Aesthetic Imagery Visioning:

Interiors

Criteria to Think About:

- Materials
- Colors
- Dramatic or Serene
- Simplistic or Intricate
- Curves versus Angular
- Patterns versus fields
- Window size and patterns:
  - Larger versus smaller
  - Regular rhythm versus irregular variety
- Utility – what is usable versus just for looks
- Authentic – does it feel like it belongs here?
- Mood

Aesthetic Imagery Visioning: Game Plan

School Building Committee – Image Review

- Assortment of boards around the room
- Invite members to view and comment on them in groups of 3-5 people
  - Five minutes per board, then rotate (15 minutes total)
  - Red, yellow, green stickers
  - Post-it sticky notes
  - Comment sheets
  - Discussion!
- Reassemble and review comments
- Look for common themes – Dec 17th
- Look for consensus on direction – Dec 17th

Site Investigation

Site Investigation Outcomes

Traffic Study

Reviewed AM/PM trips for existing conditions, 2031 no build conditions and 2031 build conditions

- Passengers Cars
- Bus

Recommendations:

- Further review of existing operational issues at Middlesex Ave at Salem Street (long term reconfiguration)
- Retime signal at Route 62 at Middlesex Ave/High Street

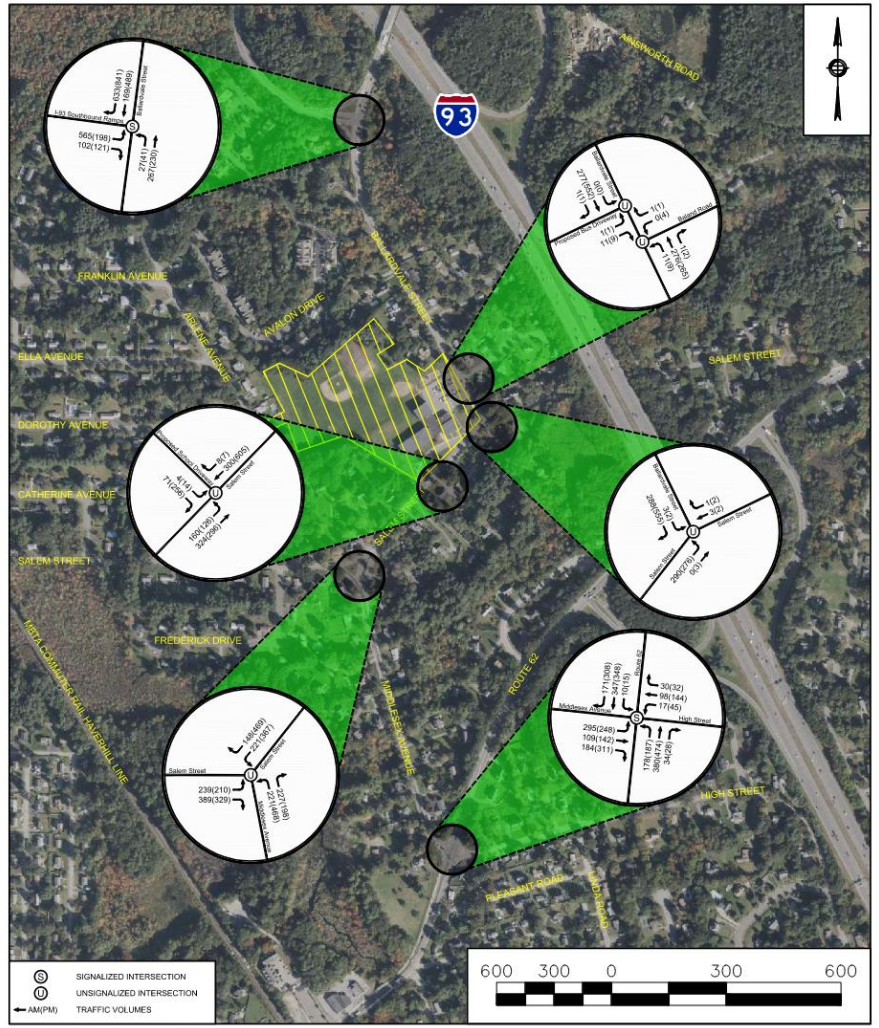


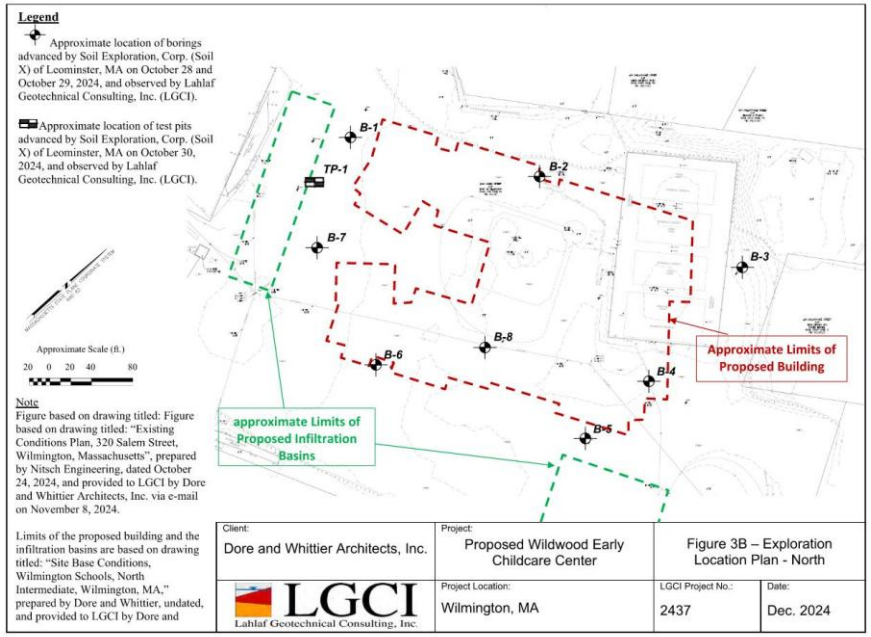
Figure 14 - 2031 Build Weekday Peak Hour Traffic Volumes
North Intermediate School
320 Salem Street
Wilmington, MA

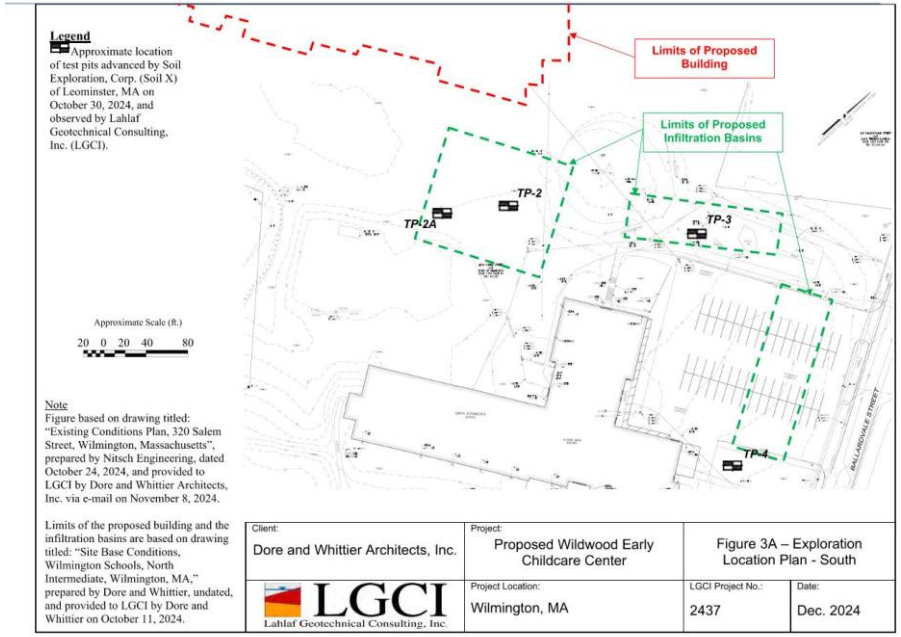
Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

Site Investigation Outcomes

Geotechnical and Geo-Environmental Investigations





Building Systems Overview

Goal of Life Cycle Cost Analysis (LCCA)

- The goal of the mechanical lifecycle engineering economic analysis is to assess the performance of **various mechanical system options** in comparison to a baseline mechanical system.
- Each option is compared to the baseline system over a 50-year cycle to determine the most advantageous system considering **utility costs, maintenance costs, replacement costs, and initial construction costs**.
- By comparison of each option to the baseline system, the option with the **greatest total life-cycle savings** is generally recommended.
- LCCA ready for review January/February 2025

LCCA: Building System Options

Four Systems for Analysis

OPTION 1 (baseline):

Air Source to Hydronic (HW/CHW) Heat Pump & VAV Displacement System

OPTION 2:

Air-Source Electric VRF (Variable Refrigerant Flow) and DOEAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pumps)

OPTION 3:

Geothermal Heat Pump & VAV Displacement System

OPTION 4:

Geothermal Water Source VRF (Variable Refrigerant Flow) and DOEAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pumps)

Working Group Updates

Discussion, Correspondence, New Items

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #26

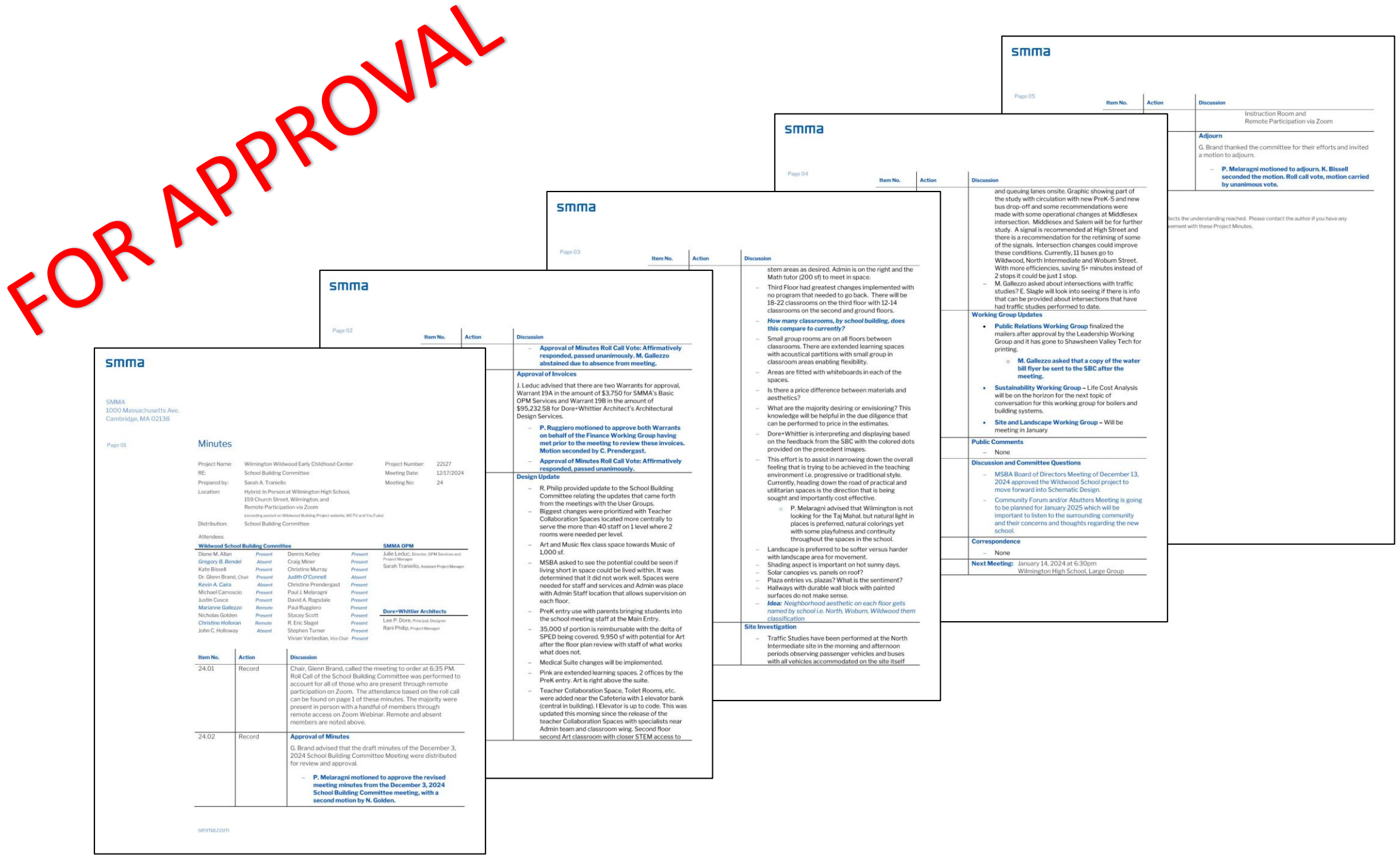
January 14, 2025

Massachusetts School Building Authority

Agenda

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. Design Update
    - Floor Plan Updates
    - Project Vision and Aesthetics
5. CM at Risk Update
6. Working Group Updates
    - Public Relations WG
    - Sustainability WG
    - Site / Landscape Working Group
7. Discussion/Correspondence/New Items
8. Committee Questions
9. Public Comments
10. Next Meeting: Jan 29, 2025
11. Adjourn

Approval of Minutes


FOR APPROVAL
smma
SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138
Page 01
Minutes
Project Name: Wilmington Wildwood Early Childhood Center
RE: School Building Committee
Prepared by: Sarah A. Traniello
Location: Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom (recording posted on Wildwood Building Project website, WCTV and YouTube)
Distribution: School Building Committee
Project Number: 22127
Meeting Date: 12/17/2024
Meeting No: 24
Attendees
Wildwood School Building Committee
Diane M. Allan Present
Gregory B. Bendel Absent
Kate Bissell Present
Dr. Glenn Brand, Chair Present
Kevin A. Caira Absent
Michael Camoscio Present
Justin Cusce Present
Marianne Gallezzo Remote
Nicholas Golden Present
Christine Holloran Remote
John C. Holloway Absent
Dennis Kelley Present
Craig Miner Present
Christine Murray Present
Judith O'Connell Absent
Christine Prendergast Present
Paul J. Melaragni Present
David A. Ragsdale Present
Paul Ruggiero Present
Stacey Scott Present
R. Eric Slagel Present
Stephen Turner Present
Vivian Varbedian, Vice Chair Present
SMMA OPM
Julie LeDuc, Director, OPM Services and Project Manager
Sarah Traniello, Assistant Project Manager
Dore+Whittier Architects
Lee P. Dore, Principal, Designer
Rani Philip, Project Manager
Item No. | Action | Discussion
24.01 | Record | Chair, Glenn Brand, called the meeting to order at 6:35 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
24.02 | Record | Approval of Minutes
G. Brand advised that the draft minutes of the December 3, 2024 School Building Committee Meeting were distributed for review and approval.
– P. Melaragni motioned to approve the revised meeting minutes from the December 3, 2024 School Building Committee meeting, with a second motion by N. Golden.
smma.com
smma
Page 02
Item No. | Action | Discussion
– Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. M. Gallezzo abstained due to absence from meeting.
Approval of Invoices
J. Leduc advised that there are two Warrants for approval, Warrant 19A in the amount of $3,750 for SMMA's Basic OPM Services and Warrant 19B in the amount of $95,232.58 for Dore+Whittier Architect's Architectural Design Services.
– P. Ruggiero motioned to approve both Warrants on behalf of the Finance Working Group having met prior to the meeting to review these invoices. Motion seconded by C. Prendergast.
– Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously.
Design Update
– R. Philip provided update to the School Building Committee relating the updates that came forth from the meetings with the User Groups.
– Biggest changes were prioritized with Teacher Collaboration Spaces located more centrally to serve the more than 40 staff on 1 level where 2 rooms were needed per level.
– Art and Music flex class space towards Music of 1,000 sf.
– MSBA asked to see the potential could be seen if living short in space could be lived within. It was determined that it did not work well. Spaces were needed for staff and services and Admin was place with Admin Staff location that allows supervision on each floor.
– PreK entry use with parents bringing students into the school meeting staff at the Main Entry.
– 35,000 sf portion is reimbursable with the delta of SPED being covered. 9,950 sf with potential for Art after the floor plan review with staff of what works what does not.
– Medical Suite changes will be implemented.
– Pink are extended learning spaces. 2 offices by the PreK entry. Art is right above the suite.
– Teacher Collaboration Space, Toilet Rooms, etc. were added near the Cafeteria with 1 elevator bank (central in building). I Elevator is up to code. This was updated this morning since the release of the teacher Collaboration Spaces with specialists near Admin team and classroom wing. Second floor second Art classroom with closer STEM access to
smma
Page 03
Item No. | Action | Discussion
stem areas as desired. Admin is on the right and the Math tutor (200 sf) to meet in space.
– Third Floor had greatest changes implemented with no program that needed to go back. There will be 18-22 classrooms on the third floor with 12-14 classrooms on the second and ground floors.
– How many classrooms, by school building, does this compare to currently?
– Small group rooms are on all floors between classrooms. There are extended learning spaces with acoustical partitions with small group in classroom areas enabling flexibility.
– Areas are fitted with whiteboards in each of the spaces.
– Is there a price difference between materials and aesthetics?
– What are the majority desiring or envisioning? This knowledge will be helpful in the due diligence that can be performed to price in the estimates.
– Dore+Whittier is interpreting and displaying based on the feedback from the SBC with the colored dots provided on the precedent images.
– This effort is to assist in narrowing down the overall feeling that is trying to be achieved in the teaching environment i.e. progressive or traditional style. Currently, heading down the road of practical and utilitarian spaces is the direction that is being sought and importantly cost effective.
○ P. Melaragni advised that Wilmington is not looking for the Taj Mahal, but natural light in places is preferred, natural colorings yet with some playfulness and continuity throughout the spaces in the school.
– Landscape is preferred to be softer versus harder with landscape area for movement.
– Shading aspect is important on hot sunny days.
– Solar canopies vs. panels on roof?
– Plaza entries vs. plazas? What is the sentiment?
– Hallways with durable wall block with painted surfaces do not make sense.
– Idea: Neighborhood aesthetic on each floor gets named by school i.e. North, Woburn, Wildwood them classification
Site Investigation
– Traffic Studies have been performed at the North Intermediate site in the morning and afternoon periods observing passenger vehicles and buses with all vehicles accommodated on the site itself
smma
Page 04
Item No. | Action | Discussion
and queuing lanes onsite. Graphic showing part of the study with circulation with new PreK-5 and new bus drop-off and some recommendations were made with some operational changes at Middlesex intersection. Middlesex and Salem will be for further study. A signal is recommended at High Street and there is a recommendation for the retiming of some of the signals. Intersection changes could improve these conditions. Currently, 11 buses go to Wildwood, North Intermediate and Woburn Street. With more efficiencies, saving 5+ minutes instead of 2 stops it could be just 1 stop.
– M. Gallezzo asked about intersections with traffic studies? E. Slagle will look into seeing if there is info that can be provided about intersections that have had traffic studies performed to date.
Working Group Updates
• Public Relations Working Group finalized the mailers after approval by the Leadership Working Group and it has gone to Shawsheen Valley Tech for printing.
○ M. Gallezzo asked that a copy of the water bill flyer be sent to the SBC after the meeting.
• Sustainability Working Group – Life Cost Analysis will be on the horizon for the next topic of conversation for this working group for boilers and building systems.
• Site and Landscape Working Group – Will be meeting in January
Public Comments
– None
Discussion and Committee Questions
– MSBA Board of Directors Meeting of December 13, 2024 approved the Wildwood School project to move forward into Schematic Design.
– Community Forum and/or Abutters Meeting is going to be planned for January 2025 which will be important to listen to the surrounding community and their concerns and thoughts regarding the new school.
Correspondence
– None
Next Meeting: January 14, 2024 at 6:30pm Wilmington High School, Large Group
smma
Page 05
Item No. | Action | Discussion
Instruction Room and Remote Participation via Zoom
Adjourn
G. Brand thanked the committee for their efforts and invited a motion to adjourn.
– P. Melaragni motioned to adjourn. K. Bissell seconded the motion. Roll call vote, motion carried by unanimous vote.
ects the understanding reached. Please contact the author if you have any
ement with these Project Minutes.

Approval of Invoices

FOR APPROVAL

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 20 A

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 1/14/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date	Invoice Amount	ProPay Code	Balance After Invoice
SMMA *OPM Basic Services - Feasibility Study*	62518	1/8/2025	$ 3,750.00	0001-0000	$ 7,500.00
		Total	$ 3,750.00		

Activities for the Month of December 2024

1. Weekly Leadership Working Group meetings to review progress
2. Participate in PR Working Group meetings
3. Preparation of the Monthly Reporting to the MSBA
4. Working with Designer and Leadership Working Group to finalize details for the December 3 and December 17 Meeting Agendas and Presentations
5. Participated in Meetings with the Sustainability Working Group
6. Led the CM-R Procurement Process and conducted CM Prequalification Working Group Kick-Off Meeting
7. Prepared meeting minutes of the December 3, 2024 School Building Committee Meeting for review and approval at the December 17, 2024 SBC Meeting.
8. Prepare meeting minutes of the December 17, 2024 School Building Committee Meeting for review and approval at the January 14, 2025 SBC Meeting.
9. Prepare presentation and participate in School Building Committee Meeting November 19, 2024
10. Prepare response and documentation in response to MSBA's PSR Comments for District's Response Submission
11. Submission of Application and answering any followup questions that were forthcoming relating to the Inspector General Application to Proceed with Construction Management at Risk Construction Delivery Method upon District's decision.
12. Coordination with District Procurement Office for Advertisement Issuance
13. Finalizing the Request for Qualifications for the Construction Manager at Risk and Preparing for Distribution
14. Draft, review and refinement of the Request for Proposals from Construction Managers at Risk for review by Town and Town Counsel.
15. Coordination with District Procurement Office for Distribution of the Request for Qualifications
16. Preparing tabulation documentation for review of anticipated qualifications submissions for review for the Prequalification Working Group
17. Tracking of the Response Forms for the Potential Construction Manager Respondents
18. Created Presentation and Conducted Virtual Walkthrough with Potential Construction Management Firm Respondents and reviewing project details and answering questions.
19. Setting the meetings in the Calendars of the 2025 School Building Committee Meetings and creating Agendas to correspond with these dates as placeholders to be set with the Town Clerk.

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 20 B

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 1/14/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date		Invoice Amount	ProPay Code	Balance After Invoice
Dore+Whittier Architects *Architectural Basic Services - Schematic Design*	19	12/31/2024		$ 53,900.00	0002-0000	$ 238,700.00
Dore+Whittier Architects Site Services - Designer Amendment No. 3 *Site Survey*	19	12/31/2024	*AM-3*	$ 5,087.50	0003-0000	$ 6,050.00
Dore+Whittier Architects Site Services - Designer Amendment No. 3 *Geotechnical Engineering*	19	12/31/2024	*AM-3*	$ 22,242.00	0003-0000	$ 5,527.50
Dore+Whittier Architects Site Services - Designer Amendment No. 3 *Traffic Study*	18	12/31/2024	*AM-3*	$ 13,200.00	0003-0000	$ 11,880.00
Michael Camoscio Reimbursement for Printing, Cutting and Shrink Wrapped for Delivery of Water Bill Inserts in Color for Wildwood School Building Project performed by Shawsheen Valley Technical High School	Check 262	12/5/2024		$ 625.00	0004-0000	$ 5,435.41
			Total	$ 95,054.50		

Activities for the Month of December 2024

1. Weekly Leadership Working Group meetings to review progress
2. Participate in PR Working Group meetings
3. Prepare presentation and participate in School Building Committee Meetings on Dec 3rd and Dec 17th
4. Report out on investigation reports (Traffic Study, Site Survey, Geotech, Geoenvironmental) of preferred site.
5. Floor plan refinement and associated meetings with District Leadership Team
6. Exterior, interior and landscape visioning
7. Meeting with Sustainability Working Group
8. Building Systems Overview presentation
9. Assist with CM-R procurement process

Design Update

User Group Meeting Update

User Group Update: Program Variations

	PSR	SD	MSBA Guidelines	Difference
Core Academic	45,700	45,700	35,250	10,450
Special Education	19,010	19,010	9,060	9,950
Art & Music	4,040	5,075	5,075	0
Health & PE	12,300	12,300	6,300	6,000
Media Center	4,068	4,068	4,068	0
Dining & Food Services	9,458	9,458	9,458	0
Medical	710	710	710	0
Administration + Guidance	5,308	5,548	2,890	2,658
Custodial & Maintenance	2,355	2,355	2,355	0
Other	6,100	5,800	0	5,800
Total Building NFA	**109,049**	**110,024**	**75,165**	**34, 858**
Total Building GFA	**163,573**	**165,035**	**109,475**	**55,560**

Feedback

Core Academic
- Teacher Collab. locate centrally, combined
- No change in Square Footage

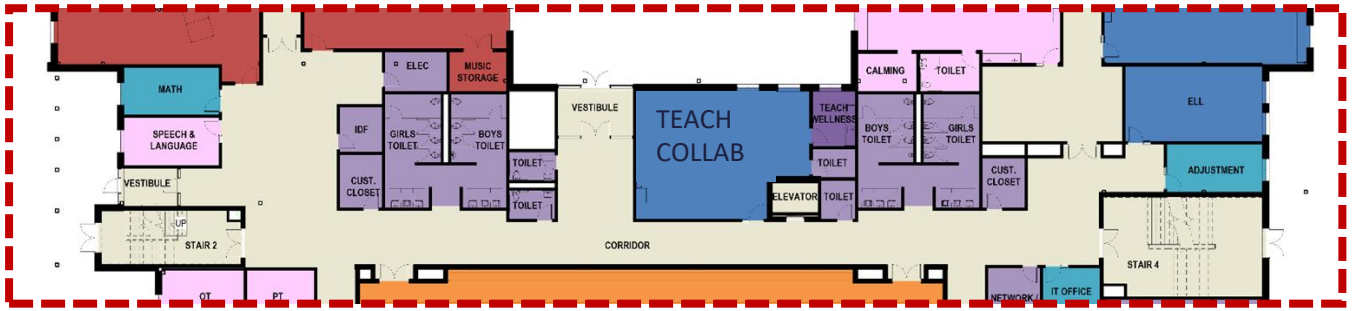
Art & Music
- Additional Art classroom
- Change in overall Square Footage

Admin & Guidance
- Locating Assistant Principal on second level
- Space for Literacy Coordinator
- Space for STEM Coordinator
- Change in Square Footage

Other
- Reduction in Wellness Rooms
- Change in overall Square Footage

Floor Plan Update

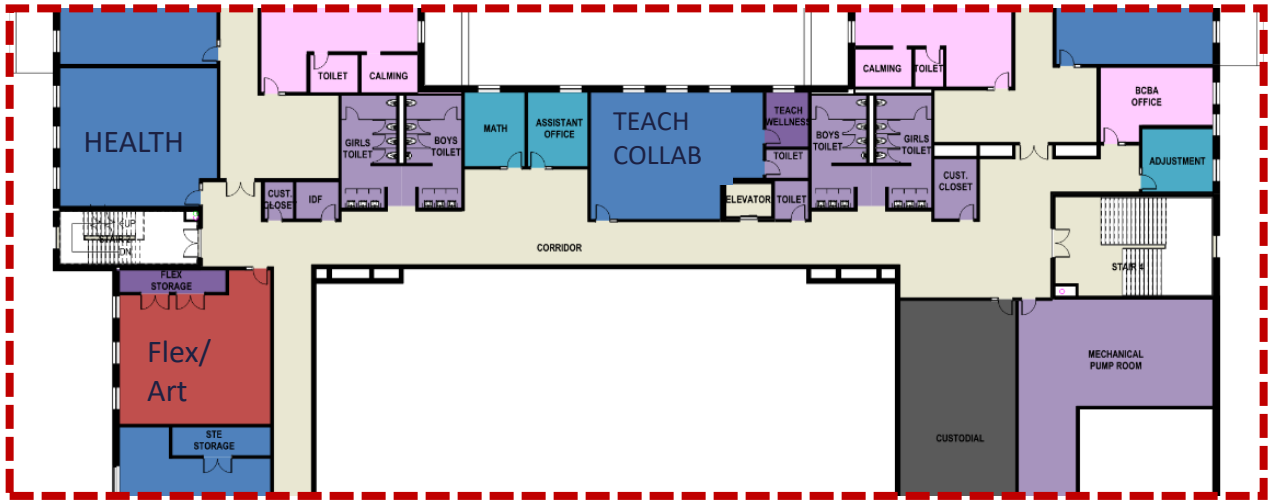
Floor Plan Review: Teacher Collaboration



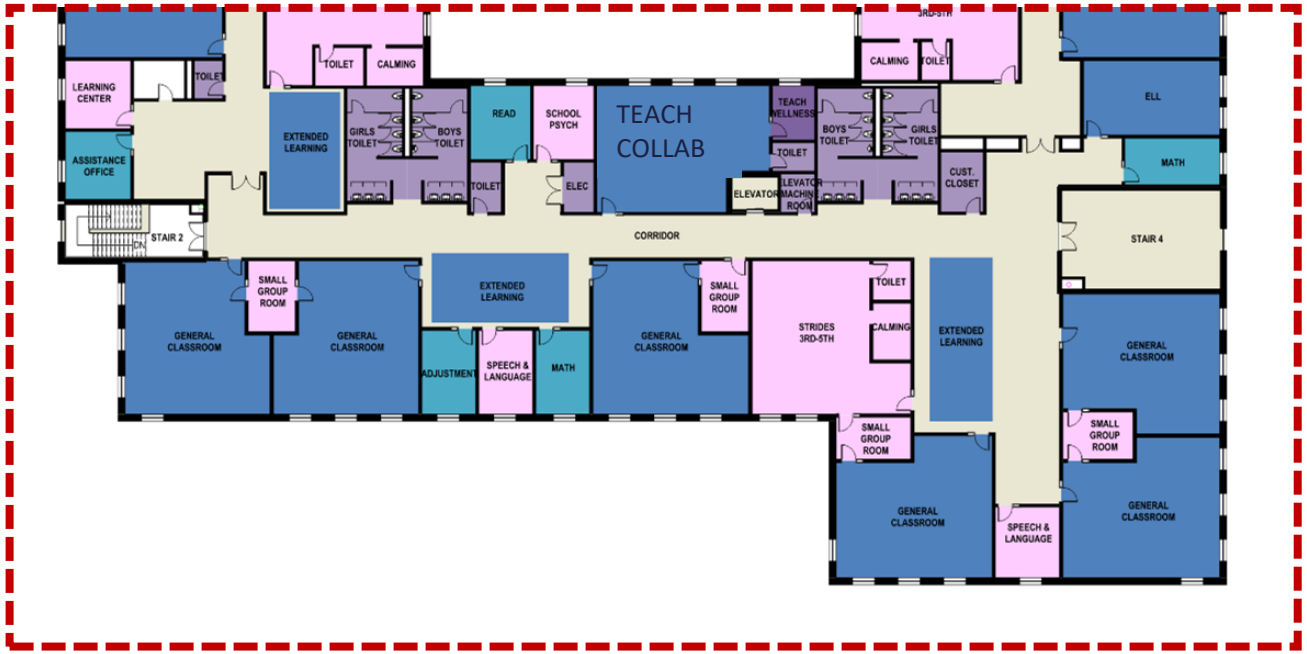
First Floor

Floor Plan Review: Art and Teacher Collaboration

Second Floor



Floor Plan Review: Teacher Collaboration



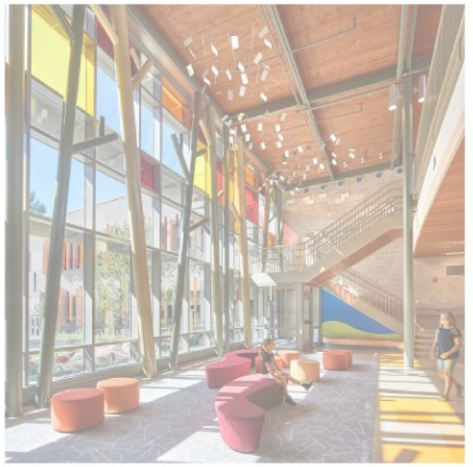
Third Floor

Aesthetic Imagery Visioning: Interiors

Common Themes:

Aesthetic Imagery Visioning:

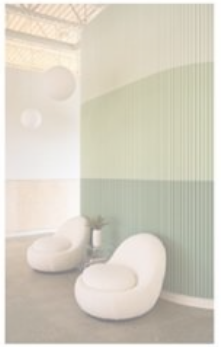
Interior



Common Themes:

Aesthetic Imagery Visioning:

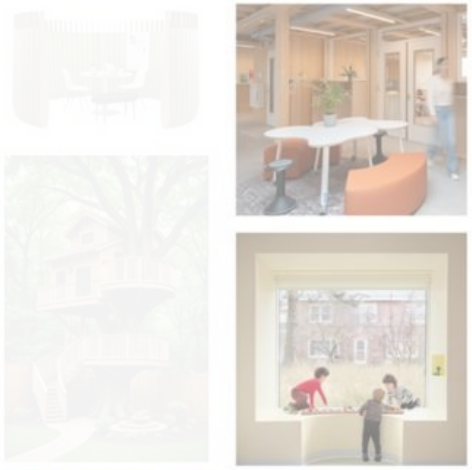
Interior

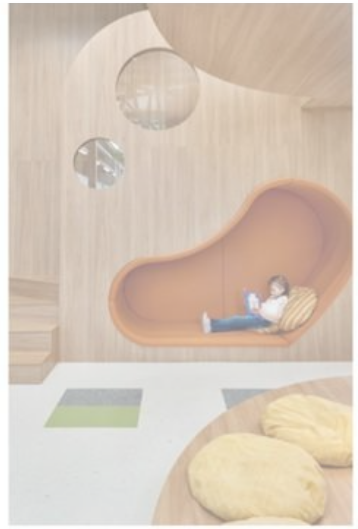


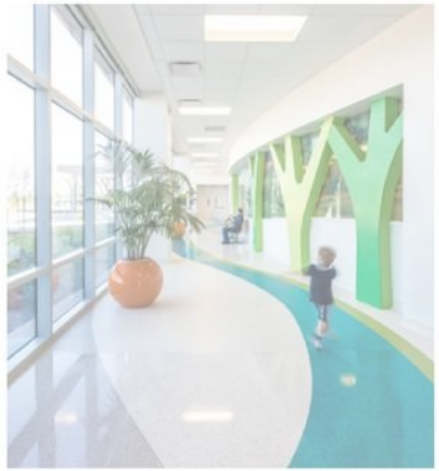
Aesthetic Imagery Visioning:

Interior

Common Themes:







Aesthetic Imagery Visioning: Inspiration

Inspiration from Wilmington's History

The Baldwin Tree

The Baldwin apple, a once-popular variety in New England, has deep roots in Wilmington, Massachusetts. Around 1740, a chance seedling was discovered on the farm of John Ball in Wilmington. The farm later came into the possession of a Mr. Butters, who named the apple "Woodpecker" because the tree was frequented by woodpeckers.
-Wikipedia

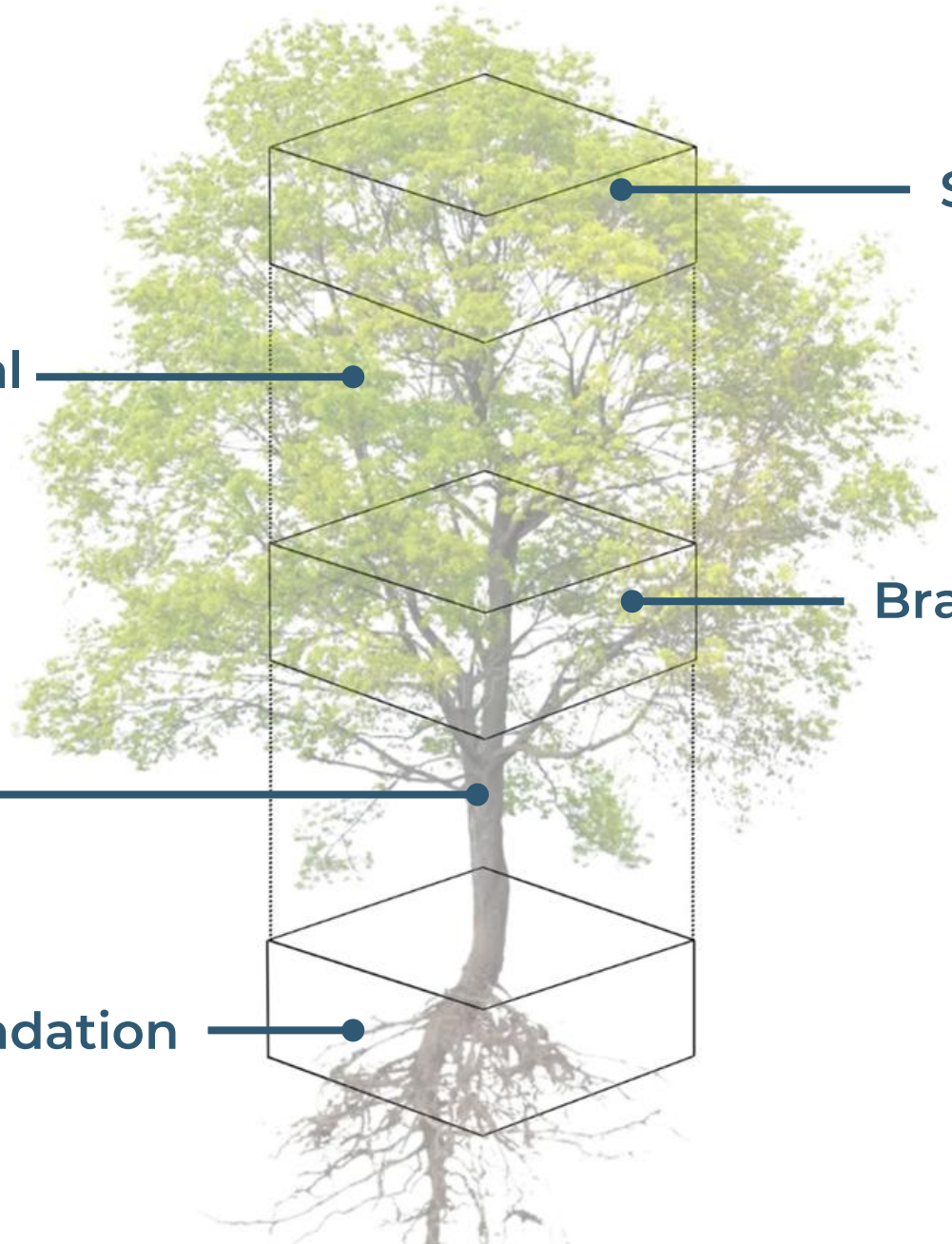
The apple gained prominence through Colonel Loammi Baldwin, a Revolutionary War veteran and engineer from nearby Woburn. After being introduced to the apple by Deacon Samuel Thompson, Baldwin recognized its potential and propagated it throughout eastern Massachusetts. In honor of his efforts, the apple was named the Baldwin.
–New England Historical Society

To commemorate the origin of the Baldwin apple, a monument was erected in 1895 by the Rumford Historical Association at the corner of Chestnut Street and Emery Lane in Wilmington. The inscription reads:
"This monument marks the site of the first Baldwin Apple Tree found growing wild near here. It fell in the gale of 1815. The apple first known as the Butters, Woodpecker or Pecker apple was named after Col. Loammi Baldwin of Woburn."
-Patch

Inspiration from Wilmington's History

Inspiration from Wilmington's History

Inspiration
Stages of Growth



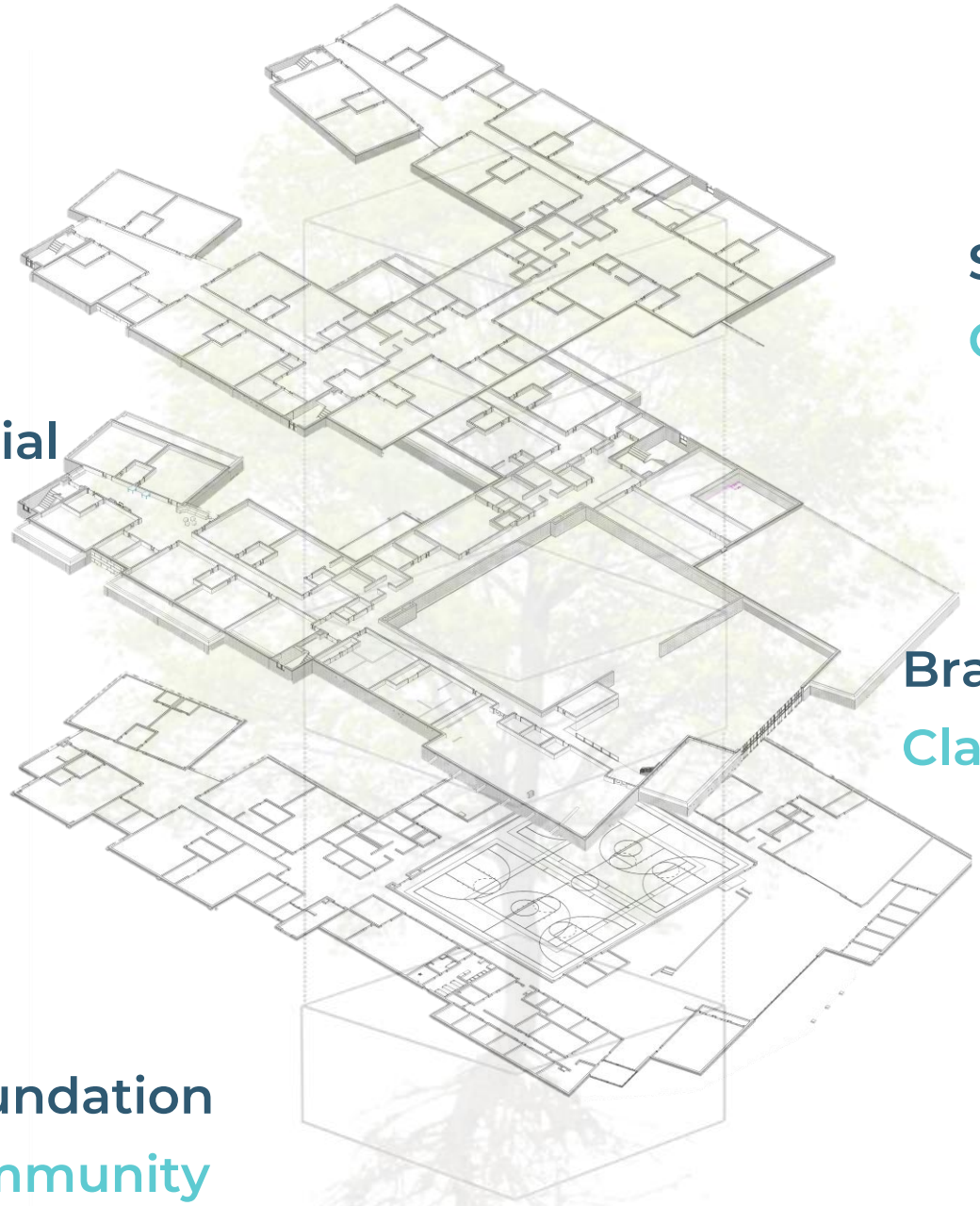
Shade = A Place for All

Leaves = Individual Potential

Branches = Canopy of Growth

Trunk = Pillar of Learning

Roots = A Strong Foundation



Shade = A Place for All

Community Spaces

Leaves = Individual Potential

The Children

Branches = Canopy of Growth

Classroom Wings

Trunk = Pillar of Learning

Gathering Spaces

Roots = A Strong Foundation

The Wilmington Community

Aesthetic Imagery Visioning:

Exteriors

Aesthetic Imagery Visioning:

Exterior

- Masonry
- Natural light
- Shading/Canopy
- Natural Materials

Common Themes:

Southeast View of Main Entry

Southeast Perspective

East Perspective

Southwest Perspective

Aesthetic Imagery Visioning:

Exterior Materials

Construction Manager at Risk

Working Group Updates

Discussion, Correspondence, New Items

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

Abutters Meeting #1

January 29, 2025

Massachusetts School Building Authority

Site Plan

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)
CIRCUITOUS CAMPUS PATH
CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)

3 RAISED GARDEN BEDS
SENSORY CORTEX

4 SENSORY GARDEN: EDUCATIONAL
SENSORY CORTEX
STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE /
PASSIVE / INCLUSIVE FRONTAL CORTEX

6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink
landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
January 2025

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #27

January 29, 2025

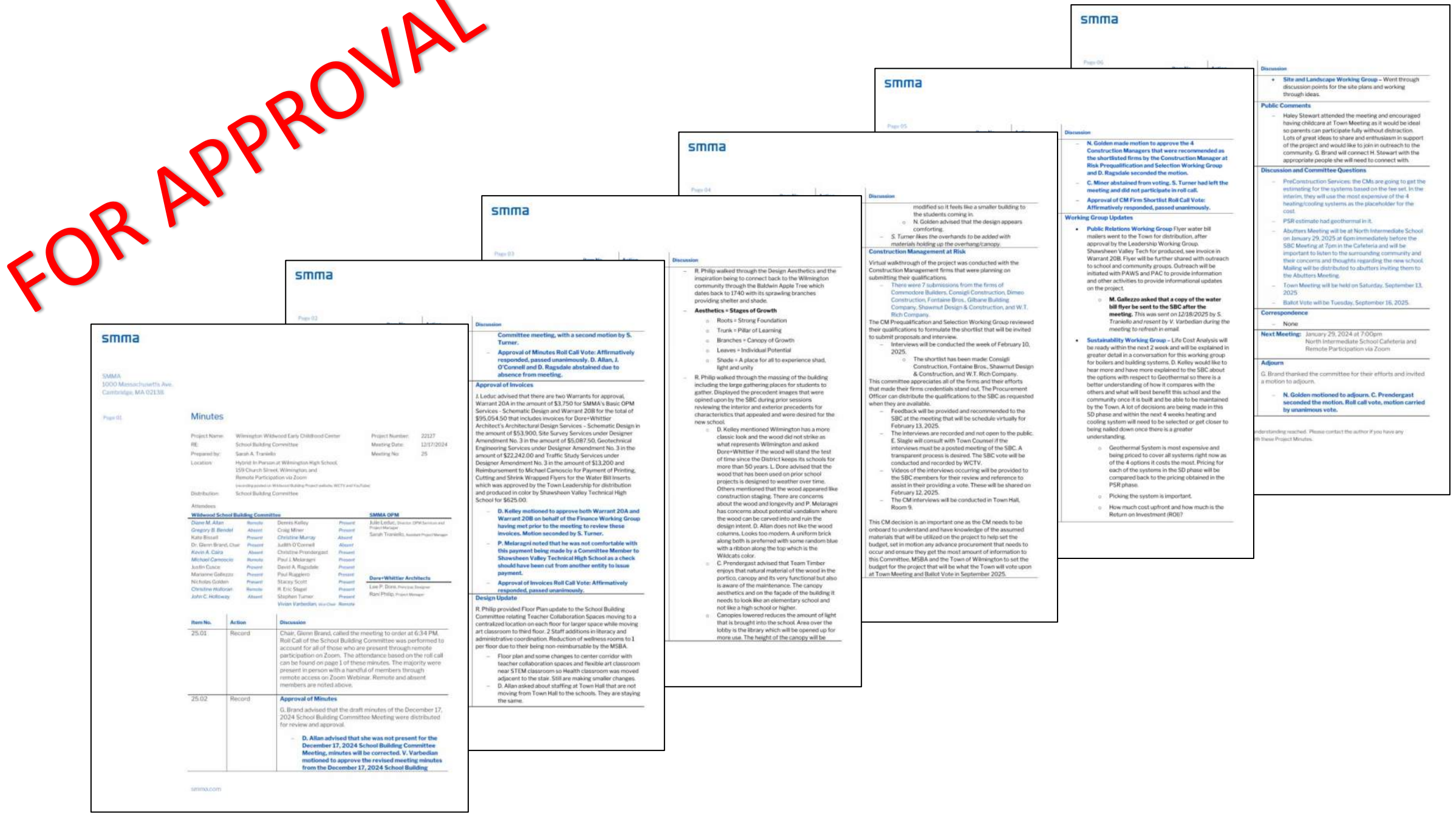
smma dw DORE + WHITTIER

Massachusetts School Building Authority

Agenda

1. Call to Order
2. Approval of Minutes
3. Design Update
    - Site Plan
    - Floor Plans
    - Project Aesthetics
    - Building Systems Update
4. CM at Risk Update
5. Working Group Updates
    - Public Relations WG
    - Sustainability WG
    - Site / Landscape Working Group
6. Discussion/Correspondence/New Items
7. Committee Questions
8. Public Comments
9. Next Meeting: Wednesday Feb 5, 2025
10. Adjourn

Approval of Minutes


FOR APPROVAL
smma
SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138
Minutes
Project Name: Wilmington Wildwood Early Childhood Center
RE: School Building Committee
Prepared by: Sarah A. Traniello
Location: Hybrid: In Person at Wilmington High School, 159 Church Street, Wilmington, and Remote Participation via Zoom
Distribution: School Building Committee
Project Number: 22127
Meeting Date: 12/17/2024
Meeting No: 25
Attendees
Wildwood School Building Committee
SMMA OPM
Dore+Whittier Architects
Item No. | Action | Discussion
25.01 | Record | Chair, Glenn Brand, called the meeting to order at 6:34 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
25.02 | Record | Approval of Minutes
G. Brand advised that the draft minutes of the December 17, 2024 School Building Committee Meeting were distributed for review and approval.
D. Allan advised that she was not present for the December 17, 2024 School Building Committee Meeting, minutes will be corrected. V. Varbedian motioned to approve the revised meeting minutes from the December 17, 2024 School Building
Committee meeting, with a second motion by S. Turner.
Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. D. Allan, J. O'Connell and D. Ragsdale abstained due to absence from meeting.
Approval of Invoices
J. Leduc advised that there are two Warrants for approval, Warrant 20A in the amount of $3,750 for SMMA's Basic OPM Services - Schematic Design and Warrant 20B for the total of $95,054.50 that includes invoices for Dore+Whittier Architect's Architectural Design Services - Schematic Design in the amount of $53,900, Site Survey Services under Designer Amendment No. 3 in the amount of $5,087.50, Geotechnical Engineering Services under Designer Amendment No. 3 in the amount of $22,242.00 and Traffic Study Services under Designer Amendment No. 3 in the amount of $13,200 and Reimbursement to Michael Camoscio for Payment of Printing, Cutting and Shrink Wrapped Flyers for the Water Bill Inserts which was approved by the Town Leadership for distribution and produced in color by Shawsheen Valley Technical High School for $625.00.
D. Kelley motioned to approve both Warrant 20A and Warrant 20B on behalf of the Finance Working Group having met prior to the meeting to review these invoices. Motion seconded by S. Turner.
P. Melaragni noted that he was not comfortable with this payment being made by a Committee Member to Shawsheen Valley Technical High School as a check should have been cut from another entity to issue payment.
Approval of Invoices Roll Call Vote: Affirmatively responded, passed unanimously.
Design Update
R. Philip provided Floor Plan update to the School Building Committee relating Teacher Collaboration Spaces moving to a centralized location on each floor for larger space while moving art classroom to third floor. 2 Staff additions in literacy and administrative coordination. Reduction of wellness rooms to 1 per floor due to their being non-reimbursable by the MSBA.
Floor plan and some changes to center corridor with teacher collaboration spaces and flexible art classroom near STEM classroom so Health classroom was moved adjacent to the stair. Still are making smaller changes.
D. Allan asked about staffing at Town Hall that are not moving from Town Hall to the schools. They are staying the same.
R. Philip walked through the Design Aesthetics and the inspiration being to connect back to the Wilmington community through the Baldwin Apple Tree which dates back to 1740 with its sprawling branches providing shelter and shade.
Aesthetics = Stages of Growth
Roots = Strong Foundation
Trunk = Pillar of Learning
Branches = Canopy of Growth
Leaves = Individual Potential
Shade = A place for all to experience shad, light and unity
R. Philip walked through the massing of the building including the large gathering places for students to gather. Displayed the precedent images that were opined upon by the SBC during prior sessions reviewing the interior and exterior precedents for characteristics that appealed and were desired for the new school.
D. Kelley mentioned Wilmington has a more classic look and the wood did not strike as what represents Wilmington and asked Dore+Whittier if the wood will stand the test of time since the District keeps its schools for more than 50 years. L. Dore advised that the wood that has been used on prior school projects is designed to weather over time. Others mentioned that the wood appeared like construction staging. There are concerns about the wood and longevity and P. Melaragni has concerns about potential vandalism where the wood can be carved into and ruin the design intent. D. Allan does not like the wood columns. Looks too modern. A uniform brick along both is preferred with some random blue with a ribbon along the top which is the Wildcats color.
C. Prendergast advised that Team Timber enjoys that natural material of the wood in the portico, canopy and its very functional but also is aware of the maintenance. The canopy aesthetics and on the façade of the building it needs to look like an elementary school and not like a high school or higher.
Canopies lowered reduces the amount of light that is brought into the school. Area over the lobby is the library which will be opened up for more use. The height of the canopy will be
modified so it feels like a smaller building to the students coming in.
N. Golden advised that the design appears comforting.
S. Turner likes the overhands to be added with materials holding up the overhang/canopy.
Construction Management at Risk
Virtual walkthrough of the project was conducted with the Construction Management firms that were planning on submitting their qualifications.
There were 7 submissions from the firms of Commodore Builders, Consigli Construction, Dimeo Construction, Fontaine Bros., Gilbane Building Company, Shawmut Design & Construction, and W.T. Rich Company.
The CM Prequalification and Selection Working Group reviewed their qualifications to formulate the shortlist that will be invited to submit proposals and interview.
Interviews will be conducted the week of February 10, 2025.
The shortlist has been made: Consigli Construction, Fontaine Bros., Shawmut Design & Construction, and W.T. Rich Company.
This committee appreciates all of the firms and their efforts that made their firms credentials stand out. The Procurement Officer can distribute the qualifications to the SBC as requested when they are available.
Feedback will be provided and recommended to the SBC at the meeting that will be schedule virtually for February 13, 2025.
The interviews are recorded and not open to the public. E. Slagle will consult with Town Counsel if the interviews must be a posted meeting of the SBC. A transparent process is desired. The SBC vote will be conducted and recorded by WCTV.
Videos of the interviews occurring will be provided to the SBC members for their review and reference to assist in their providing a vote. These will be shared on February 12, 2025.
The CM interviews will be conducted in Town Hall, Room 9.
This CM decision is an important one as the CM needs to be onboard to understand and have knowledge of the assumed materials that will be utilized on the project to help set the budget, set in motion any advance procurement that needs to occur and ensure they get the most amount of information to this Committee, MSBA and the Town of Wilmington to set the budget for the project that will be what the Town will vote upon at Town Meeting and Ballot Vote in September 2025.
N. Golden made motion to approve the 4 Construction Managers that were recommended as the shortlisted firms by the Construction Manager at Risk Prequalification and Selection Working Group and D. Ragsdale seconded the motion.
C. Miner abstained from voting. S. Turner had left the meeting and did not participate in roll call.
Approval of CM Firm Shortlist Roll Call Vote: Affirmatively responded, passed unanimously.
Working Group Updates
Public Relations Working Group Flyer water bill mailers went to the Town for distribution, after approval by the Leadership Working Group. Shawsheen Valley Tech for produced, see invoice in Warrant 20B. Flyer will be further shared with outreach to school and community groups. Outreach will be initiated with PAWS and PAC to provide information and other activities to provide informational updates on the project.
M. Gallezzo asked that a copy of the water bill flyer be sent to the SBC after the meeting. This was sent on 12/18/2025 by S. Traniello and resent by V. Varbedian during the meeting to refresh in email.
Sustainablity Working Group – Life Cost Analysis will be ready within the next 2 week and will be explained in greater detail in a conversation for this working group for boilers and building systems. D. Kelley would like to hear more and have more explained to the SBC about the options with respect to Geothermal so there is a better understanding of how it compares with the others and what will best benefit this school and the community once it is built and be able to be maintained by the Town. A lot of decisions are being made in this SD phase and within the next 4 weeks heating and cooling system will need to be selected or get closer to being nailed down once there is a greater understanding.
Geothermal System is most expensive and being priced to cover all systems right now as of the 4 options it costs the most. Pricing for each of the systems in the SD phase will be compared back to the pricing obtained in the PSR phase.
Picking the system is important.
How much cost upfront and how much is the Return on Investment (ROI)?
Site and Landscape Working Group – Went through discussion points for the site plans and working through ideas.
Public Comments
Haley Stewart attended the meeting and encouraged having childcare at Town Meeting as it would be ideal so parents can participate fully without distraction. Lots of great ideas to share and enthusiasm in support of the project and would like to join in outreach to the community. G. Brand will connect H. Stewart with the appropriate people she will need to connect with.
Discussion and Committee Questions
PreConstruction Services: the CMs are going to get the estimating for the systems based on the fee set. In the interim, they will use the most expensive of the 4 heating/cooling systems as the placeholder for the cost.
PSR estimate had geothermal in it.
Abutters Meeting will be at North Intermediate School on January 29, 2025 at 6pm immediately before the SBC Meeting at 7pm in the Cafeteria and will be important to listen to the surrounding community and their concerns and thoughts regarding the new school. Mailing will be distributed to abutters inviting them to the Abutters Meeting.
Town Meeting will be held on Saturday, September 13, 2025
Ballot Vote will be Tuesday, September 16, 2025.
Correspondence
None
Next Meeting: January 29, 2024 at 7:00pm
North Intermediate School Cafeteria and Remote Participation via Zoom
Adjourn
G. Brand thanked the committee for their efforts and invited a motion to adjourn.
N. Golden motioned to adjourn. C. Prendergast seconded the motion. Roll call vote, motion carried by unanimous vote.

Design Update

Site Plan Update

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)
CIRCUITOUS CAMPUS PATH
CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)

3 RAISED GARDEN BEDS
SENSORY CORTEX

4 SENSORY GARDEN: EDUCATIONAL
SENSORY CORTEX
STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE /
PASSIVE / INCLUSIVE FRONTAL CORTEX

6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink
landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

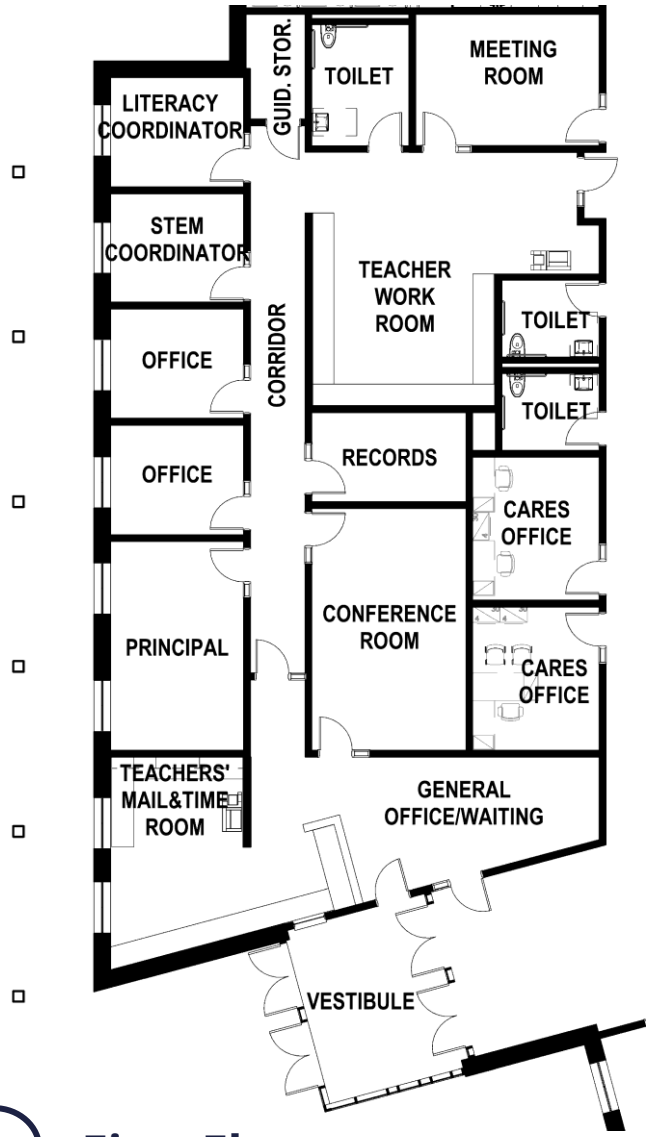
N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

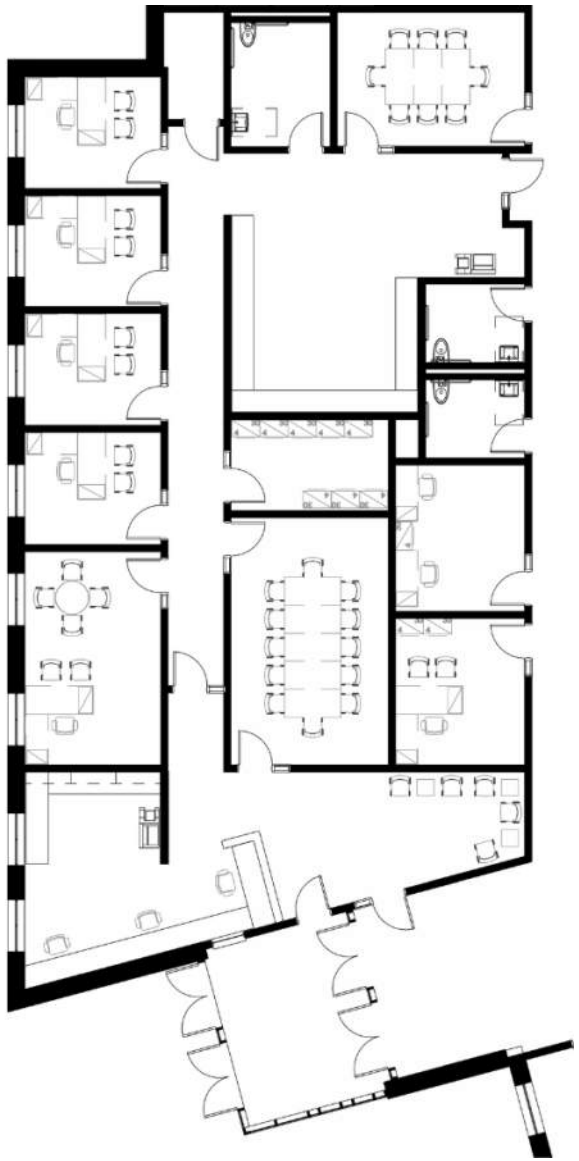
NORTH

Wilmington . Massachusetts
Schematic Design Phase
January 2025

Floor Plan Update

Floor Plan Review: Administration Suite

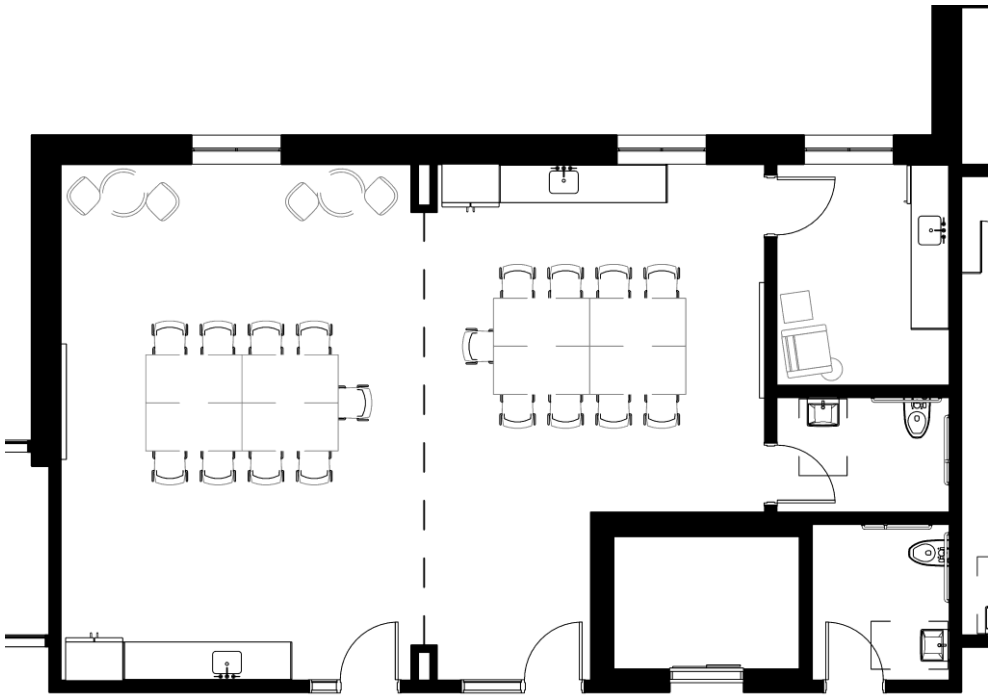




First Floor

Floor Plan Review: Teacher Collaboration

First Floor

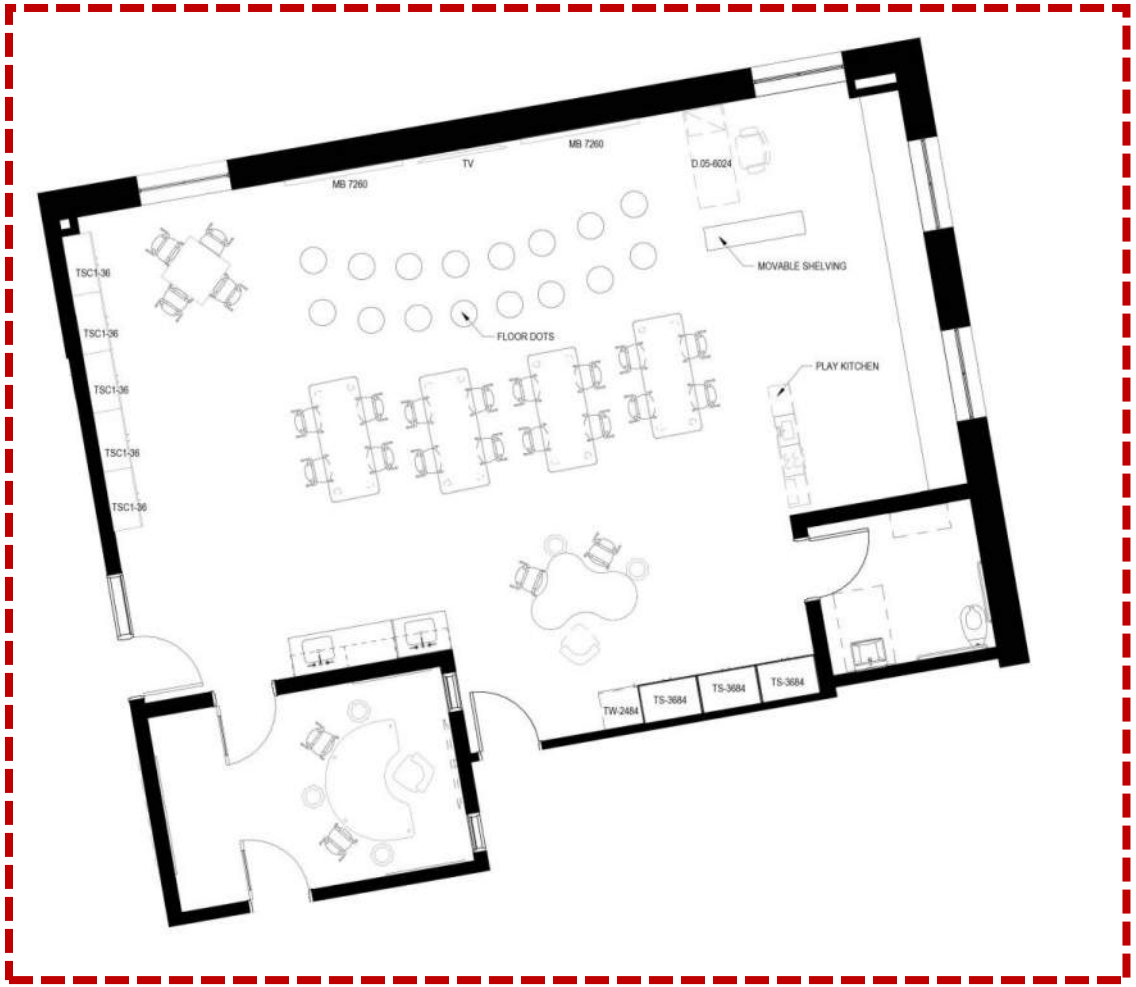


Floor Plan Review: PreK Wing

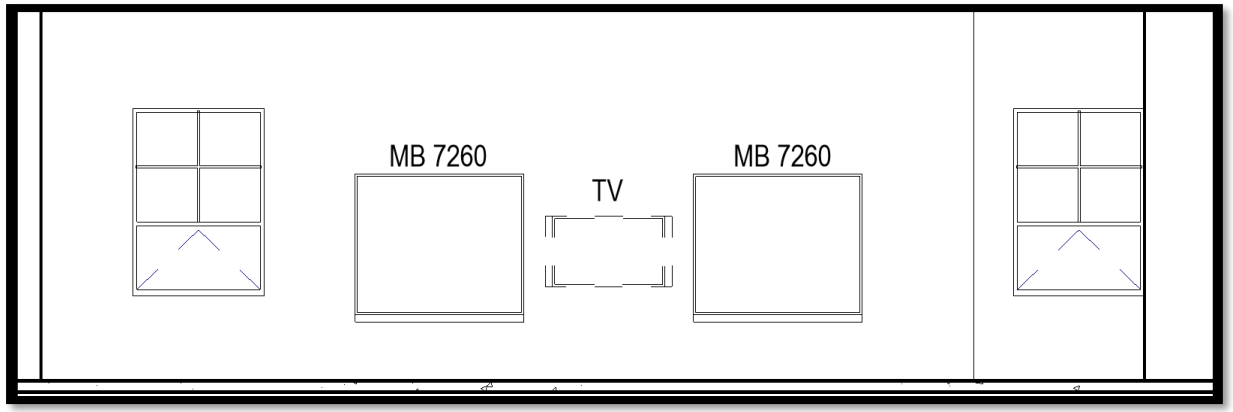
First Floor

Floor Plan Review: PreK Classroom

First Floor



Floor Plan Review: PreK Classroom



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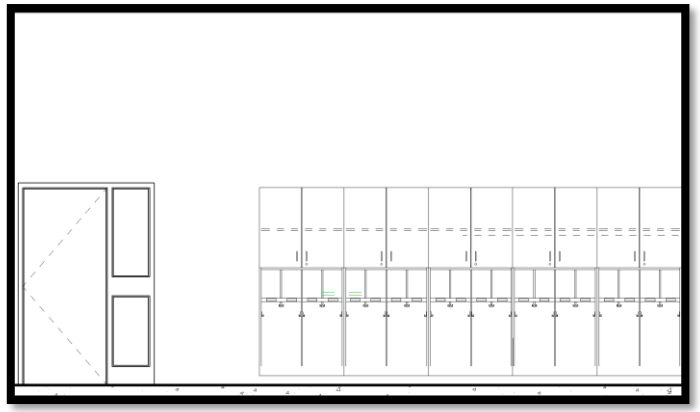
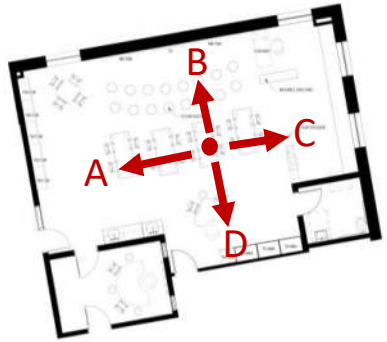
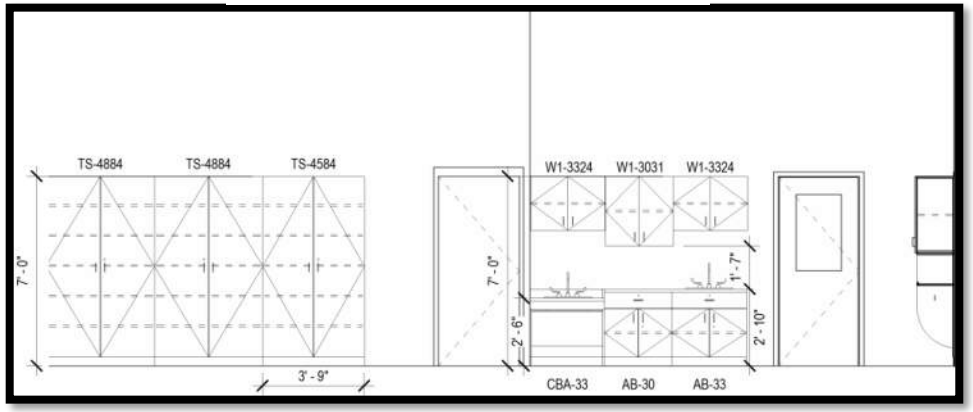


A





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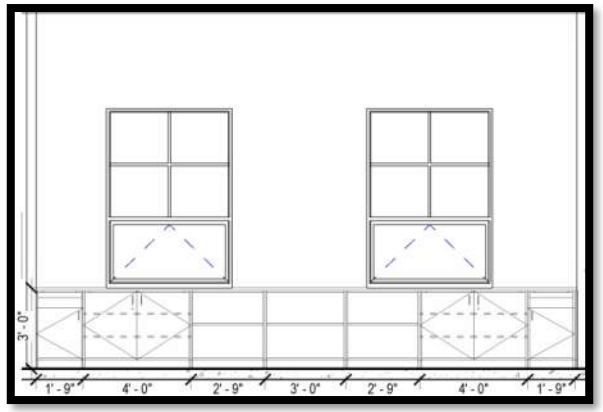
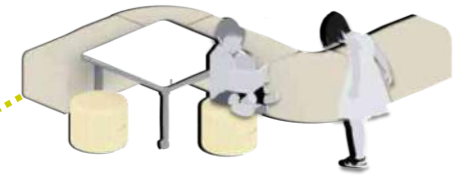


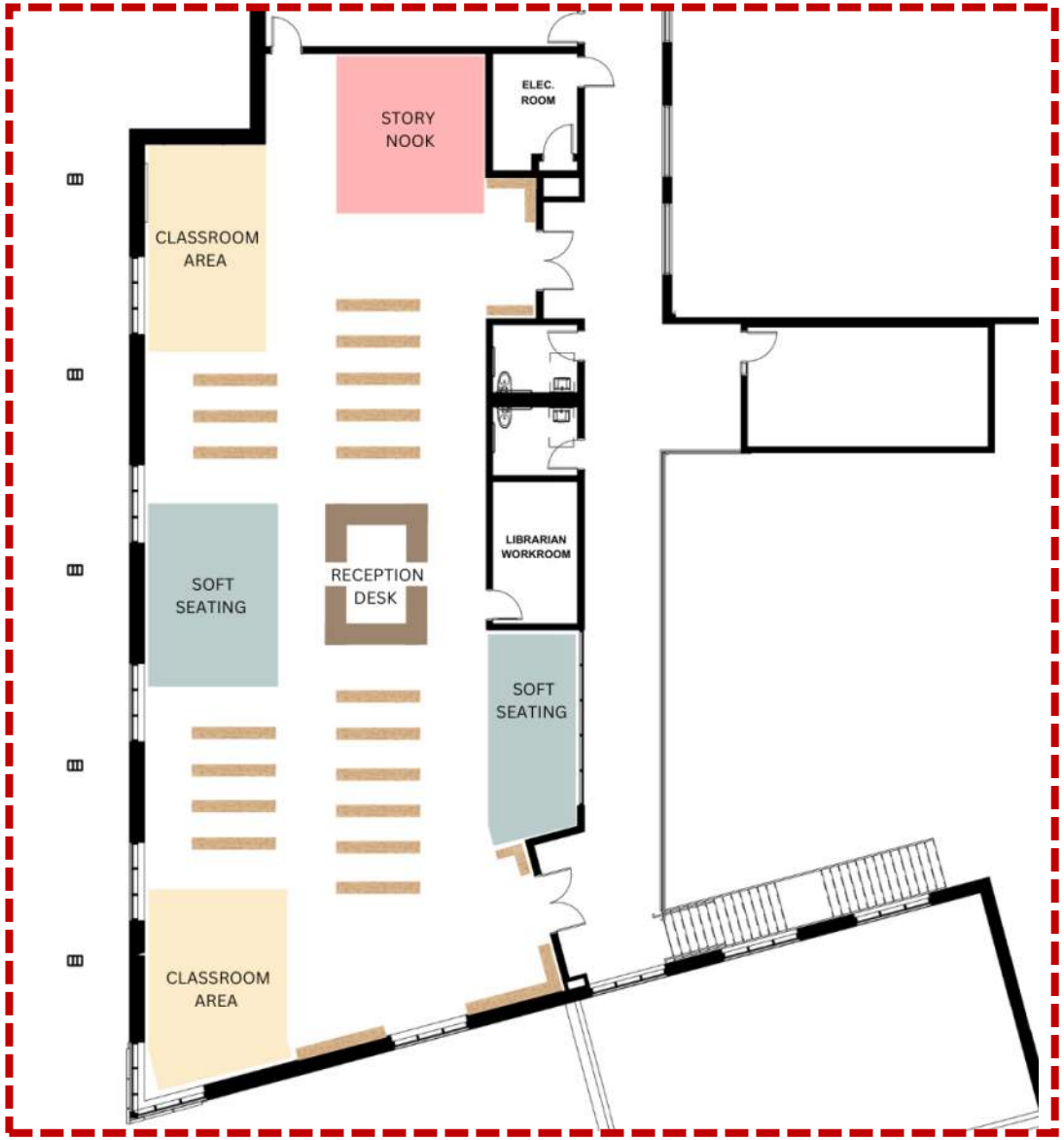
C

Extended Learning Area



Floor Plan Review: Media Center / Library

Second Floor



Project Aesthetics

Interiors

Aesthetic Imagery Visioning: Interior

Common Themes

WARM TONES:
RED, ORANGE & YELLOW

Inspired by apples, fruits, and fall leaves, warm tones bring energy, creativity, and a sense of playfulness

Applications:
- Pops of color in seating, signage, and playful details like wayfinding markers
- Corridor walls having some apple-red accents for Pre-K and Kindergarten to anchor the roots
- Yellow tones for collaborative zones to inspire optimism and creativity

Design Impact:
- Reds stimulate energy and excitement (but used sparingly to avoid overstimulation)
- Yellows bring cheerfulness and encourage collaboration
- These tones are age-appropriate and create a joyful, lively atmosphere

WOOD TONES:
WARM

Represents the trunk of the tree, serving as a metaphor for strength, stability, and a foundation for growth

Applications:
- In key structural elements such as columns, beams, along with accent walls and ceiling applications in the cafeteria, lobby, library, and corridors
- Used for furniture, handrails, and millwork to create a warm, inviting environment

Design Impact:
- Promotes feelings of safety and comfort, critical for younger students
- Connects students to the natural world, grounding them in a calm, organic setting
- Brings the outdoor environment connected to the interior and exterior

GREENS

Symbolizes the leaves and canopy of the tree, representing a connection to nature. Fostering a sense of growth, renewal, and harmony, much like being in a forest.

Applications:
- Ceiling treatments with leaf-like patterns or acoustic panels in public areas
- Wall accents and wayfinding signage to tie different areas together
- Organic shapes and natural textures further soften the space

Design Impact:
- Enhances focus, reduces stress, and provides a sense of renewal and balance
- Younger grades might see brighter greens (energetic), while older grades might transition to deeper greens (maturity)

BLUES

Reflects the sky and a guiding path through mirroring streams that navigate students through their journey. Blue symbolizes calm, trust, and creativity while connecting to Wilmington.

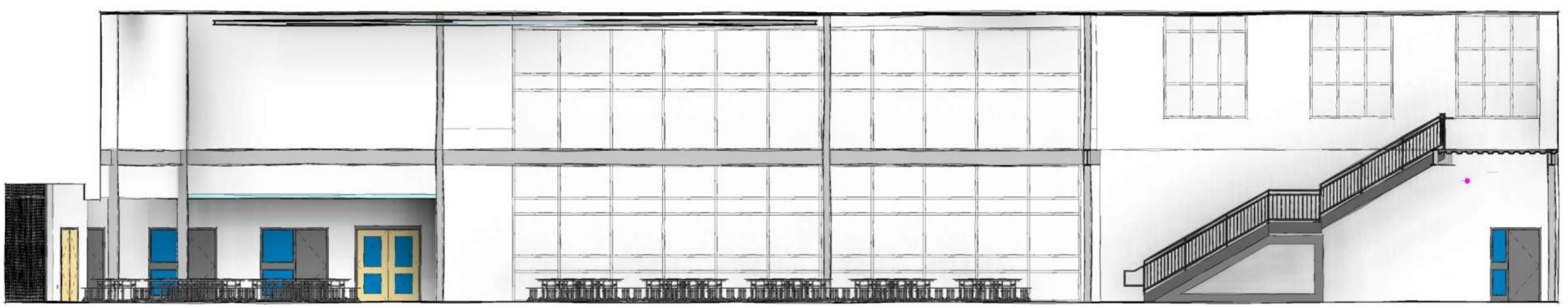
Applications:
- Flowing floor patterns in hallways, mimicking streams to guide movement
- Accent walls in breakout spaces to create zones of calm for independent work
- Ceiling treatments in collaborative areas to simulate the open sky

Design Impact:
- Encourages a sense of calm and promotes imaginative thinking
- Adds a soft contrast to warmer tones, balancing the overall palette

Cafeteria Study

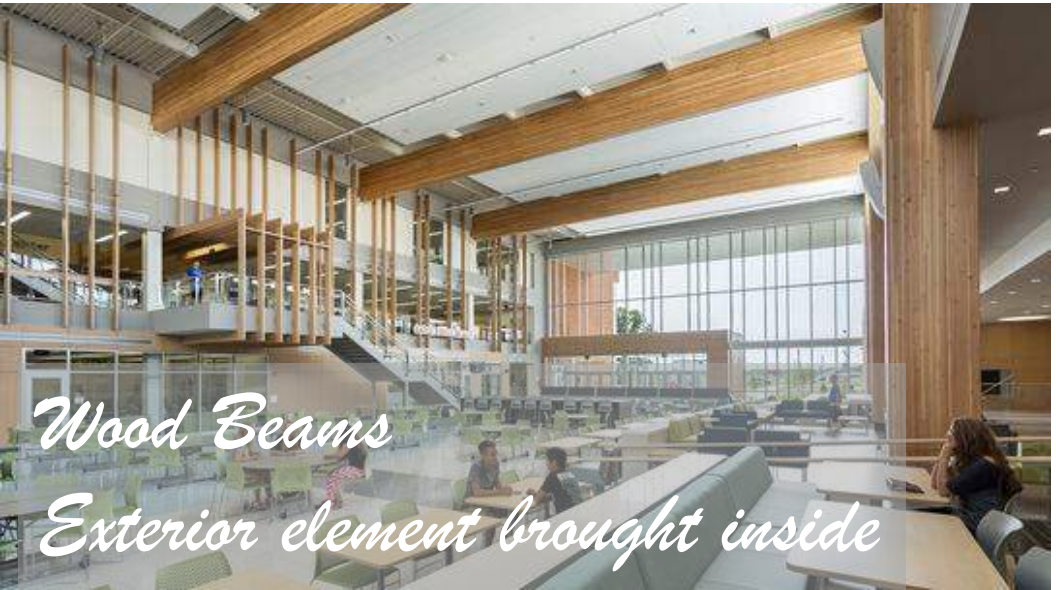
Stair

Art Wall



Stair from Cafeteria to Library

Structural columns



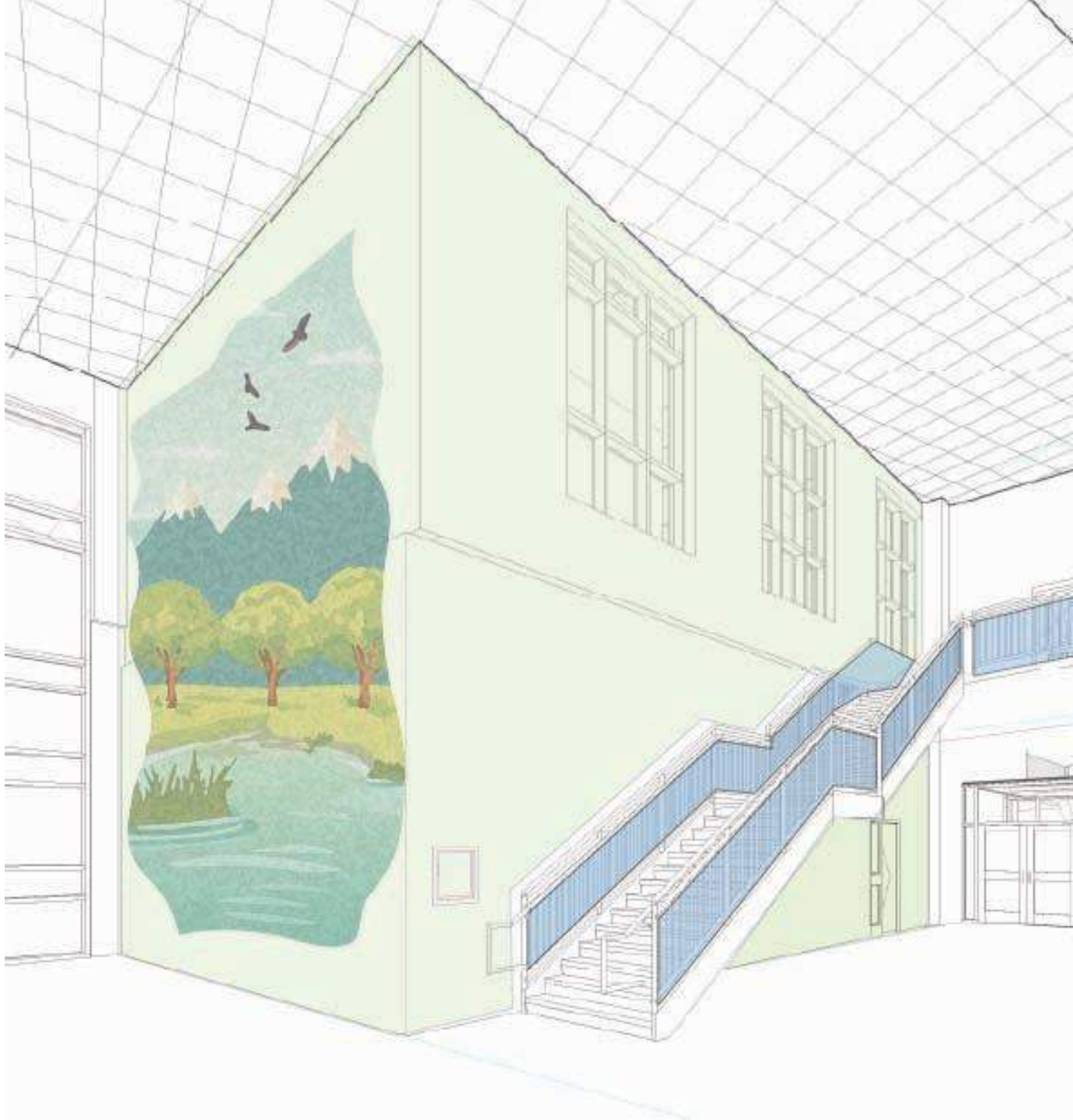
Wood Beams
Exterior element brought inside

"Under the Stair"

CAFETERIA – ART WALL STUDY

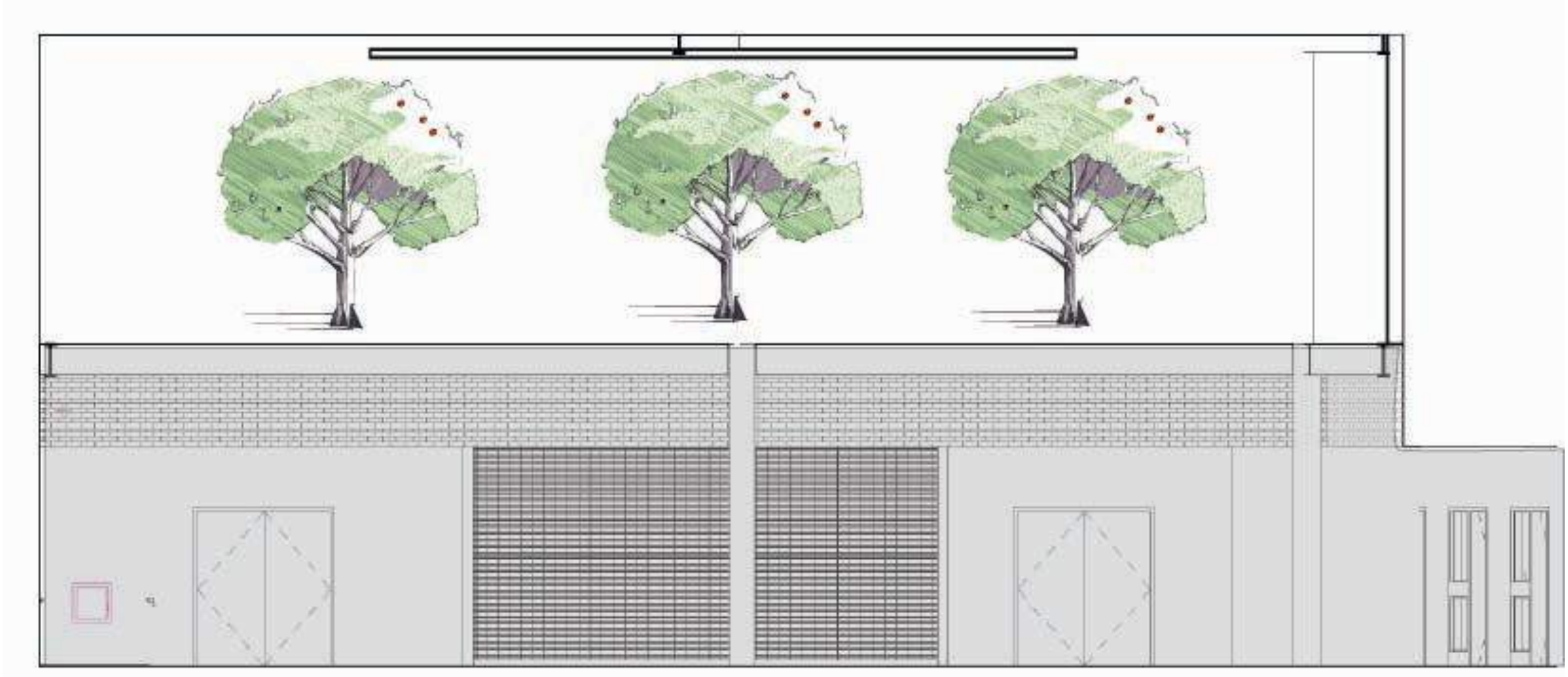
CAFETERIA
ART WALL STUDY

- Murals
- Wrap the two-story wall in from windows to library



CAFETERIA - ART WALL STUDY

- Graphics printed on acoustical wall panels – imagery TBD



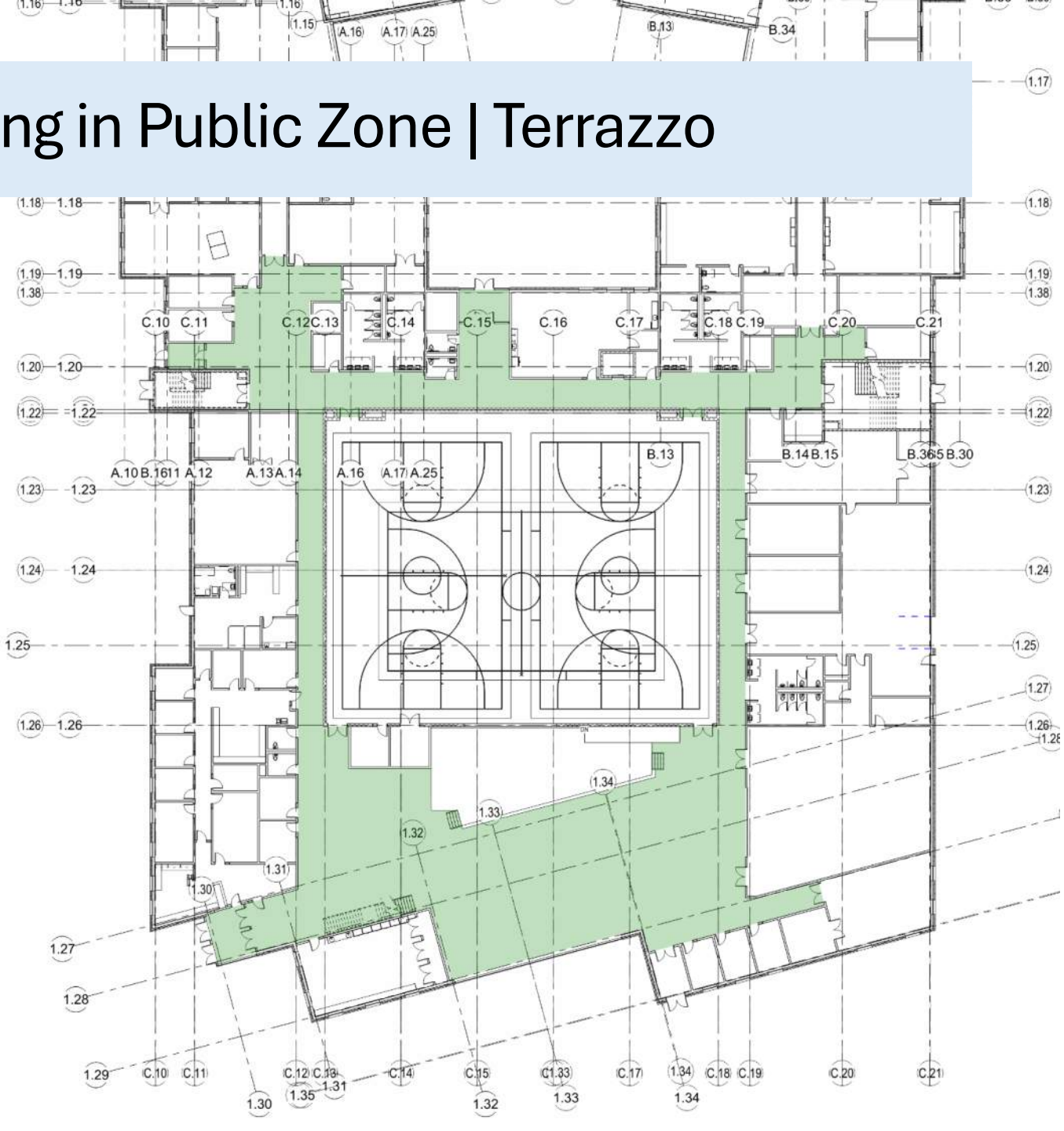
LIGHTING FIXTURES IN KEY AREAS

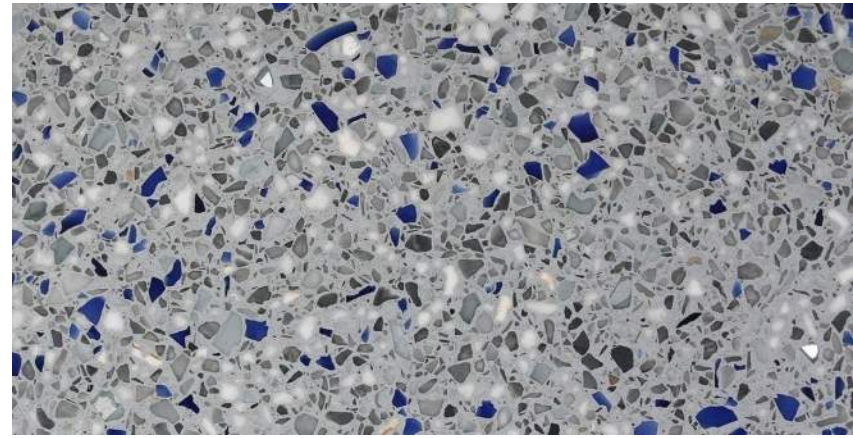
BRANCHES

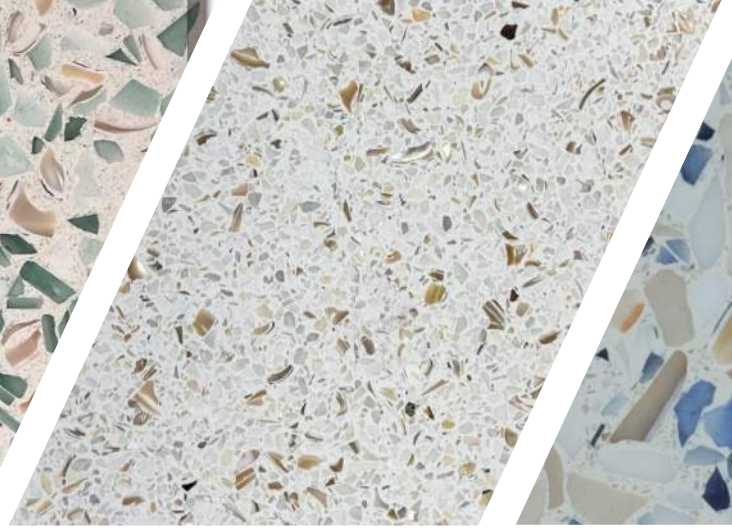
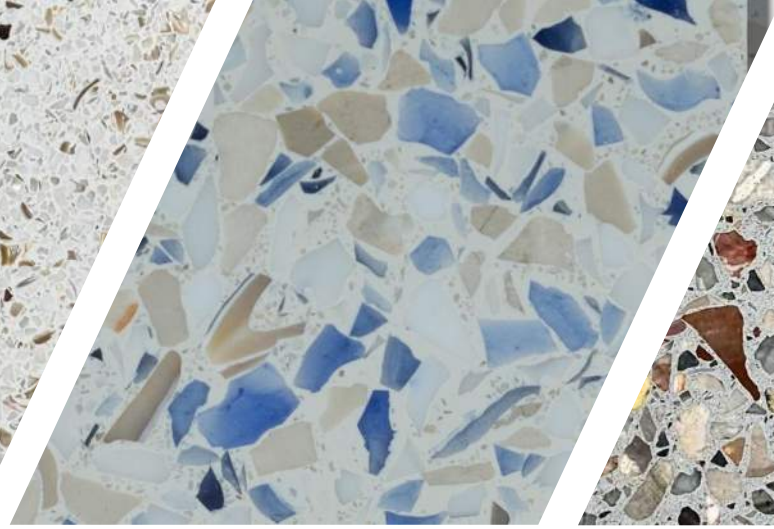
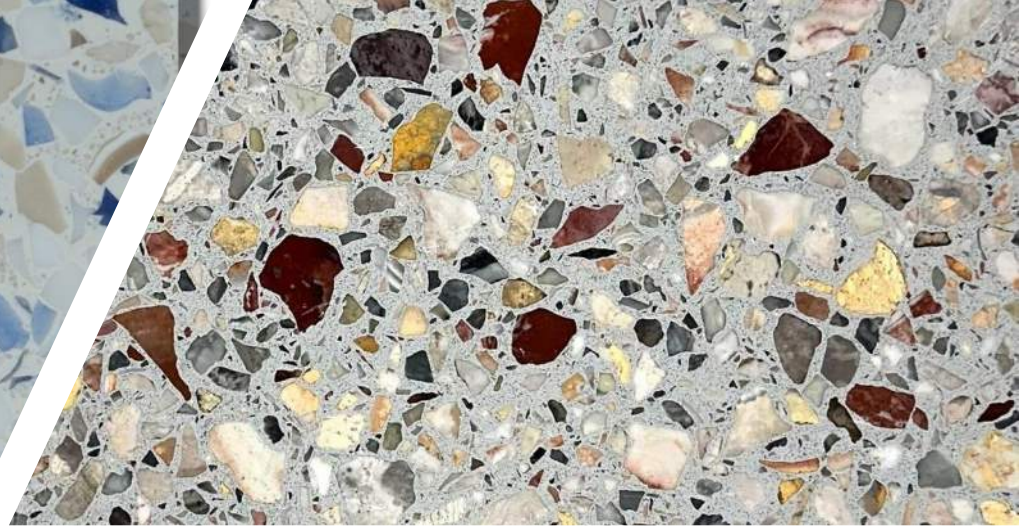
PETALS

Flooring Study

Flooring in Public Zone | Terrazzo



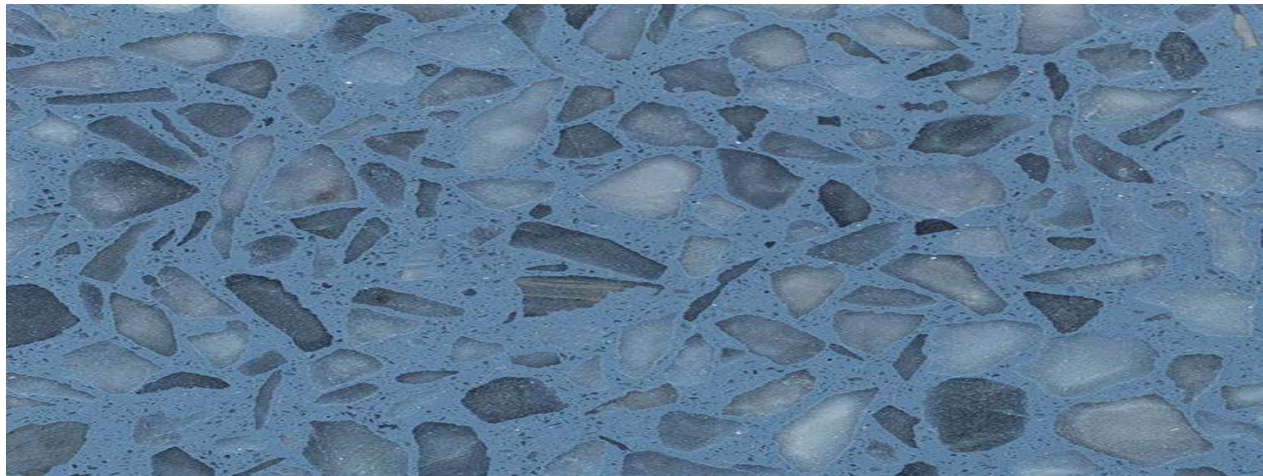


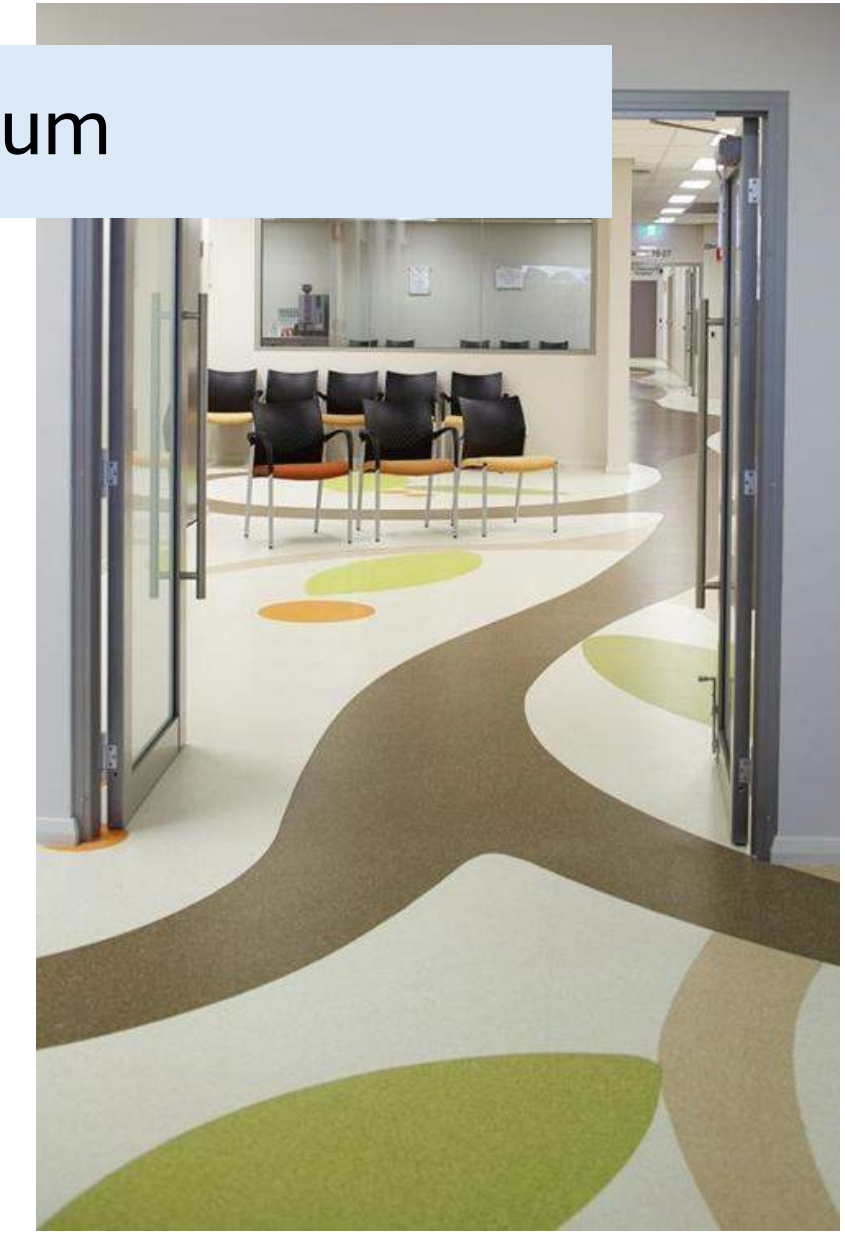
Aggregates can include, but are not limited to Glass, Shell, Synthetic, and Mirror Aggregate.

Terrazzo flooring

Terrazzo Stairs | Cascading “waterfall”

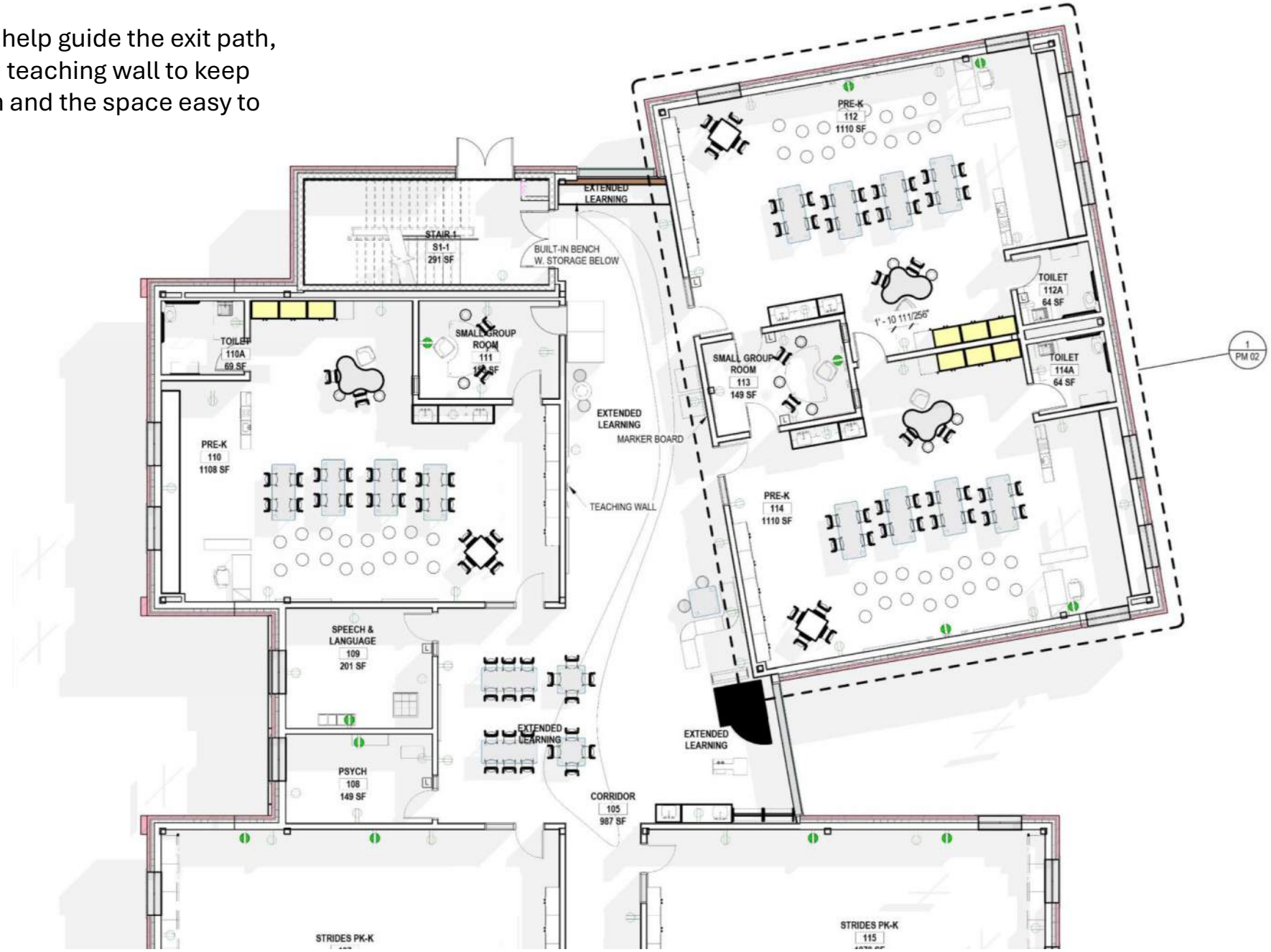


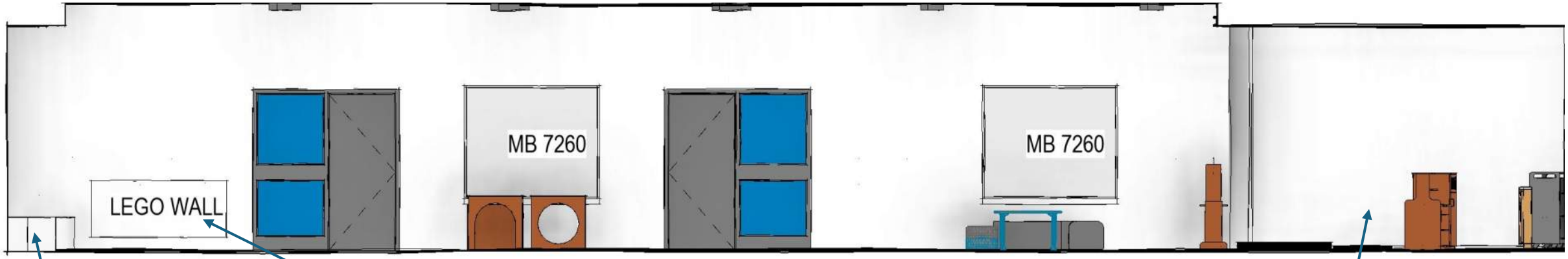
Academic Wings| Linoleum



Pre-K ELA Plan

Floor patterns can help guide the exit path, curving around the teaching wall to keep movement smooth and the space easy to navigate



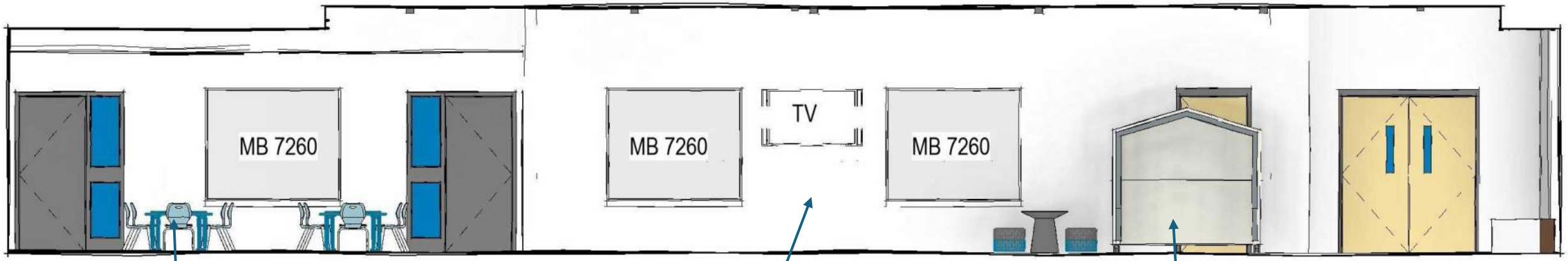


PK – ELA Elevation | East

Window Seat

LEGO Wall

Extended Learning



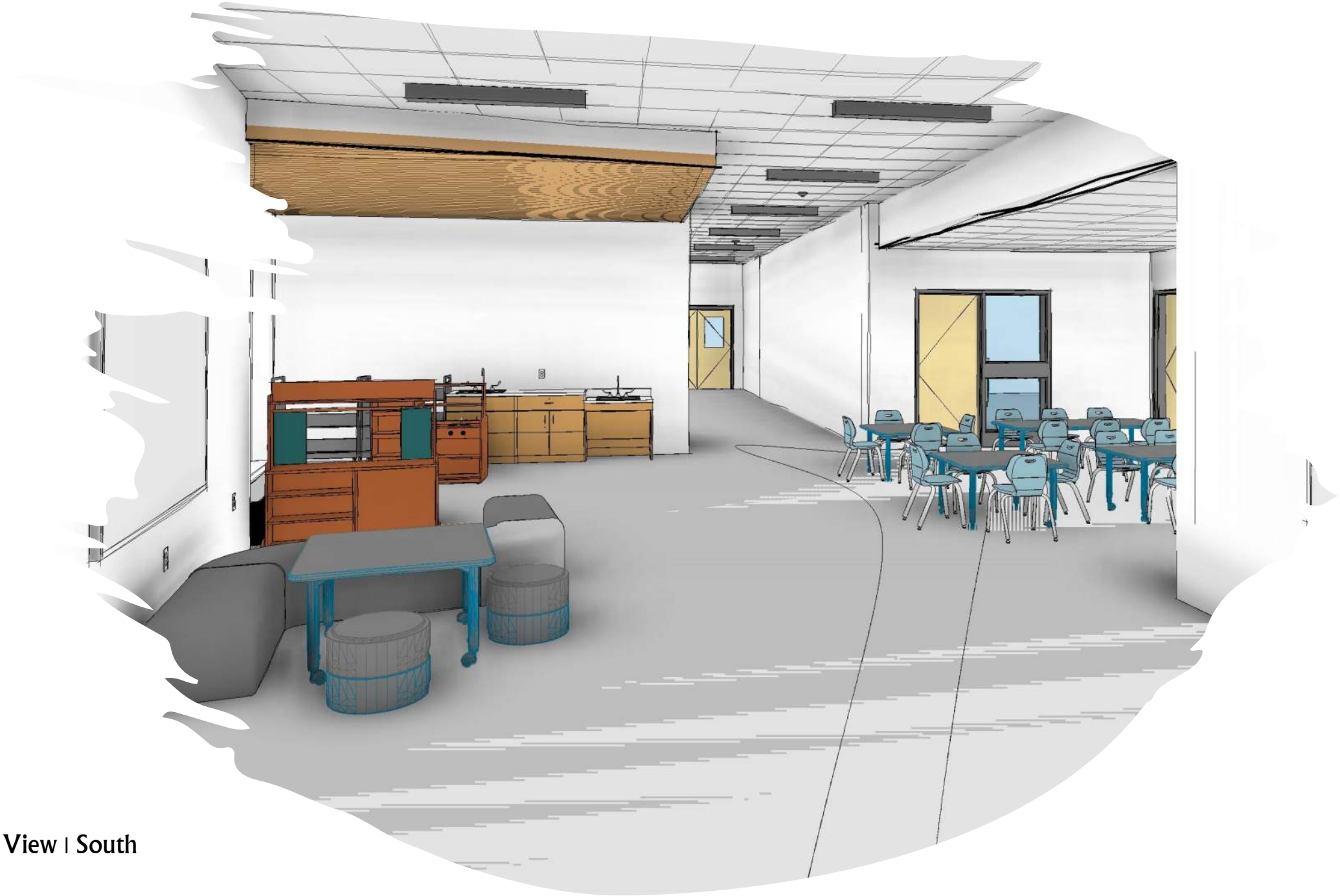
PK – Extended Learning Area Elevation | West

Extended learning

Teaching Wall

Play Zone

Pre-K ELA View | North



Pre-K ELA View | South

Project Aesthetics

Exterior Update

Project Inspiration

The school would be designed to emulate the tree's essence, where every child could feel rooted and free to grow. Here's how the Baldwin tree is a metaphor for the architectural vision:

1. **Roots: A Strong Foundation**
   The school would be grounded in the values of curiosity and community. The foundation, like the tree's roots, would spread wide and deep, symbolizing the knowledge and support systems that anchor children as they begin their educational journey.

2. **Trunk: The Pillar of Learning**
   Central, multi-purpose core: Cafeteria and Gymnasium gathering spaces are the "trunk" of the school. These spaces, tall and strong, are the core where children, teachers, and families can gather for assemblies, cultural events, and celebrations. It represents strength, stability, and shared purpose.

3. **Branches: A Canopy of Growth**
   The classrooms wings extend like branches from the central core. Each classroom is designed to be modular and adaptive, filled with natural light and airflow. Extended learning areas and small group rooms foster an environment that encourages exploration and interaction.

4. **Leaves: Individual Potential**
   The leaves, ever-changing yet integral to the tree's life, symbolize the children themselves. Outdoor learning spaces, art walls, and play areas are created to nurture each child's unique creativity and curiosity. Each child can grow and flourish, much like the leaves transforming under the sun.

5. **Shade: A Place for All**
   Like the Baldwin Tree, the school would offer shelter and inclusion. The design features communal spaces for the Town, ensuring the school is not just for children but a space for everyone to come together—celebrating life, knowledge, and unity.

Option 1

Southeast View of Main Entry

Southwest View

East Elevation at Cafeteria

Option 1

Southeast Perspective

Option 2

Southeast View of Main Entry

Southwest View

East Elevation at Cafeteria

Option 2

Southeast Perspective

Option 3

Southeast View of Main Entry

Southwest View

East Elevation at Cafeteria

Option 3

Southeast Perspective

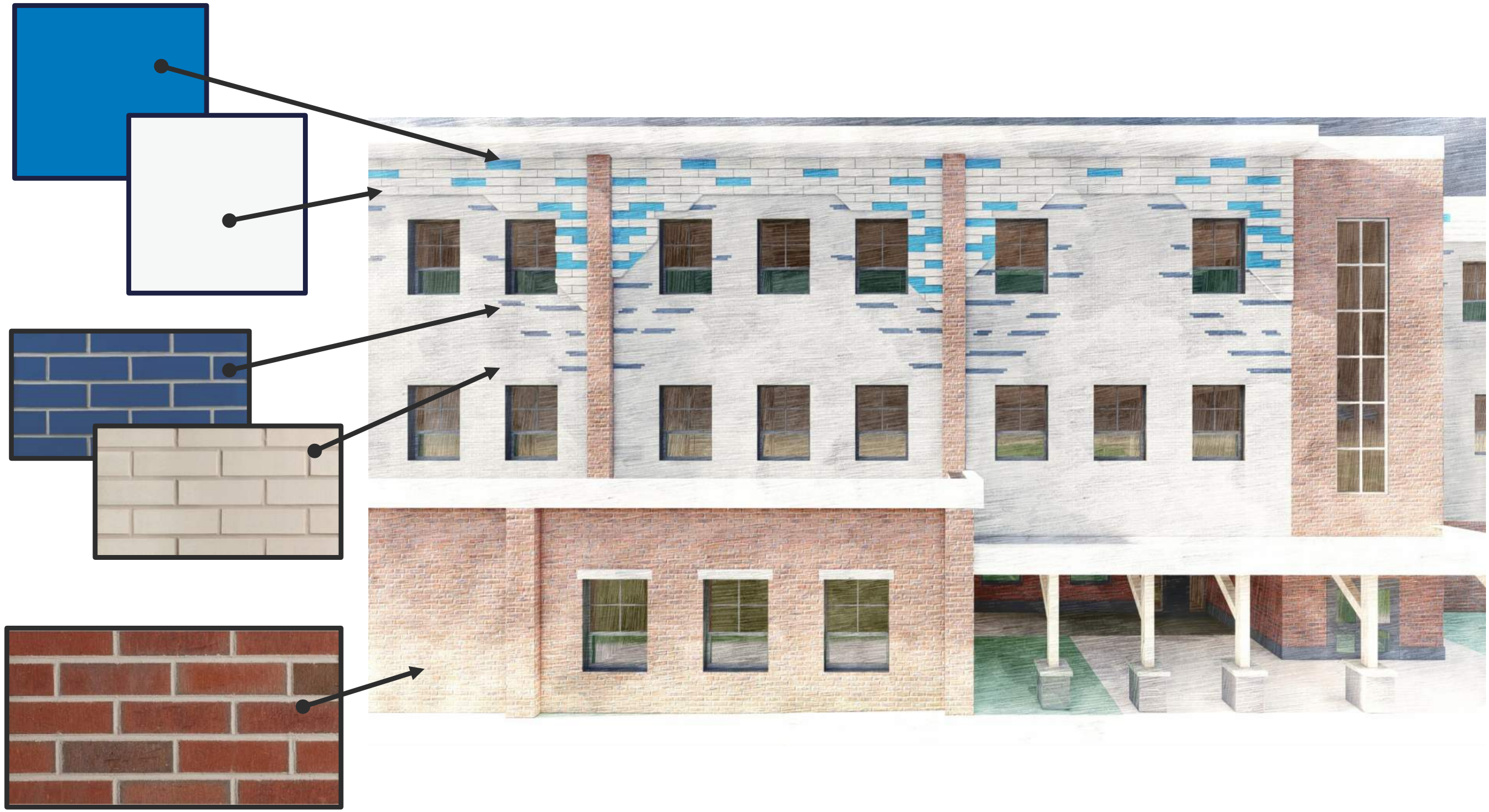
Option 3

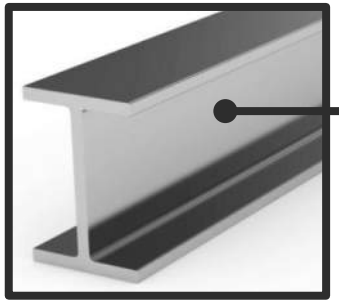
Option 2

Option 1

Aesthetic Imagery Visioning:

Elevation Studies





Building Systems Update

Wilmington
Wildwood School

WILMINGTON PUBLIC SCHOOLS

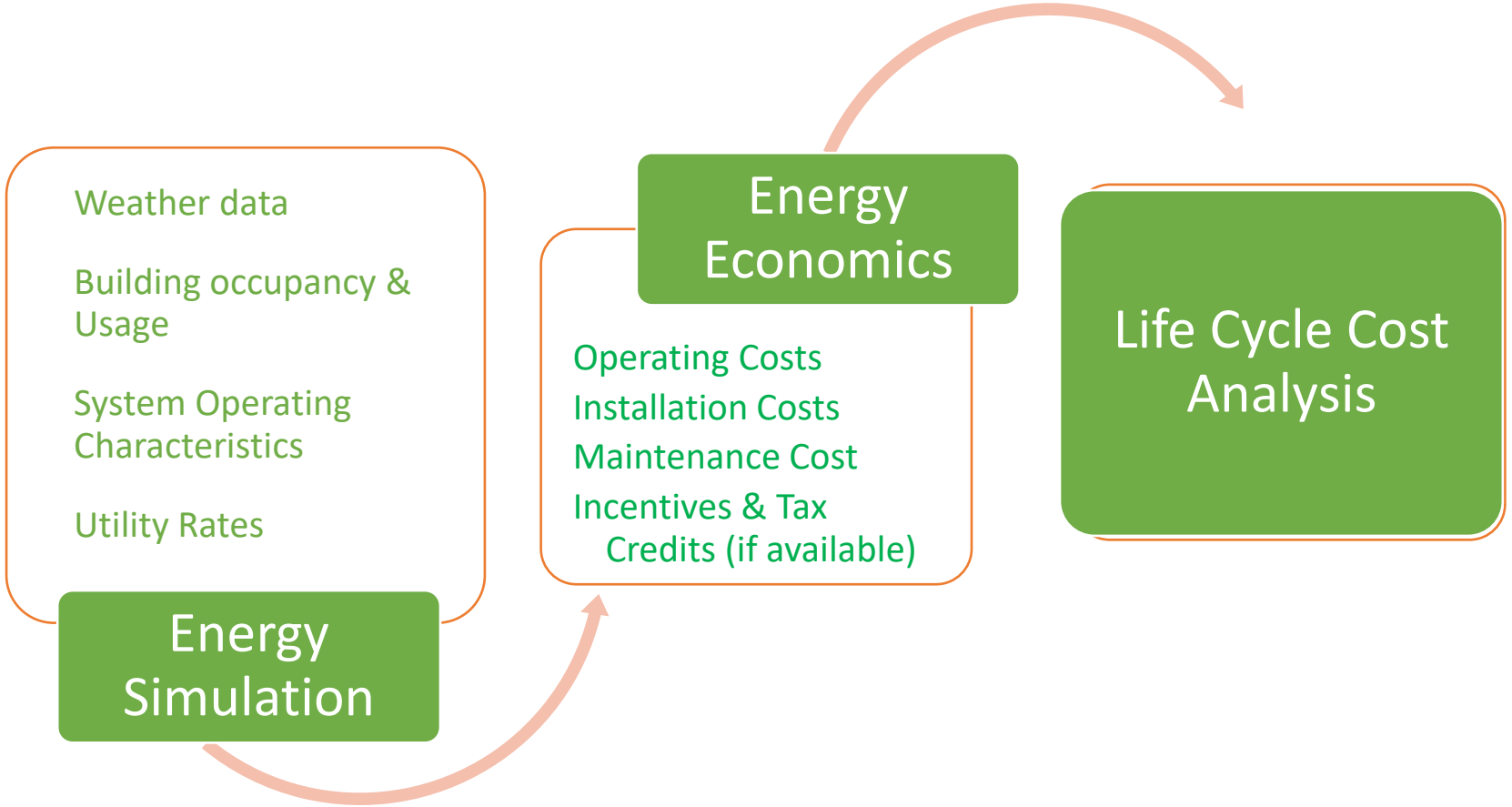
Wilmington, MA

HVAC
System Options
&
Life Cycle Cost Analysis
(LCCA)
Summary

GOAL OF LIFE CYCLE COST ANALYSIS

- The goal of the mechanical lifecycle engineering economic analysis is to assess the performance of **various mechanical system options** in comparison to a baseline mechanical system.
- Each option is compared to the baseline system over a 50-year cycle to determine the most advantageous system considering **utility costs, maintenance costs, replacement costs, and initial construction costs**.
- By comparison of each option to the baseline system, the option with the **greatest total life-cycle savings** is generally recommended.

LCCA - ENERGY ECONOMICS METHODOLOGY



LIFE CYCLE COST ANALYSIS

Proposed Design Criteria Temperature Conditions

Notes:
DB = Dry Bulb
RH = Relative Humidity
WB = Wet Bulb

Design Outdoor Temperature Data

Per ASHRAE Tables for Weather Station – Hanscom AFB: Heating 99.6% @ 2.6°F Heating & Cooling 0.4% @ 91°F db, 74°F wb

Classrooms, Office, Cafeteria, Auditorium, Gym are proposed for all options to provide:

Heating, Ventilation @ 70 °F db +/- 2°F

Air Conditioning : 75°F db +/- 2°F

with 55% RH +/- 5%RH

Storage & Utility Room: Heating and Ventilation Only @ **70°F db** for heating

Unoccupied temperature setback of **55°F db Heating** and **85°F db Cooling** is provided for **all options**.

LCCA HVAC OPTIONS

ALL HVAC OPTIONS ARE BASED ON FOSSIL FUEL FREE, ELECTRIFIED HEATING SYSTEMS THAT WILL BE COMPARED TO A MASSACHUSETTS OPT-IN CODE COMPLAINT BUILDING & HVAC SYSTEM.

ALL OPTIONS SHALL MEET OR EXCEED:

- MSBA Requirement for Additional Reimbursement
- LEED Requirements
- MA Opt-in Stretch Energy Code RequirementS

ALL PROPOSED SYSTEMS INCLUDE AIR CONDITIONING.

LCCA HVAC OPTIONS

BASELINE: Air Source Heat Pump Plant - Mixed-Air Overhead VAV System and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

OPTION 1: Air-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Air Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free)

OPTION 2: Geothermal Water-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Water-Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free)

OPTION 3: Air Source Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

OPTION 4: Geothermal Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and Geothermal Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

LCCA Summary (without Federal Tax Credits)

Baseline	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
-	1. Mixed-Air Overhead CHW/HHW VAV AHU's w/ ERV & Terminal VAV's w/ Hot Water Re-Heat Coils 2. High-Efficiency ASHP Chiller/Heater Plant	$15,838,440	1,738,354	$327,852	$1.96	**35.5**	$77,410	$1,620,000	$3,198,500	$1,620,000	$405,262	-	-	-

Option	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
1	1. Variable Refrigerant Flow (VRF) Units w/ Air-Source Condensers serving the Classrooms, Administration and Support Areas 2. ASHP DOAS AHU's w/ ERV & Terminal VAV's w/ DCV providing Ventilation to the VRF Units 3. Mixed-Air Overhead AHSP VAV AHU's w/ ERV & DCV serving the Cafe/Stage and Gym areas 4. Supplemental Electric Resistance Heating Units	$14,007,900	1,443,027	$291,930	$1.75	**29.5**	$58,460	$1,943,500	$1,185,000	$3,167,000	$350,390	**$54,872**	**$4,025,486**	Instant*****
2	1. VRF System w/ Water-Source Heat Pump (WSHP) Heat Recovery Condensing Units 2. WSHP VAV Dedicated Outdoor Air Systems (DOAS) w/ ERV & DCV with Terminal VAV Boxes 3. Supplemental Electric Heating 4. Geothermal Well Field and Distribution Plant	$19,358,100	1,183,958	$223,944	$1.34	**24.2**	$62,235	$0	$3,945,000	$0	$286,179	**$119,083**	**$2,446,273**	**23**
3	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW Dedicated Outdoor Air System (DOAS) AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency ASHP Chiller/Heater Plant 4. Backup Electric Boiler Plant	$14,442,360	1,160,735	$229,174	$1.37	**23.7**	$74,000	$1,620,000	$2,289,500	$1,620,000	$303,174	**$102,088**	**$5,680,330**	Instant*****
4	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW DOAS AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency Ground Source Heat Pump (GSHP) Chiller/Heater Plant w/ Geothermal Well Field 4. Backup Side-Stream Electric Boiler Plant	$18,306,360	1,093,195	$205,748	$1.23	**22.3**	$75,675	$0	$3,379,500	$0	$281,423	**$123,839**	**$4,041,912**	**21**

LCCA Summary (with Geothermal Federal Tax Credits)

Baseline	System	Gross Capital Investment*	25.5% IRA Geothermal Federal Tax Credit***	Net Investment	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings***	Total Life-Cycle Savings***	Discounted Payback (Years)****
-	1. Mixed-Air Overhead CHW/HHW VAV AHU's w/ ERV & Terminal VAV's w/ Hot Water Re-Heat Coils 2. High-Efficiency ASHP Chiller/Heater Plant	$15,838,440	$0	**$15,838,440**	1,738,354	$327,852	$1.96	**35.5**	$77,410	$1,620,000	$3,198,500	$1,620,000	$405,262	-	-	-

Option	System	Gross Capital Investment*	25.5% IRA Geothermal Federal Tax Credit***	Net Investment	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings***	Total Life-Cycle Savings***	Discounted Payback (Years)****
1	1. Variable Refrigerant Flow (VRF) Units w/ Air-Source Condensers serving the Classrooms, Administration and Support Areas 2. ASHP DOAS AHU's w/ ERV & Terminal VAV's w/ DCV providing Ventilation to the VRF Units 3. Mixed-Air Overhead AHSP VAV AHU's w/ ERV & DCV serving the Cafe/Stage and Gym areas 4. Supplemental Electric Resistance Heating Units	$14,007,900	$0	**$14,007,900**	1,443,027	$291,930	$1.75	**29.5**	$58,460	$1,943,500	$1,185,000	$3,167,000	$350,390	**$54,872**	**$4,025,486**	**Instant*****
2	1. VRF System w/ Water-Source Heat Pump (WSHP) Heat Recovery Condensing Units 2. WSHP VAV Dedicated Outdoor Air Systems (DOAS) w/ ERV & DCV with Terminal VAV Boxes 3. Supplemental Electric Heating 4. Geothermal Well Field and Distribution Plant	$19,358,100	$4,936,316	**$14,421,785**	1,183,958	$223,944	$1.34	**24.2**	$62,235	$0	$3,945,000	$0	$286,179	**$119,083**	**$7,382,588**	**Instant*****
3	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW Dedicated Outdoor Air System (DOAS) AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency ASHP Chiller/Heater Plant 4. Backup Electric Boiler Plant	$14,442,360	$0	**$14,442,360**	1,160,735	$229,174	$1.37	**23.7**	$74,000	$1,620,000	$2,289,500	$1,620,000	$303,174	**$102,088**	**$5,680,330**	**Instant*****
4	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW DOAS AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency Ground Source Heat Pump (GSHP) Chiller/Heater Plant w/ Geothermal Well Field 4. Backup Side-Stream Electric Boiler Plant	$18,306,360	$4,668,122	**$13,638,238**	1,093,195	$205,748	$1.23	**22.3**	$75,675	$0	$3,379,500	$0	$281,423	**$123,839**	**$8,710,034**	**Instant*****

HVAC LCCA CONCLUSIONS

- **Without Tax Credits**…

  Option 3, Displacement Ventilation with an Air-Source Heat Pump Plant, represents the **lowest life cycle cost** (L.L.C.) of the system options studied by yielding an approximate $5,680,330 savings over the 50 year study period with an instant payback by having a lower capital investment than the baseline system.

- **With Utility Federal Tax Credits**…

  Option 4, Ground-Source Heat Pump Displacement Ventilation System, represents the greatest total life cycle savings by yielding an approximate $8,710,034 savings over the 50 year study period with an instant payback.

  The **geothermal system** additionally provides further benefits that should be considered:

  - Second lowest EUI of all options at 22.3 kBTU/s.f./yr.
  - System longevity
  - Reduced maintenance
  - Reduced downtime
  - Improved controllability of equipment
  - Best acoustics - does not require exterior mounted condensing equipment

HVAC LCCA SIMPLIFIED SUMMARY

		Initial Cost	Lifetime Cost Savings	Expected Operating Cost (annual)	Maintenance Zones	Primary HVAC Fluid	Outdoor Noise	Indoor Noise	Ventilation Effectiveness	Frequency of Replacement
Options	1	$14.0M	$4.0M	$350K	All Spaces	Refrigerant	Moderate	Low	Standard	20 yr
	2	$19.4M	$2.5M	$286K	All Spaces	Refrigerant	Low	Low	Standard	30 yr
	3	$14.4M	$5.7M	$303K	Roof & Mech Rm	Water	Highest	Very Low	Improved	20 yr
	4	$18.3M	$4.0M	$281K	Roof & Mech Rm	Water	Low	Very Low	Improved	30 yr

HVAC LCCA SIMPLIFIED SUMMARY

		Initial Cost	Lifetime Cost Savings	Expected Operating Cost (annual)	Maintenance Zones	Primary HVAC Fluid	Outdoor Noise	Indoor Noise	Ventilation Effectiveness	Frequency of Replacement
Options	1	$14.0M	$4.0M	$350K	All Spaces	Refrigerant	Moderate	Low	Standard	20 yr
	2	$19.4M	$2.5M	$286K	All Spaces	Refrigerant	Low	Low	Standard	30 yr
	3	$14.4M	$5.7M	$303K	Roof & Mech Rm	Water	Highest	Very Low	Improved	20 yr
	4	$18.3M	$4.0M	$281K	Roof & Mech Rm	Water	Low	Very Low	Improved	30 yr

Construction Manager at Risk

Working Group Updates

Discussion, Correspondence, New Items

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #28

February 5, 2025

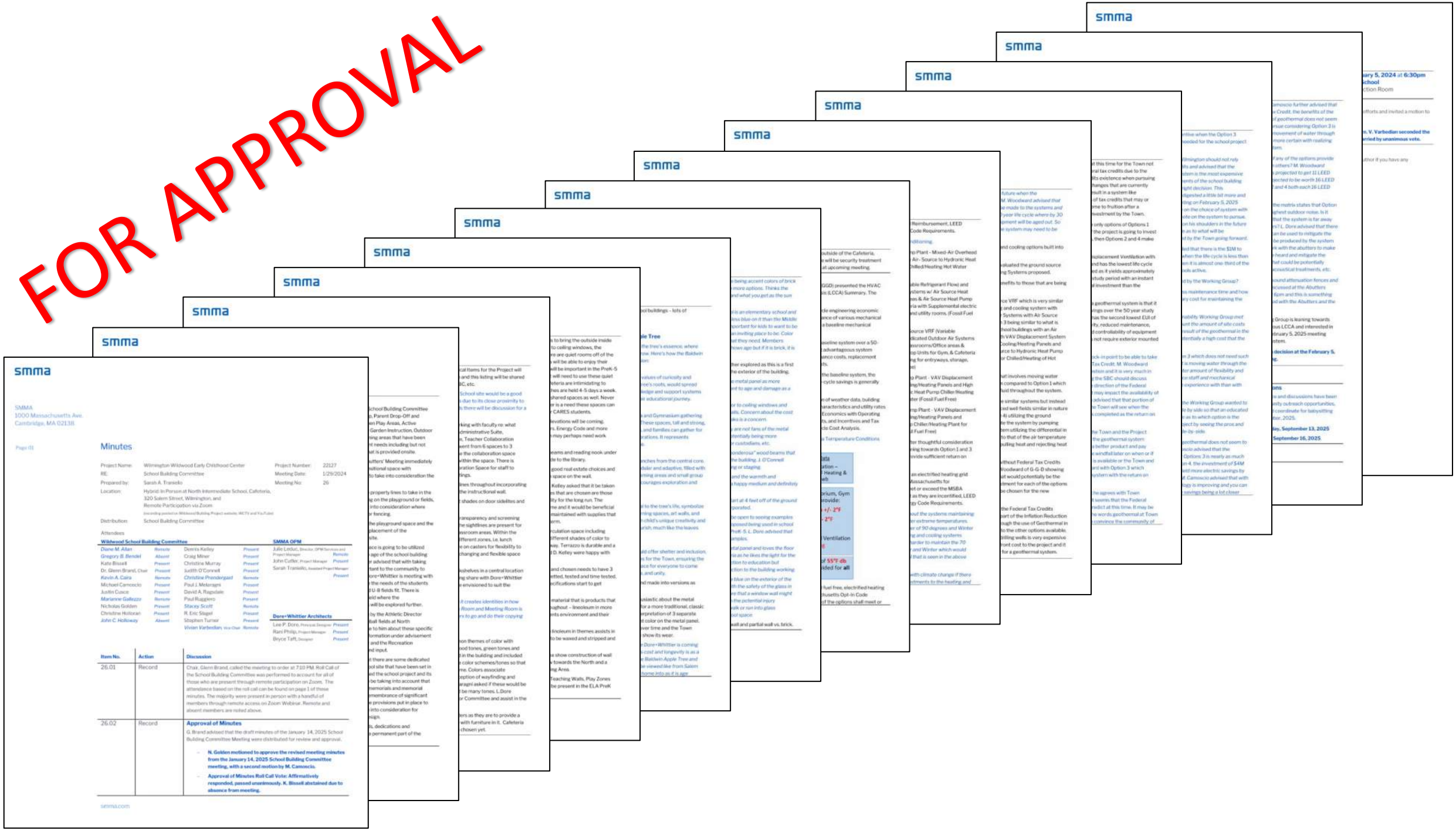
smma dw DORE + WHITTIER

Massachusetts School Building Authority

Agenda

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. Design Update
    - Plans
    - Exterior and Interior
    - Building Systems Update
5. CM at Risk Update
6. Working Group Updates
7. Discussion/Correspondence/New Items
8. Committee Questions
9. Public Comments
10. Next Meeting: Wednesday February 13, 2025 (virtual)
11. Adjourn

Approval of Minutes


FOR APPROVAL
smma
SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138
Minutes
Project Name: Wilmington Wildwood Early Childhood Center
RE: School Building Committee
Prepared by: Sarah A. Trankello
Location: Hybrid: In Person at North Intermediate School, Cafeteria, 320 Salem Street, Wilmington, and Remote Participation via Zoom
Project Number: 22127
Meeting Date: 1/29/2024
Meeting No: 26
Distribution: School Building Committee
Attendees
Wildwood School Building Committee
SMMA OPM
Dore+Whittier Architects
Item No. | Action | Discussion
26.01 | Record | Chair, Glenn Brand, called the meeting to order at 7:10 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. The majority were present in person with a handful of members through remote access on Zoom Webinar. Remote and absent members are noted above.
26.02 | Record | Approval of Minutes
G. Brand advised that the draft minutes of the January 14, 2025 School Building Committee Meeting were distributed for review and approval.
N. Golden motioned to approve the revised meeting minutes from the January 14, 2025 School Building Committee meeting, with a second motion by M. Camosscio.
Approval of Minutes Roll Call Vote: Affirmatively responded, passed unanimously. K. Bissell abstained due to absence from meeting.
smma.com

Approval of Invoices

FOR APPROVAL

smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 21 A

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 2/5/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date	Invoice Amount	ProPay Code	Balance After Invoice
SMMA	62667	1/30/2025	$ 3,750.00	0001-0000	$ 3,750.00
OPM Basic Services - Schematic Design					
		Total	$ 3,750.00		

Activities for the Month of January 2025

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3. Preparation of the Monthly Reporting to the MSBA.
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9. Conducted Prequalification Reference Checks on all 7 Construction Management Firms and prepared documentation for review and consideration by the Construction Manager at Risk Prequalification and Selection Working Group in the efforts to analyze and formulate a shortlist for the purpose of interviews and requesting proposals be submitted.
10. Assembly of the results from members of the Working Group into tabulation documentation for review of anticipated qualifications submissions for review together as CM-R Prequalification / Selection Working Group during review.
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smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 21 B

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 2/5/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

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Architectural Basic Services - Schematic Design						
Dore+Whittier Architects	20	1/30/2025	*AM-3*	$ 5,604.50	0003-0000	$ 445.50
Site Services - Designer Amendment No. 3						
Site Survey						
			Total	$ 59,504.50		

Activities for the Month of January 2025

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4. Report out on investigation reports (Traffic Study, Site Survey, Geotech, Geoenvironmental) of preferred site.
5. Floor plan refinement
6. Meeting with District Leadership Team on January 17, 2025
7. Meetings with User Groups - Follow-up with Technology and Food Services
8. Development of Schematic Design drawings and specifications
9. Development of Exterior, Interior and Landscape Design

Design Update

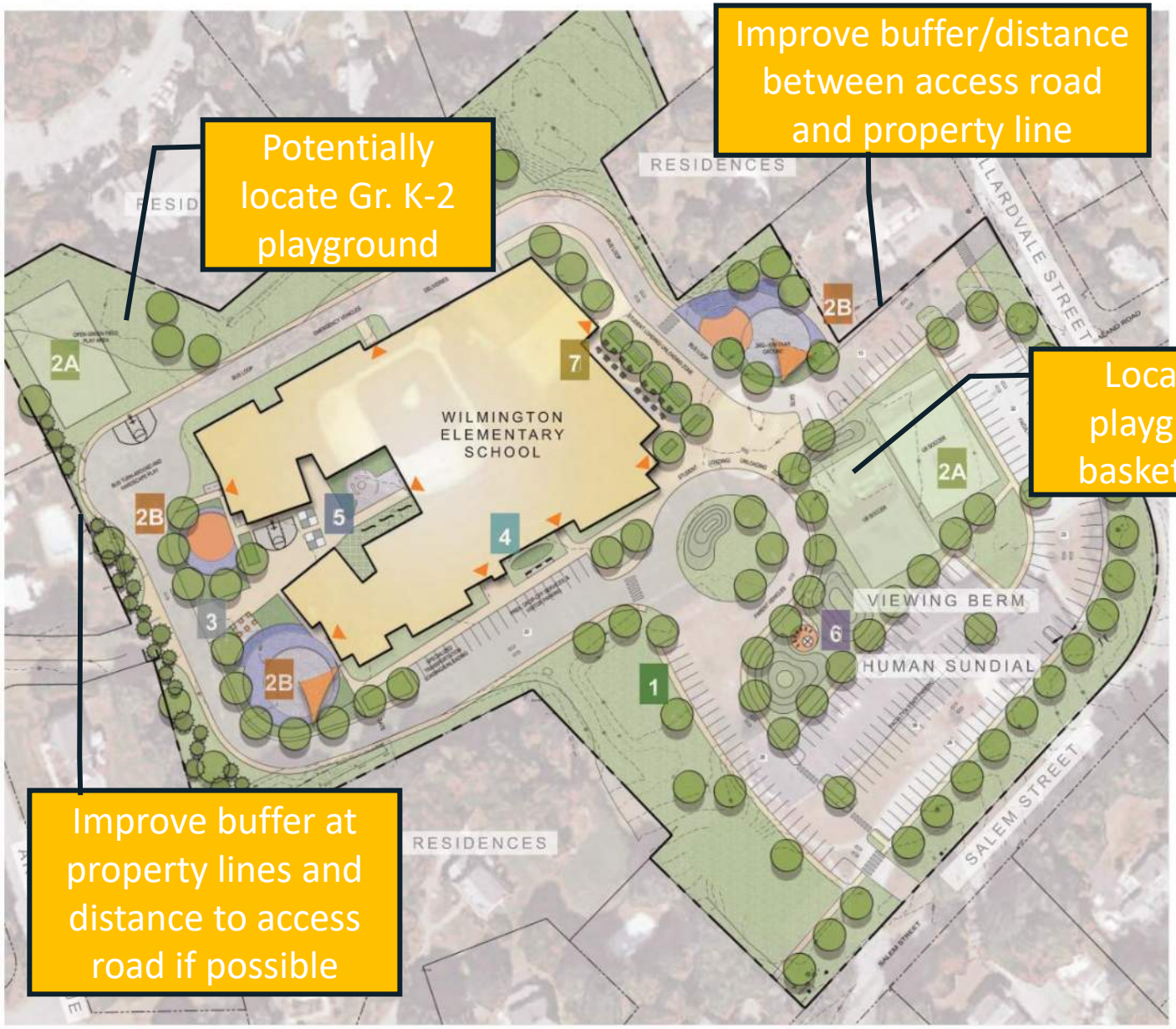
Site Plan Update

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)
CIRCUITOUS CAMPUS PATH CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

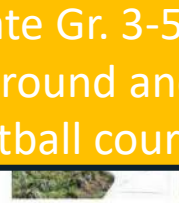
2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)

3 RAISED GARDEN BEDS
SENSORY CORTEX



4 SENSORY GARDEN: EDUCATIONAL
SENSORY CORTEX
STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE / PASSIVE / INCLUSIVE FRONTAL CORTEX



6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

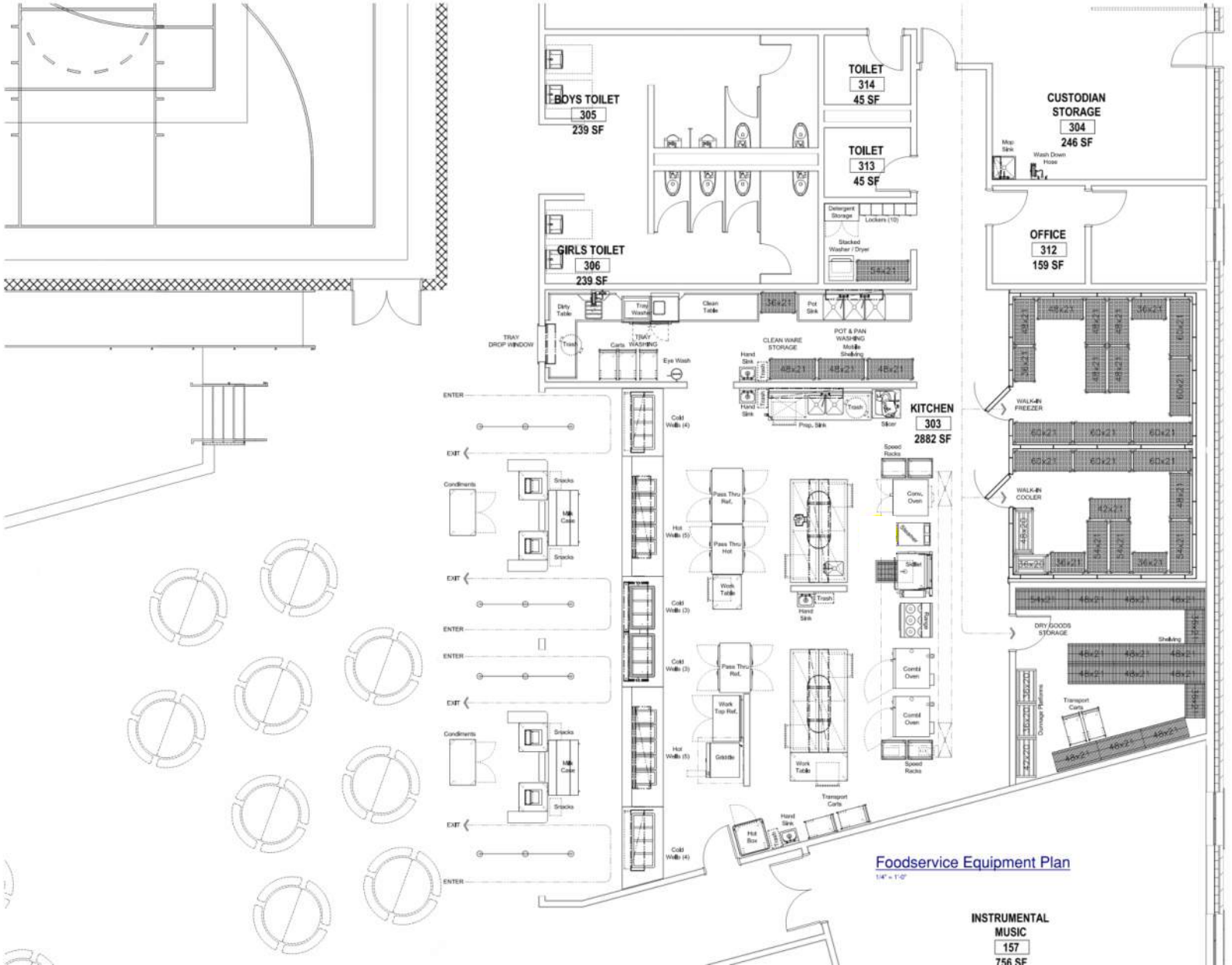
Wilmington . Massachusetts
Schematic Design Phase
January 2025

Floor Plan Update

Floor Plan Review: Stage Area

First Floor

Floor Plan Review: Food Service

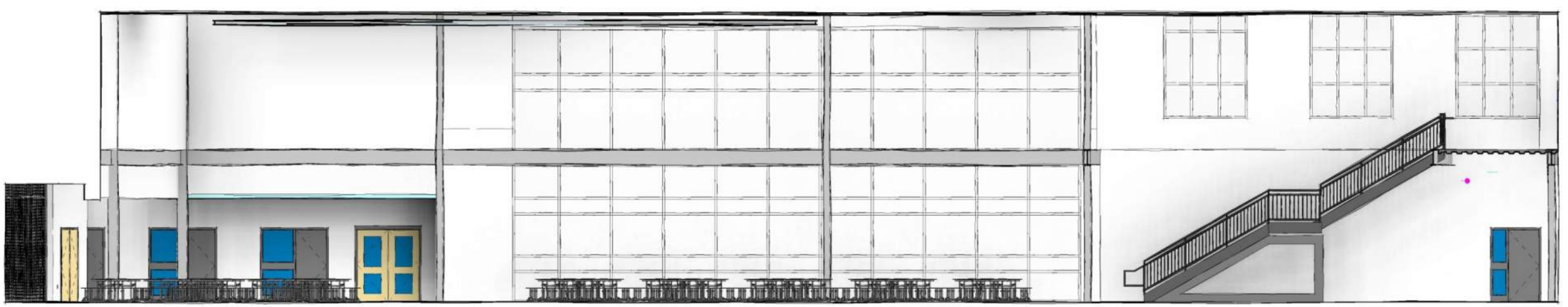


Project Aesthetics

Interiors

Cafeteria Study

Stage



Project Aesthetics

Exterior Update

Option 4

South Perspective

Southwest View

East Perspective at Cafeteria

Option 4

Southeast Perspective

Option 5

South Perspective

Southwest View

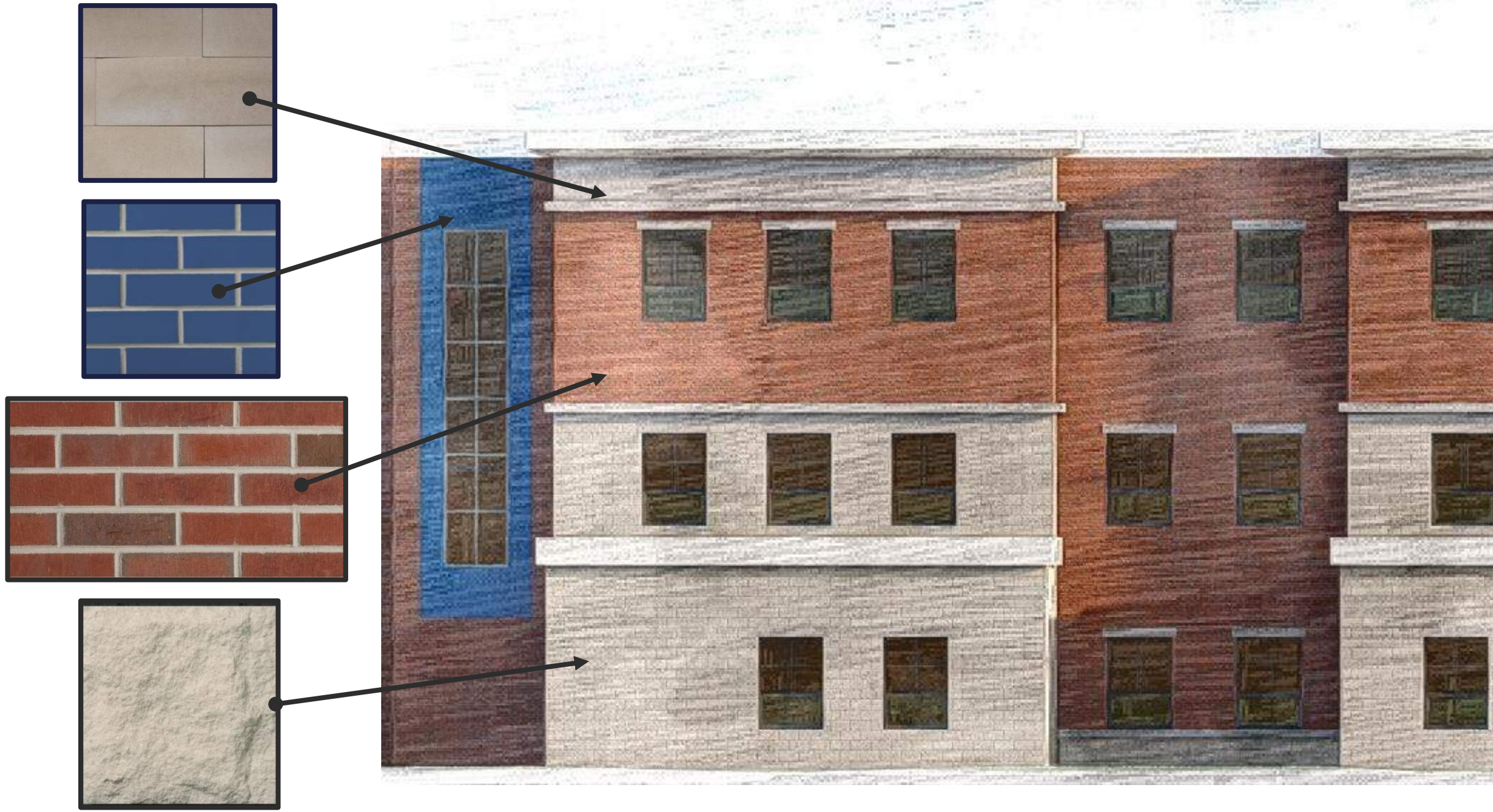
East Perspective at Cafeteria

Option 5

Southeast Perspective

Option 5

Option 4



Building Systems Update

GOAL OF LIFE CYCLE COST ANALYSIS

- The goal of the mechanical lifecycle engineering economic analysis is to assess the performance of **various mechanical system options** in comparison to a baseline mechanical system.
- Each option is compared to the baseline system over a 50-year cycle to determine the most advantageous system considering **utility costs, maintenance costs, replacement costs, and initial construction costs**.
- By comparison of each option to the baseline system, the option with the **greatest total life-cycle savings** is generally recommended.

LCCA HVAC OPTIONS

ALL HVAC OPTIONS ARE BASED ON FOSSIL FUEL FREE, ELECTRIFIED HEATING SYSTEMS THAT WILL BE COMPARED TO A MASSACHUSETTS OPT-IN CODE COMPLAINT BUILDING & HVAC SYSTEM.

ALL OPTIONS SHALL MEET OR EXCEED:

- MSBA Requirement for Additional Reimbursement
- LEED Requirements
- MA Opt-in Stretch Energy Code RequirementS

ALL PROPOSED SYSTEMS INCLUDE AIR CONDITIONING.

LCCA HVAC OPTIONS SHORTLIST COMPARISON

BASELINE: Air Source Heat Pump Plant - Mixed-Air Overhead VAV System and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

OPTION 1: Air-Source VRF (Variable Refrigerant Flow) and DOAS (Dedicated Outdoor Air Systems w/ Air Source Heat Pump) for Classrooms/Office areas & Air Source Heat Pump Rooftop Units for Gym, & Cafeteria with Supplemental electric heating for entryways, storage, and utility rooms. (Fossil Fuel Free)

OPTION 3: Air Source Heat Pump Plant - VAV Displacement System w/ Passive Radiant Cooling/Heating Panels and High Efficiency Air-Source to Hydronic Heat Pump Chiller/Heating Plant for Chilled/Heating Hot Water (Fossil Fuel Free)

LCCA Summary (without Federal Tax Credits)

Baseline	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
-	1. Mixed-Air Overhead CHW/HHW VAV AHU's w/ ERV & Terminal VAV's w/ Hot Water Re-Heat Coils 2. High-Efficiency ASHP Chiller/Heater Plant	$15,838,440	1,738,354	$327,852	$1.96	**35.5**	$77,410	$1,620,000	$3,198,500	$1,620,000	$405,262	-	-	-

Option	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
1	1. Variable Refrigerant Flow (VRF) Units w/ Air-Source Condensers serving the Classrooms, Administration and Support Areas 2. ASHP DOAS AHU's w/ ERV & Terminal VAV's w/ DCV providing Ventilation to the VRF Units 3. Mixed-Air Overhead AHSP VAV AHU's w/ ERV & DCV serving the Cafe/Stage and Gym areas 4. Supplemental Electric Resistance Heating Units	$14,007,900	1,443,027	$291,930	$1.75	**29.5**	$58,460	$1,943,500	$1,185,000	$3,167,000	$350,390	**$54,872**	**$4,025,486**	Instant*****
2	1. VRF System w/ Water-Source Heat Pump (WSHP) Heat Recovery Condensing Units 2. WSHP VAV Dedicated Outdoor Air Systems (DOAS) w/ ERV & DCV with Terminal VAV Boxes 3. Supplemental Electric Heating 4. Geothermal Well Field and Distribution Plant	$19,358,100	1,183,958	$223,944	$1.34	**24.2**	$62,235	$0	$3,945,000	$0	$286,179	**$119,083**	**$2,446,273**	**23**
3	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW Dedicated Outdoor Air System (DOAS) AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency ASHP Chiller/Heater Plant 4. Backup Electric Boiler Plant	$14,442,360	1,160,735	$229,174	$1.37	**23.7**	$74,000	$1,620,000	$2,289,500	$1,620,000	$303,174	**$102,088**	**$5,680,330**	Instant*****
4	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW DOAS AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency Ground Source Heat Pump (GSHP) Chiller/Heater Plant w/ Geothermal Well Field 4. Backup Side-Stream Electric Boiler Plant	$18,306,360	1,093,195	$205,748	$1.23	**22.3**	$75,675	$0	$3,379,500	$0	$281,423	**$123,839**	**$4,041,912**	**21**

SYSTEM COMPARISON

Variable Refrigerant Flow Air Source Heat Pumps Option 1

- Maintenance zones: All spaces
- Standard Ventilation
- Less Outdoor Noise
- LEED Points: 11
- No additional Initial Cost
- Not Manufacturer Agnostic
- $4.0M added life cycle savings
- Full Heating + Air Conditioning

Displacement Ventilation Air Source Heat Pumps Option 3

- Maintenance zones: Roof and Mech Space
- Improved Ventilation
- Less Indoor Noise
- LEED Points: 16
- +$435K initial cost
- Manufacturer Agnostic
- $5.6M added life cycle savings
- Full Heating + Air Conditioning

Construction Manager at Risk

Working Group Updates

Discussion, Correspondence, New Items

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #30

March 5, 2025

smma dw DORE + WHITTIER

Massachusetts School Building Authority

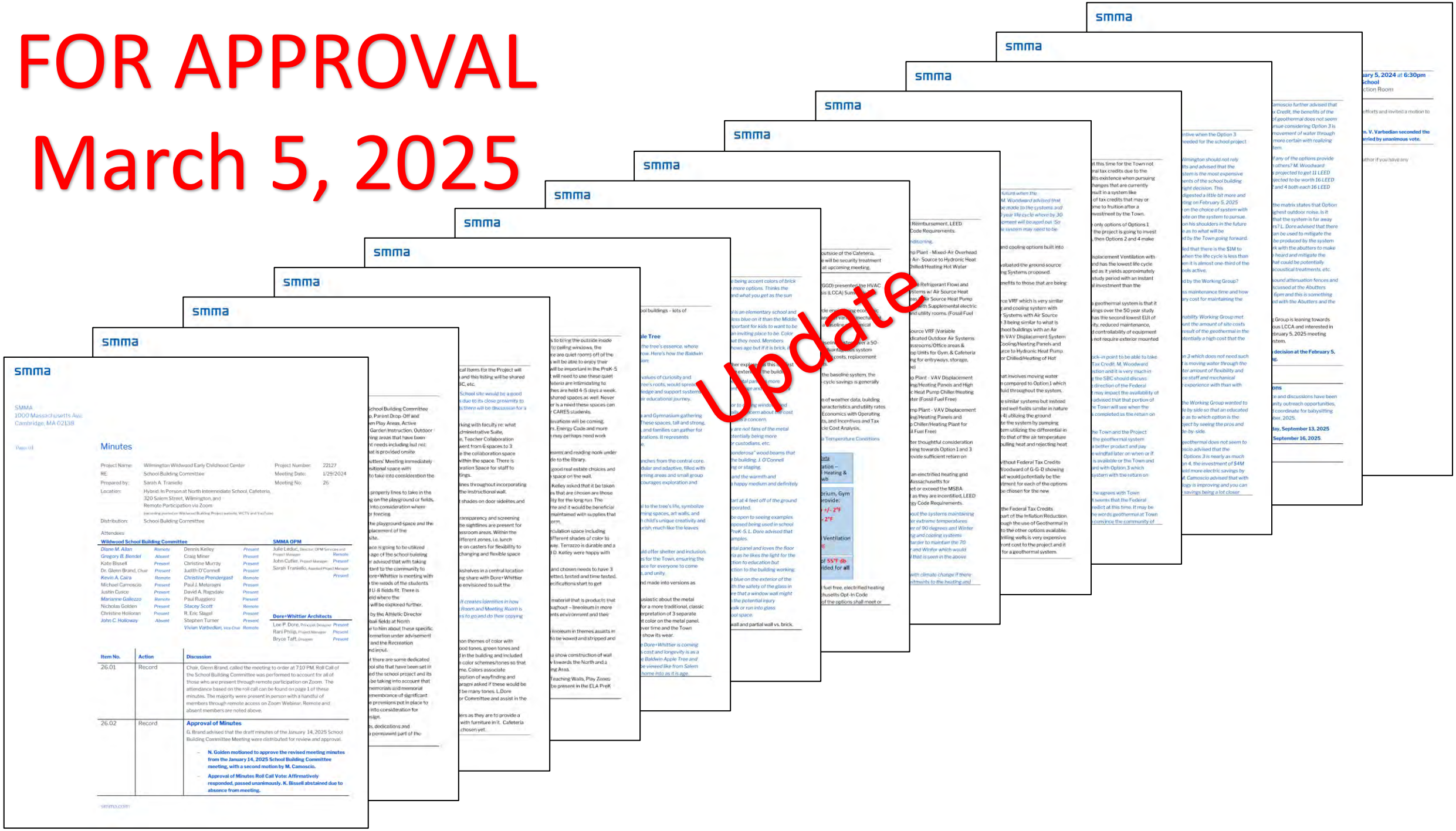
Agenda

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. CM at Risk Update
5. Design Update
    - Site Plan Update
    - Interiors Update
    - Traffic Study Update
6. Working Group Updates
7. Discussion/Correspondence/New Items
8. Committee Questions
9. Public Comments
10. Next Meeting: Wednesday March 25, 2025
11. Adjourn

Approval of Minutes

FOR APPROVAL

March 5, 2025



Approval of Invoices

FOR APPROVAL

Update

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 21 A

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 2/5/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

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Construction Manager at Risk

Design Update

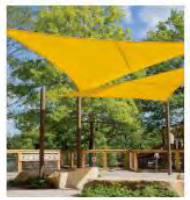
Site Plan Update

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)

CIRCUITOUS CAMPUS PATH CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)



3 RAISED GARDEN BEDS
SENSORY CORTEX

4 SENSORY GARDEN: EDUCATIONAL
SENSORY CORTEX

STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE / PASSIVE / INCLUSIVE FRONTAL CORTEX

6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Option A

44 +/- vehicles on-site queue space

15 +/- busses on-site queue space

199 +/- on site parking spaces

LEGEND

- : PASSENGER CARS
- : MINIBUS
- : BUS
- : BUS CIRCULATION
- : CAR CIRCULATION

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | VEHICULAR CIRCULATION - OPTION A

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Option B

88 +/- vehicles on-site queue space

12 +/- busses on-site queue space

199 +/- on site parking spaces

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | VEHICULAR CIRCULATION - OPTION B

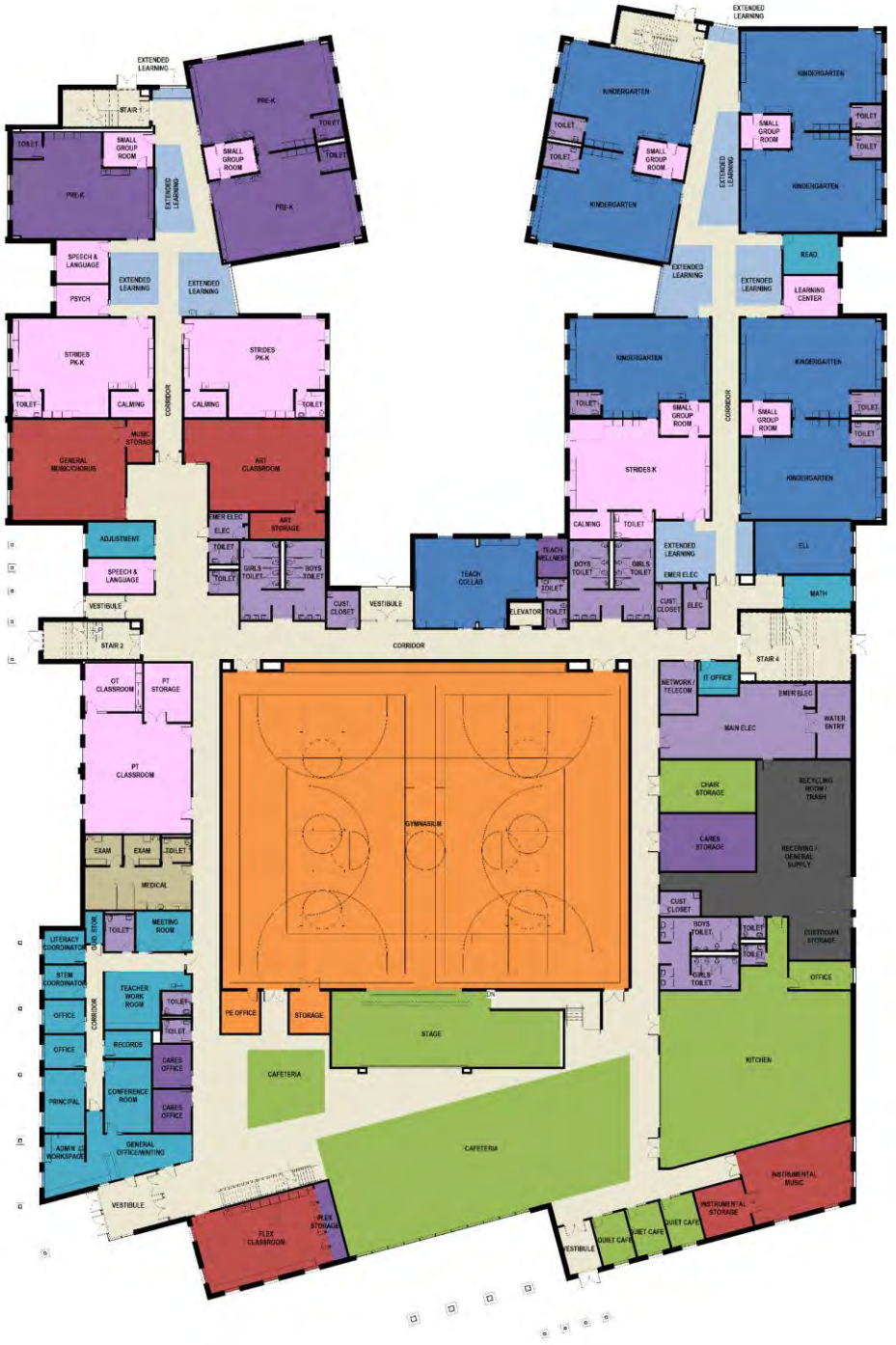
N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Floor Plan Update

Floor Plan Review



First Floor

Floor Plan Review

Second Floor

Floor Plan Review

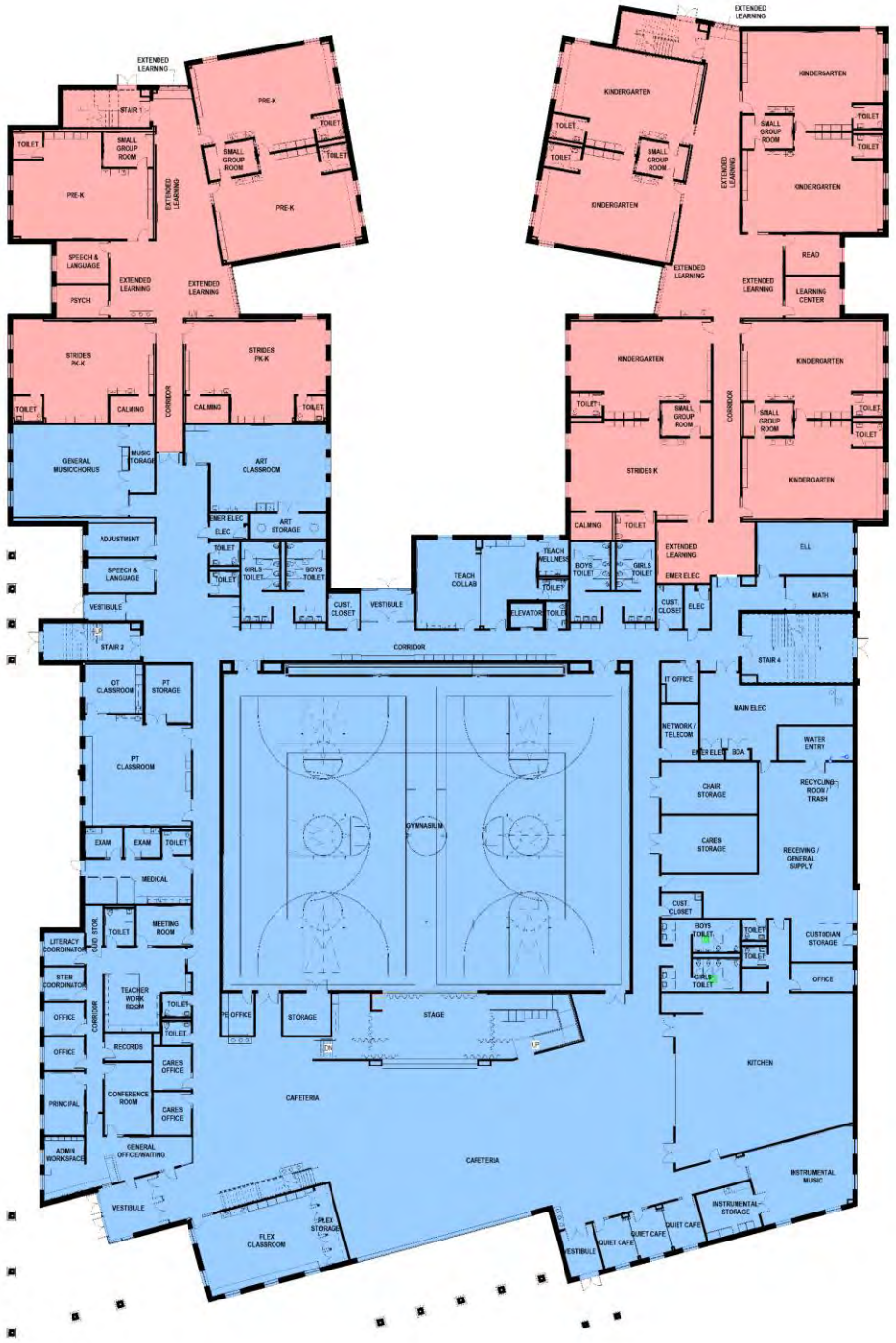
Third Floor

Floor Plan Public/Private

Floor Plan Review

Public

Private



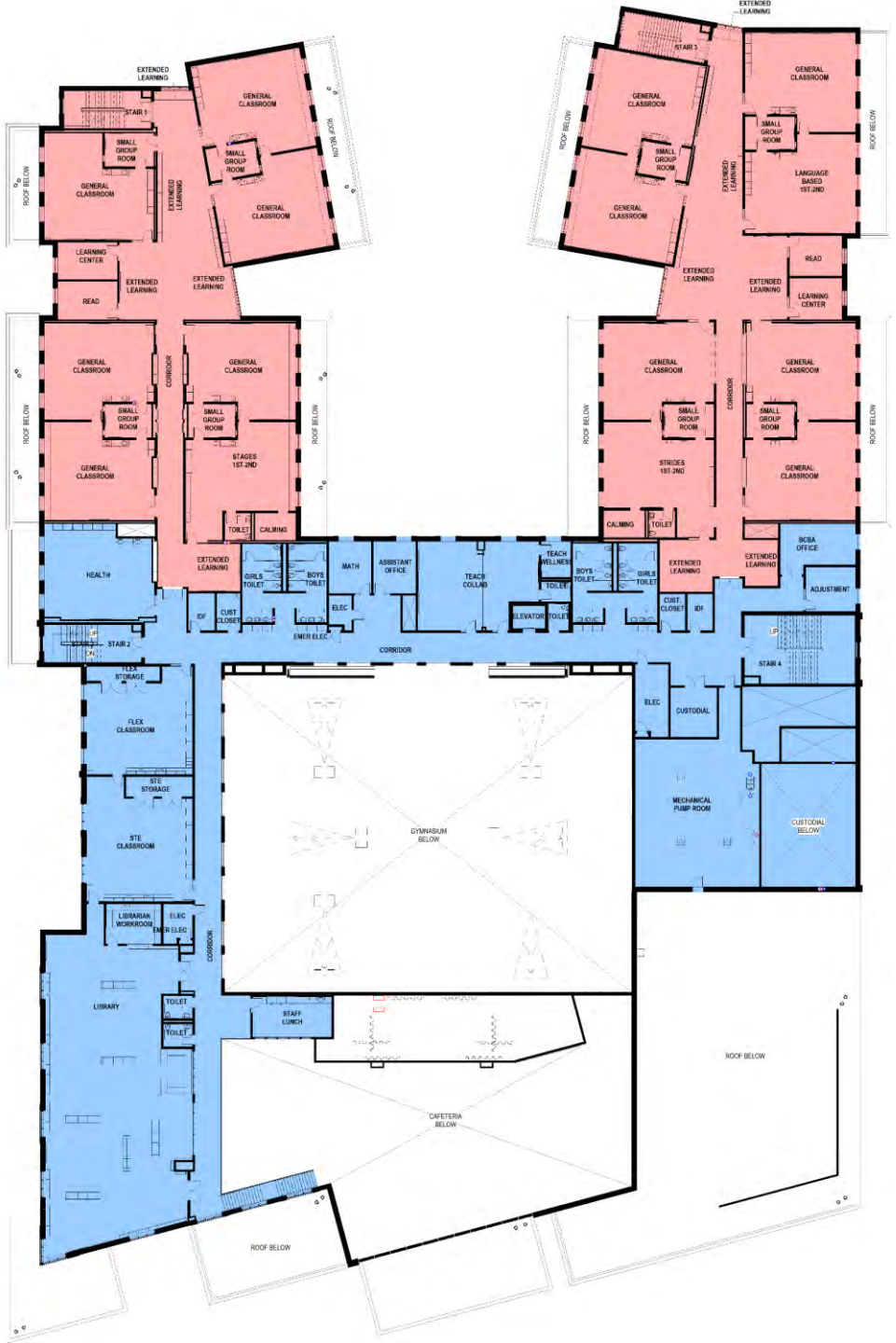
First Floor

Floor Plan Review

Public

Private

Second Floor



Floor Plan Review

Public

Private

Third Floor

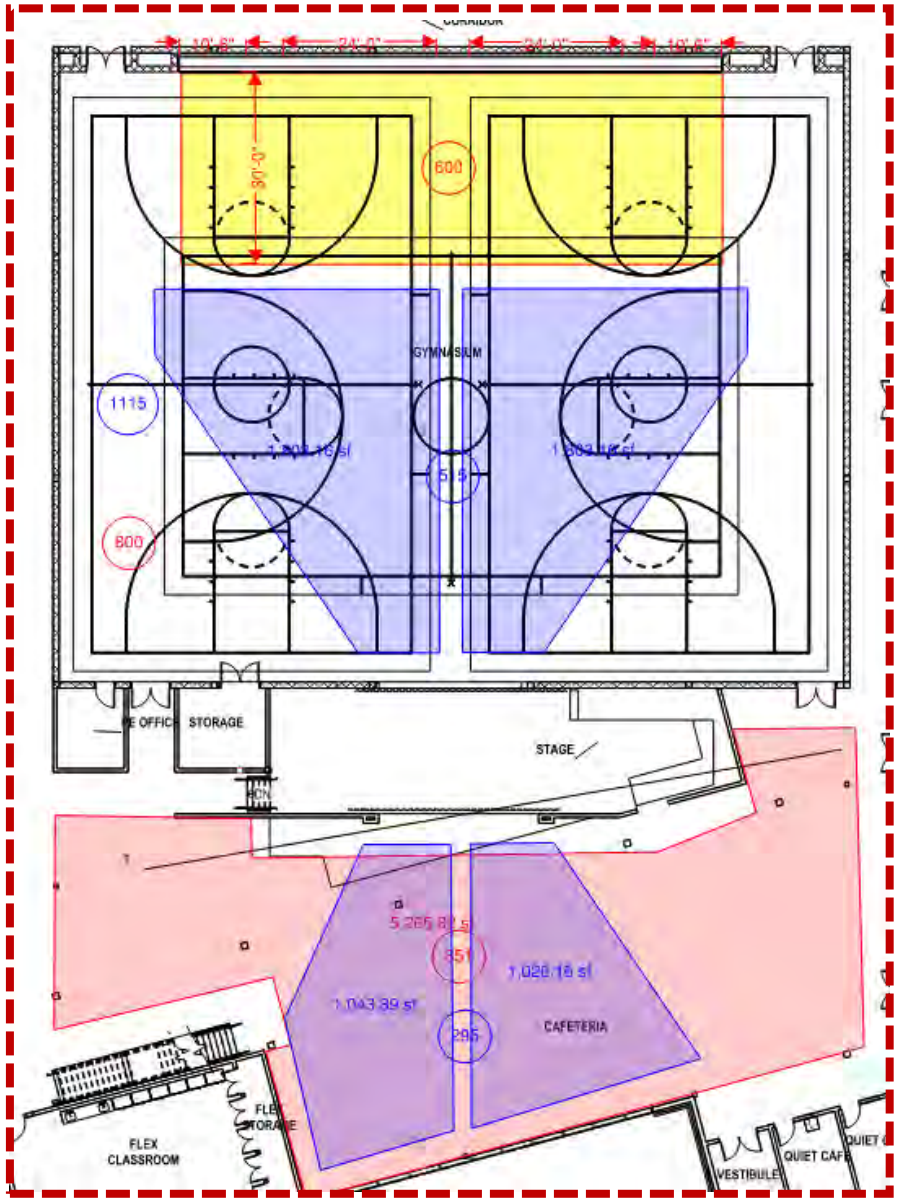
Project Aesthetics

Interiors

Public Spaces – Sample Imagery

Floor Plan Review: Cafeteria/Stage

Second Floor



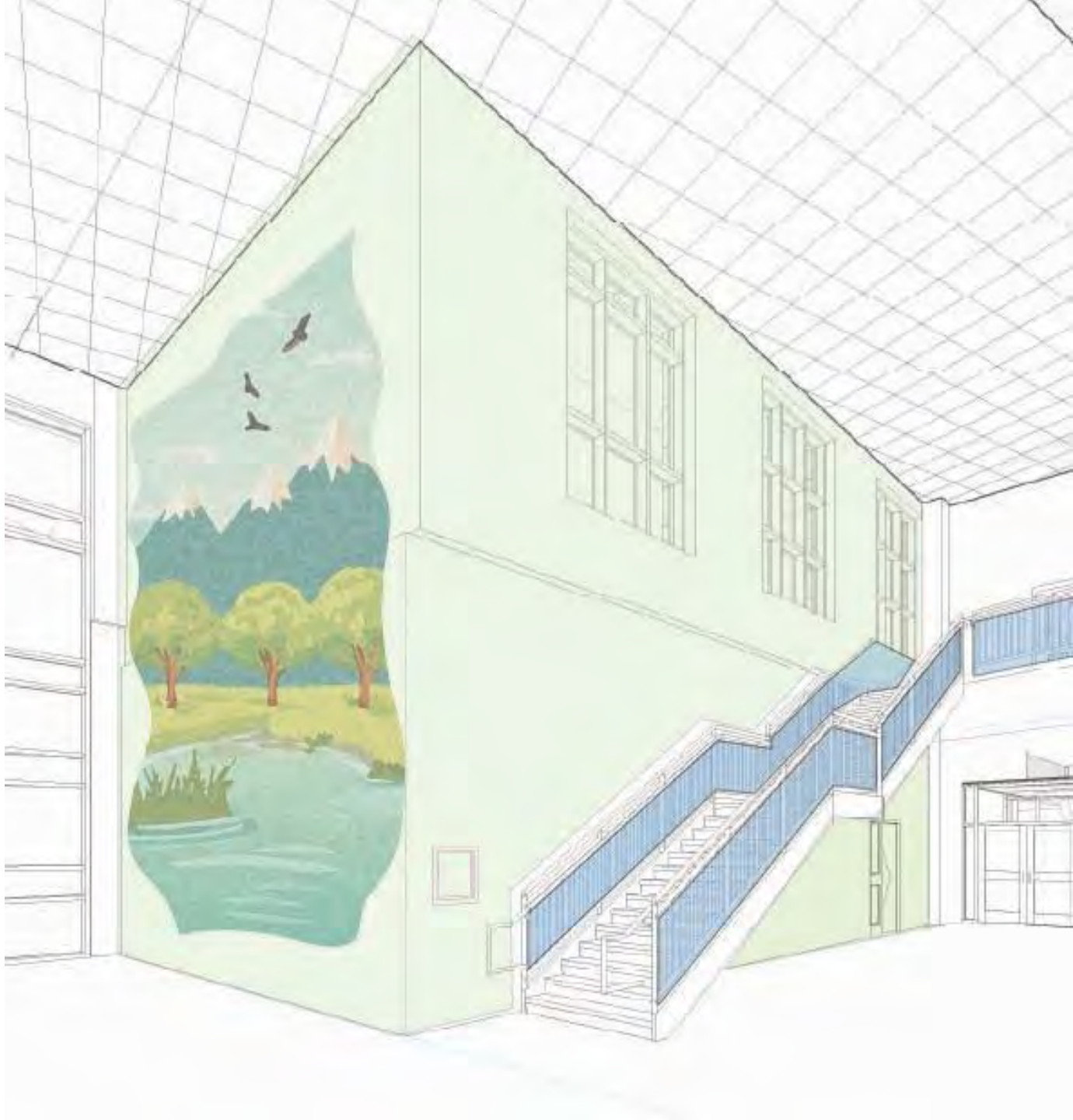
Performance capacities

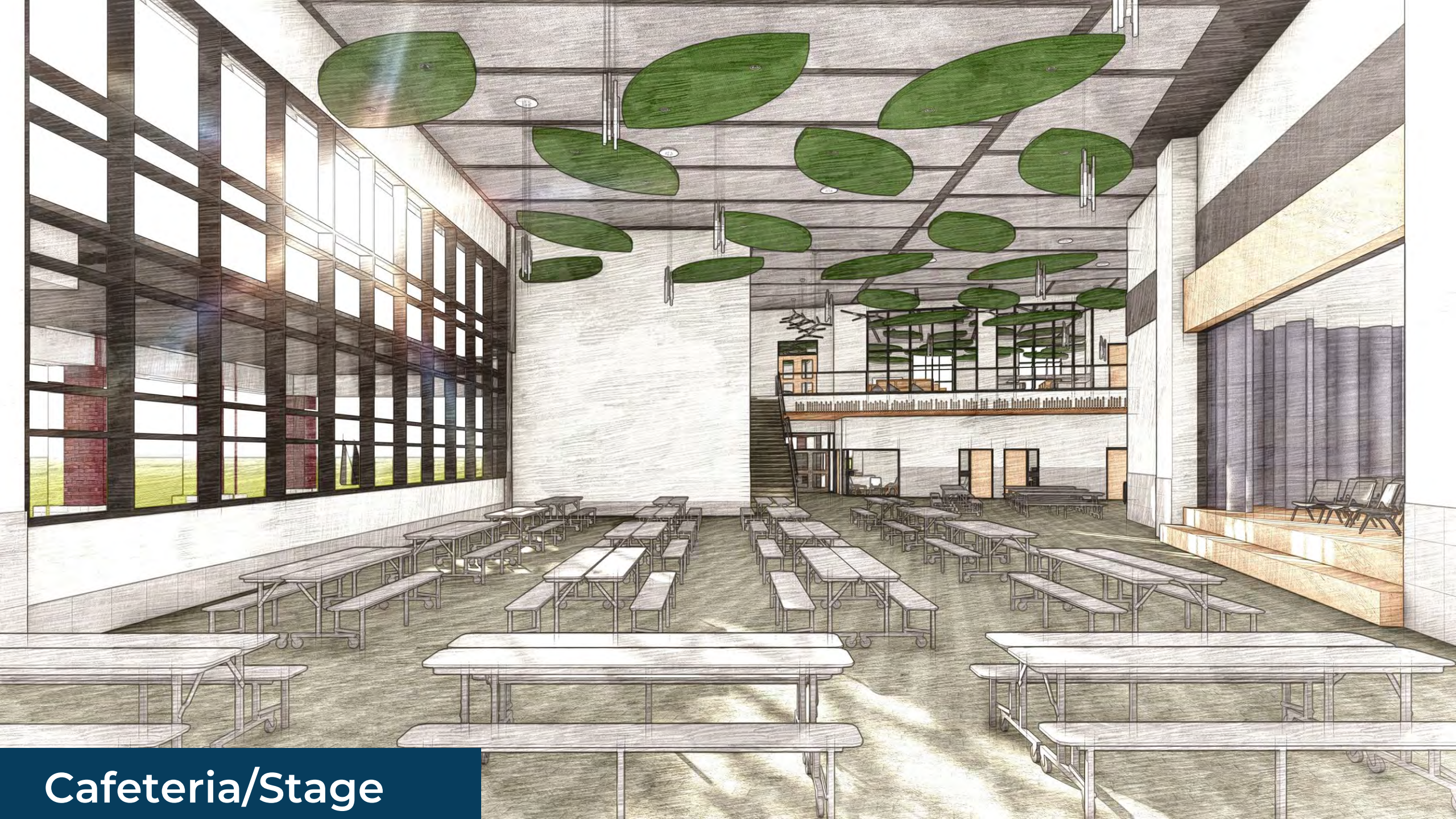
Gym
800 seats

Cafeteria
295 seats

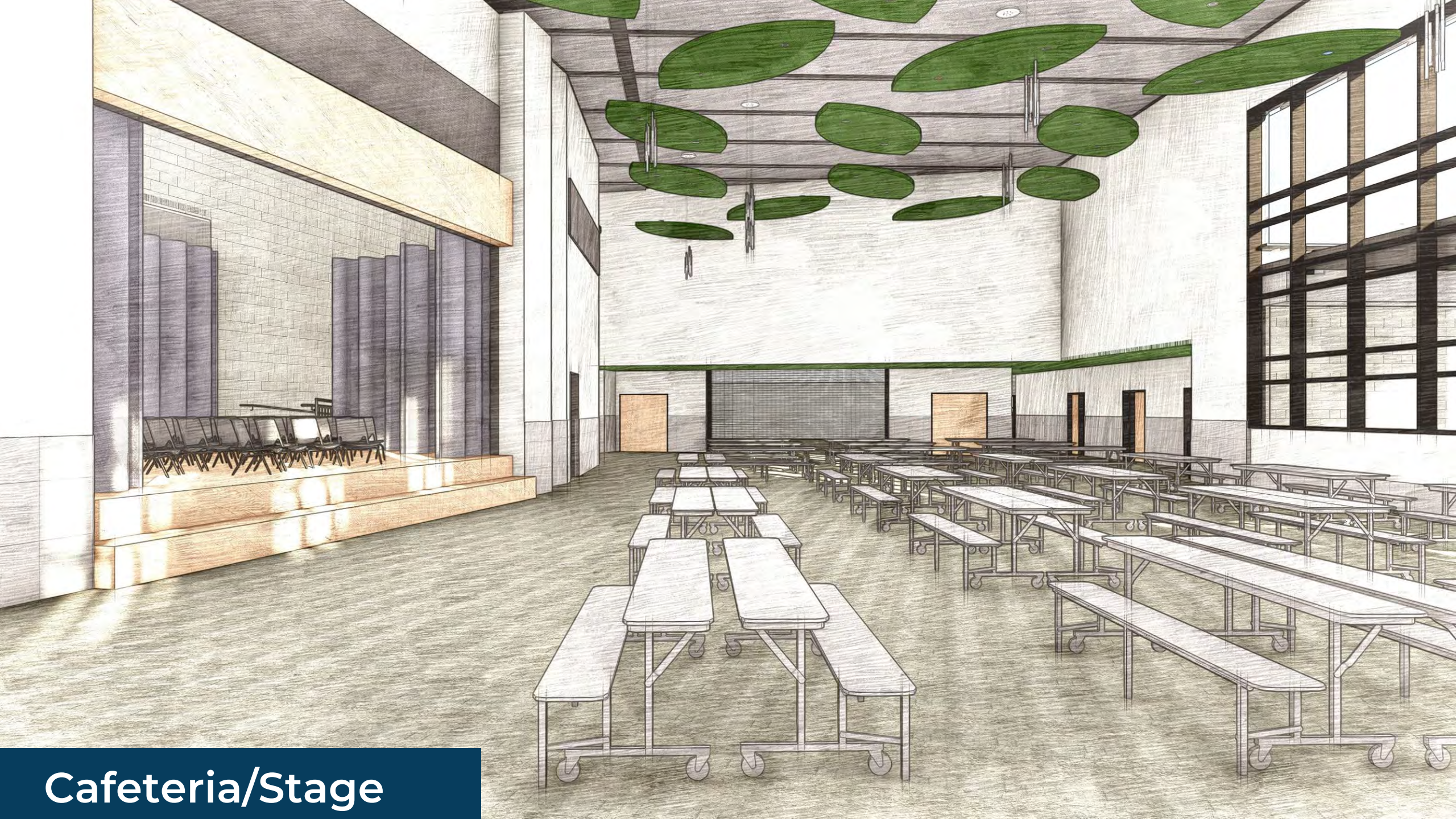
Cafeteria:
Wall Mural Study

- Murals
- Wrap the two-story wall in from windows to library





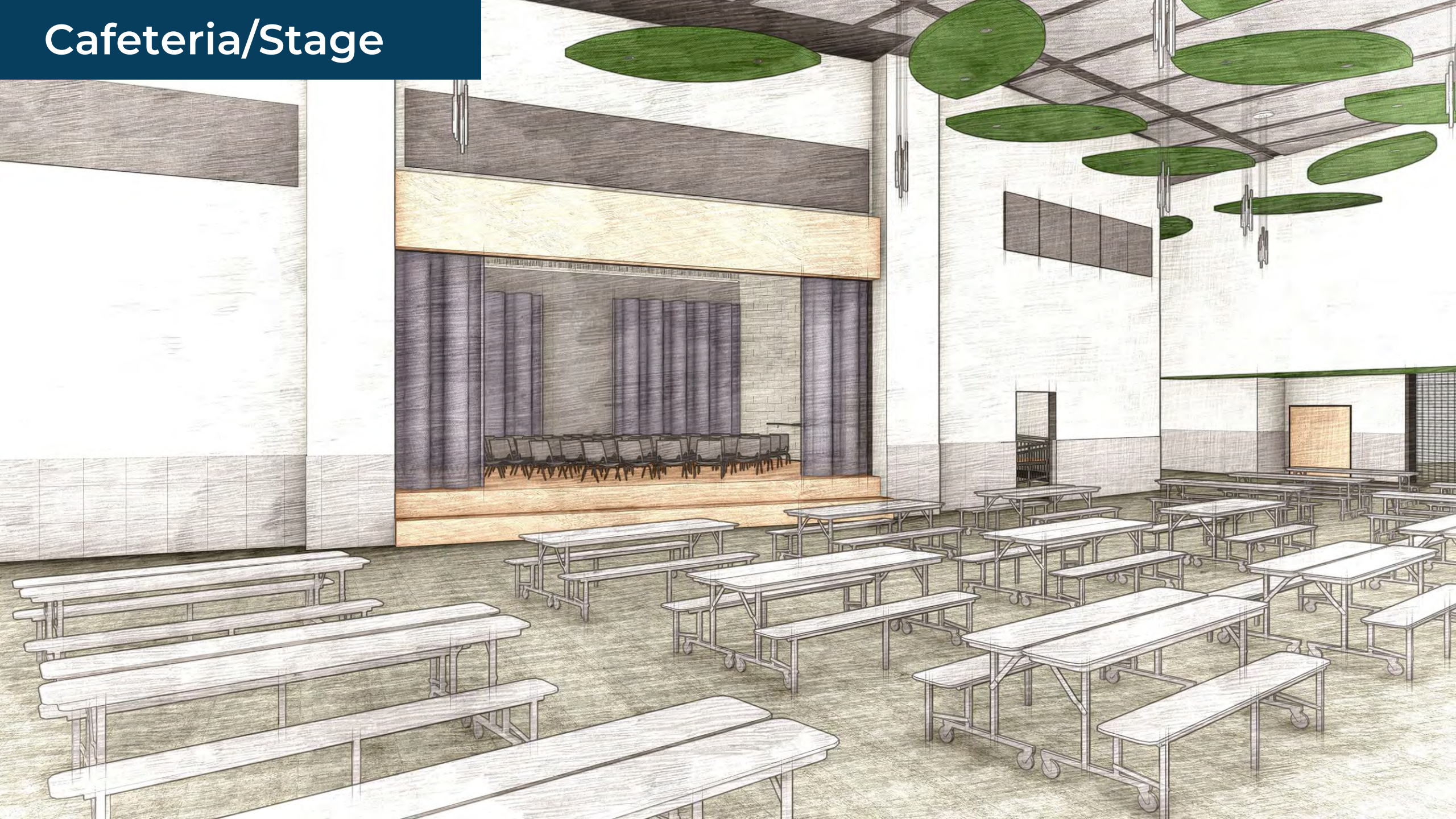
Cafeteria/Stage



Cafeteria/Stage

Cafeteria/Stage

Cafeteria/Stage



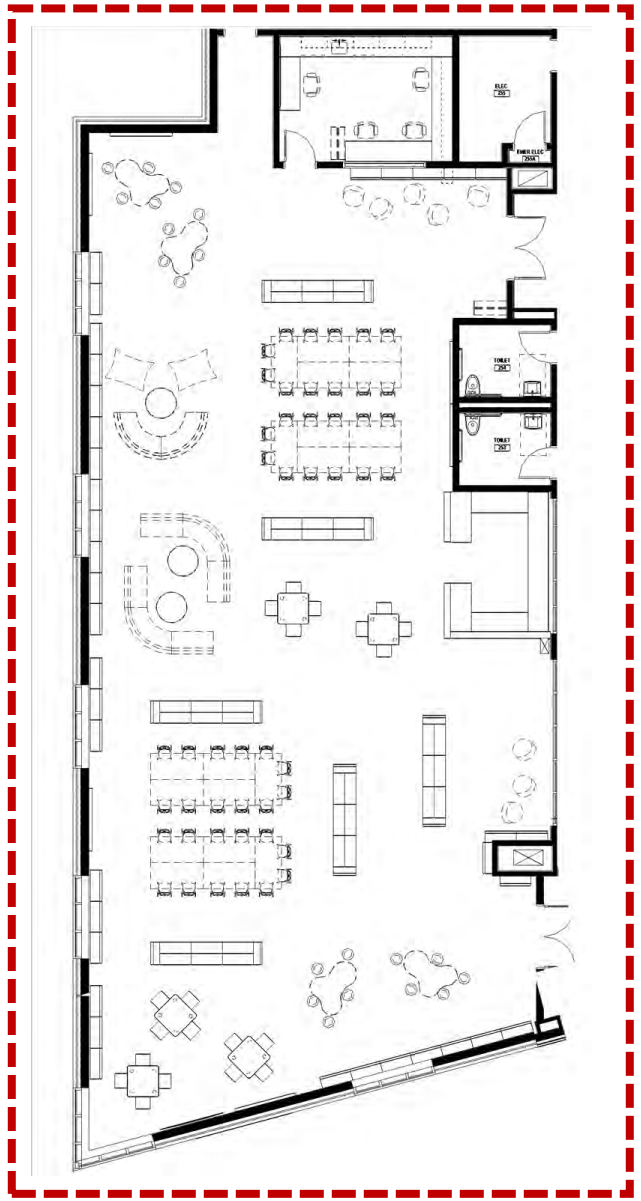
View from balcony:

Entry / Stair

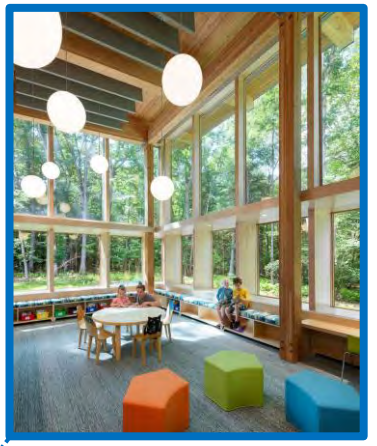
Entry / Stair

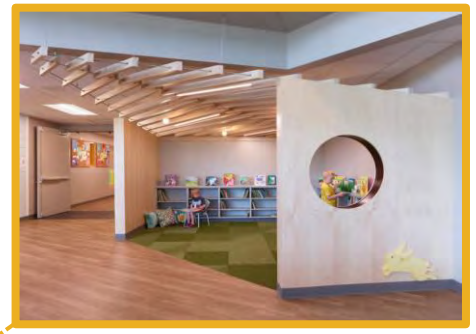
Floor Plan Review: Media Center / Library

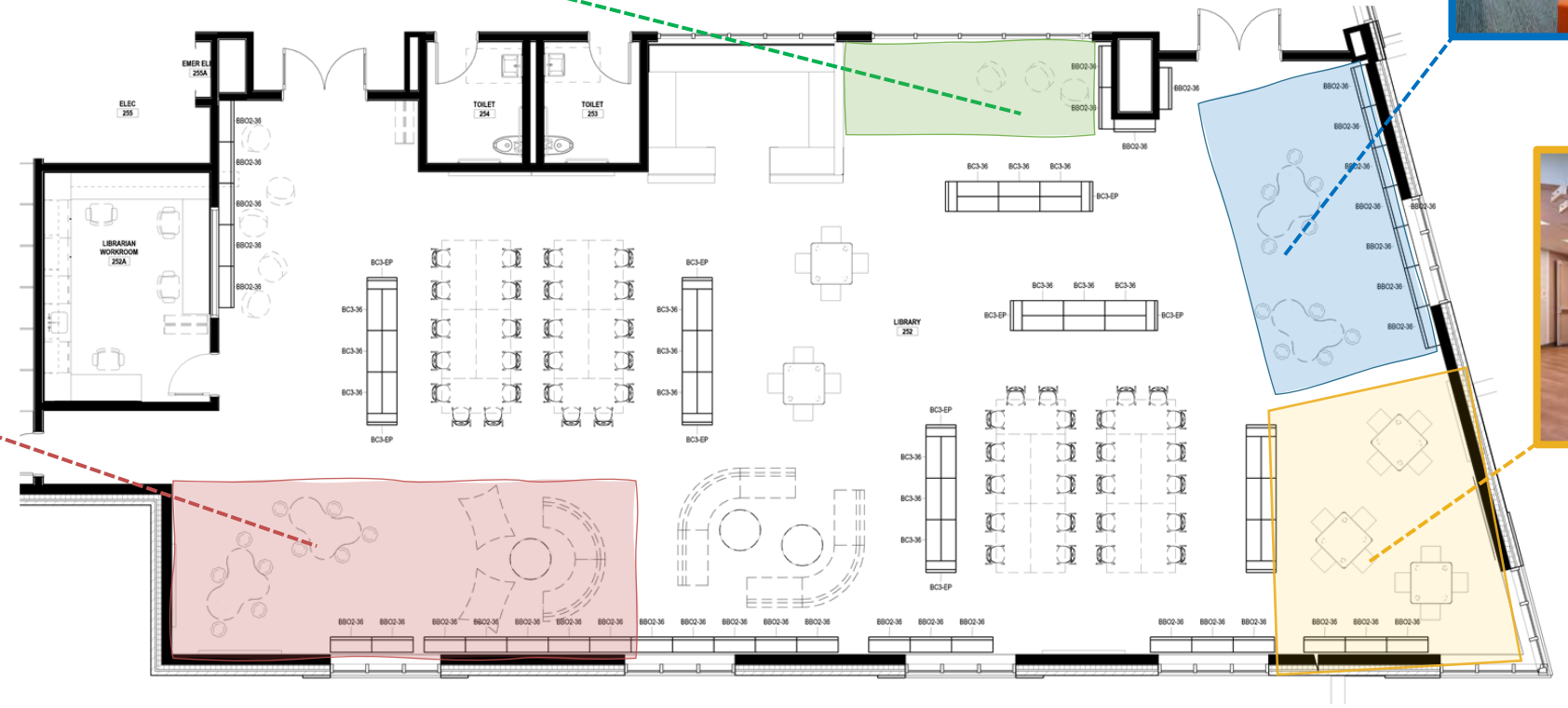
Second Floor



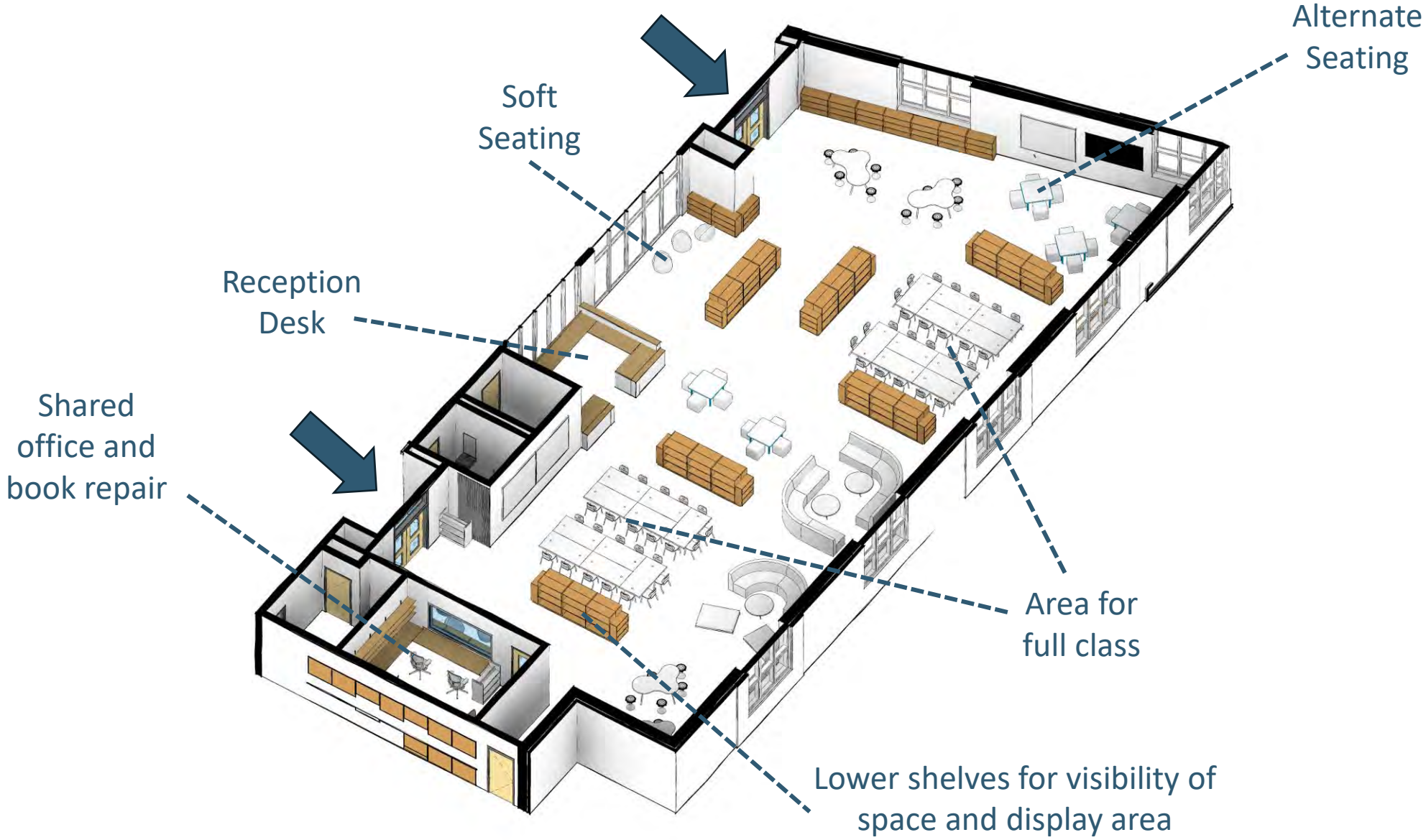
Floor Plan Review: Media Center / Library







Media Center / Library Axon



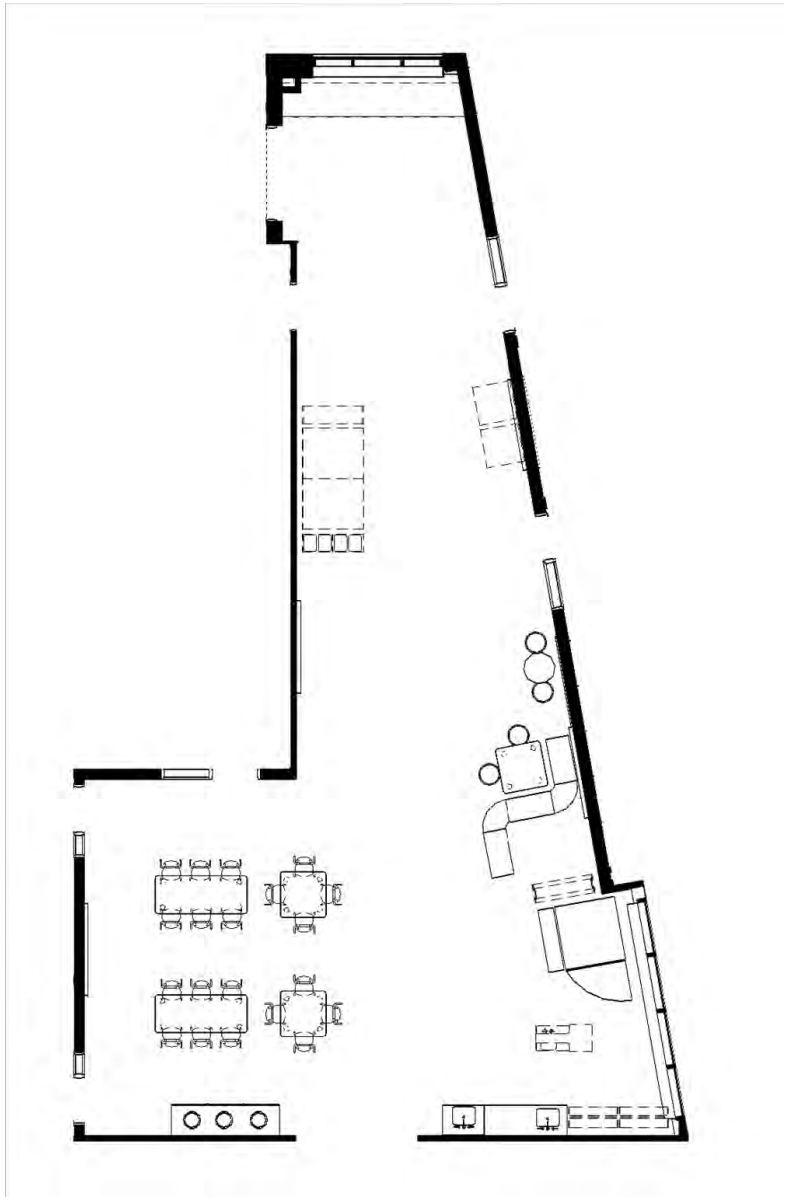
Media Center / Library

Media Center / Library

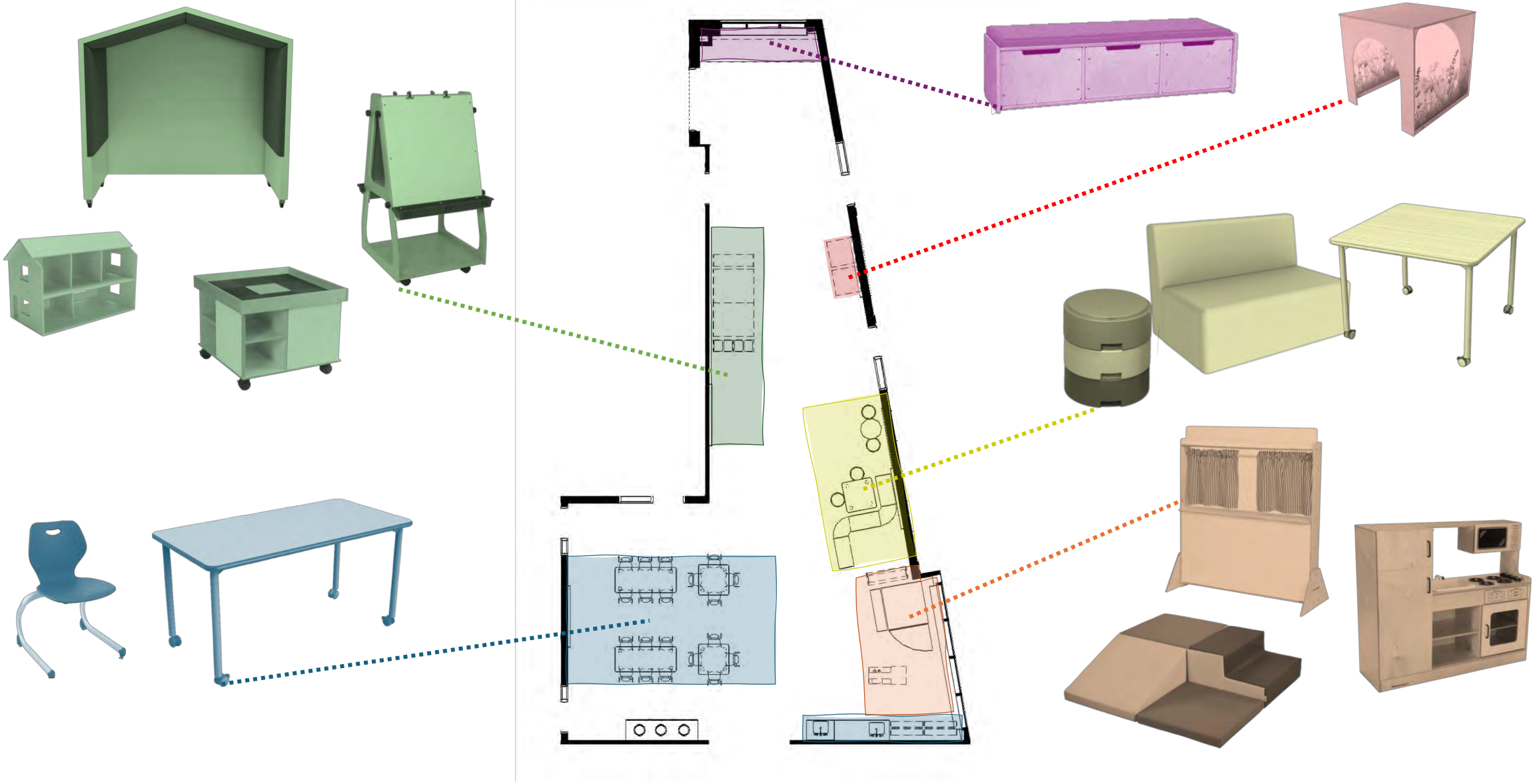
Media Center / Library

PRE-K EXTENDED LEARNING: OVERVIEW

First Floor



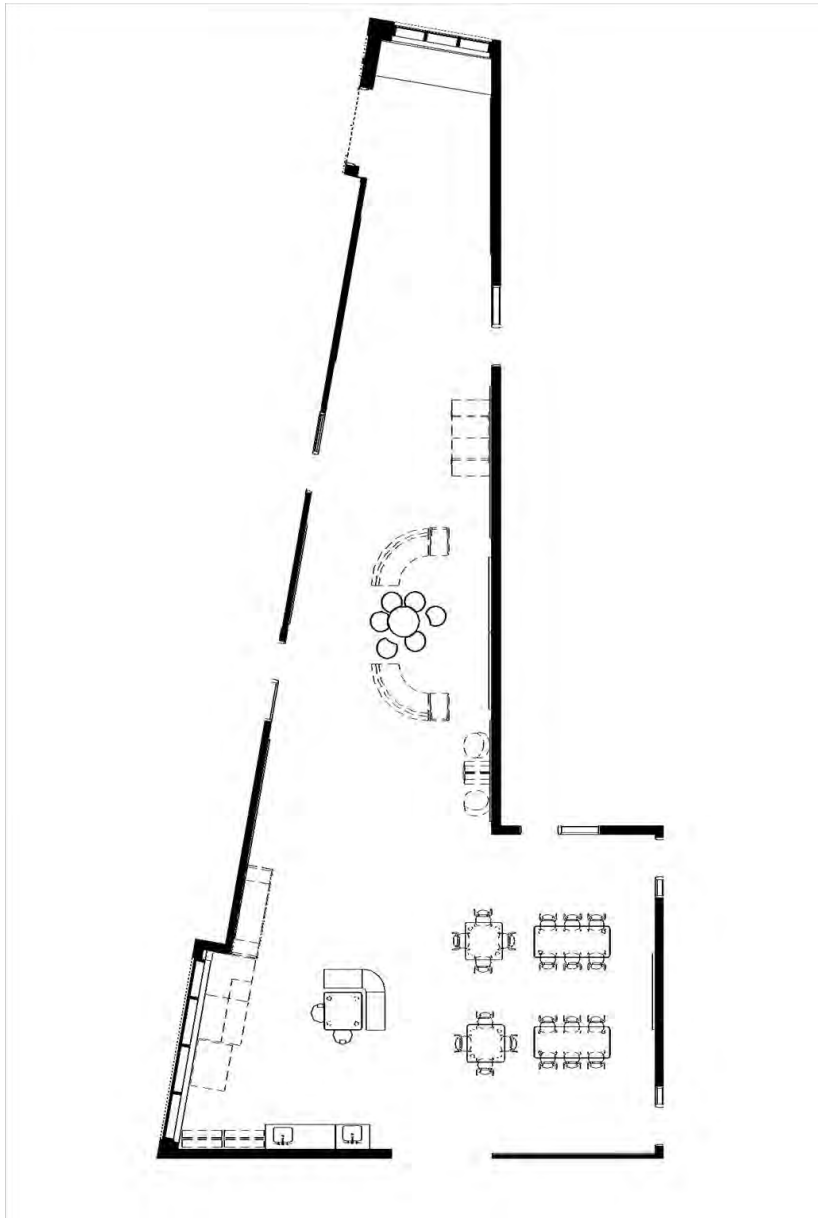
PRE-K EXTENDED LEARNING: OVERVIEW



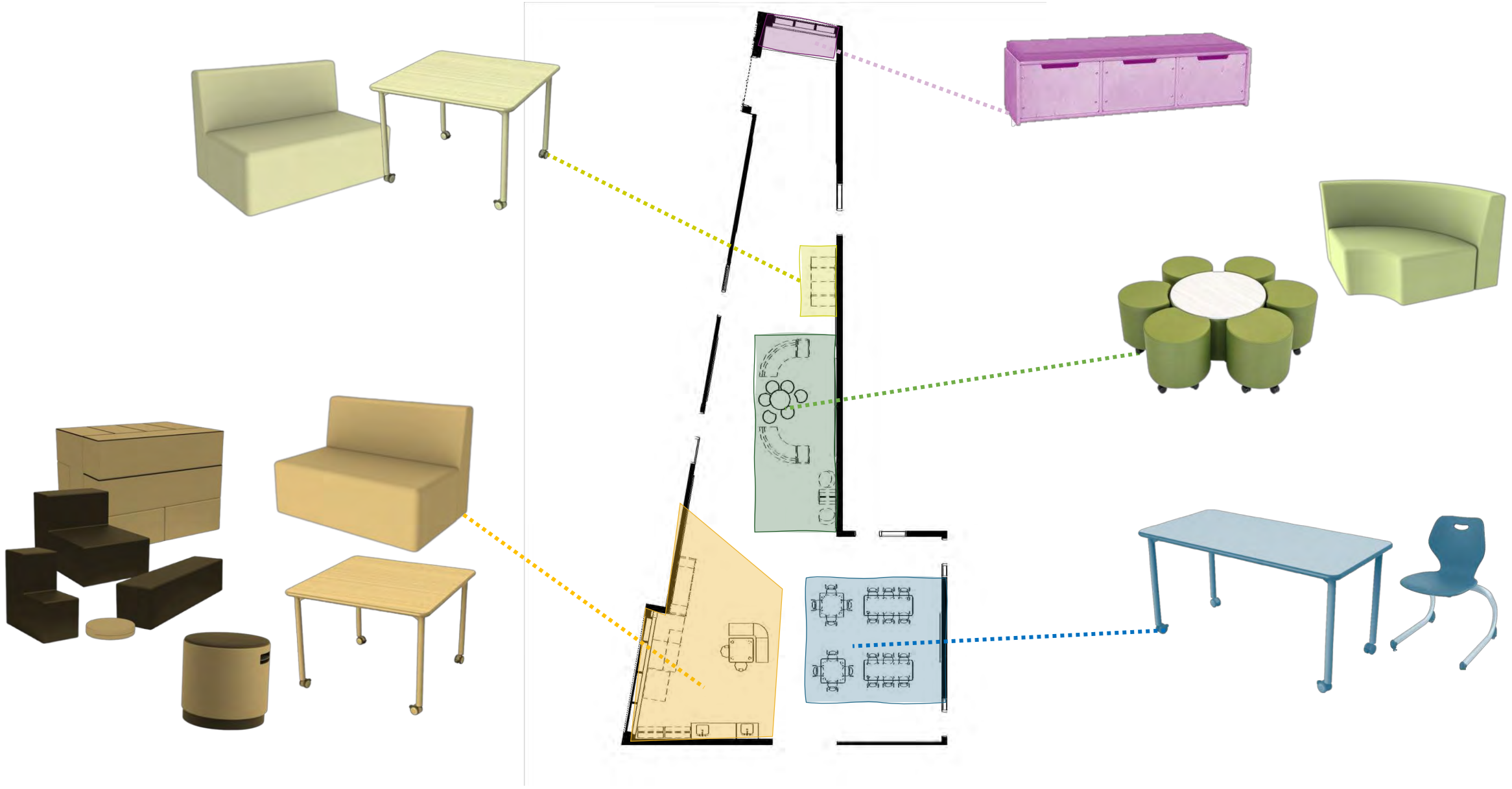
PRE-K EXTENDED LEARNING: AXON

KINDERGARTEN EXTENDED LEARNING: OVERVIEW

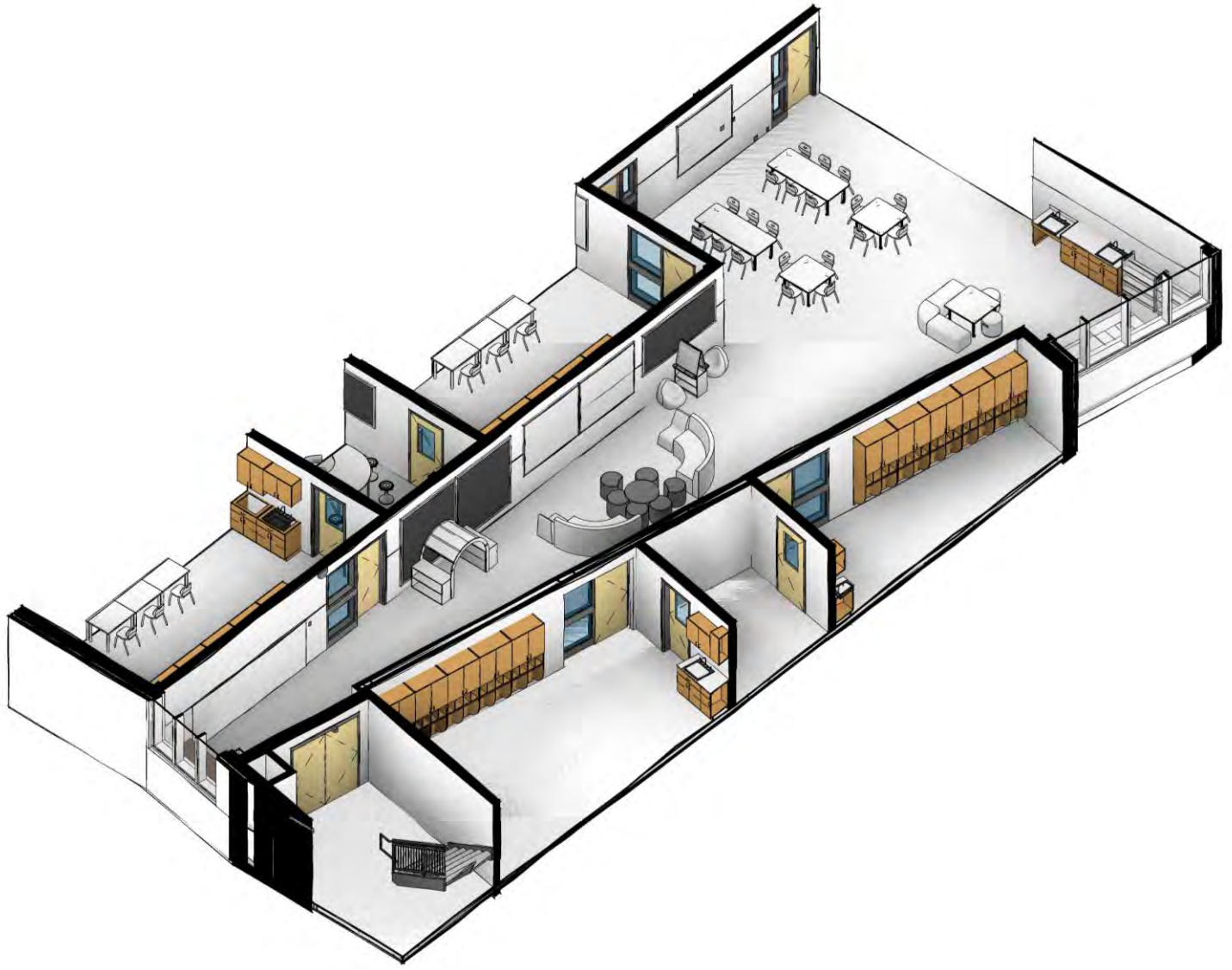
First Floor



KINDERGARTEN EXTENDED LEARNING: OVERVIEW



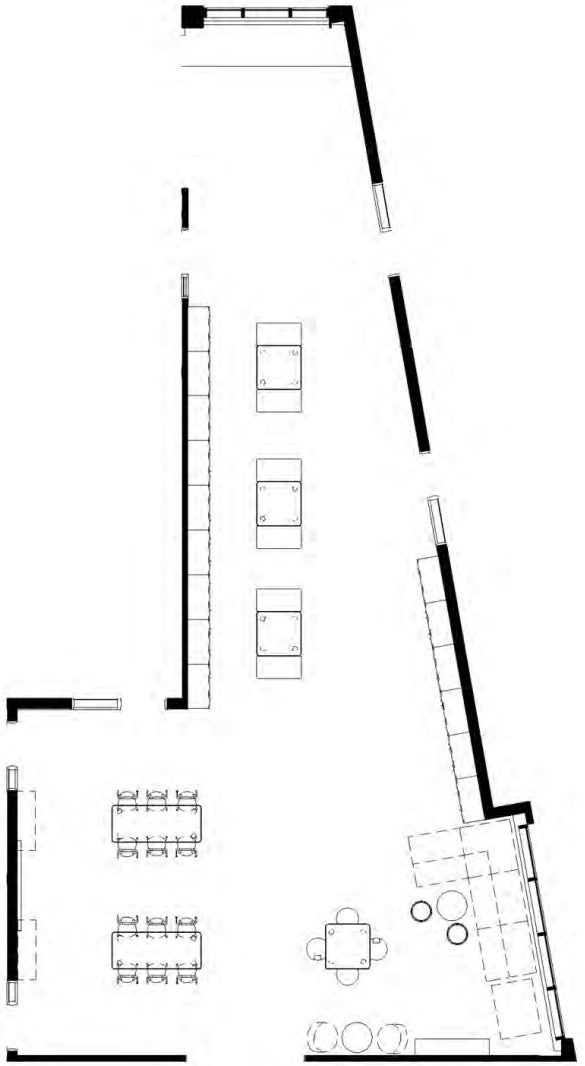
KINDERGARTEN EXTENDED LEARNING: AXON

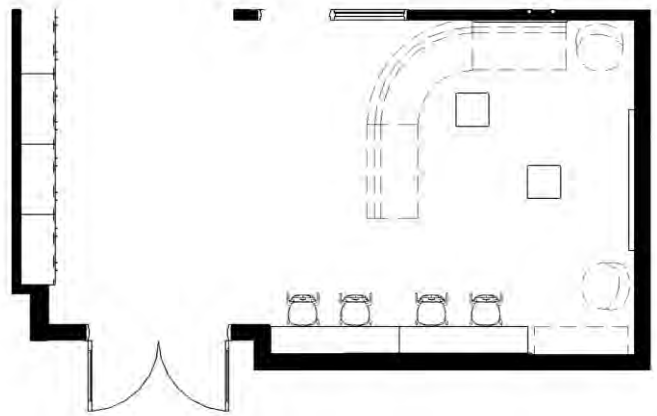


1ST GRADE EXTENDED LEARNING: OVERVIEW

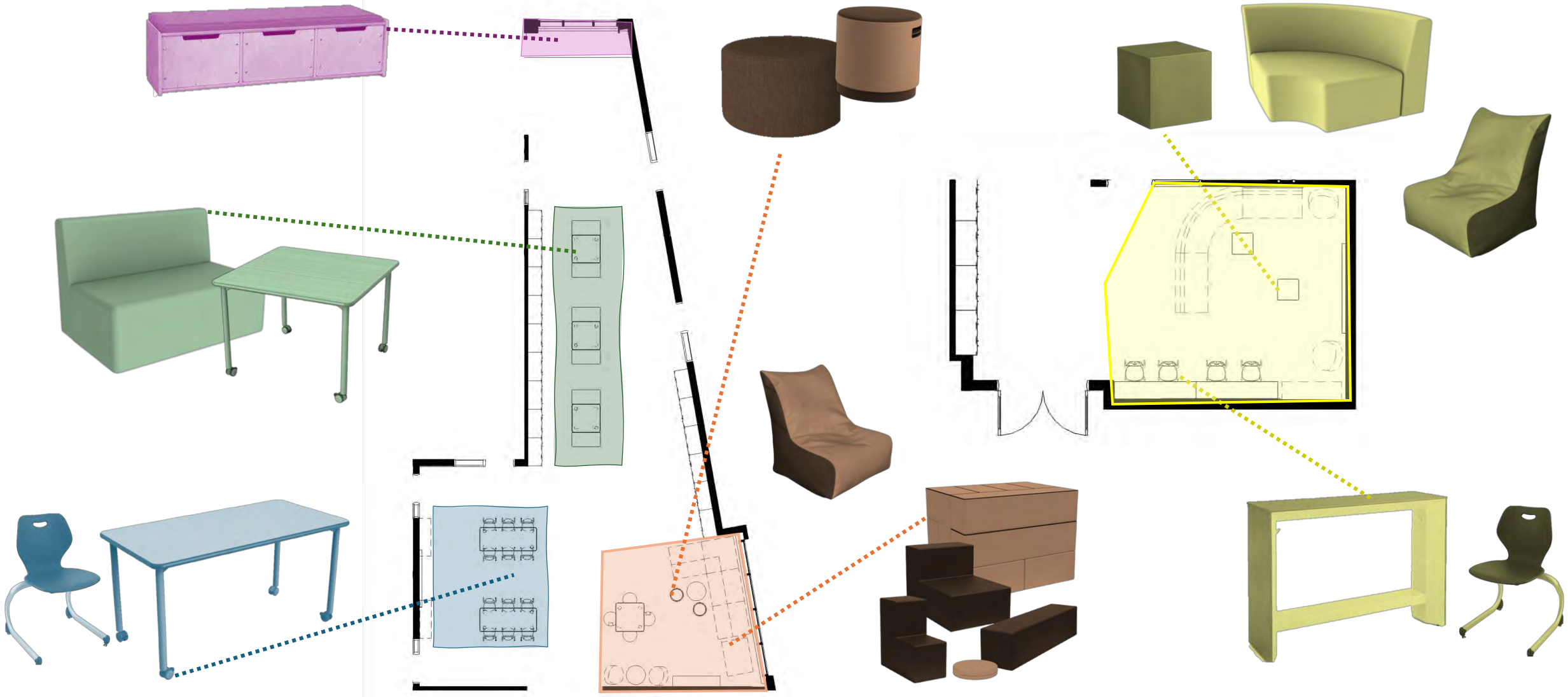
Second Floor

FLOOR PLANS

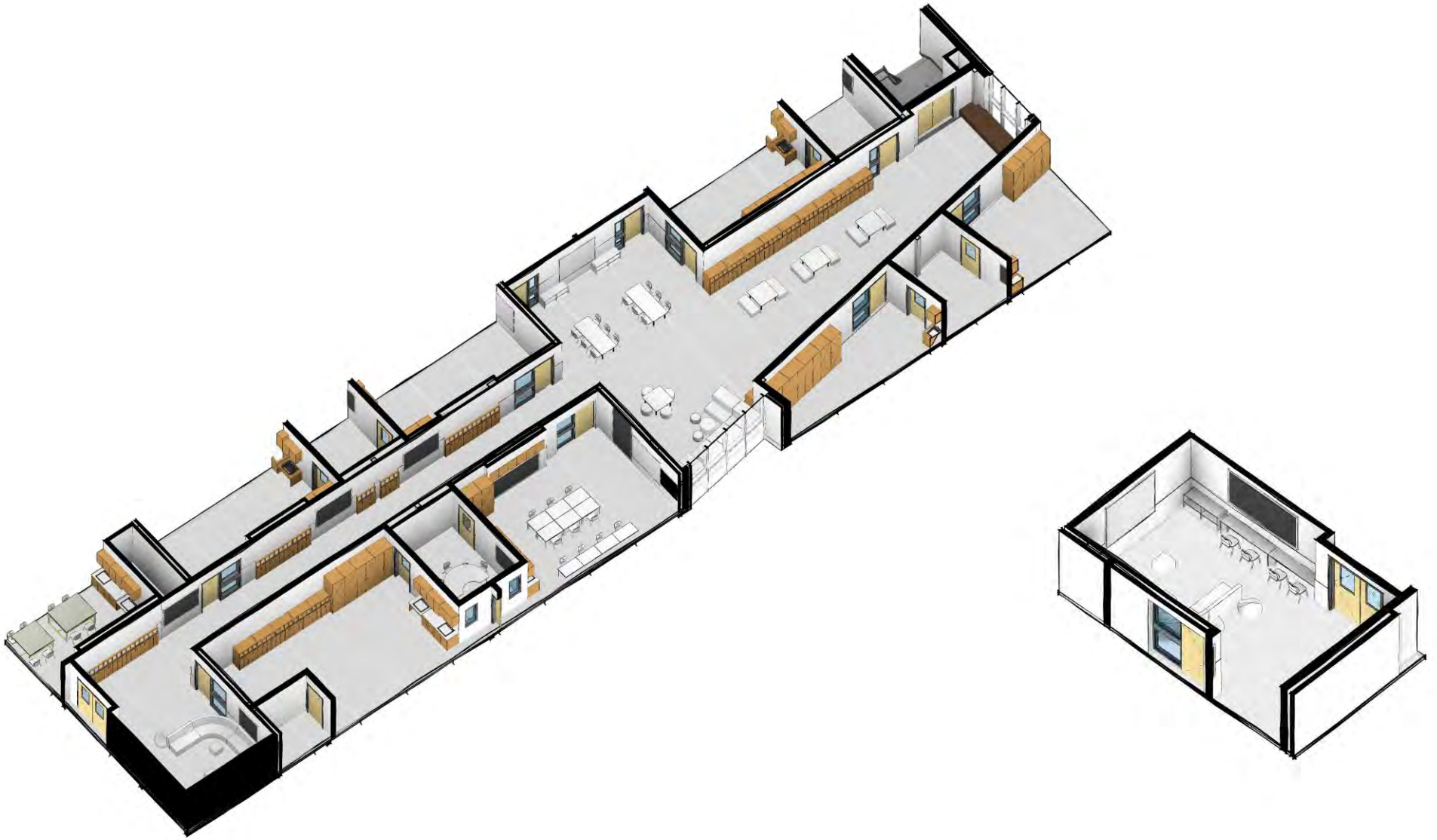




1ST GRADE EXTENDED LEARNING: FLOOR PLAN



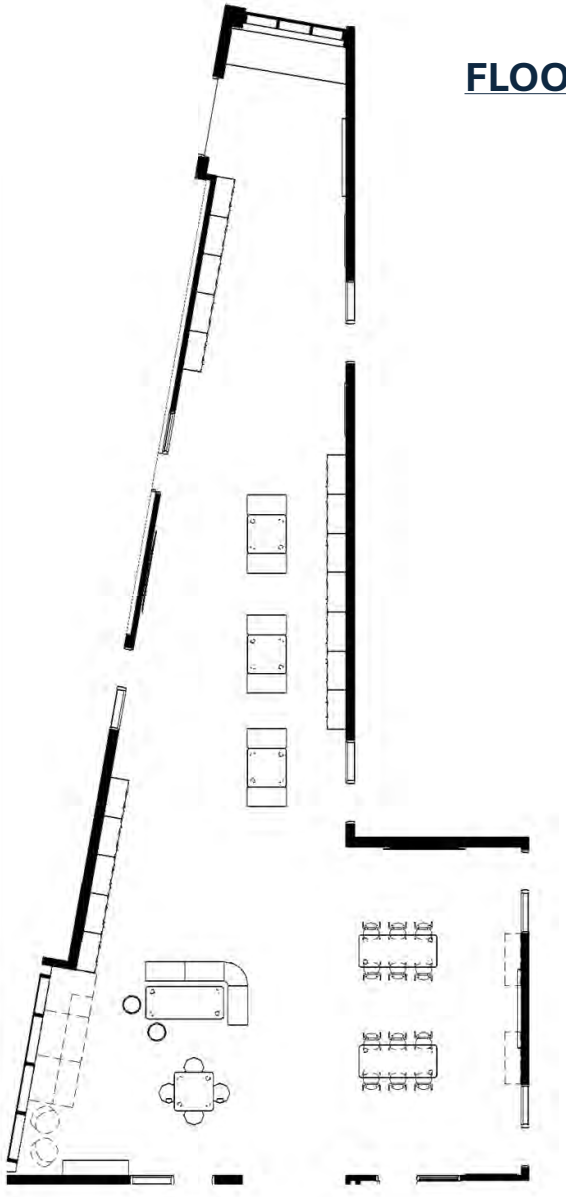
1ST GRADE EXTENDED LEARNING: AXON VIEW

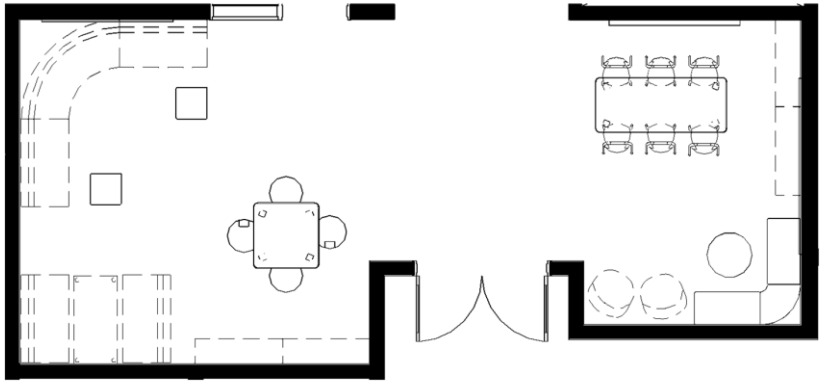


2ND GRADE EXTENDED LEARNING: OVERVIEW

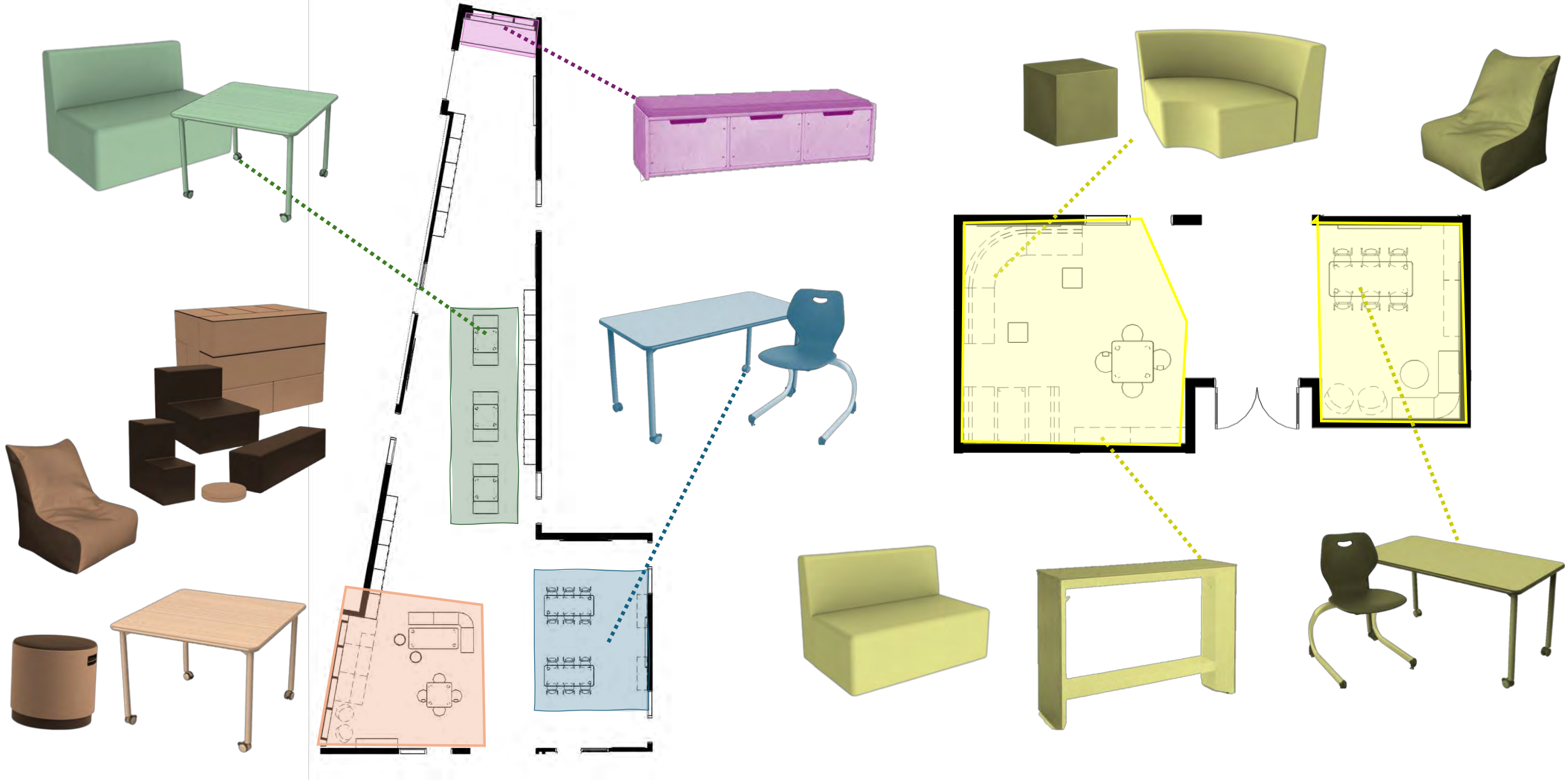
Second Floor

FLOOR PLANS

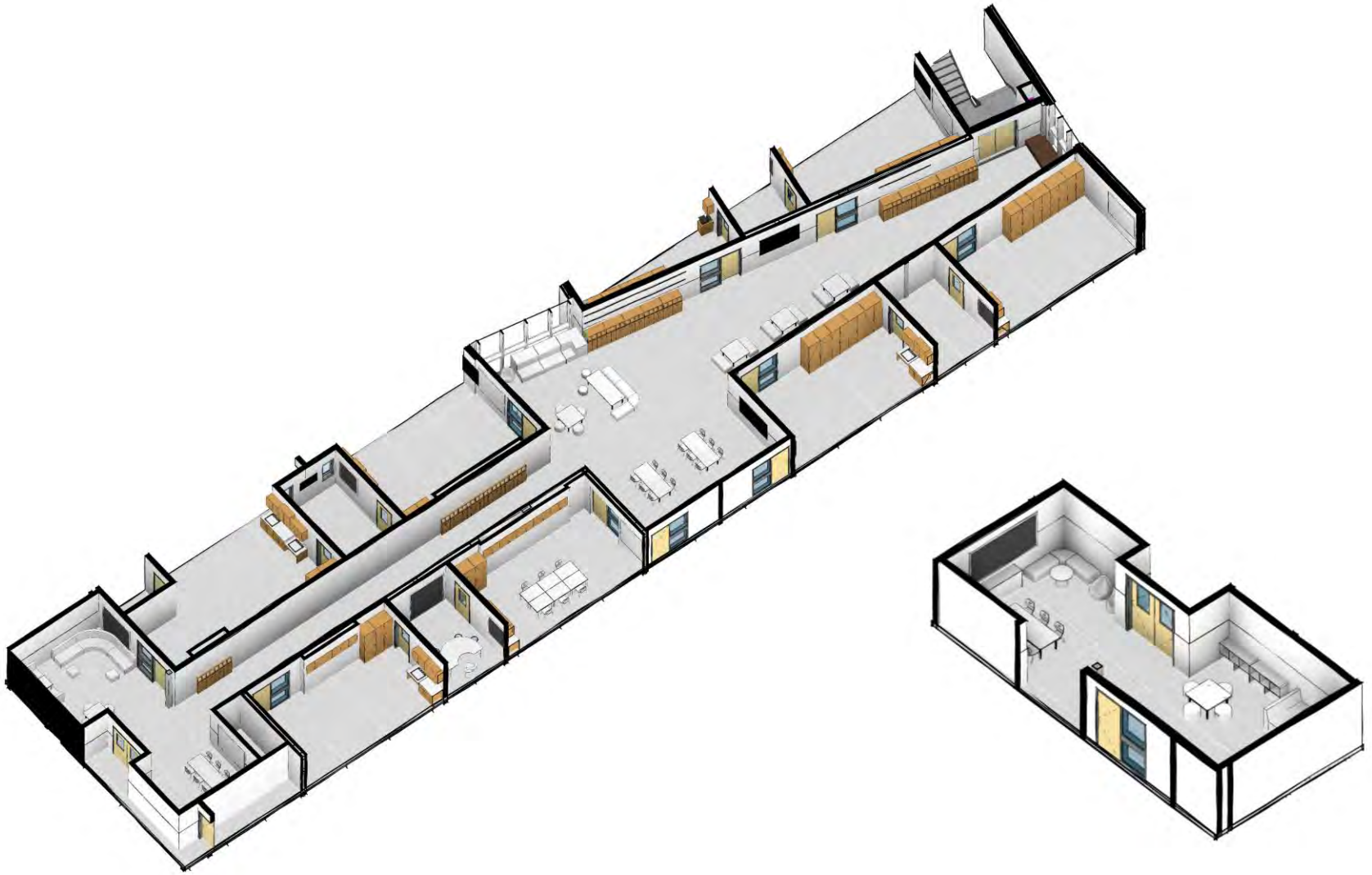




2ND GRADE EXTENDED LEARNING: OVERVIEW



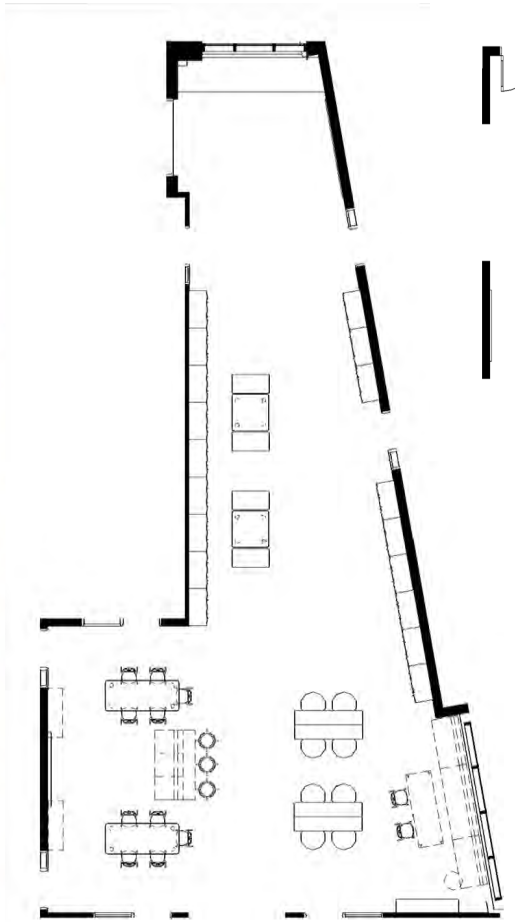
2ND GRADE EXTENDED LEARNING: AXON VIEW

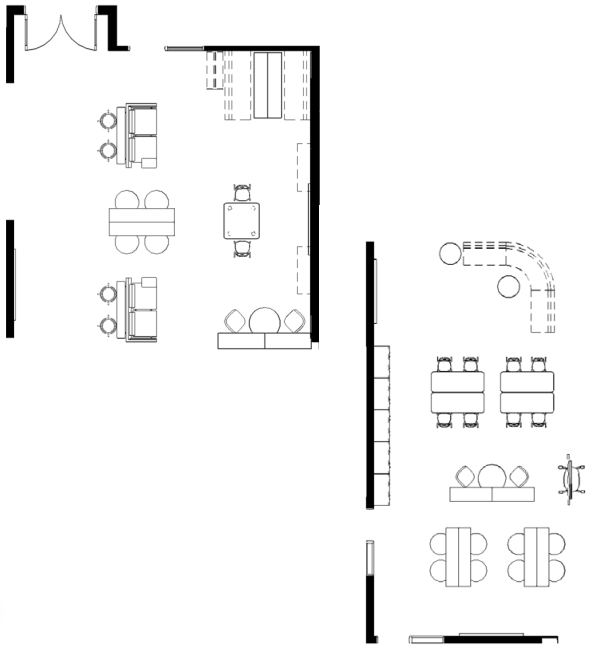


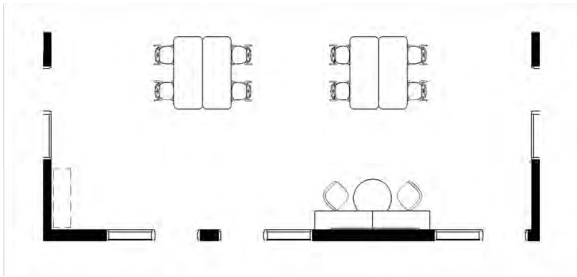
3RD, 4TH & 5TH GRADE EXTENDED LEARNING: OVERVIEW

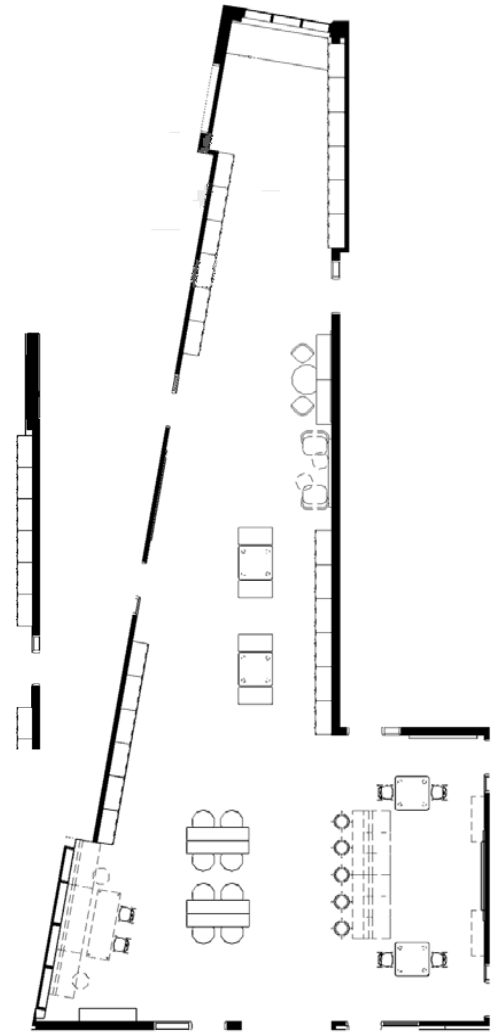
Third Floor

FLOOR PLANS



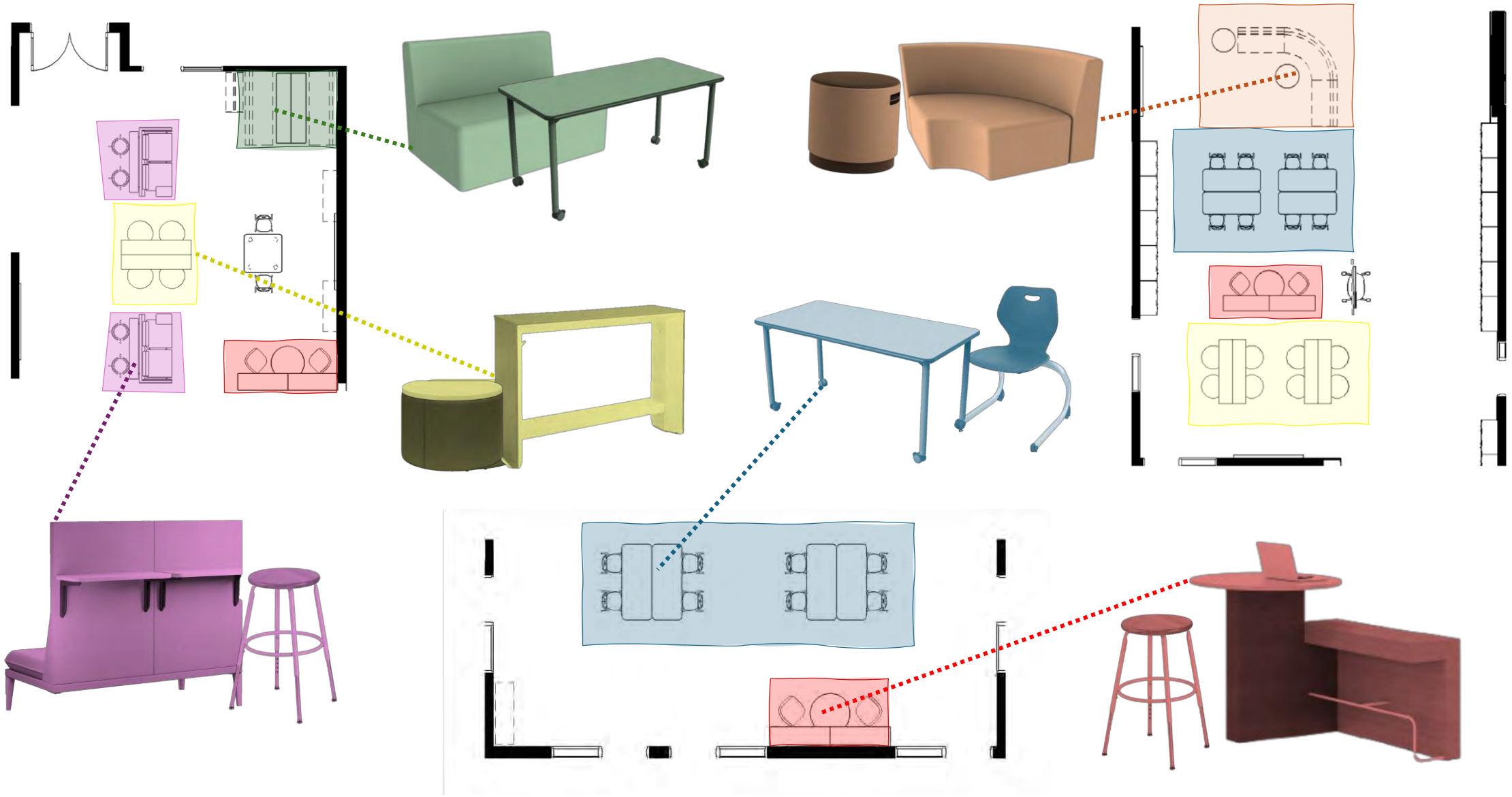




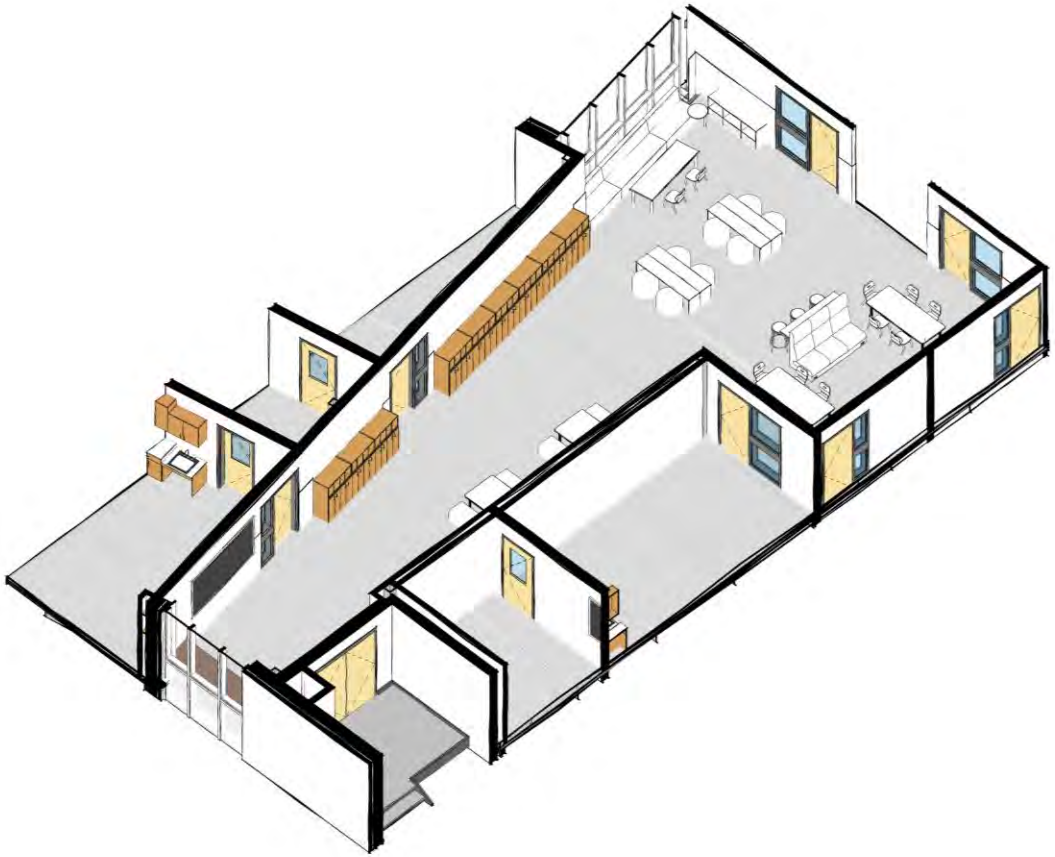


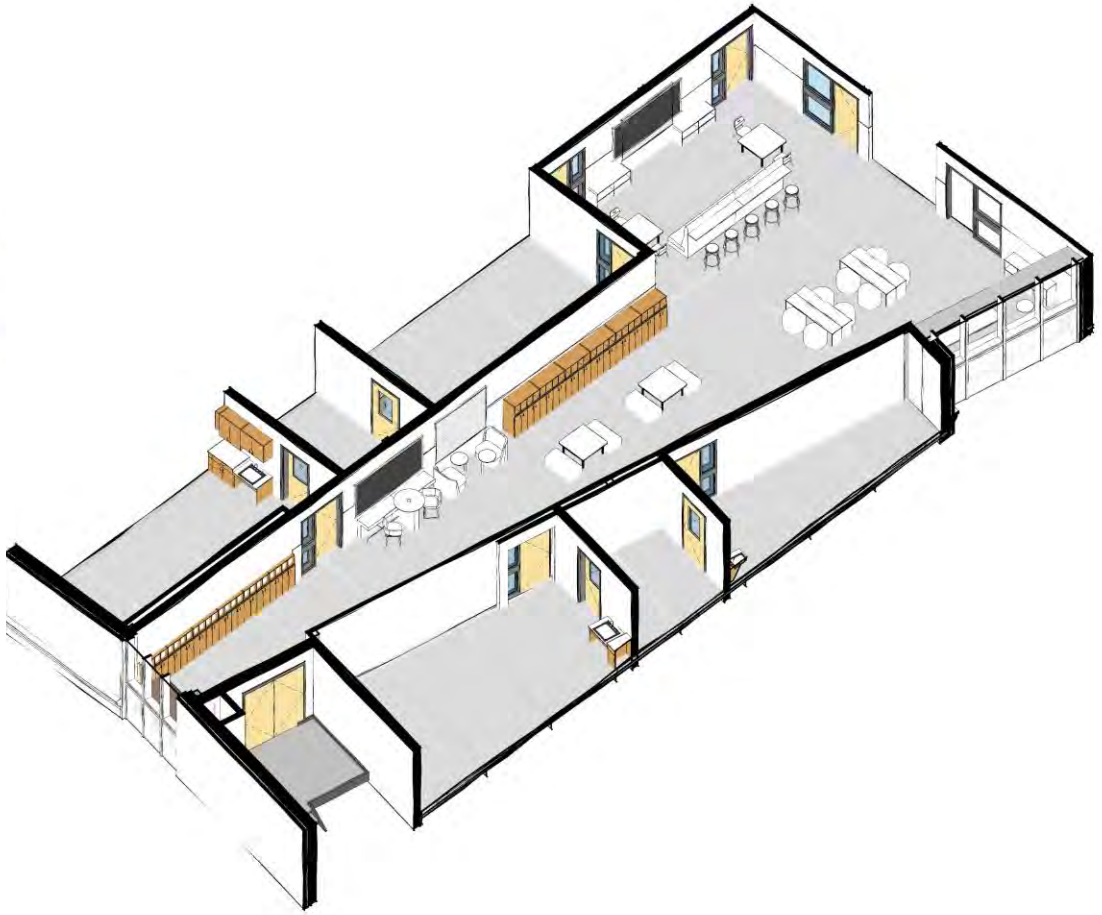
3RD, 4TH & 5TH GRADE EXTENDED LEARNING: FLOOR PLAN

3RD, 4TH & 5TH GRADE EXTENDED LEARNING: FLOOR PLAN

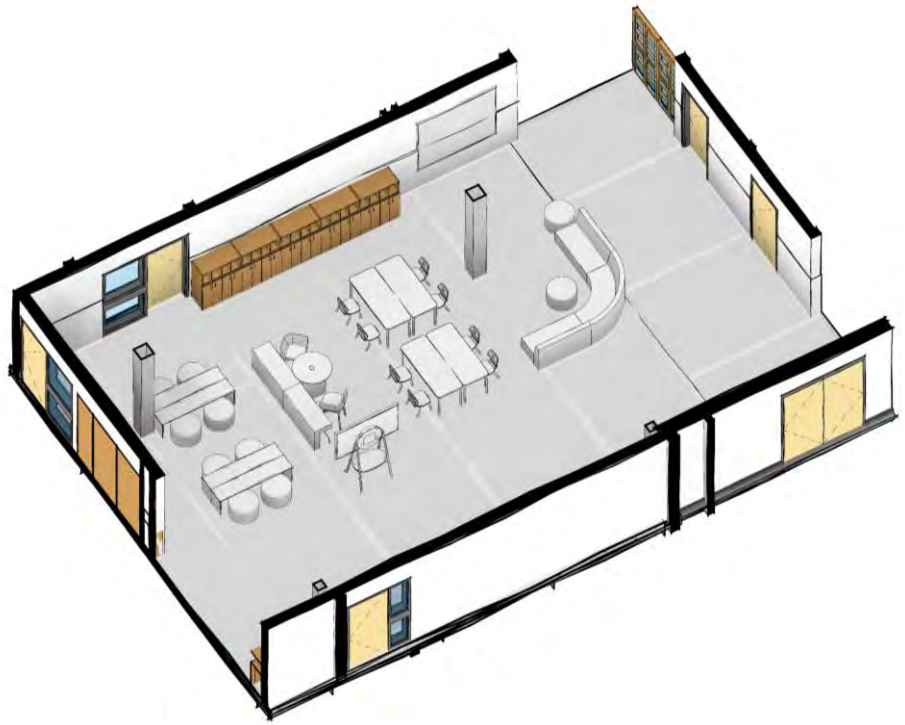


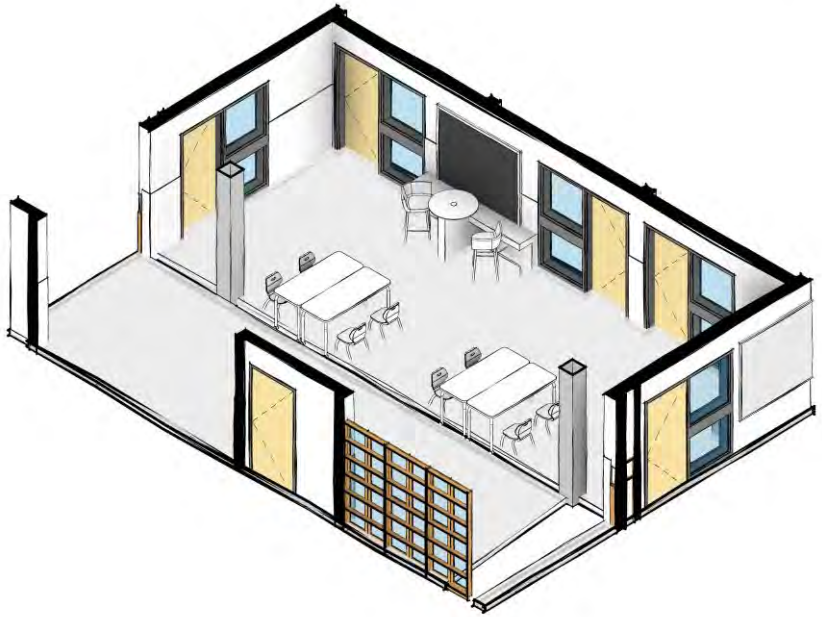
3RD, 4TH & 5TH GRADE EXTENDED LEARNING: AXON VIEW



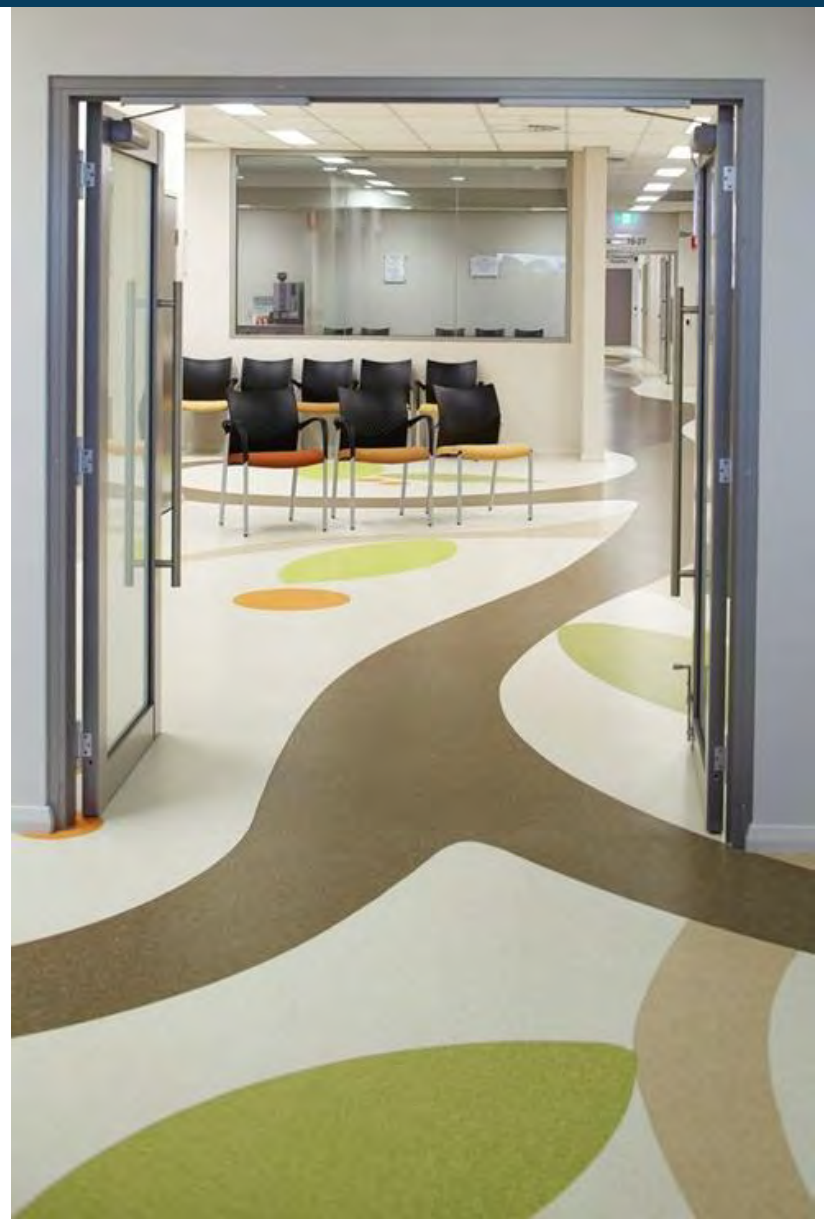


3RD, 4TH & 5TH GRADE EXTENDED LEARNING: AXON VIEW





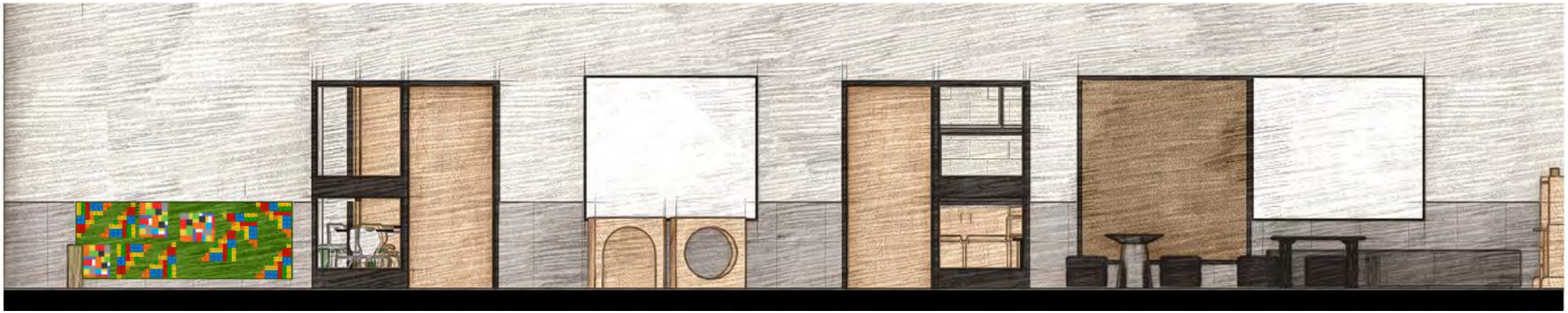
Academic Wings| Linoleum



Window Seat

LEGO Wall

Extended Learning

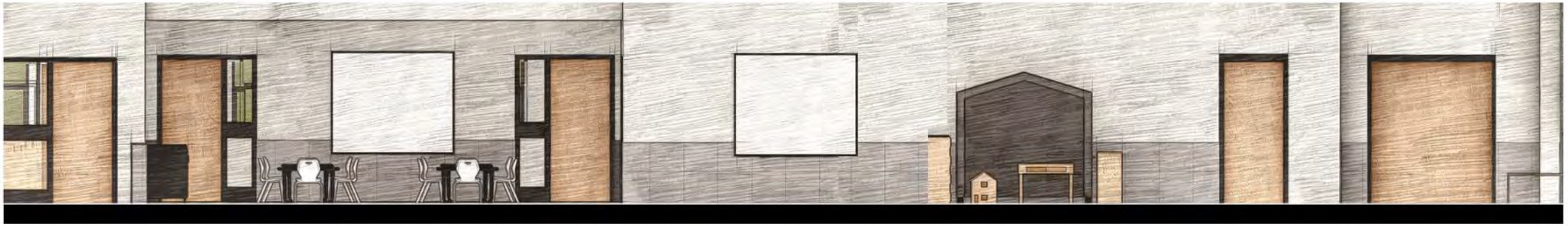


PK – ELA Elevation | East

Extended learning

Teaching Wall

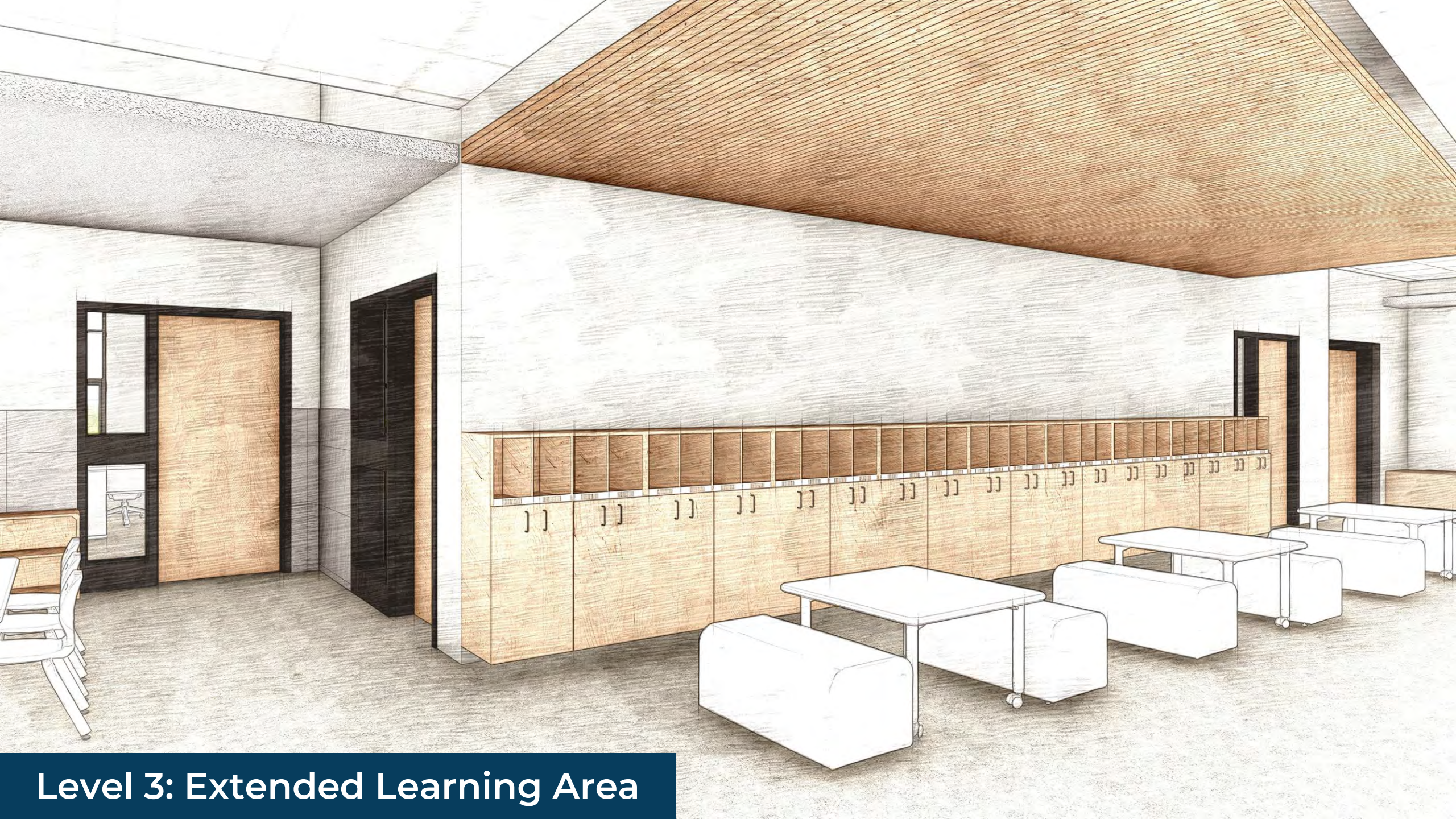
Play Zone



PK – Extended Learning Area
Elevation | West

Level 2: Extended Learning Area

Level 2: Extended Learning Area



Level 3: Extended Learning Area

Small Group Room – Sample Imagery

Small Group Room

Classroom – Sample Imagery

Typical Classrooms:

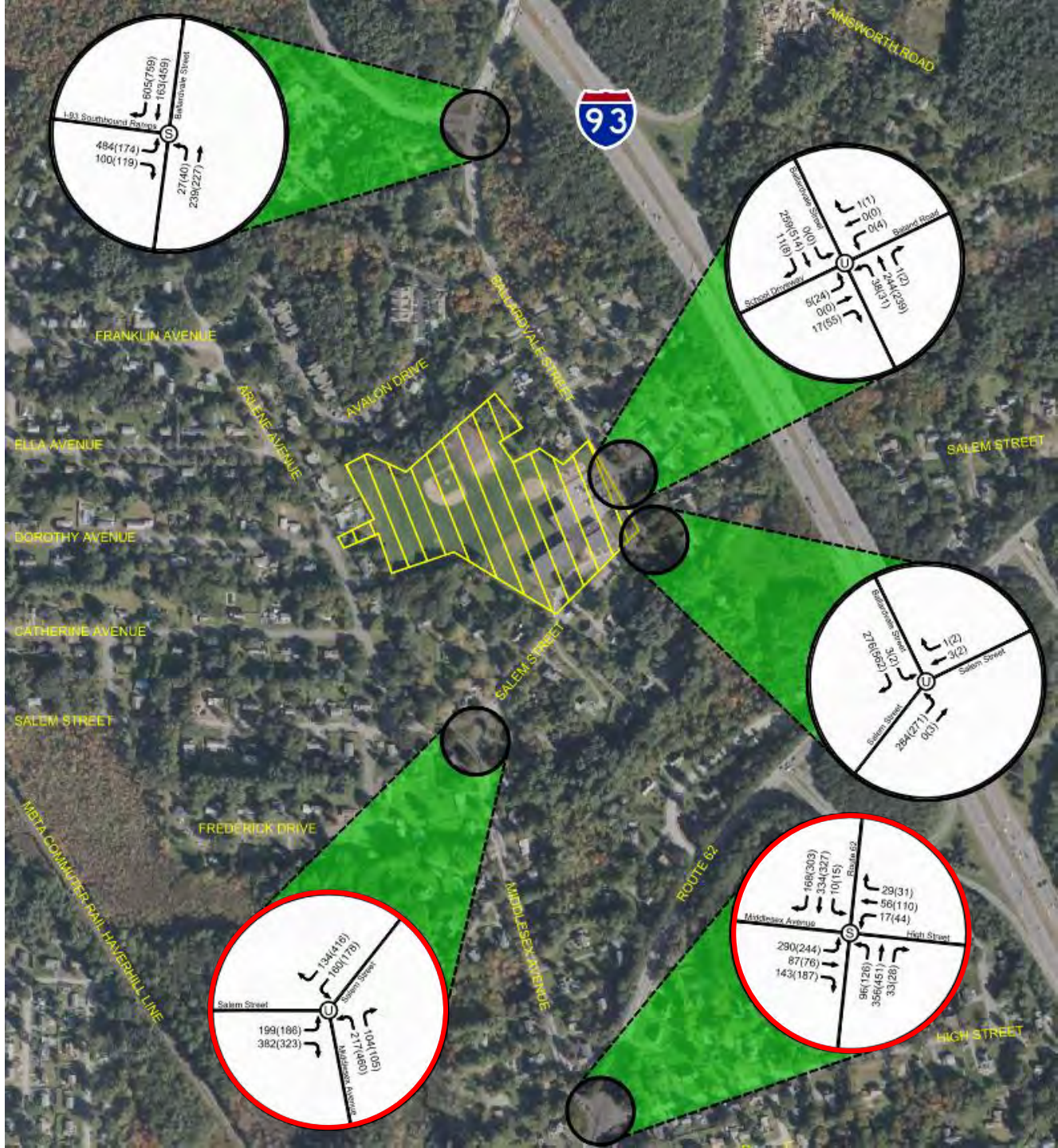
Typical Classrooms:

Typical Classrooms:

Traffic Study Update

Existing Traffic

- Existing operational issues at intersections
  - Salem Street at Middlesex Avenue
  - Route 62 at Middlesex Avenue/High Street
- Intersection crash rates lower than state and district averages
- 85th percentile vehicle speed is 31 MPH on Ballardvale Street near school driveways
- Approx. 8,000 vehicles per day on Ballardvale Street
- Majority of students arrive and depart by bus
- 193 parking spaces to be provided on-site (recommended 120 spaces minimum)
- Space for 24 vehicles to queue on-site during pick-up/drop-off without spilling onto adjacent roadways



Traffic Impact

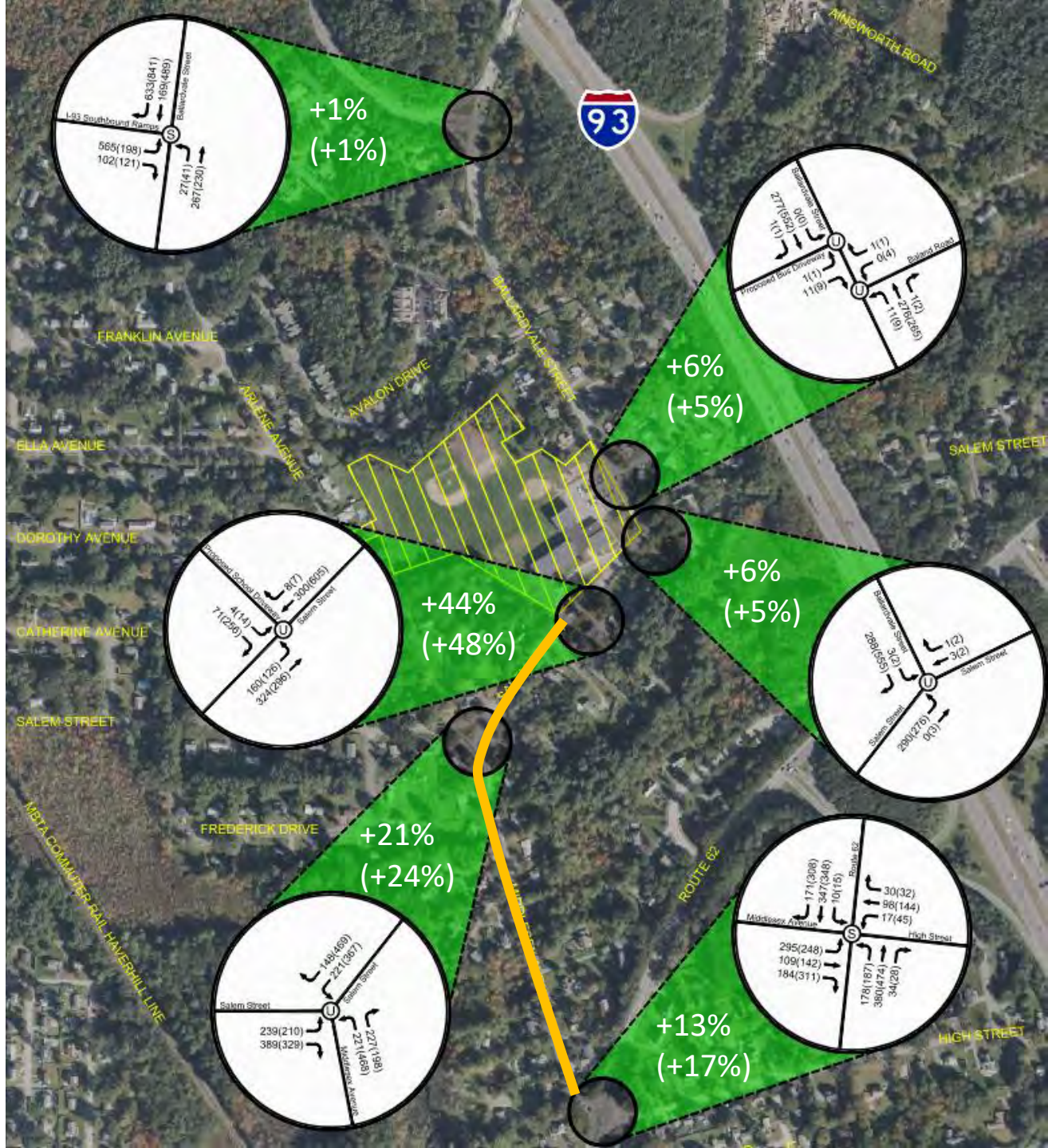
- School trips to increase by a factor of 3.42
- 6% increase on Ballardvale Street
- Most traffic increases concentrated on Salem Street and Middlesex Avenue

Passenger Car Trips – Existing vs Proposed

Time	Elementary School (LUC 520) North Intermediate School		
	Existing with 250 Students	Redeveloped with 855 Students	Net Increase
Weekday Morning Peak	71	243	172
Entering	49	168	119
Exiting	22	75	53
Weekday Afternoon Peak	118	403	285
Entering	39	133	94
Exiting	79	270	191

Anticipated School Trips by Mode

Time	Mode		
	Walking Trips	Passenger Car Trips	Bus Trips
Weekday Morning Peak	24	243	24
Entering	12	168	12
Exiting	12	75	12
Weekday Afternoon Peak	24	403	20
Entering	12	133	10
Exiting	12	270	10



Intersection Operations

Level of Service (LOS) during AM Peak Hour/PM Peak Hour

Build analysis indicates capacity issues present in existing condition further degrades at two intersections:

Salem Street at Middlesex Avenue

- Existing: LOS A/F
- No-Build: LOS A/F+
- Build: LOS A/F+
- Mitigation: Explore alternative intersection designs

Route 62 at Middlesex Avenue/High Street

- Existing: LOS C/C
- No-Build: LOS D/C
- Build: LOS D/D
- Mitigation: Signal retiming to reduce overall delay 19% during PM Peak Hour

All other intersections to operate overall LOS B or better

Level of Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: HCM 6th Edition

Working Group Updates

Discussion, Correspondence, New Items

Committee Questions

Public Comment

Thank You

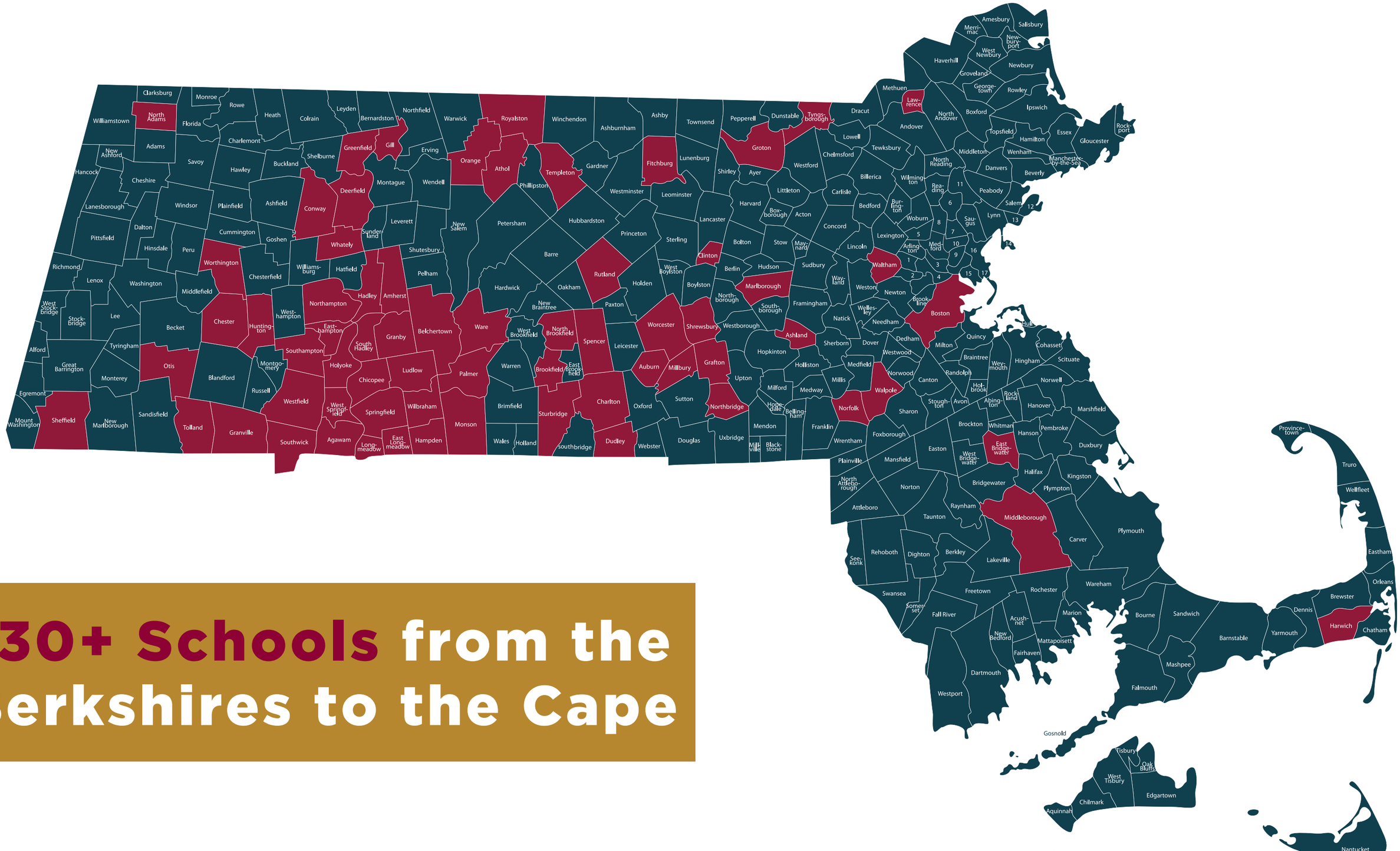
WILMINGTON ELEMENTARY SCHOOL

TOWN OF WILMINGTON

The Journey Starts Here

FONTAINE'S SCHOOL EXPERIENCE

LOCAL
TRUSTED
RESULTS



130+ Schools from the Berkshires to the Cape

TEAM INTRODUCTION

LOCAL
TRUSTED
RESULTS

CORE TEAM

DAVE FONTAINE, SR.
President

DAVE FONTAINE, JR.
Chief Executive Officer

JOEL KENT
Chief Operating Officer

ROB DAY
Project Executive

CHAD L'ECUYER
Project Manager

JONATHAN NADREAU
Assistant Project Manager

ALEX OMAR
Senior Superintendent

JOE CANAL
Superintendent

KEY IN HOUSE RESOURCES

CHELSEY MUTRIE
VP of Preconstruction Services

ELIZABETH WAMBUI
Director of Diversity, Equity, & Community Impact

BEN HEDGES
Director of VDC and Construction Technology

BRIAN DAVIES
Director of Construction/MEPs

CONSTRUCTION PHASE TEAM PROFILE

- ELEMENTARY SCHOOL EXPERIENCE
- EXPERIENCE WITH WILMINGTON PROJECT TEAM
- IMPECCABLE REFERENCES FROM INDUSTRY PROFESSIONALS

TEAM SIMILAR PROJECT EXPERIENCE

LOCAL
TRUSTED
RESULTS

NORTHBRIDGE ELEMENTARY SCHOOL

NORTHBRIDGE, MA

RAYMOND SHAW ELEMENTARY SCHOOL

MILLBURY, MA

TYNGSBOROUGH MIDDLE SCHOOL

TYNGSBOROUGH, MA

LOCAL
TRUSTED
RESULTS

SINCE 2015, FONTAINE HAS BEEN AWARDED

13 CM SCHOOL PROJECTS TOTALING **$900 MILLION**

AND

14 GC SCHOOL PROJECTS TOTALING **$600 MILLION**

PRECONSTRUCTION SERVICES

LOCAL TRUSTED RESULTS

CHELSEY MUTRIE

Vice President of
Preconstruction Services

WE HAVE A DEDICATED TEAM OF INHOUSE RESOURCES

01

ESTIMATING

Shane Sampson

02

BIM + VDC

Ben Hedges

03

SAFETY

Mark Bisson

04

SUSTAINABILITY

Tracy Routhier

05

MEP

Brian Davies

06

SCHEDULING

Christa Spedding

KEY MSBA STEPS AND DELIVERABLES

LOCAL TRUSTED RESULTS

PHASES

NTP	2/13 - 3/18 *<5 weeks*	• Phasing and Logistics • Schedule • MEP Phasing
SD DOCUMENTS	3/19 - 4/17 *4 weeks*	• Cost Estimate • Constructability Review • Incorporate Value Engineering • Secure Town Budget Approvals
MSBA SUBMISSION	4/18 - 4/24 *<1 week*	• Finalize SD Binder • Submit to MSBA
MSBA APPROVALS	4/25 - 6/25	• FAS Meeting (5/14 or 5/21) • Address MSBA Comments • MSBA Board Meeting

JUNE 25

MSBA

Board of Directors

DRIVING VALUE

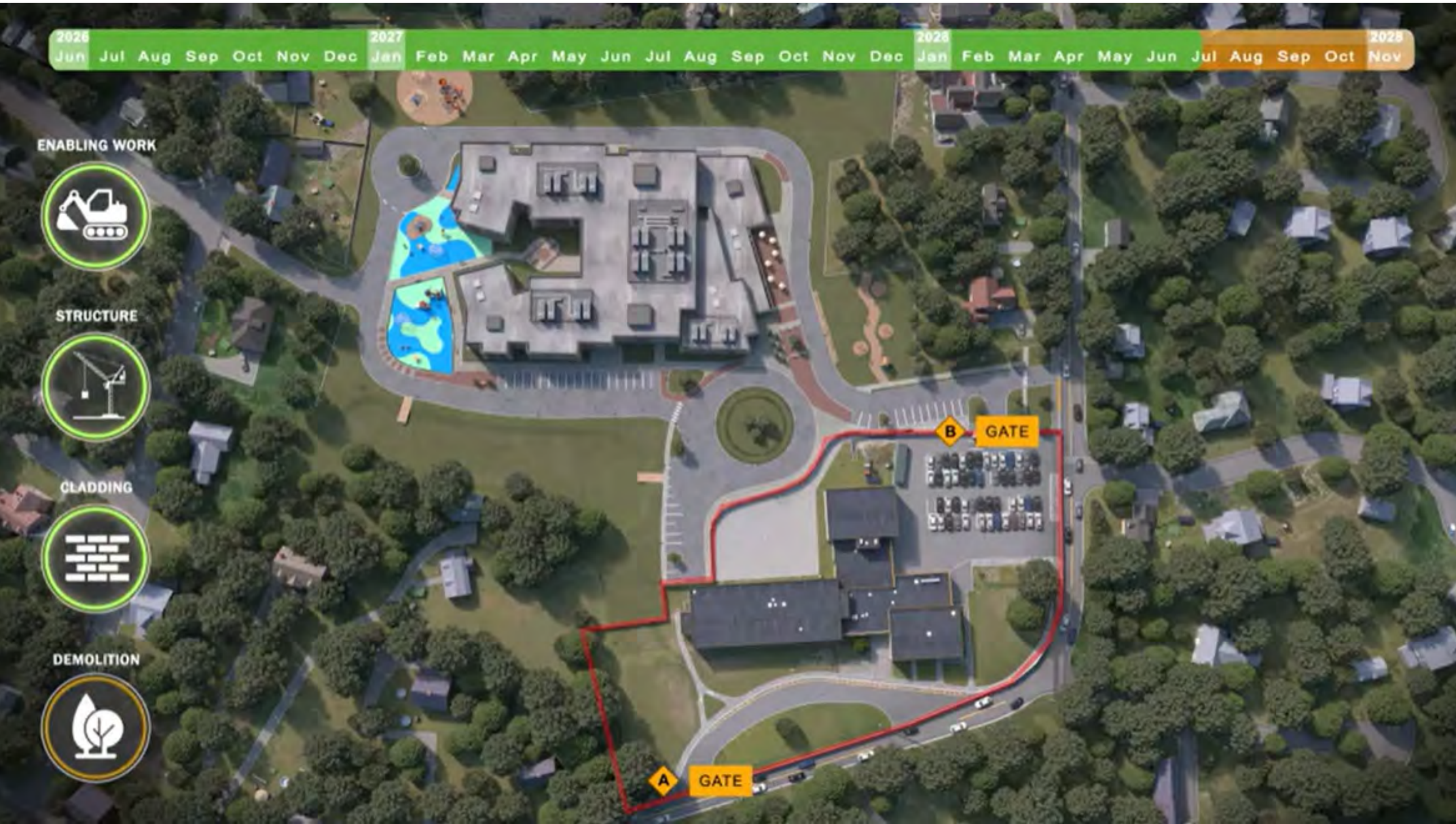
LOCAL
TRUSTED
RESULTS

FEATURES

- SITE DEVELOPMENT
- ENVELOPE
- HVAC

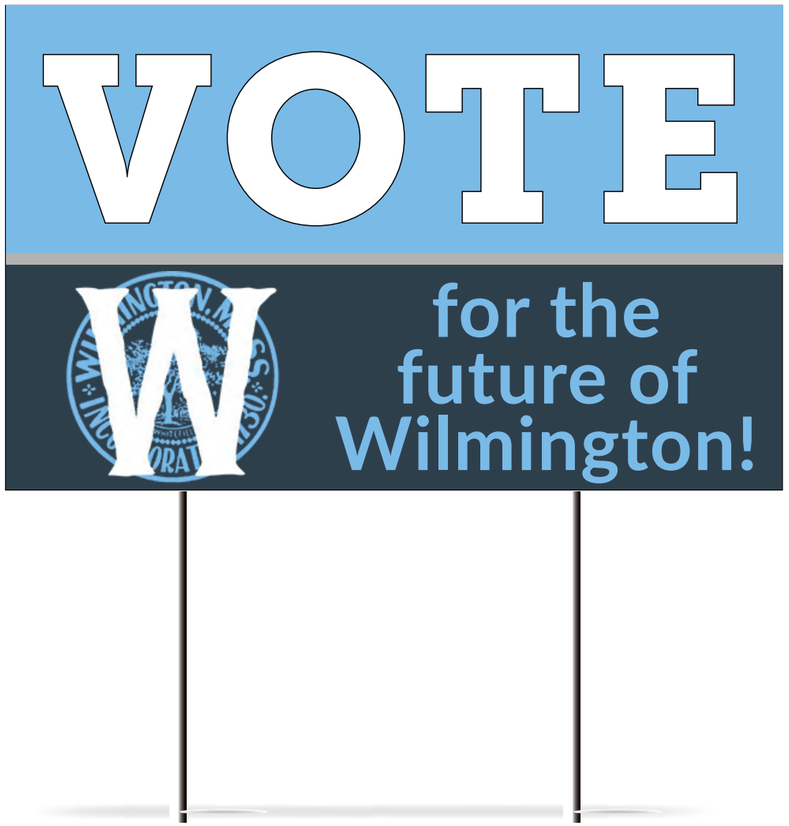
BRINGING YOUR VISION TO LIFE

LOCAL
TRUSTED
RESULTS



SECURING THE VOTE

LOCAL TRUSTED RESULTS



WILMINGTON ELECTION TURNOUT	REGISTERED VOTERS	TOTAL VOTES	VOTER %	STATE AVG
RECENT PRESIDENTIAL ELECTIONS				
2024 Election	18,605	14,400	77.40%	68.31%
2020 Election	17,424	14,916	85.60%	76.00%

WILMINGTON ELECTION TURNOUT	REGISTERED VOTERS	TOTAL VOTES	VOTER %	STATE AVG
RECENT STAND-ALONE GUBERNATORIAL ELECTION				
2022 Election	18,004	10,318	57.31%	51.42%

WILMINGTON ELECTION TURNOUT	REGISTERED VOTERS	TOTAL VOTES	VOTER %
SPECIAL TOWN ELECTION			
2021 Election	17,845	735	4.12%

LOCAL
TRUSTED
RESULTS

13,025

70% OF VOTER TURNOUT

6,512

TARGET GOAL

2,756

WPS ENROLLMENT

YOUR VOTE

HOW TO BUILD AWARENESS

01 SOCIAL MEDIA

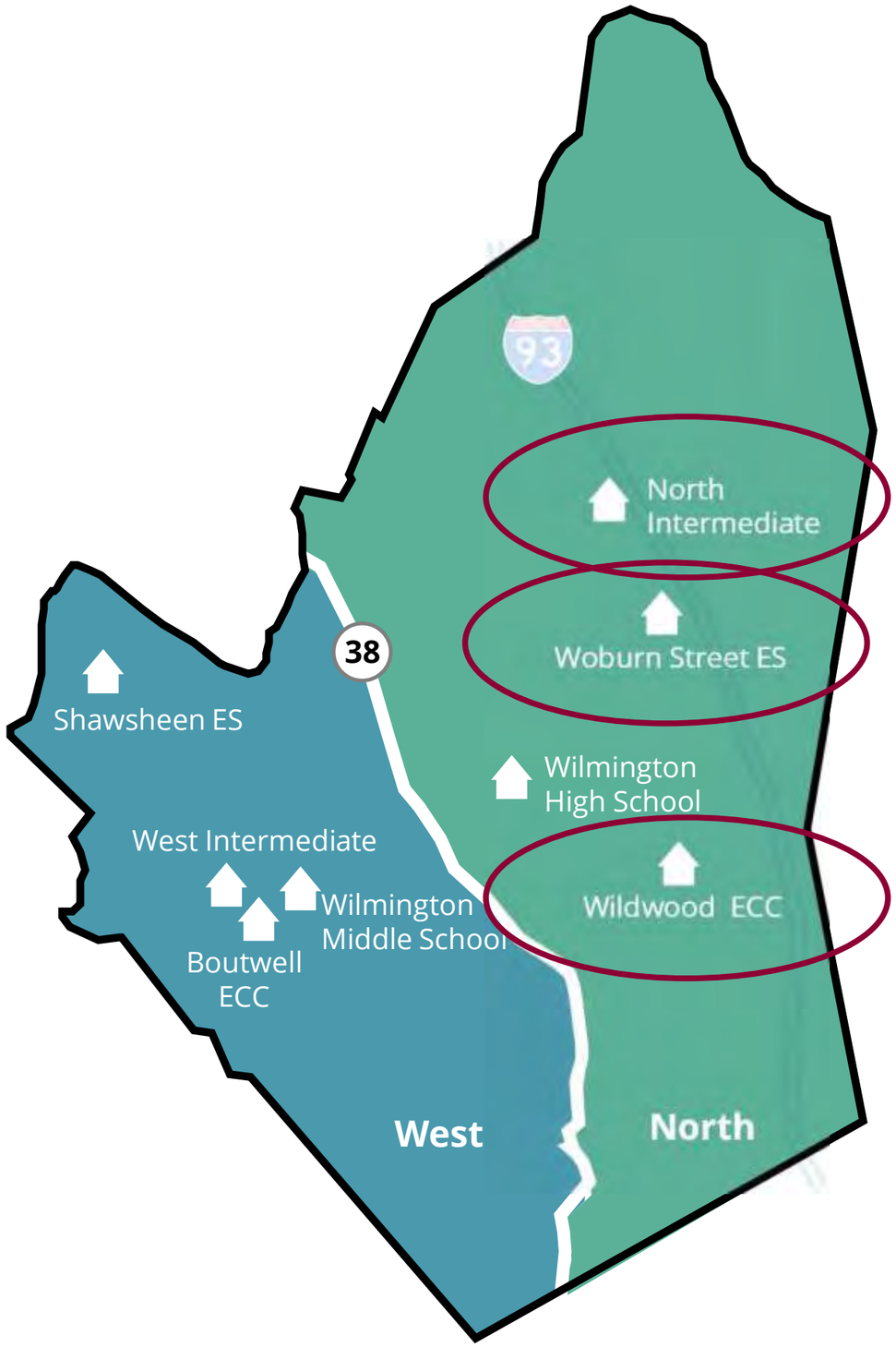
02 COMMUNITY EVENTS

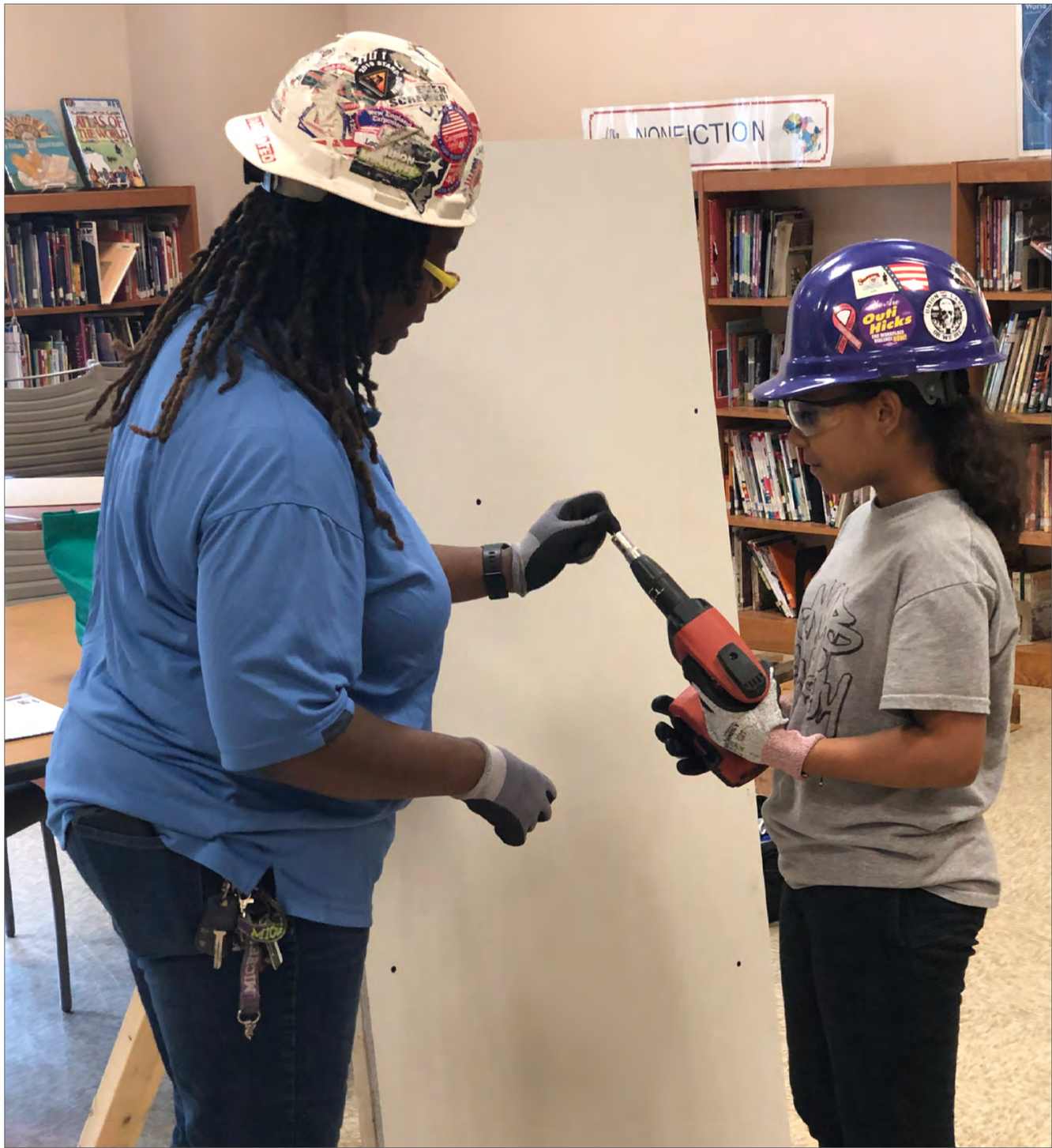
03 YOUTH SPORTS

04 OPEN HOUSE SERIES

BUILDING SCHOOL CULTURE

LOCAL
TRUSTED
RESULTS





SCHOOL/COMMUNITY PARTNERSHIPS

LOCAL TRUSTED RESULTS

SCHEDULE

2022 | 2023 | 2024 | 2025

J F M A M J J A S O N D

CONCRETE & STEEL
PBI/BDI STRUCTURAL PRESENATION
SITE VISIT
ETA CLASS COLLABORATION
GEOTECHNICAL PRESENTATION

STRUCTURAL ENGINEER

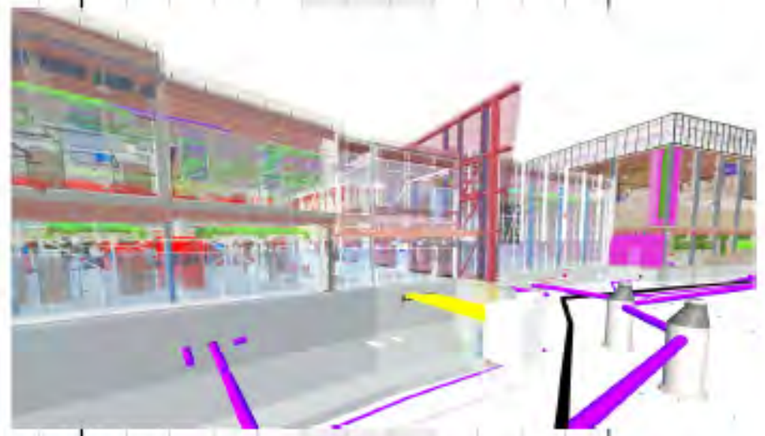
ROOFING

FIREPROOFING

EXTERIOR FACADE
SITE VISITS
MASONRY / CURTAIN WALL / METAL PANEL
ENVELOPE OBSERVATION AND TESTING

MOCK-UP WALL

ENVELOPE TESTING



BIM COORDINATION
BIM COORDINATION
PRESENTATION

BIM COORDINATOR PRESENTATION

MECHANICAL ELECTRICAL AND PLUMBING INSTALLATION
SITE VISITS
COLLABORATION WITH UNION REPRESENTATIVES
COMMISSIONING PRESENTATION
SUSTAINABLE DESIGN ANALYSIS

COMMISSIONING AGENT

INTERIOR FRAMING AND FINISHES
SITE VISITS
STUDENT PROJECTS (HISTORY WALL, CLASS DEDICATIONS)

SUSTAINABLE DESIGN

HVAC ENGINEER

FURNITURE
SITE VISITS

ACCESS AND PARKING FOR NEW SCHOOL

ABATE AND DEMO EXISTING BUILDING

FIELD AND SITE COMPLETION

LANDSCAPE ARCH.

JOB FAIR | JOB FAIR | JOB FAIR | NEW SCHOOL OCCUPANCY | JOB FAIR | PROJECT COMPLETION | JOB FAIR

FB
SINCE
33

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #31

March 25, 2025

Massachusetts School Building Authority

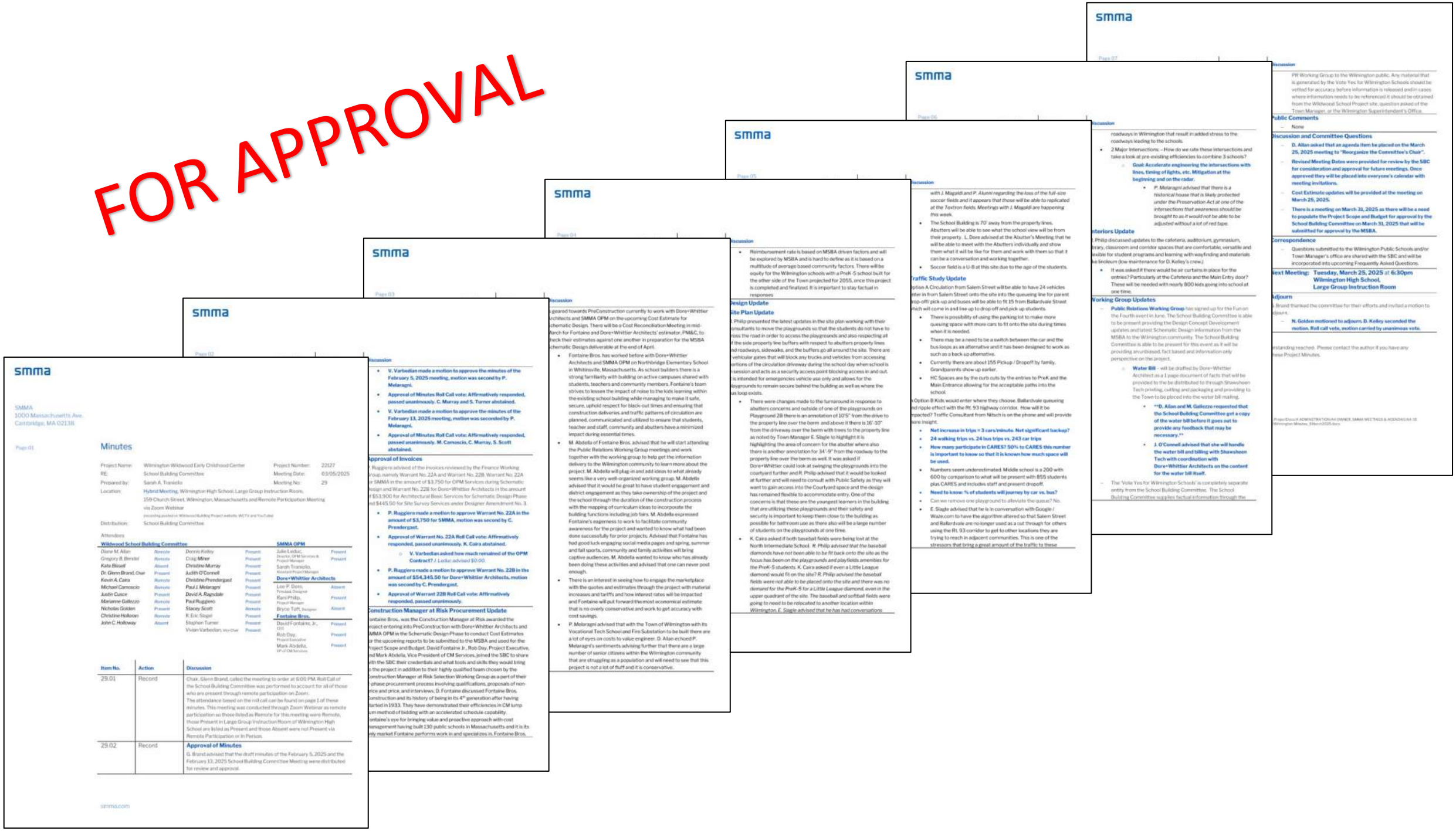
smma dw DORE + WHITTIER FONTAINE

Agenda

1. Call to Order
2. Approval of Minutes
3. Design Update
    - Site Plan Update
    - Interiors Update
    - Cost Estimate Update
4. Working Group Updates
    - Public Relations Working Group
5. Discussion/Correspondence/New Items
    - Reorganize the School Building Committee's Chairperson
    - Review and Approve Project Name
    - Review and Approve Schedule Updates
6. Committee Questions
7. Public Comments
8. Next Meeting: Wednesday March 31, 2025
9. Adjourn

Approval of Minutes

FOR APPROVAL



smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Page 01

Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	03/05/2025
Prepared by:	Sarah A. Trankello	Meeting No:	29
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar (recording posted on Wildwood Building Project website, WCTV and YouTube)		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee			
Diane M. Allen	Remote	Dennis Kelley	Present
Gregory B. Bierdel	Remote	Craig Miner	Present
Kate Bissell	Absent	Christine Murray	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	Remote	Christine Prendergast	Present
Michael Camoscio	Remote	Paul J. Melaragni	Present
Justin Cuoco	Present	David A. Ragsdale	Present
Marianne Gallezzo	Remote	Paul Ruggiero	Present
Nicholas Golden	Present	Stacey Scott	Remote
Christine Holloran	Remote	R. Eric Siegel	Present
John C. Holloway	Absent	Stephen Turner	Present
		Vivian Varbedian, Vice-Chair	Present

SMMA OPM	
Julie Leduc, Director, OPM Services & Project Manager	Present
Sarah Trankello, Assistant Project Manager	Present
Dore+Whittier Architects	
Lee P. Dore, Principal Designer	Absent
Rani Philip, Project Manager	Present
Bryce Tuff, Designer	Absent
Fontaine Bros.	
David Fontaine, Jr., CEO	Present
Rob Day, Project Executive	Present
Mark Abdella, VP of CM Services	Present

Item No.	Action	Discussion
29.01	Record	Chair, Glenn Brand, called the meeting to order at 6:00 PM. Roll Call of the School Building Committee was performed to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person.
29.02	Record	**Approval of Minutes** G. Brand advised that the draft minutes of the February 5, 2025 and the February 13, 2025 School Building Committee Meeting were distributed for review and approval.

smma.com

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Discussion

- **V. Varbedian made a motion to approve the minutes of the February 5, 2025 meeting, motion was second by P. Melaragni.**
- **Approval of Minutes Roll Call vote: Affirmatively responded, passed unanimously. C. Murray and S. Turner abstained.**
- **V. Varbedian made a motion to approve the minutes of the February 13, 2025 meeting, motion was seconded by P. Melaragni.**
- **Approval of Minutes Roll Call vote: Affirmatively responded, passed unanimously. M. Camoscio, C. Murray, S. Scott abstained.**

Approval of Invoices

J. Ruggiero advised of the invoices reviewed by the Finance Working Group, namely Warrant No. 22A and Warrant No. 22B. Warrant No. 22A for SMMA in the amount of $3,750 for OPM Services during Schematic Design and Warrant No. 22B for Dore+Whittier Architects in the amount of $53,900 for Architectural Basic Services for Schematic Design Phase and $445.50 for Site Survey Services under Designer Amendment No. 3.

- **P. Ruggiero made a motion to approve Warrant No. 22A in the amount of $3,750 for SMMA, motion was second by C. Prendergast.**
- **Approval of Warrant No. 22A Roll Call vote: Affirmatively responded, passed unanimously. K. Caira abstained.**
  - **V. Varbedian asked how much remained of the OPM Contract? J. Leduc advised $0.00.**
- **P. Ruggiero made a motion to approve Warrant No. 22B in the amount of $54,345.50 for Dore+Whittier Architects, motion was second by C. Prendergast.**
- **Approval of Warrant 22B Roll Call vote: Affirmatively responded, passed unanimously.**

Construction Manager at Risk Procurement Update

Fontaine Bros., was the Construction Manager at Risk awarded the project entering into PreConstruction with Dore+Whittier Architects and SMMA OPM in the Schematic Design Phase to conduct Cost Estimates for the upcoming reports to be submitted to the MSBA and used for the Project Scope and Budget. David Fontaine Jr., Rob Day, Project Executive, and Mark Abdella, Vice President of CM Services, joined the SBC to share with the SBC their credentials and what tools and skills they would bring to the project in addition to their highly qualified team chosen by the Construction Manager at Risk Selection Working Group as a part of their 2-phase procurement process involving qualifications, proposals of non-price and price, and interviews. D. Fontaine discussed Fontaine Bros. construction and its history of being in its 4th generation after having started in 1933. They have demonstrated their efficiencies in CM lump sum method of bidding with an accelerated schedule capability. Fontaine's eye for bringing value and proactive approach with cost management having built 130 public schools in Massachusetts and it is its only market Fontaine performs work in and specializes in. Fontaine Bros.

Page 03

Discussion

geared towards PreConstruction currently to work with Dore+Whittier Architects and SMMA OPM on the upcoming Cost Estimate for Schematic Design. There will be a Cost Reconciliation Meeting in mid-March for Fontaine and Dore+Whittier Architects' estimator, PM&C, to check their estimates against one another in preparation for the MSBA Schematic Design deliverable at the end of April.

- Fontaine Bros. has worked before with Dore+Whittier Architects and SMMA OPM on Northbridge Elementary School in Whitinsville, Massachusetts. As school builders there is a strong familiarity with building on active campuses shared with students, teachers and community members. Fontaine's team strives to lessen the impact of noise to the kids learning within the existing school building while managing to make it safe, secure, uphold respect for black-out times and ensuring that construction deliveries and traffic patterns of circulation are planned, communicated and utilized to ensure that students, teacher and staff, community and abutters have a minimized impact during essential times.
- M. Abdella of Fontaine Bros. advised that he will start attending the Public Relations Working Group meetings and work together with the working group to help get the information delivery to the Wilmington community to learn more about the project. M. Abdella will plug-in and add ideas to what already seems like a very well-organized working group. M. Abdella advised that it would be great to have student engagement and district engagement as they take ownership of the project and the school through the duration of the construction process with the mapping of curriculum ideas to incorporate the building functions including job fairs. M. Abdella expressed Fontaine's eagerness to work to facilitate community awareness for the project and wanted to know what had been done successfully for prior projects. Advised that Fontaine has had good luck engaging social media pages and spring, summer and fall sports, community and family activities will bring captive audiences. M. Abdella wanted to know who has already been doing these activities and advised that one can never post enough.
- There is an interest in seeing how to engage the marketplace with the quotes and estimates through the project with material increases and tariffs and how interest rates will be impacted and Fontaine will put forward the most economical estimate that is no overly conservative and work to get accuracy with cost savings.
- P. Melaragni advised that with the Town of Wilmington with its Vocational Tech School and Fire Substation to be built there are a lot of eyes on costs to value engineer. D. Allan echoed P. Melaragni's sentiments advising further that there are a large number of senior citizens within the Wilmington community that are struggling as a population and will need to see that this project is not a lot of fluff and it is conservative.

Page 04

Discussion

- Reimbursement rate is based on MSBA driven factors and will be explored by MSBA and is hard to define as it is based on a multitude of average based community factors. There will be equity for the Wilmington schools with a PreK-5 school built for the other side of the Town projected for 2055, once this project is completed and finalized. It is important to stay factual in responses

Design Update

Site Plan Update

R. Philip presented the latest updates in the site plan working with their consultants to move the playgrounds so that the students do not have to cross the road in order to access the playgrounds and also respecting all of the side property line buffers with respect to abutters property lines and roadways, sidewalks, and the buffers go all around the site. There are vehicular gates that will block any trucks and vehicles from accessing portions of the circulation driveway during the school day when school is in session and acts as a security access point blocking access in and out. It is intended for emergencies vehicle use only and allows for the playgrounds to remain secure behind the building as well as where the bus loop exists.

- There were changes made to the turnaround in response to abutters concerns and outside of one of the playgrounds on Playground 2B there is an annotation of 10'5" from the drive to the property line over the berm and above it there is 16'-10" from the driveway over the berm with trees to the property line as noted by Town Manager E. Slagle to highlight it is highlighting the area of concern for the abutter where also there is another annotation for 34'-9" from the roadway to the property line over the berm as well. It was asked if Dore+Whittier could look at swinging the playgrounds into the courtyard further and R. Philip advised that it would be looked at further and will need to consult with Public Safety as they will want to gain access into the Courtyard space and the design has remained flexible to accommodate entry. One of the concerns is that these are the youngest learners in the building that are utilizing these playgrounds and their safety and security is important to keep them close to the building as possible for bathroom use as there also will be a large number of students on the playgrounds at one time.
- K. Caira asked if both baseball fields were being lost at the North Intermediate School. *R. Philip advised that the baseball diamonds have not been able to be fit back onto the site as the focus has been on the playgrounds and playfields amenities for the PreK-5 students.* K. Caira asked if even a Little League diamond would fit on the site? *R. Philip advised the baseball fields were not able to be placed onto the site and there was no demand for the PreK-5 for a Little League diamond, even in the upper quadrant of the site. The baseball and softball fields were going to need to be relocated to another location within Wilmington. E. Slagle advised that he has had conversations*

Page 05

Discussion

with J. Magaldi and P. Alunni regarding the loss of the full-size soccer fields and it appears that those will be able to replicated at the Textron fields. Meetings with J. Magaldi are happening this week.

- The School Building is 70' away from the property lines. Abutters will be able to see what the school view will be from their property. L. Dore advised at the Abutter's Meeting that he will be able to meet with the Abutters individually and show them what it will be like for them and work with them so that it can be a conversation and working together.
- Soccer field is a U-8 at this site due to the age of the students.

Traffic Study Update

Option A Circulation from Salem Street will be able to have 24 vehicles enter in from Salem Street onto the site into the queueing line for parent drop-off/ pick-up and buses will be able to fit 15 from Ballardvale Street which will come in and line up to drop off and pick up students.

- There is possibility of using the parking lot to make more queuing space with more cars to fit onto the site during times when it is needed.
- There may be a need to be a switch between the car and the bus loops as an alternative and it has been designed to work as such as a back up alternative.
- Currently there are about 155 Pickup / Dropoff by family, Grandparents show up earlier.
- HC Spaces are by the curb cuts by the entries to PreK and the Main Entrance allowing for the acceptable paths into the school.

Option B Kids would enter where they choose. Ballardvale queueing and ripple effect with the Rt. 93 highway corridor. How will it be impacted? Traffic Consultant from Nitsch is on the phone and will provide more insight.

- **Net increase in trips = 3 cars/minute. Net significant backup?**
- **24 walking trips vs. 24 bus trips vs. 243 car trips**
- **How many participate in CARES? 50% to CARES this number is important to know so that it is known how much space will be used.**
- Numbers seem underestimated. Middle school is a 200 with 600 by comparison to what will be present with 855 students plus CARES and includes staff and present dropoff.
- **Need to know: % of students will journey by car vs. bus?**
- Can we remove one playground to alleviate the queue? No.
- E. Slagle advised that he is in conversation with Google / Waze.com to have the algorithm altered so that Salem Street and Ballardvale are no longer used as a cut through for others using the Rt. 93 corridor to get to other locations they are trying to reach in adjacent communities. This is one of the stressors that bring a great amount of the traffic to these

Page 06

Discussion

roadways in Wilmington that result in added stress to the roadways leading to the schools.

- 2 Major Intersections: – How do we rate these intersections and take a look at pre-existing efficiencies to combine 3 schools?
  - **Goal: Accelerate engineering the intersections with lines, timing of lights, etc. Mitigation at the beginning and on the radar.**
    - *P. Melaragni advised that there is a historical house that is likely protected under the Preservation Act at one of the intersections that awareness should be brought to as it would not be able to be adjusted without a lot of red tape.*

Interiors Update

R. Philip discussed updates to the cafeteria, auditorium, gymnasium, library, classroom and corridor spaces that are comfortable, versatile and flexible for student programs and learning with wayfinding and materials like linoleum (low maintenance for D. Kelley's crew.)

- It was asked if there would be air curtains in place for the entries? Particularly at the Cafeteria and the Main Entry door? These will be needed with nearly 800 kids going into school at one time.

Working Group Updates

- **Public Relations Working Group** has signed up for the Fun on the Fourth event in June. The School Building Committee is able to be present providing the Design Concept Development updates and latest Schematic Design information from the MSBA to the Wilmington community. The School Building Committee is able to be present for this event as it will be providing an unbiased, fact based and information only perspective on the project.
  - **Water Bill** – will be drafted by Dore+Whittier Architect as a 1 page document of facts that will be provided to the be distributed to through Shawsheen Tech printing, cutting and packaging and providing to the Town to be placed into the water bill mailing.
    - ****D. Allan and M. Gallezzo requested that the School Building Committee get a copy of the water bill before it goes out to provide any feedback that may be necessary.****
    - **J. O'Connell advised that she will handle the water bill and billing with Shawsheen Tech with coordination with Dore+Whittier Architects on the content for the water bill itself.**
- The 'Vote Yes for Wilmington Schools' is completely separate entity from the School Building Committee. The School Building Committee supplies factual information through the

Page 07

Discussion

PR Working Group to the Wilmington public. Any material that is generated by the Vote Yes for Wilmington Schools should be vetted for accuracy before information is released and in cases where information needs to be referenced it should be obtained from the Wildwood School Project site, question asked of the Town Manager, or the Wilmington Superintendent's Office.

Public Comments

- None

Discussion and Committee Questions

- **D. Allan asked that an agenda item be placed on the March 25, 2025 meeting to "Reorganize the Committee's Chair".**
- **Revised Meeting Dates were provided for review by the SBC for consideration and approval for future meetings. Once approved they will be placed into everyone's calendar with meeting invitations.**
- **Cost Estimate updates will be provided at the meeting on March 25, 2025.**
- **There is a meeting on March 31, 2025 as there will be a need to populate the Project Scope and Budget for approval by the School Building Committee on March 31, 2025 that will be submitted for approval by the MSBA.**

Correspondence

- Questions submitted to the Wilmington Public Schools and/or Town Manager's office are shared with the SBC and will be incorporated into upcoming Frequently Asked Questions.

Next Meeting: Tuesday, March 25, 2025 at 6:30pm
Wilmington High School,
Large Group Instruction Room

Adjourn

G. Brand thanked the committee for their efforts and invited a motion to adjourn.

- **N. Golden motioned to adjourn. D. Kelley seconded the motion. Roll call vote, motion carried by unanimous vote.**

Understanding reached. Please contact the author if you have any corrections to these Project Minutes.

P:\Projects\xx\xx ADMIN\STRATION\04 OWNER, SMMA MEETINGS & AGENDAS\04 03 Wilmington Minutes, 5March2025.docx

Design Update

Site Plan Update

Option B

88 +/- vehicles on-site queue space

12 +/- busses on-site queue space

193 +/- on site parking spaces

LEGEND

: PASSENGER CARS
: MINIBUS
: BUS
: BUS CIRCULATION
: CAR CIRCULATION

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | VEHICULAR CIRCULATION - OPTION B

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Project Imagery

Exterior

Overview

Overview

Southeast view towards Main Entry

View from East towards Cafeteria

View from West towards Courtyard

Project Imagery

Interiors

Main Entry

Cafeteria/Stage

Cafeteria/Stage

Cafeteria/Stage

Cafeteria/Stage

DENNIS 3000

Gymnasium

Gymnasium

Gymnasium

Library

Library

Typical Classroom

Level 1: Extended Learning Area

Level 1: Extended Learning Area

Level 2: Extended Learning Area

Level 2: Extended Learning Area

Level 2/3: Extended Learning Area

Level 3: Extended Learning Area

Cost Estimate Update

Preliminary Design Program

Estimated Construction Cost Range

$149.3M – $165.0M

$936/SF

Preferred Schematic Report

Estimated Construction Cost

$136.4M - $150.7M

$878/SF

Schematic Design

Estimated Construction Cost

$137,743,666

$835/SF

Preliminary Design Program

Estimated Construction Cost Range

$149.3M – $165.0M

$936/SF

Preferred Schematic Report

Estimated Construction Cost Range

$136.4M - $150.7M

$878/SF

Schematic Design

Estimated Construction Cost

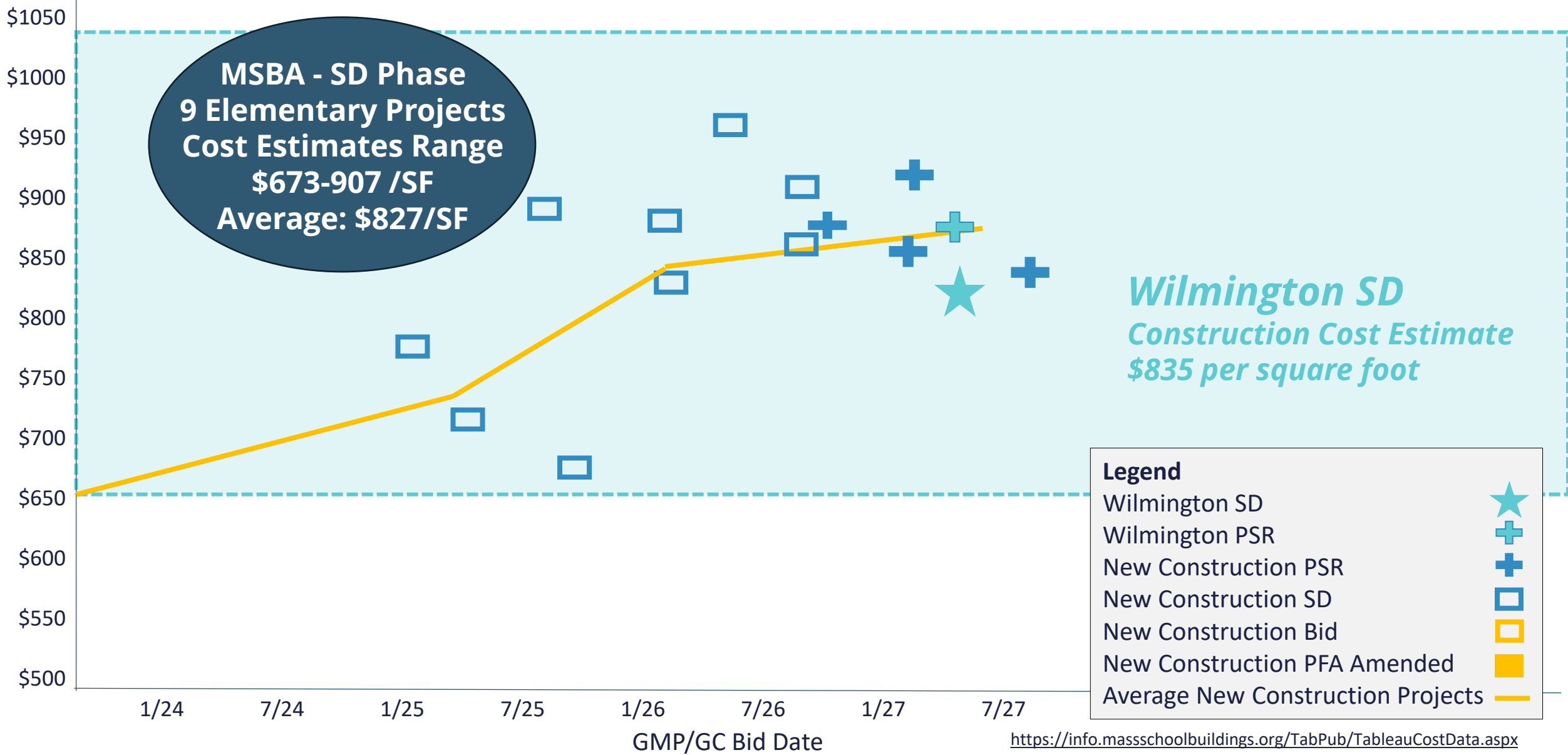
$137,743,666

$835/SF

On Budget!

MSBA Project Cost Data

Phase: SD Elementary Schools



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Working Group Updates

Public Relations Working Group Update

Sustainability Working Group Update

Preferred Schematic Phase:

LEED-Schools v4 “Silver”
+ 4% add. reimbursement

Tracking 55 points
(50 points minimum)

Schematic Design Phase:

LEED-Schools v4 “Gold”
+ 4% add. reimbursement

Tracking 64 points

Discussion, Correspondence, New Items

Project Name

New Wilmington Elementary School Project

Wilmington Elementary Consolidation Project

Wilmington Elementary Unification Project

Wilmington PreK-5 Elementary School Project

Wilmington PreK-5 Consolidation Project

Wilmington PreK-5 Unification Project

Wildcat PreK-5 Elementary School Project

Wildcat PreK-5 Consolidation Project

Wildcat Prek-5 Unification Project

Northside Elementary School Building Project

WPS Elementary School Project

North Elementary School Building Project

Wilmington Elementary School Project

Wilmington Elementary Building Project

North Wilmington Elementary School Project

Wildwood Building Project

Salem Street Project

NextGen Elementary Project

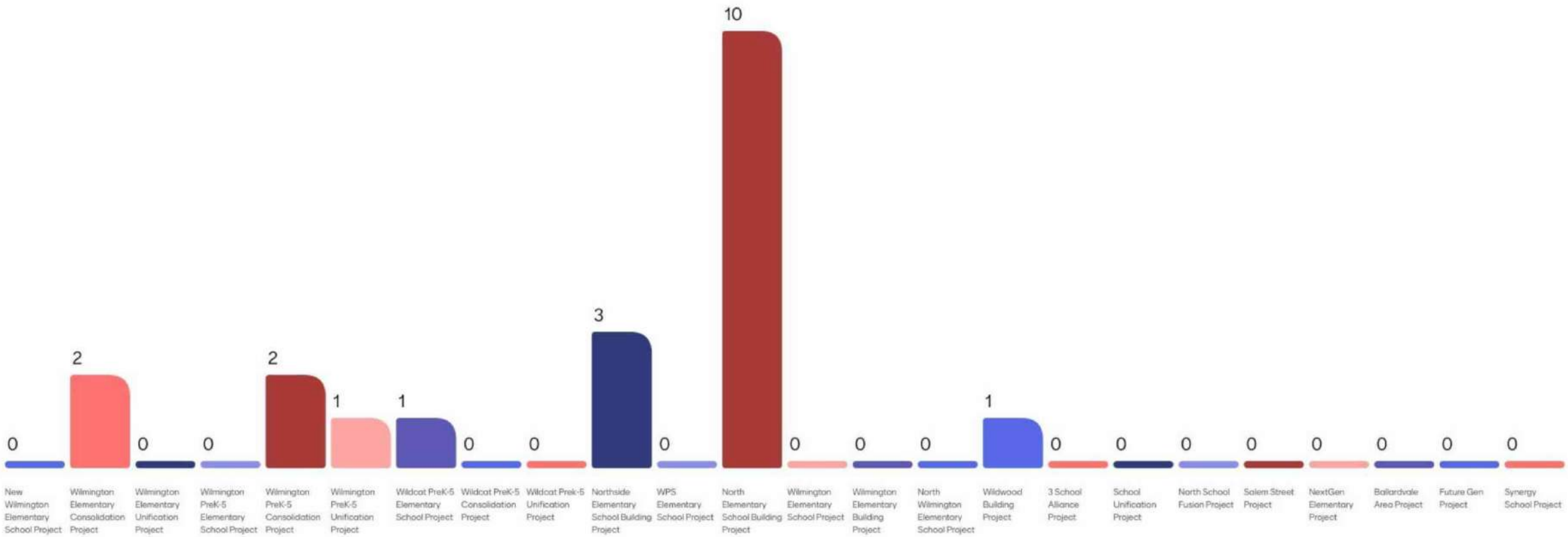
3 School Alliance Project

Ballardvale Area Project

Future Gen Project

Synergy School Project

How should we refer to the PK-5 school project moving forward in PR efforts? Select your preferred option from the list provided.



Project Name

Shortlist

North Elementary School Building Project

Northside Elementary School Building Project

Wilmington Elementary Consolidation Project

Wilmington PreK-5 Consolidation Project

Schedule Updates

Upcoming Milestones	Deliverable Date	Upcoming Meeting Dates
School Building Committee Meeting		**Wednesday, March 5, 2025**
School Building Committee Meeting: *Schematic Design Cost Estimate Results*		**Tuesday, March 25, 2025**
Community Forum No. 6	**Monday, March 31, 2025**	
School Building Committee Meeting: Project Scope & Budget Approval		**Monday, March 31, 2025**
School Building Committee Meeting: *Approval of Submission of the Schematic Design Submission to MSBA*		**Tuesday, April 15, 2025**
Schematic Design Submission to MSBA	**Thursday, May 1, 2025**	
Abutter's Meeting		*TBD*
School Building Committee Meeting		*Tuesday, May 20, 2025*
School Building Committee Meeting		*Monday, June 2, 2025*
Community Forum		*TBD*
School Building Committee Meeting		***Tuesday, June 17, 2025 - TBD***
MSBA Board Meeting	**Wednesday, June 25, 2025**	***Wednesday, June 25, 2025 - TBD***
School Building Committee Meeting		*Tuesday, July 22, 2025*
School Building Committee Meeting		*Tuesday, August 19, 2025*
Town Meeting Vote	**Saturday, September 13, 2025**	
Ballot Vote	**Tuesday, September 16, 2025**	
School Building Committee Meeting		*Tuesday, September 23, 2025*

Key: **Bold/Bold** = Confirmed/Scheduled *Italic* = *Proposed for Approval*

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #32

March 31, 2025

Massachusetts School Building Authority

smma dw DORE + WHITTIER FONTAINE

Agenda

1. Call to Order
2. Approval of Minutes
3. Project Scope and Budget Update
4. Design Update
5. Discussion/Correspondence/New Items
6. Committee Questions
7. Public Comments
8. Next Meeting: Tuesday April 15, 2025
9. Adjourn

Project Scope and Budget Update

Preliminary Design Program

Estimated Project Cost Range

$194.0M – $214.5M

$1,156 - $1,278 /SF

Preferred Schematic Report

Estimated Project Cost Range

$177.6M - $196.3M

$1,086 - $1,200 /SF

Schematic Design

Estimated Project Cost

$173,250,626

$1,050/SF

Preliminary Design Program

Estimated Project Cost Range

$194.0M – $214.5M
(March 2024)

$1,156 - $1,278 /SF

Preferred Schematic Report

Estimated Project Cost Range

$177.6M - $196.3M
(July 2024)

$1,086 - $1,200 /SF

Schematic Design

Estimated Project Cost

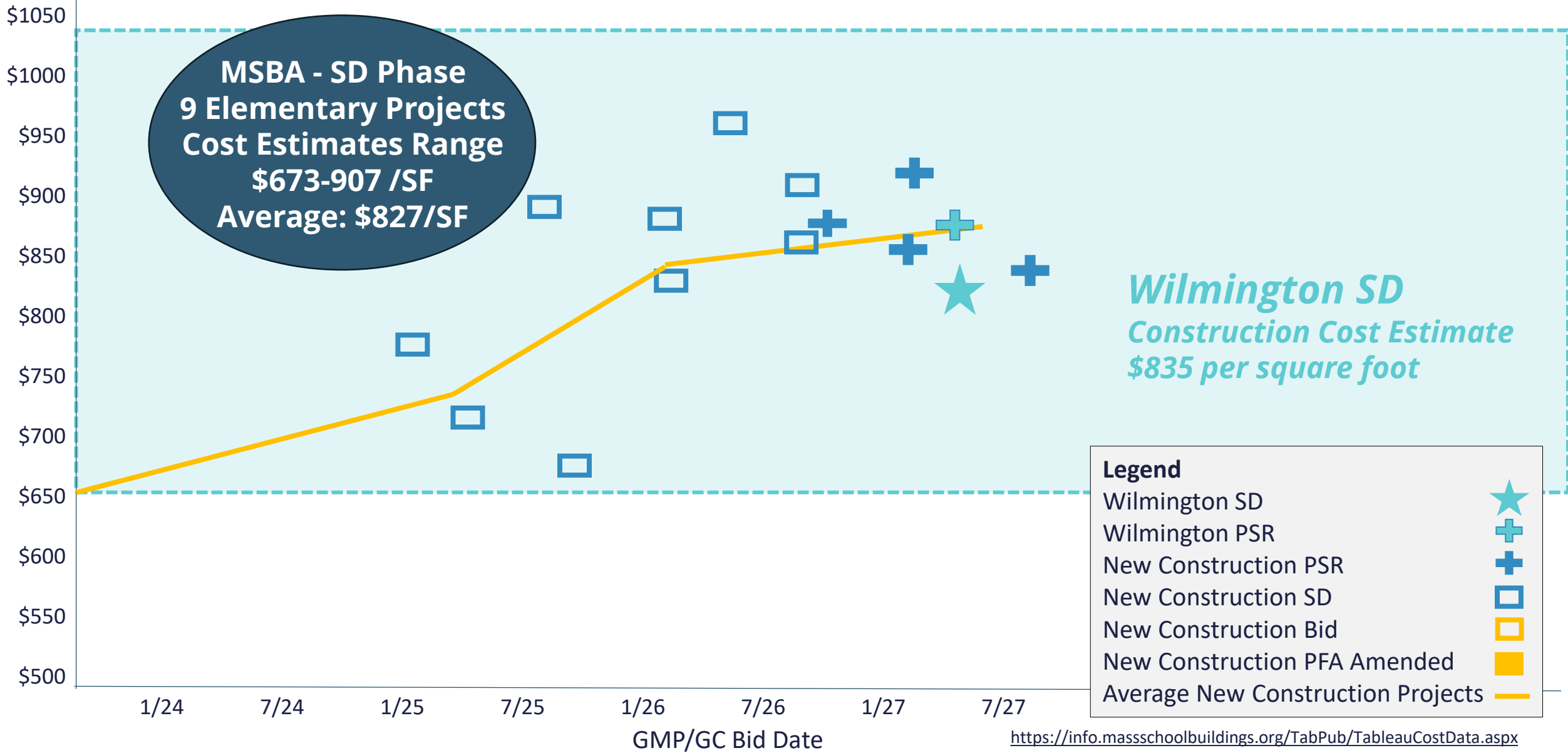
$173,250,626
(March 2025)

$1,050/SF

On Budget!

MSBA Projects – Construction Cost Data

Phase: SD Elementary Schools



https://info.massschoolbuildings.org/TabPub/TableauCostData.aspx

FOR APPROVAL

DRAFT

Wilmington School District
Woburn Elementary School

Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5)	**Estimated Budget**	**Scope Items Excluded from the Estimated Basis of Maximum Total Facilities Grant** Enter Budget Values for all light yellow highlighted cells.	**Estimated Basis of Maximum Total Facilities Grant** Enter Budget Values for Ineligible Costs in light yellow highlighted cells.	**Estimated Maximum Total Facilities Grant[1]**
Feasibility Study Agreement				
OPM Feasibility Study	$200,000	$0	$200,000	
A&E Feasibility Study	$800,000	$0	$800,000	
Environmental & Site	$100,000	$0	$100,000	
Other	$100,000	$0	$100,000	
Feasibility Study Agreement Subtotal	**$1,200,000**	**$0**	**$1,200,000**	**$634,000**
Administration				
Legal Fees	$100,000	$100,000	$0	$0
Owner's Project Manager				
Design Development	$400,000	$0		
Construction Contract Documents	$600,000	$261,800		
Bidding	$250,000	$0		
Construction Contract Administration	$3,170,000	$1,349,420		
Closeout	$140,000	$0		
Extra Services	$140,000	$0	$140,000	
Reimbursable & Other Services	$80,000	$0	$80,000	
Cost Estimates	$0	$0	$0	
Advertising	$20,000	$0	$20,000	
Permitting	$120,000	$0	$120,000	
Owner's Insurance	$300,000	$0	$300,000	
Other Administrative Costs	$200,000	$0	$200,000	
Administration Subtotal	**$5,520,000**	**$1,711,220**	**$3,808,780**	**$2,012,559**
Architecture and Engineering				
Basic Services				
Design Development	$3,409,156	$720,482		
Construction Contract Documents	$4,772,818	$803,639		
Bidding	$681,831	$0		
Construction Contract Administration	$4,090,986	$4,090,986		
Closeout	$681,831	$0		
Other Basic Services	$175,000	$0		
Basic Services Subtotal	**$13,811,622**	**$5,615,107**	**$8,196,515**	
Reimbursable Services				
Construction Testing	$25,000	$0	$25,000	
Printing (over minimum)	$40,000	$0	$40,000	
Other Reimbursable Costs	$630,000	$0	$630,000	
Hazardous Materials	$300,000	$0	$300,000	
Geotechnical & Geo-Environmental	$250,000	$0	$250,000	
Site Survey	$25,000	$0	$25,000	
Wetlands	$0	$0	$0	
Traffic Studies	$60,000	$0	$60,000	
Architectural / Engineering Subtotal	**$15,141,622**	**$5,615,107**	**$9,526,515**	**$5,033,811**
CM at Risk Pre-Construction Services				
Pre-Construction Services	$320,000	$0	$320,000	$169,088
Site Acquisition				
Land / Building Purchase	$0	$0	$0	
Appraisal Fees	$0	$0	$0	
Recording fees	$0	$0	$0	
Site Acquisition Subtotal	**$0**	**$0**	**$0**	**$0**
Construction Costs				
SUBSTRUCTURE				
Foundations	$2,196,232			
Basement Construction	$3,622,362			
SHELL				
Super Structure	$11,031,003			
Exterior Closure	$0			
Exterior Walls	$12,000,405			
Exterior Windows	$2,325,955			
Exterior Doors	$167,920			
Roofing	$2,660,570			
INTERIORS				
Interior Construction	$9,676,384			
Staircases	$1,058,675			
Interior Finishes	$6,518,455			
SERVICES				
Conveying Systems	$259,620			
Plumbing	$3,504,350			
HVAC	$13,913,566			
Fire Protection	$1,317,979			
Electrical	$9,832,425			
EQUIPMENT & FURNISHINGS				
Equipment	$1,298,040			
Furnishings	$2,797,852			
SPECIAL CONSTRUCTION & DEMOLITION				
Special Construction	$0	$0		
Existing Building Demolition	$555,410	$0		
In-Building Hazardous Material Abatement	$1,316,600	$0		
Asbestos Containing Floor Material / Ceiling Tile Abatement	$160,000	$160,000		
Other Hazardous Material Abatement	$0	$0		
BUILDING SITE WORK				
Site Preparation	$4,013,109	$0		
Site Improvements	$8,197,222	$0		
Site Civil / Mechanical Utilities	$2,418,926	$0		
Site Electrical Utilities	$965,690	$0		
Scope Excluded Site Work	$0	$0		
Construction Trades Subtotal	$101,808,770	$160,000		
Contingencies (Design and Pricing)	$10,180,877	$16,000		
Sub-Contractor Bonds	$768,665	$1,208		
D/B/B Insurance	$0	$0		
General Conditions	$12,691,698	$19,946		
D/B/B Overhead & Profit	$0	$0		
GMP Insurance	$0	$0		
GMP Fee	$2,661,713	$4,183		
GMP Contingency	$1,996,285	$3,137		
Escalation to Mid-Point of Construction	$7,635,658	$12,000		

Cell C13 - Scope Excluded OPM Fees (Cell I40)

Cell C15 - Costs beyond MSBA funding cap for OPM Basic Services (Cell K48)

Cell C28 - Scope excluded Designer Fees (Cell I41)

Cell C30 - Costs beyond MSBA funding cap for Designer Basic Services (Cell K52)

Cell C86 - Scope Excluded Sitework Costs such as a stadium, out buildings, concession stand etc. (Enter Direct Construction Costs)

Cell C98 - Represents construction costs over MSBA funding limits (Cell H103)

Cell C112 - Represents the amount exceeding the $1,200 per student allowance for FF&E (Cell J109)

Cell C113 - Represents the amount exceeding the $1,200 per student allowance for Technology (Cell J110)

Cell C116 - Soft costs that exceed 20% of the construction cost (Cell G21)

Construction Cost over Funding Cap		$43,961,064		
Construction Budget	**$137,743,666**	**$44,177,538**		**$49,440,342**
Alternates				
Ineligible Work Included in the Base Project	$0	$0	$0	
Alternates Included in the Total Project Budget	$0	$0	$0	
Alternates Excluded from the Total Project Budget	$0		$0	
Subtotal to be Included in Total Project Budget	**$0**	**$0**	**$0**	**$0**
Miscellaneous Project Costs				
Utility Company Fees	$200,000	$0	$200,000	
Testing Services	$500,000	$0	$500,000	
Swing Space / Modulars	$0	$0	$0	
Other Project Costs (Mailing & Moving)	$350,000	$350,000	$350,000	
Miscellaneous Project Costs Subtotal	**$1,050,000**	**$350,000**	**$350,000**	**$369,880**
Furnishings and Equipment				
Furniture, Fixtures, and Equipment	$1,661,000	$755,000	$755,000	
Technology	$1,661,000	$755,000	$755,000	
FF&E Subtotal	**$3,322,000**	**$1,510,000**	**$1,510,000**	**$957,461**
Soft Costs that exceed 20% of Construction Cost		$0	$0	
Project Budget	**$164,297,288**	**$53,363,865**		**$58,617,221**

Board Authorization	
Design Enrollment	755
Total Building Gross Floor Area (GSF)	163,573
Total Project Budget (excluding Contingencies)	$164,297,288
Scope Items Excluded or Otherwise Ineligible	- $53,363,865
Third Party Funding (Ineligible)	- $0
Estimated Basis of Maximum Total Facilities Grant[1]	$110,933,423
Reimbursement Rate[1]	52.84%
Est. Max. Total Facilities Grant (before recovery)[1]	$58,617,221
Cx Costs associated with Ineligible Building Area[2]	- $21,763
Cost Recovery associated with Prior Projects[2]	- $172,410
Estimated Maximum Total Facilities Grant[1]	$58,423,048

Construction Contingency[3]	$6,887,183
Ineligible Construction Contingency[3]	$5,509,746
"Potentially Eligible" Construction Contingency[3]	$1,377,437
Owner's Contingency[3]	$2,066,155
Ineligible Owner's Contingency[3]	$1,377,437
"Potentially Eligible" Owner's Contingency[3]	$688,718
Total Potentially Eligible Contingency[3]	$2,066,155
Reimbursement Rate	52.84%
Potential Additional Contingency Grant Funds[3]	$1,091,756
Maximum Total Facilities Grant	$59,514,804
Total Project Budget	$173,250,626

47.84 Reimbursement Rate Before Incentive Points
5.00 Total Incentive Points
52.84% MSBA Reimbursement Rate

NOTES

This template was prepared by the MSBA as a tool to assist Districts and consultants in understanding MSBA policies and practices regarding potential impact on the MSBA's calculation of a potential Basis of Total Facilities Grant and potential Total Maximum Facilities Grant. This template does not contain a final, exhaustive list of all evaluations which the MSBA may use in determining whether items are eligible for reimbursement by the MSBA. The MSBA will perform an independent analysis based on a review of information and estimates provided by the District for the proposed school project that may or may not agree with the estimates generated by the District using this template.

1 - The Estimated Basis of Total Facilities Grant and Estimated Maximum Facilities Grant amounts do not include any potentially eligible contingency funds and are subject to review and audit by the MSBA.

2 - Costs associated with the commissioning of ineligible building area is estimated to result in the recovery of a portion of the overall commissioning cost. The OPM has estimated this recovery of funds to be $_____. The proposed demolition of the _____ School is expected to result in the MSBA recovering a portion of state funds previously paid to the District for the _____ project at the existing facilities completed in ____. The MSBA will perform an independent analysis based on a review of its records and information and estimates provided by the District for the proposed school project that may or may not agree with the estimated cost recovery generated by the District and its consultants using this template.

3 - Pursuant to Section 3.21 of the Project Funding Agreement and the applicable policies and guidelines of the Authority, any project costs associated with the reallocation or transfer of funds from either the Owner's contingency or the Construction contingency to other budget line items shall be subject to review by the Authority to determine whether any such costs are eligible for reimbursement by the Authority. All costs are subject to review and audit by the MSBA.

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By: _____
Title: Chair of School Building Committee

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By: _____
Title: Chief Executive Officer

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By: _____
Title: Superintendent of Schools

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By: _____
Title: Chair of the School Committee

Date: _____

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

School Building Committee Meeting #33

April 15, 2025

Massachusetts School Building Authority

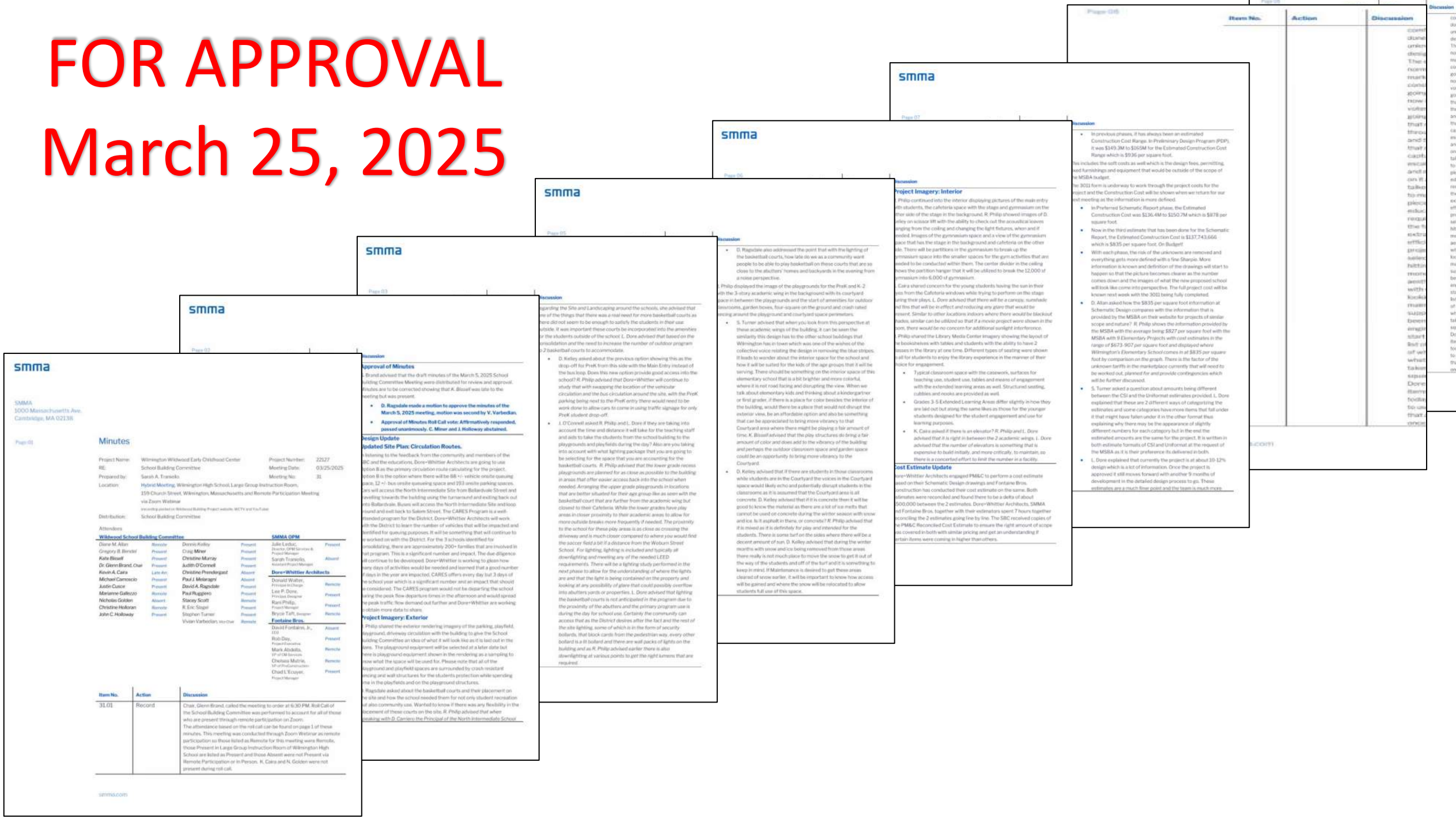
smma dw DORE + WHITTIER FONTAINE

Agenda

1. Call to Order
2. Approval of Minutes
3. Approval of Invoices
4. Design Update
    1. Cost Update
    2. Schematic Design Package
    3. Approval of Schematic Design Package Submission
5. Discussion/Correspondence/New Items
6. Committee Questions
7. Public Comments
8. Next Meeting: Tuesday June 3, 2025
9. Adjourn

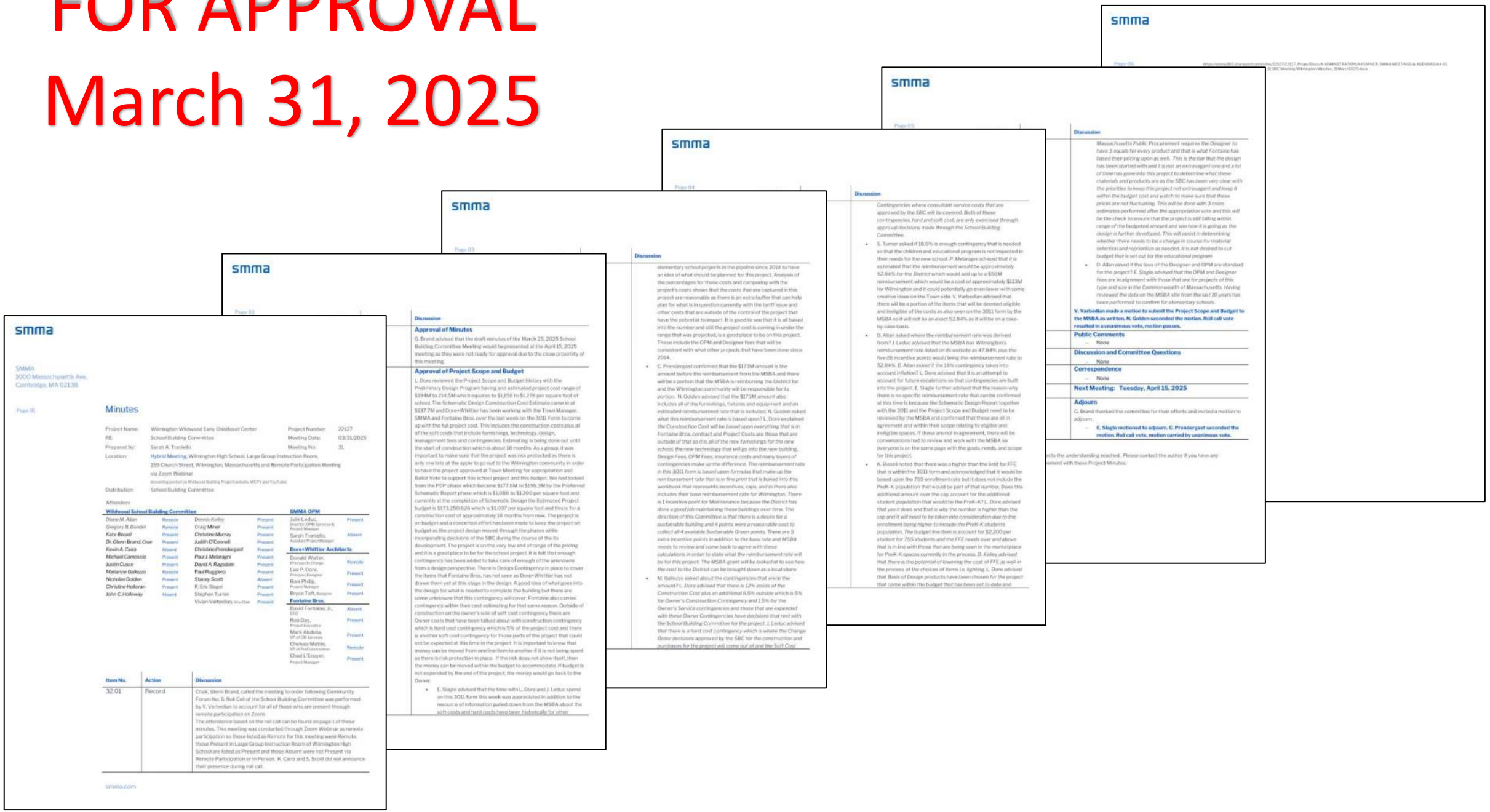
Approval of Minutes

FOR APPROVAL
March 25, 2025



FOR APPROVAL

March 31, 2025



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SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

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Minutes

Project Name:	Wilmington Wildwood Early Childhood Center	Project Number:	22127
RE:	School Building Committee	Meeting Date:	03/31/2025
Prepared by:	Sarah A. Trankello	Meeting No:	31
Location:	Hybrid Meeting, Wilmington High School, Large Group Instruction Room, 159 Church Street, Wilmington, Massachusetts and Remote Participation Meeting via Zoom Webinar		
Distribution:	School Building Committee		

Attendees

Wildwood School Building Committee			
Diane M. Allen	Remote	Dennis Kelley	Present
Gregory B. Biondel	Remote	Craig Miner	Present
Kate Bissell	Present	Christine Murray	Present
Dr. Glenn Brand, Chair	Present	Judith O'Connell	Present
Kevin A. Caira	Absent	Christine Prendergast	Present
Michael Camoscio	Present	Paul J. Melaragni	Present
Justin Cusce	Present	David A. Ragsdale	Present
Marianne Gallezzo	Remote	Paul Ruggiero	Present
Nicholas Golden	Present	Stacey Scott	Absent
Christine Holloran	Present	R. Eric Slagel	Present
John C. Holloway	Absent	Stephen Turner	Present
		Vivian Varbedian, Vice-Chair	Present

SMMA OPM	
Julie Leduc, Director, OPM Services & Project Manager	Present
Sarah Tranielis, Assistant Project Manager	Absent

Dore+Whittier Architects	
Donald Walter, Principal In Charge	Remote
Lee P. Dore, Principal Designer	Present
Rani Philip, Project Manager	Present
Brycie Taft, Designer	Present

Fontaine Bros.	
David Fontaine, Jr., CEO	Absent
Rob Day, Project Executive	Present
Mark Abdella, VP of Old Services	Present
Chelsea Mutrie, VP of Pre-Construction	Remote
Chad L. Ecuyer, Project Manager	Present

Item No.	Action	Discussion
32.01	Record	Chair, Glenn Brand, called the meeting to order following Community Forum No. 6. Roll Call of the School Building Committee was performed by V. Varbedian to account for all of those who are present through remote participation on Zoom. The attendance based on the roll call can be found on page 1 of these minutes. This meeting was conducted through Zoom Webinar as remote participation so those listed as Remote for this meeting were Remote, those Present in Large Group Instruction Room of Wilmington High School are listed as Present and those Absent were not Present via Remote Participation or In Person. K. Caira and S. Scott did not announce their presence during roll call.

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Discussion

Approval of Minutes

G. Brand advised that the draft minutes of the March 25, 2025 School Building Committee Meeting would be presented at the April 15, 2025 meeting as they were not ready for approval due to the close proximity of this meeting.

Approval of Project Scope and Budget

L. Dore reviewed the Project Scope and Budget history with the Preliminary Design Program having and estimated project cost range of $194M to 214.5M which equates to $1,155 to $1,278 per square foot of school. The Schematic Design Construction Cost Estimate came in at $137.7M and Dore+Whittier has been working with the Town Manager, SMMA and Fontaine Bros. over the last week on the 3011 Form to come up with the full project cost. This includes the construction costs plus all of the soft costs that include furnishings, technology, design, management fees and contingencies. Estimating is being done out until the start of construction which is about 18 months. As a group, it was important to make sure that the project was risk protected as there is only one bite at the apple to go out to the Wilmington community in order to have the project approved at Town Meeting for appropriation and Ballot Vote to support this school project and this budget. We had looked from the PDP phase which became $177.6M to $196.3M by the Preferred Schematic Report phase which is $1,086 to $1,200 per square foot and currently at the completion of Schematic Design the Estimated Project budget is $173,250,626 which is $1,037 per square foot and this is for a construction cost of approximately 18 months from now. The project is on budget and a concerted effort has been made to keep the project on budget as the project design moved through the phases while incorporating decisions of the SBC during the course of the its development. The project is on the very low end of range of the pricing and it is a good place to be for the school project. It is felt that enough contingency has been added to take care of enough of the unknowns from a design perspective. There is Design Contingency in place to cover the items that Fontaine Bros. has not seen as Dore+Whittier has not drawn them yet at this stage in the design. A good idea of what goes into the design for what is needed to complete the building but there are some unknowns that this contingency will cover. Fontaine also carries contingency within their cost estimating for that same reason. Outside of construction on the owner's side of soft cost contingency there are Owner costs that have been talked about with construction contingency which is hard cost contingency which is 5% of the project cost and there is another soft cost contingency for those parts of the project that could not be expected at this time in the project. It is important to know that money can be moved from one line item to another if it is not being spent as there is risk protection in place. If the risk does not show itself, then the money can be moved within the budget to accommodate. If budget is not expended by the end of the project, the money would go back to the Owner.

- E. Slagle advised that the time with L. Dore and J. Leduc spend on this 3011 form this week was appreciated in addition to the resource of information pulled down from the MSBA about the soft costs and hard costs have been historically for other

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Page 03

Discussion

elementary school projects in the pipeline since 2014 to have an idea of what should be planned for this project. Analysis of the percentages for these costs and comparing with the project's costs shows that the costs that are captured in this project are reasonable as there is an extra buffer that can help plan for what is in question currently with the tariff issue and other costs that are outside of the control of the project that have the potential to impact. It is good to see that it is all baked into the number and still the project cost is coming in under the range that was projected, is a good place to be on this project. These include the OPM and Designer fees that will be consistent with what other projects that have been done since 2014.

- C. Prendergast confirmed that the $173M amount is the amount before the reimbursement from the MSBA and there will be a portion that the MSBA is reimbursing the District for and the Wilmington community will be responsible for its portion. N. Golden advised that the $173M amount also includes all of the furnishings, fixtures and equipment and an estimated reimbursement rate that is included. N. Golden asked what this reimbursement rate is based upon? L. Dore explained the Construction Cost will be based upon everything that is in Fontaine Bros. contract and Project Costs are those that are outside of that so it is all of the new furnishings for the new school, the new technology that will go into the new building, Design Fees, OPM Fees, insurance costs and many layers of contingencies make up the difference. The reimbursement rate in this 3011 form is based upon formulas that make up the reimbursement rate that is in fine print that is baked into this workbook that represents incentives, caps, and in there also includes their base reimbursement rate for Wilmington. There is 1 incentive point for Maintenance because the District has done a good job maintaining these buildings over time. The direction of this Committee is that there is a desire for a sustainable building and 4 points were a reasonable cost to collect all 4 available Sustainable Green points. There are 5 extra incentive points in addition to the base rate and MSBA needs to review and come back to agree with these calculations in order to state what the reimbursement rate will be for this project. The MSBA grant will be looked at to see how the cost to the District can be brought down as a local share.
- M. Gallezzo asked about the contingencies that are in the amount? L. Dore advised that there is 12% inside of the Construction Cost plus an additional 6.5% outside which is 5% for Owner's Construction Contingency and 1.5% for the Owner's Service contingencies and those that are expended with these Owner Contingencies have decisions that rest with the School Building Committee for the project. J. Leduc advised that there is a hard cost contingency which is where the Change Order decisions approved by the SBC for the construction and purchases for the project will come out of and the Soft Cost

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Discussion

Contingencies where consultant service costs that are approved by the SBC will be covered. Both of these contingencies, hard and soft cost, are only exercised through approval decisions made through the School Building Committee.

- S. Turner asked if 18.5% is enough contingency that is needed so that the children and educational program is not impacted in their needs for the new school. P. Melaragni advised that it is estimated that the reimbursement would be approximately 52.84% for the District which would add up to a $50M reimbursement which would be a cost of approximately $113M for Wilmington and it could potentially go even lower with some creative ideas on the Town side. V. Varbedian advised that there will be a portion of the items that will be deemed eligible and ineligible of the costs as also seen on the 3011 form by the MSBA so it will not be an exact 52.84% as it will be on a case-by-case basis.
- D. Allan asked where the reimbursement rate was derived from? J. Leduc advised that the MSBA has Wilmington's reimbursement rate listed on its website as 47.84% plus the five (5) incentive points would bring the reimbursement rate to 52.84%. D. Allan asked if the 18% contingency takes into account inflation? L. Dore advised that it is an attempt to account for future escalations so that contingencies are built into the project. E. Slagle further advised that the reason why there is no specific reimbursement rate that can be confirmed at this time is because the Schematic Design Report together with the 3011 and the Project Scope and Budget need to be reviewed by the MSBA and confirmed that these are all in agreement and within their scope relating to eligible and ineligible spaces. If these are not in agreement, there will be conversations had to review and work with the MSBA so everyone is on the same page with the goals, needs, and scope for this project.
- K. Bissell noted that there was a higher than the limit for FFE that is within the 3011 form and acknowledged that it would be based upon the 755 enrollment rate but it does not include the PreK-K population that would be part of that number. Does this additional amount over the cap account for the additional student population that would be the PreK-K? L. Dore advised that yes it does and that is why the number is higher than the cap and it will need to be taken into consideration due to the enrollment being higher to include the PreK-K students population. The budget line item is account for $2,200 per student for 755 students and the FFE needs over and above that is in line with those that are being seen in the marketplace for PreK-K spaces currently in the process. D. Kelley advised that there is the potential of lowering the cost of FFE as well in the process of the choices of items i.e. lighting. L. Dore advised that Basis of Design products have been chosen for the project that come within the budget that has been set to date and

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Discussion

Massachusetts Public Procurement requires the Designer to have 3 equals for every product and that is what Fontaine has based their pricing upon as well. This is the bar that the design has been started with and it is not an extravagant one and a lot of time has gone into this project to determine what these materials and products are as the SBC has been very clear with the priorities to keep this project not extravagant and keep it within the budget cost and watch to make sure that these prices are not fluctuating. This will be done with 3 more estimates performed after the appropriation vote and this will be the check to ensure that the project is still falling within range of the budgeted amount and see how it is going as the design is further developed. This will assist in determining whether there needs to be a change in course for material selection and reprioritize as needed. It is not desired to cut budget that is set out for the educational program.

- D. Allan asked if the fees of the Designer and OPM are standard for the project? E. Slagle advised that the OPM and Designer fees are in alignment with those that are for projects of this type and size in the Commonwealth of Massachusetts. Having reviewed the data on the MSBA site from the last 10 years has been performed to confirm for elementary schools.

V. Varbedian made a motion to submit the Project Scope and Budget to the MSBA as written. N. Golden seconded the motion. Roll call vote resulted in a unanimous vote, motion passes.

Public Comments

- None

Discussion and Committee Questions

- None

Correspondence

- None

Next Meeting: Tuesday, April 15, 2025

Adjourn

G. Brand thanked the committee for their efforts and invited a motion to adjourn.

- **E. Slagle motioned to adjourn. C. Prendergast seconded the motion. Roll call vote, motion carried by unanimous vote.**

cts the understanding reached. Please contact the author if you have any ment with these Project Minutes.

FOR APPROVAL

April 3, 2025

Town of Wilmington
Wilmington School Building Committee
121 Glen Road Wilmington, 01887

Meeting Minutes
Thursday, April 3, 2025

Dr. Glenn Brand called the meeting to order at 6:00 PM.

Ms. Vivian Varbedian proceeded to make a roll call of attendance.

Present: Diane Allan, Greg Bendel, Glenn Brand, Kevin Caira, Michael Camoscio, Maryanne Gallezzo, Nicholas Golden, Dennis Kelley, Paul Melaragni, Greg Minor, Judy O'Connell, Paul Ruggiero, and Eric Slagle.

Absent: Kate Bissel, Justin Cusce, Christine Holloran, John Holloway, Christine Murray, Christine Prendergast, David Ragsdale, Stephen Turner, and Stacey Scott.

DISCUSSION OF CONSULTANT CONTRACTS

Dr. Brand turned the room over to Mr. Slagle. Mr. Slagle made committee members and viewers at home that the contract for OPM and Design Services are structured by MSBA to expire at the end of Schematic Design Phase. For purposes of the OPM contract, after multiple meetings with the Leadership Teams, SMMA, MSBA, Town Counsel, and various Committee Members, it has been determined that the Town will not be moving forward with SMMA acting as the OPM for the construction phase of the project. Mr. Slagle added that the town had chosen not to exercise the option to make a change in key personnel, rather SMMA has indicated that they would amicably part ways.

Mr. Slagle explained that the town would need to go out to bid for OPM services and that MSBA has provided an outline of how that process would look. A request for services will need to be submitted by April 17th, 2025. Mr. Slagle provided an overview of the required advertising requirements and timeline, resulting in the approval of a new OPM in early July. Mr. Slagle clarified that the Schematic Design Phase would not end on May 1st in conjunction with the submission of the Schematic Design but would end after the June 25th MSBA hearing; SMMA would be assigned to the project until then.

Mr. Slagle explained that Dore and Whittier, as well as the Construction Manager At-Risk firm, Fontaine Bros., Inc., had been notified of the Towns standpoint. Mr. Slagle added that despite parting ways with SMMA, the town still has two excellent firms assigned to the project. Mr. Slagle added that the two firms would be responsible for establishing preliminary estimates, and that SMMA offered $35,000 from their contract for Fontaine Bros., Inc., and Dore and Whittier to do so.

Mr. Slagle informed the Committee that the new OPM will be hired within the budget that was submitted with the 30-11 form. Mr. Slagle explained that most OPMs are aware of similar situations happening, and that he was aware of multiple firms looking forward to bidding on this project.

Mr. Slagle stated that he is fully prepared to execute an amendment with Dore and Whittier for them to continue their services through the construction phase of the project. From his perspective, he was impressed with their flexibility and ability to listen to what the town is saying and bring the design closer to what the town wants. Mr. Ruggiero agreed with Mr. Slagle. Mr. Golden expressed that he was impressed with how they handled the abutters meeting. Mr. Bendel stated that he had been impressed with Rani Phillips of Dore and Whittier, specifically her thoroughness and ability to answer questions. Dr. Brand added that behind the scenes communication has been excellent, and that they have been wonderful to work with. Ms. Allan agreed, stating that she was pleased with their performance so far.

Dr. Brand asked Mr. Slagle if the committee would need to take any action at tonight's meeting with respect to either contract. Mr. Slagle clarified that the committee would be voting on an extension of the Dore and Whittier contract later in the summer.

Ms. O'Connell stated that Mr. Slagle had taken a very methodical approach as a new manager, not rushing any decisions, reaching major milestones in the process, and reaching a collective decision. Ms. O'Connell also added that MSBA had reassured the town that changing OPMs would not negatively affect the project. Mr. Bendel added that the Yentile Farm Project had seen a change in management, and the project had turned out quite well.

VOTE TO ESTABLISH AN OPM REVIEW COMMITTEE (VOTES MAY BE TAKEN)

Mr. Slagle noted that he had asked folks to participate as members of the OPM Review Committee, and that the committee will have a window of May 21st through June 11th, to shortlist firms, interview, have a meeting to select an OPM and to prepare a selection package to provide MSBA. Mr. Slagle stated it would be beneficial to have Mr. Kelley on the Committee, along with Paul Melaragni, Paul Ruggiero, and Judy O'Connell; given their experience and involvement with the project. Mr. Slagle stated that one more member is needed. Ms. Allan volunteered, explaining that she had been involved in a similar process for the Senior Center.

Mr. Slagle made a motion to appoint Mr. Kelley, Paul Melaragni, Paul Ruggiero, Judy O'Connell, and Diane Allan to the OPM Review Committee, seconded by Craig Minor and voted unanimously:

VOTED: To appoint Mr. Kelley, Paul Melaragni, Paul Ruggiero, Judy O'Connell, and Diane Allan to the OPM Review Committee.

DISCUSSION/NEW ITEMS

Ms. O'Connell advised that the water bill inserts had been completed by Shawsheen Tech, and had come out great. These will be delivered to the Treasurer/Collector's Office by April 17th. Ms. O'Connell thanked Mr. Camoscio for establishing a working relationship with Shawsheen Tech, as he had handled the prior water bill insert order. Dr. Brand also thanked Mr. Camoscio for bringing up the Fourth of July Celebration and how to incorporate advertisement materials into the event.

ADJOURNMENT

At the conclusion of the discussion, being no further business, a motion was made by Ms. Varbedian for the Wilmington School Building Committee to adjourn, seconded by Mr. Craig and voted unanimously:

VOTED: That the Wilmington School Building Committee adjourn.

The meeting adjourned at 6:27 pm.

Respectfully submitted,

_____

Thomas F. Donahue

Approval of Invoices

FOR APPROVAL

smma

SMMA
1000 Massachusetts Ave.
Cambridge, MA 02138

Warrant No. 23

Project: Wildwood Early Childhood Center, Wilmington, MA
SMMA Project No. 22127
Date: 4/15/2025
Prepared by: Julie Leduc, Sarah Traniello

Approved On: _____

School Building Committee for the Wilmington Early Childhood Center hereby authorizes the payment for the obligations incurred for the value received in services and for materials shown below:

Vendor	Invoice No.	Invoice Date		Invoice Amount	ProPay Code	Balance After Invoice
Dore+Whittier Architects *Architectural Basic Services - Schematic Design*	22	3/31/2025		$ 53,900.00	0002-0000	$ 77,000.00
Dore+Whittier Architects Site Services - Designer Amendment No. 3 *Traffic Study*	22	3/31/2025	*AM-3*	$ 1,320.00	0003-0000	$ 10,560.00
Dore+Whittier Architects Site Services - Designer Amendment No. 3 *GeoEnvironmental Engineering*	22	3/31/2025	*AM-3*	$ 14,369.30	0003-0000	$ 13,836.90
			Total	$ 69,589.30		

Activities for the Month of February 2025

1	Weekly Leadership Working Group meetings to review progress.
2	Prepare imagery for exterior, interior and landscape imagery
3	Prepare presentation and participate in School Building Committee Meeting on March 5, 2025 – Updated Project Imagery
4	Meeting with CISA to review Security – March 6, 2025
5	Cost Estimate Review and Reconciliation Process held on March 18, 2025
6	Weekly meetings with PR Working Group
7	Meetings with the Sustainability Working Group – March 19, 2025
8	Prepare project information insert for distribution in the Town water bill mailing.
9	Prepare presentation and participate in School Building Committee Meeting on March 25, 2025 – Review Construction Cost Estimate nad Updated Project Imagery
10	Meetings with the Sustainability Working Group – March 19, 2025
11	Develop Project Scope and Budget with OPM and Review with Town
12	Prepare presentation and participate in School Building Committee Meeting on March 31, 2025 – Approve Project Scope and Budget

Project Scope and Budget Update

Preliminary Design Program

Estimated Project Cost Range

$194.0M – $214.5M
(March 2024)

$1,156 - $1,278 /SF

Preferred Schematic Report

Estimated Project Cost Range

$177.6M - $196.3M
(July 2024)

$1,086 - $1,200 /SF

Schematic Design

Estimated Project Cost

$173,250,626
(March 2025)

$1,050/SF

On Budget!

Updated

Wilmington School District
Wildwood Elementary School

DRAFT

Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5)	Estimated Budget	Scope Items Excluded from the Estimated Basis of [illegible] (Enter Budget Values for all light yellow highlighted cells.)	Estimated Basis of Maximum Total Facilities Grant (Enter Budget Values for Ineligible Costs in light yellow highlighted cells.)	Estimated Maximum Total Facilities Grant[1]
Feasibility Study Agreement				
OPM Feasibility Study	$200,000	$0	$200,000	
A&E Feasibility Study	$800,000	$0	$800,000	
Environmental & Site	$100,000	$0	$100,000	
Other	$100,000	$0	$100,000	
Feasibility Study Agreement Subtotal	**$1,200,000**	**$0**	**$1,200,000**	**$634,080**
Administration				
Legal Fees	$100,000	$100,000	$0	$0
Owner's Project Manager				
Design Development	$400,000	$0		
Construction Contract Documents	$800,000	$259,420		
Bidding	$250,000	$0		
Construction Contract Administration	$3,170,000	$1,323,656		
Closeout	$140,000	$0		
Extra Services	$140,000	$0	$140,000	
Reimbursable & Other Services	$80,000	$0	$80,000	
Cost Estimates	$0	$0	$0	
Advertising	$20,000	$0	$20,000	
Permitting	$120,000	$0	$120,000	
Owner's Insurance	$300,000	$0	$300,000	
Other Administrative Costs	$200,000	$0	$200,000	
Administration Subtotal	**$5,520,000**	**$1,683,076**	**$3,836,924**	**$2,027,431**
Architecture and Engineering				
Basic Services				
Design Development	$3,409,156	$720,482		
Construction Contract Documents	$4,772,819	$796,333		
Bidding	$681,831	$0		
Construction Contract Administration	$4,090,986	$4,017,882		
Closeout	$681,831	$0		
Other Basic Services	$175,000	$0		
Basic Services Subtotal	**$13,811,622**	**$5,534,697**	**$8,276,925**	
Reimbursable Services				
Construction Testing	$25,000	$0	$25,000	
Printing (over minimum)	$40,000	$0	$40,000	
Other Reimbursable Costs	$630,000	$0	$630,000	
Hazardous Materials	$300,000	$0	$300,000	
Geotechnical & Geo-Environmental	$250,000	$0	$250,000	
Site Survey	$25,000	$0	$25,000	
Wetlands	$0	$0	$0	
Traffic Studies	$60,000	$0	$60,000	
Architectural / Engineering Subtotal	**$15,141,622**	**$5,534,697**	**$9,606,925**	**$5,076,299**
CM at Risk Pre-Construction Services				
Pre-Construction Services	$320,000	$0	$320,000	$169,088
Site Acquisition				
Land / Building Purchase	$0	$0	$0	
Appraisal Fees	$0	$0	$0	
Recording fees	$0	$0	$0	
Site Acquisition Subtotal	**$0**	**$0**	**$0**	**$0**
Construction Costs				
SUBSTRUCTURE				
Foundations	$2,196,232			
Basement Construction	$3,622,362			
SHELL				
Super Structure	$11,031,003			
Exterior Closure	$0			
Exterior Walls	$12,000,405			
Exterior Windows	$2,325,955			
Exterior Doors	$167,920			
Roofing	$2,660,570			
INTERIORS				
Interior Construction	$9,676,384			
Staircases	$1,058,675			
Interior Finishes	$6,518,455			
SERVICES				
Conveying Systems	$259,629			
Plumbing	$3,504,350			
HVAC	$13,913,586			
Fire Protection	$1,317,979			
Electrical	$9,832,425			
EQUIPMENT & FURNISHINGS				
Equipment	$1,298,040			
Furnishings	$2,797,852			
SPECIAL CONSTRUCTION & DEMOLITION				
Special Construction	$0	$0		
Existing Building Demolition	$555,470	$0		
In-Building Hazardous Material Abatement	$1,316,600	$0		
Asbestos Containing Floor Material / Ceiling Tile Abatement	$160,000	$160,000		
Other Hazardous Material Abatement	$0	$0		
BUILDING SITE WORK				
Site Preparation	$4,013,109	$0		
Site Improvements	$8,197,222	$0		
Site Civil / Mechanical Utilities	$2,418,926	$0		
Site Electrical Utilities	$965,690	$0		
Scope Excluded Site Work	$0	$0		
Construction Trades Subtotal	$101,808,770	$160,000		
Contingencies (Design and Pricing)	$10,180,877	$16,000		
Sub-Contractor Bonds	$768,665	$1,208		
D/B/B Insurance	$0	$0		
General Conditions	$12,691,698	$19,946		
D/B/B Overhead & Profit	$0	$0		
CMP Insurance	$0	$0		
GMP Fee	$2,661,713	$4,183		
GMP Contingency	$1,996,285	$3,137		
Escalation to Mid-Point of Construction	$7,635,658	$12,000		
Construction Cost over Funding Cap		$43,961,064		
Construction Budget	**$137,743,666**	**$44,177,538**		**$49,440,342**
Alternates				
Ineligible Work Included in the Base Project	$0	$0	$0	
Alternates Included in the Total Project Budget	$0	$0	$0	
Alternates Excluded from the Total Project Budget	$0		$0	
Subtotal to be Included in Total Project Budget	**$0**	**$0**	**$0**	**$0**
Miscellaneous Project Costs				
Utility Company Fees	$200,000	$0	$200,000	
Testing Services	$500,000	$0	$500,000	
Swing Space / Modulars	$0	$0	$0	
Other Project Costs (Mailing & Moving)	$350,000	$350,000		
Miscellaneous Project Costs Subtotal	**$1,050,000**	**$350,000**		**$369,880**
Furnishings and Equipment				
Furniture, Fixtures, and Equipment	$1,661,000	$755,000		
Technology	$1,661,000	$755,000		
FF&E Subtotal	**$3,322,000**	**$1,510,000**		**$957,461**
Soft Costs that exceed 20% of Construction Cost		$0	$0	
Project Budget	**$164,297,288**	**$53,255,311**		**$58,674,581**

Cell C13 - Scope Excluded OPM Fees (Cell I40)

Cell C15 - Costs beyond MSBA funding cap for OPM Basic Services (Cell K48)

Cell C28 - Scope excluded Designer Fees (Cell I41)

Cell C30 - Costs beyond MSBA funding cap for Designer Basic Services (Cell K52)

Cell C86 - Scope Excluded Sitework Costs such as a stadium, out buildings, concession stand etc. (Enter Direct Construction Costs)

Cell C98 - Represents construction costs over MSBA funding limits (Cell H103)

Cell C112 - Represents the amount exceeding the $1,200 per student allowance for FF&E (Cell J109)

Cell C113 - Represents the amount exceeding the $1,200 per student allowance for Technology (Cell J110)

Cell C116 - Soft costs that exceed 20% of the construction cost (Cell G21)

Board Authorization	
Design Enrollment	755
Total Building Gross Floor Area (GSF)	165,035
Total Project Budget (excluding Contingencies)	[illegible]
Scope Items Excluded or Otherwise Ineligible	- $53,255,311
Third Party Funding (Ineligible)	- $0
Estimated Basis of Maximum Total Facilities Grant[1]	$111,041,977
Reimbursement Rate[1]	52.84%
Est. Max. Total Facilities Grant (before recovery)[1]	$58,674,581
Cx Costs associated with Ineligible Building Area[2]	- $21,763
Cost Recovery associated with Prior Projects[2]	- $172,410
Estimated Maximum Total Facilities Grant[1]	$58,480,408

Construction Contingency[3]	$6,887,183
Ineligible Construction Contingency[3]	$5,509,746
"Potentially Eligible" Construction Contingency[3]	$1,377,437
Owner's Contingency[3]	$2,066,155
Ineligible Owner's Contingency[3]	$1,377,437
"Potentially Eligible" Owner's Contingency[3]	$688,718
Total Potentially Eligible Contingency[3]	$2,066,155
Reimbursement Rate	52.84%
Potential Additional Contingency Grant Funds[3]	$1,091,756
Maximum Total Facilities Grant	$59,572,164
Total Project Budget	$173,250,626

47.84 Reimbursement Rate Before Incentive Points

5.00 Total Incentive Points

52.84% MSBA Reimbursement Rate

NOTES

This template was prepared by the MSBA as a tool to assist Districts and consultants in understanding MSBA policies and practices regarding potential impact on the MSBA's calculation of a potential Basis of Total Facilities Grant and potential Total Maximum Facilities Grant. This template does not contain a final, exhaustive list of all evaluations which the MSBA may use in determining whether items are eligible for reimbursement by the MSBA. The MSBA will perform an independent analysis based on a review of information and estimates provided by the District for the proposed school project that may or may not agree with the estimates generated by the District using this template.

1 - The Estimated Basis of Total Facilities Grant and Estimated Maximum Facilities Grant amounts do not include any potentially eligible contingency funds and are subject to review and audit by the MSBA.

2 - Costs associated with the commissioning of ineligible building area is estimated to result in the recovery of a portion of the overall commissioning cost. The OPM has estimated this recovery of funds to be $_____. The proposed demolition of the _____ School is expected to result in the MSBA recovering a portion of state funds previously paid to the District for the _____ project at the existing facilities completed in ____. The MSBA will perform an independent analysis based on a review of its records and information and estimates provided by the District for the proposed school project that may or may not agree with the estimated cost recovery generated by the District and its consultants using this template.

3 - Pursuant to Section 3.21 of the Project Funding Agreement and the applicable policies and guidelines of the Authority, any project costs associated with the reallocation or transfer of funds from either the Owner's contingency or the Construction contingency to other budget line items shall be subject to review by the Authority to determine whether any such costs are eligible for reimbursement by the Authority. All costs are subject to review and audit by the MSBA.

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By:
Title: Chair of School Building Committee

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By:
Title: Chief Executive Officer

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By:
Title: Superintendent of Schools

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

By:
Title: Chair of the School Committee

Date: _____

Schematic Design Package

Schematic Design Submission Contents

Module 4

4.1.1 DESE Submission

4.1.2 Schematic Design Binder

4.1.3 Schematic Design Project Manual

4.1.4 Schematic Design Drawings

Schematic Design Submission Contents

4.1.1 DESE Submission

- Special Education Delivery Methodology
- Space Summary and Narrative
- Floor Plans
- Adjacency Table

4.1.2 Schematic Design Binder

- Narrative of Process, Analysis and Design Updates, Cost and Approvals

Schematic Design Submission Contents

4.1.3 Schematic Design Project Manual

- Outline Specifications that define the scope of construction

4.1.4 Schematic Design Drawings

- Site/Civil
- Floor Plans
- Roof Plans
- Interior and Building Elevations

Schematic Design Next Steps

SBC Approves SD Submission

Project Scope and Budget Review with MSBA

MSBA Review Comments

MSBA Board of Directors Meeting – June 18, 2025

Town Meeting Vote – Sept 13, 2025

Town Debt Exclusion Vote – Sept 16, 2025

Project Scope and Budget Agreement with MSBA

Proceed into Detail Design – Fall 2025

Approval of Schematic Design Submission

Discussion/ Correspondence/ New Items

Committee Questions

Public Comment

Thank You

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

Abutters Meeting #1

January 29, 2025

Massachusetts School Building Authority

Site Plan

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)
CIRCUITOUS CAMPUS PATH
CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)

3 RAISED GARDEN BEDS
SENSORY CORTEX

4 SENSORY GARDEN: EDUCATIONAL
SENSORY CORTEX
STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE /
PASSIVE / INCLUSIVE FRONTAL CORTEX

6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink
landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
January 2025

WILMINGTON PUBLIC SCHOOLS

Wildwood Early Childhood Center Project

Community Forum #6

March 31, 2025

Massachusetts School Building Authority

smma dw FONTAINE

Agenda

Introductions

MSBA Process and Schedule

The Big Picture

The Project Need

Schematic Design Update

Supporting Education Through Design

Cost Update

Community Outreach

Stay Connected

Questions

Introductions

The Team

Massachusetts School Building Authority
Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities

Program Administrator & Funding Partner

School Committee

School Building Committee

Owner's Project Manager (OPM)

Designer (Architect)

Construction Manager (CM)

Who is the School Building Committee?

Glenn Brand, Superintendent, WPS; Chair SBC
Vivian Varbedian, Parent Representative; Vice-Chair SBC
Paul Ruggiero, Assist. Superintendent of Admin & Finance
Diane M. Allan, Permanent Building Committee
John C. Holloway, Permanent Building Committee
Christine Murray, Dir. of Student Support Services
Gregory B. Bendel, Board of Selectmen
Kevin A. Caira, Board of Selectmen
Kate Bissell, Wildwood School Principal
Stacey Scott, Woburn School Principal
Christine Holloran, Wildwood School Teacher
Dennis Kelley, Public Buildings

R. Eric Slagle, Town Manager
Judith L. O'Connell, Assistant Town Manager
Nicholas Golden, School Committee
David A. Ragsdale, School Committee
Stephen Turner, School Committee
Marianne Gallezzo, Finance Committee Member
Paul J. Melaragni, Permanent Building Committee
Michael Camoscio, Parent Representative
Craig Miner, Parent Representative
Christine Prendergast, Parent Representative
Justin Cusce, Parent Representative

MSBA Process and Schedule

How we got here...
Wilmington Elementary Schools

- All six elementary schools are of similar vintage 1950s/1960s and experience space deficiencies in their educational programs
- Each school needs significant upgrades, including HVAC, plumbing, electrical, exterior windows and envelope, accessibility, etc.
- **Wildwood** was determined to be in the most need of the six district elementary schools.

Wildwood Early Childhood Center
1955 (**68 yrs**)

Enrollments & Grade Configurations

PreK-K

Wildwood Only

130+

PreK-3rd

Wildwood & Woburn St.

510+

PreK-5th

Wildwood, Woburn St., & North

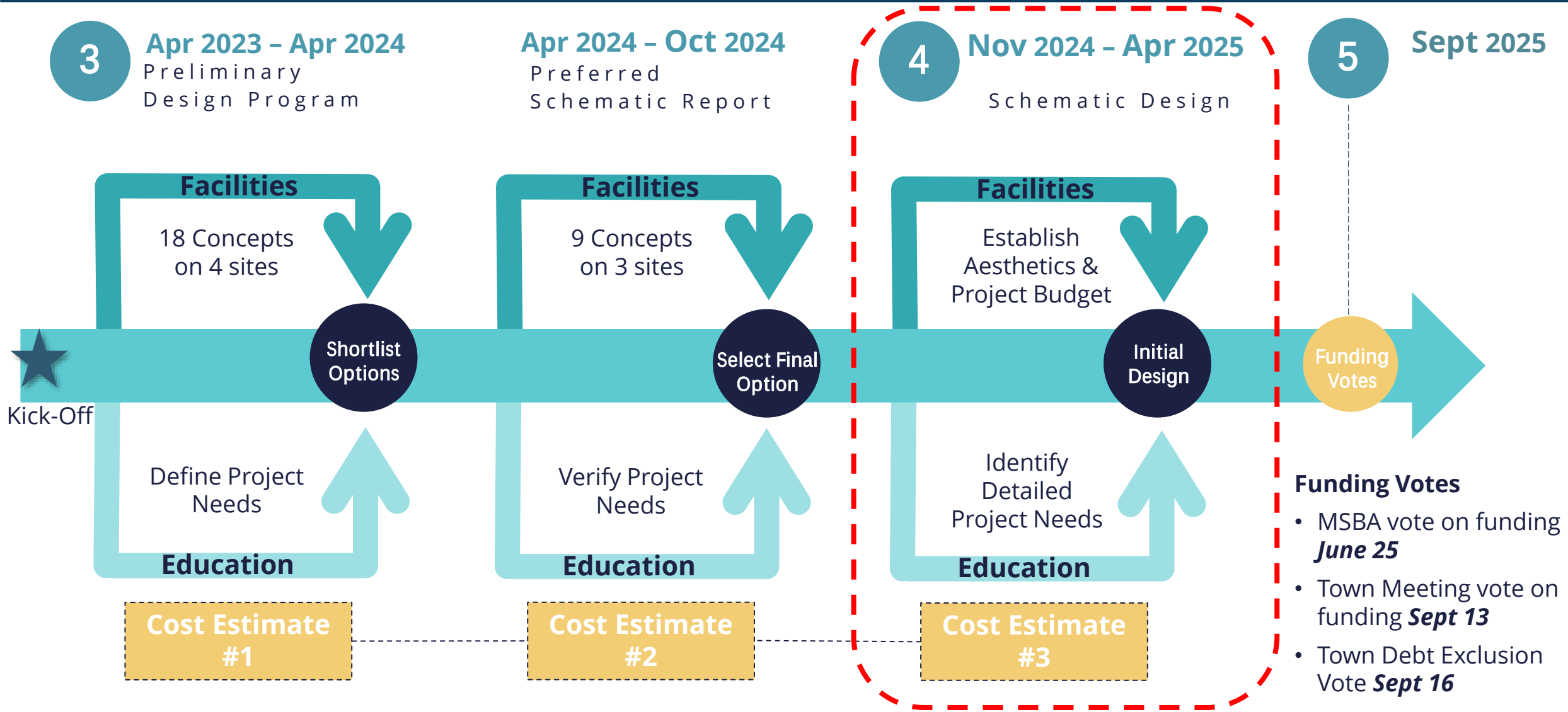
755+

MSBA Process

Step-by-Step

MSBA Process

Where We're Going: Schematic Design



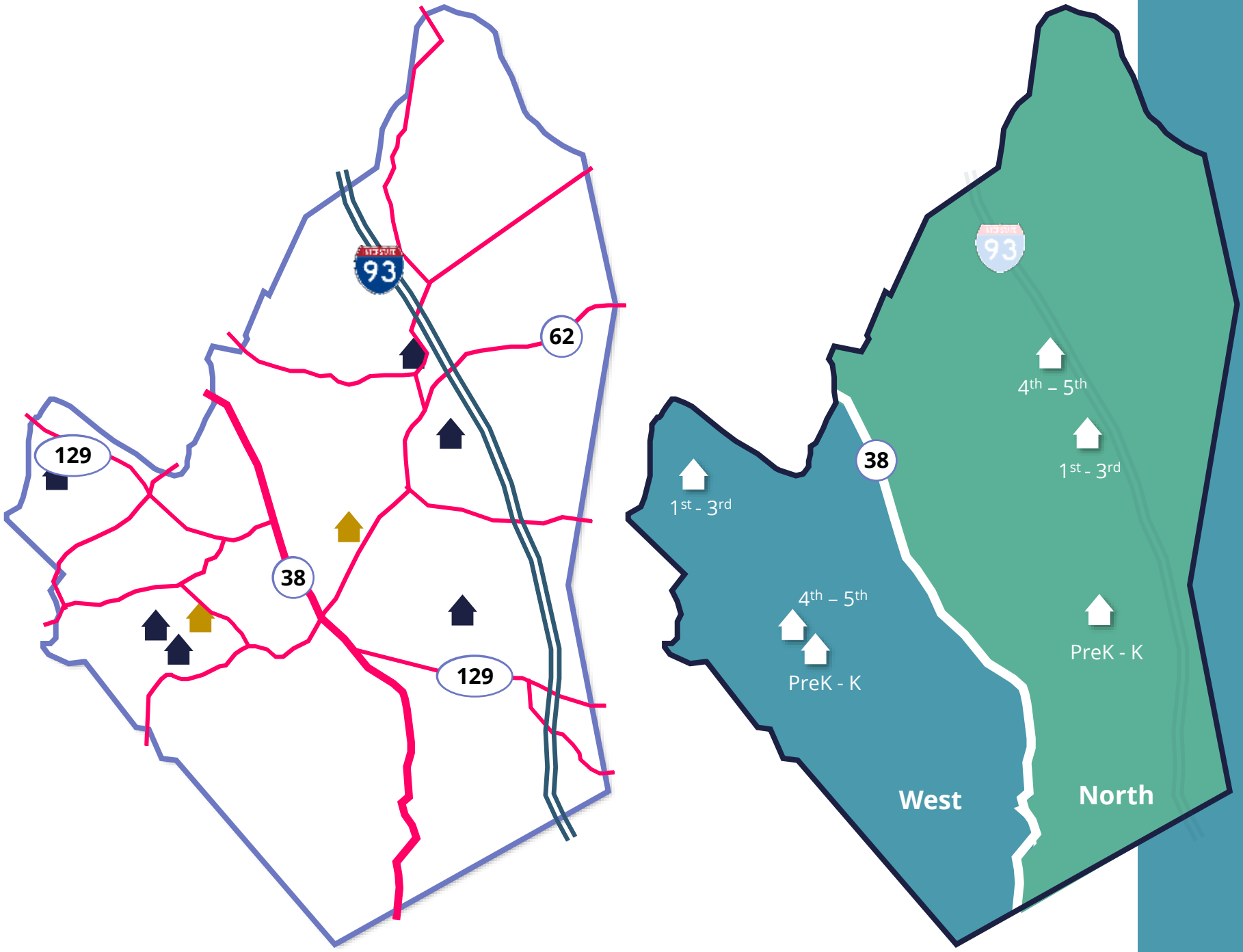
Funding Votes

- MSBA vote on funding ***June 25***
- Town Meeting vote on funding ***Sept 13***
- Town Debt Exclusion Vote ***Sept 16***

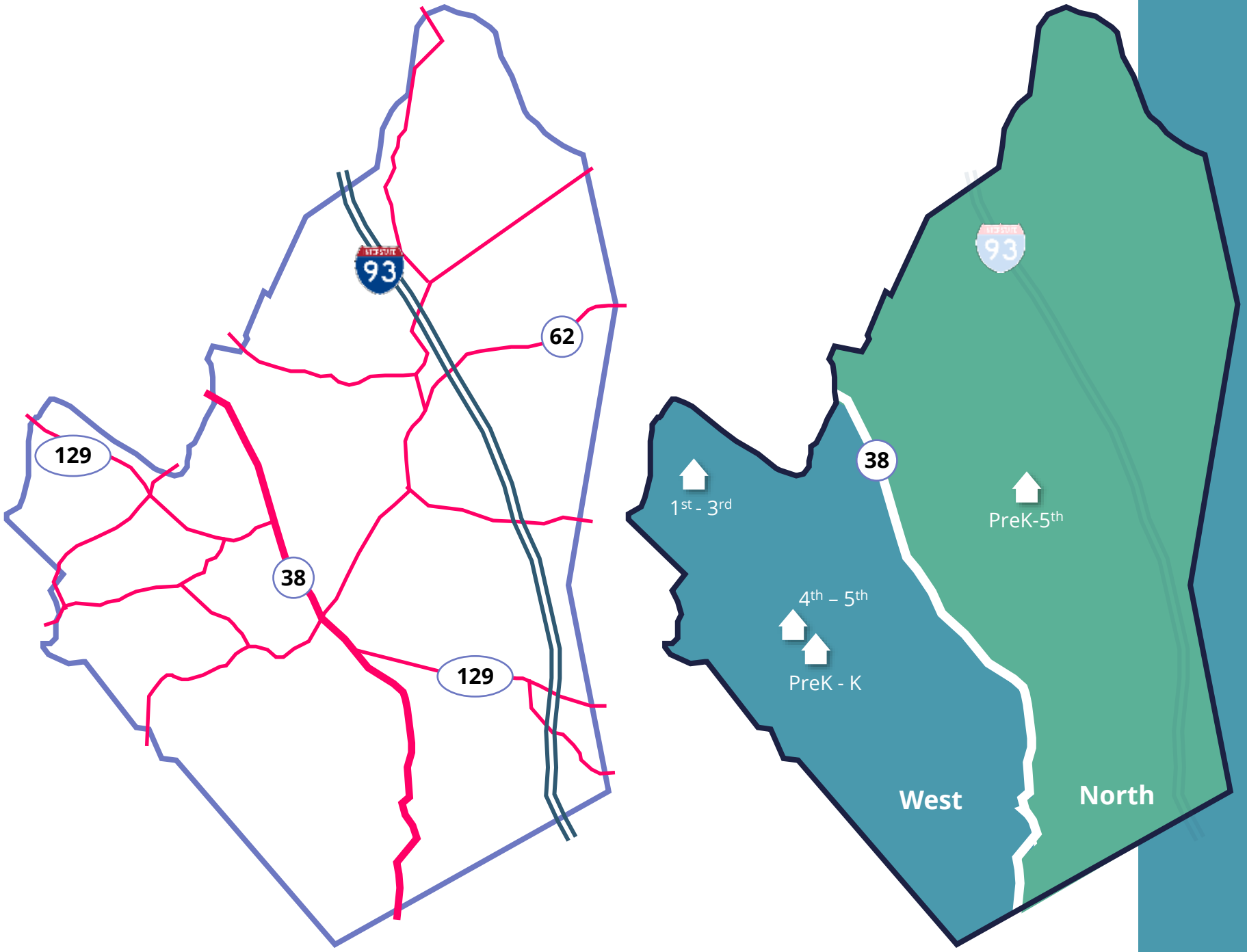
The Big Picture

The Big Picture

A District-Wide Solution



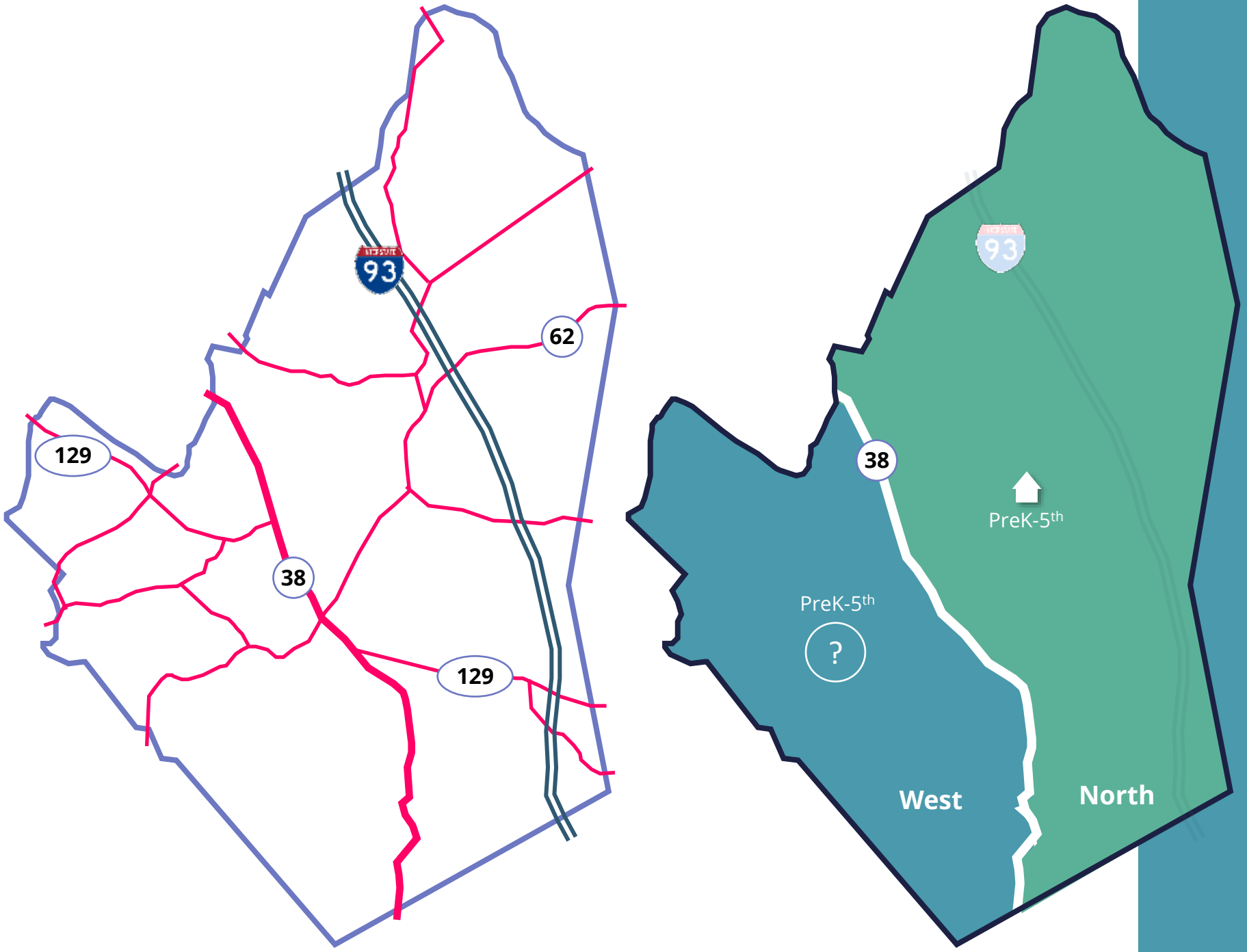
- Capacity Mismatch
  - Number of Facilities
  - Grade Configuration
- Multiple Elementary Transitions



The Big Picture

A District-Wide Solution
PreK-5

- Capacity Mismatch
  - Number of Facilities
  - Grade Configuration
- Multiple Elementary Transitions
- Potential Solution:
  - Consolidate North Elementaries
  - Eliminates elementary transitions on North side



The Big Picture

A District-Wide Solution
PreK-5

- Capacity Mismatch
  - Number of Facilities
  - Grade Configuration
- Multiple Elementary Transitions
- Potential Solution:

  Consolidate Elementaries from 6 to 2 in two steps.

  Step 1: North Elementaries

  Step 2: West Elementaries

The Project Need

Existing Conditions Summary

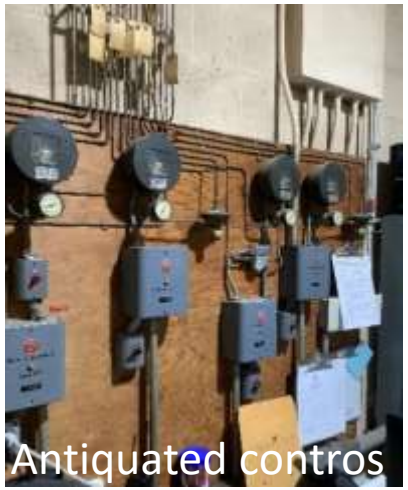
Outdated finishes

Thermal Envelop

Accessibility

Doors/Accessibility

Site


Antiquated contros

Outdated finishes

Windows / Thermal Envelop

Ongoing maintenance

Inefficient MEP

MEP/Finishes

Accessibility

MEP/Finishes

Outdated interiors

Accessibility

Educational Challenges Identified

- Multiple transitions in elementary years
- Schools have different start and end times
- Undersized classrooms as compared to MSBA guidelines
- Need for dedicated classrooms for differentiated instruction
- Limitations of spaces to support wide range of student needs
- No designated science and computer spaces (STEM)
- Limited dedicated workspaces for service providers to meet with students
- Limited time and spaces for staff collaboration and combined professional development
- Accessibility throughout buildings
- Nurses Suite with separate examination area

Scan me!

Feasibility Study Phase Outcomes

- **3 Design Enrollments Under Consideration**
  - PK-K: 130+ PreK
  - PK-3: 510+ PreK
  - PK-5: 755+ PreK
- **Documentation of Programs, Services, and Guiding Principles**
  - Extended PreK
  - STEM
- **Space Necessary to Deliver Educational Program**
  - PK-K: 66,810 GSF
  - PK-3: 117,318 GSF
  - PK-5: 167,755 GSF
- **18 Alternatives Explored:**
  - Repair Only, Renovation/Addition, New Construction
- **9 Alternatives Identified for Further Development and Evaluation**
- **Total Project Costs Range for Short List**
  - $26.6 M - $214.5 M
- **New PreK-5 School at North Int. Site Selected and Approved**

Schematic Design

Site Plan Update

1 ACCESSIBLE PATH
MOTOR CORTEX (PHYSICAL)
CIRCUITOUS CAMPUS PATH
CONNECTING PROGRAMS

2A OPEN PLAY
MOTOR CORTEX (PHYSICAL)

2B ACTIVE PLAY: PLAYGROUND
MOTOR CORTEX (PHYSICAL)

3 RAISED GARDEN BEDS
SENSORY CORTEX

4 SENSORY GARDEN: EDUCATIONAL
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STORMWATER MITIGATION
HANDS-ON OBSERVATION

5 OUTDOOR CLASSROOM / INTERACTIVE /
PASSIVE / INCLUSIVE FRONTAL CORTEX

6 OUTDOOR DISCOVERY LAB
SENSORY CORTEX

7 DINING & GATHERING
SOCIAL / EMOTIONAL / INTERACTIVE

terraink landscape architecture

WILMINGTON ELEMENTARY SCHOOL | CONCEPT PLAN

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Site Circulation

88 +/- vehicles on-site queue space

12 +/- busses on-site queue space

193 +/- on site parking spaces

Floor Plan Update

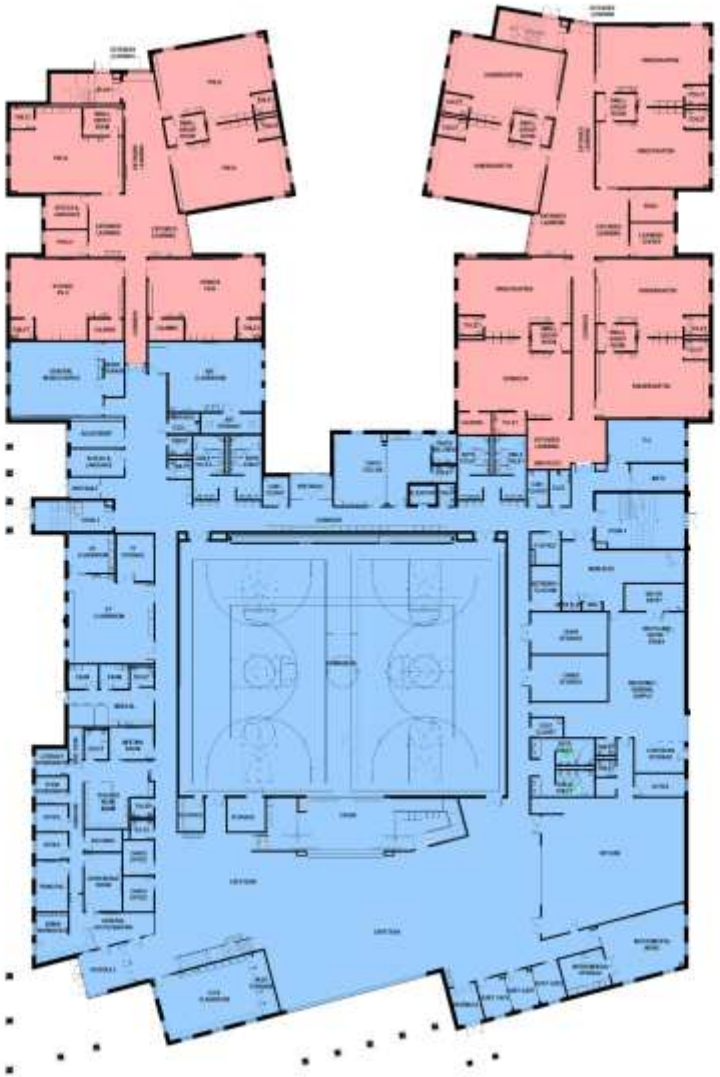
Floor Plan Review

First Floor

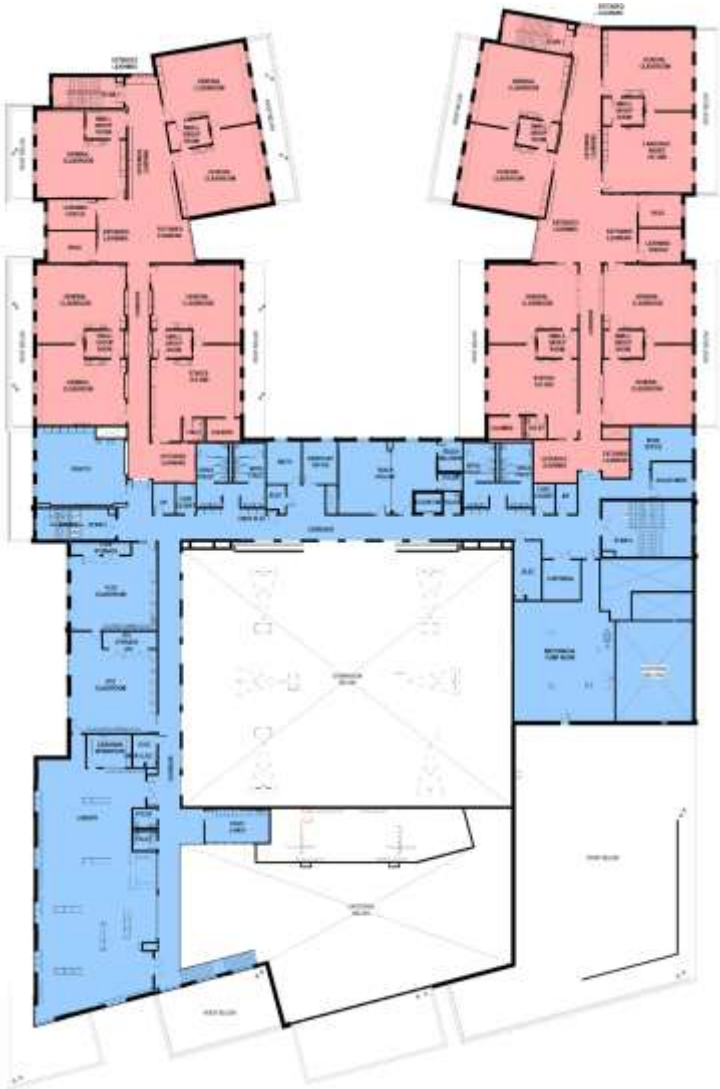
Second Floor

Third Floor

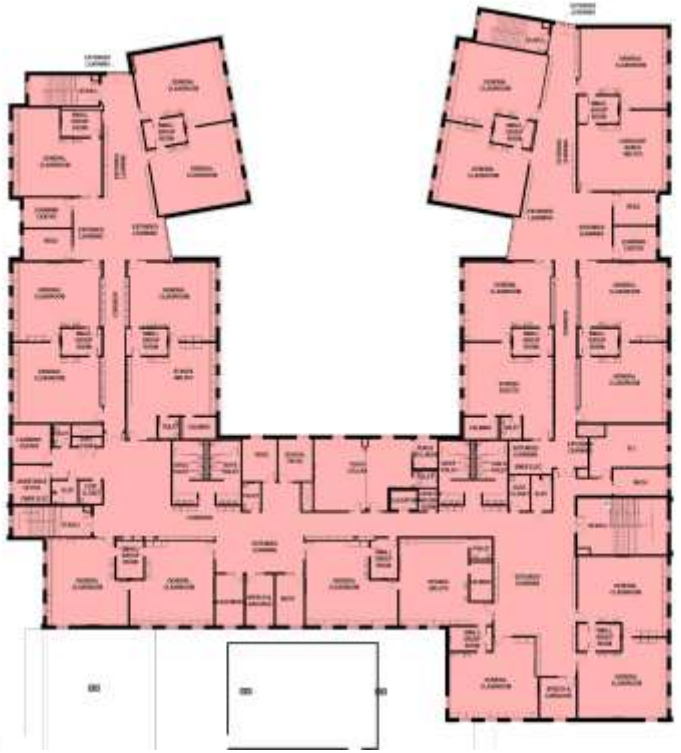
Floor Plan Review



First Floor



Second Floor



Third Floor

Public

Private

Supporting Education Through Design

Overview

Overview

Southeast view towards Main Entry

View from East towards Cafeteria

View from West towards Courtyard

Main Entry

Cafeteria/Stage

Cafeteria/Stage

Cafeteria/Stage

Gymnasium

Gymnasium

Gymnasium

Library

Library

Typical Classroom

Level 1: Extended Learning Area

Level 1: Extended Learning Area

Level 2: Extended Learning Area

Level 2: Extended Learning Area

Level 2/3: Extended Learning Area

Level 3: Extended Learning Area

Cost Overview

Preliminary Design Program	Preferred Schematic Report
Estimated Construction Cost Range	Estimated Construction Cost Range
$149.3M – $165.0M	$136.4M - $150.7M
$936/SF	$878/SF

Preliminary Design Program

Estimated Construction Cost Range

$149.3M – $165.0M

$936/SF

Preferred Schematic Report

Estimated Construction Cost Range

$136.4M - $150.7M

$878/SF

Schematic Design

Estimated Construction Cost

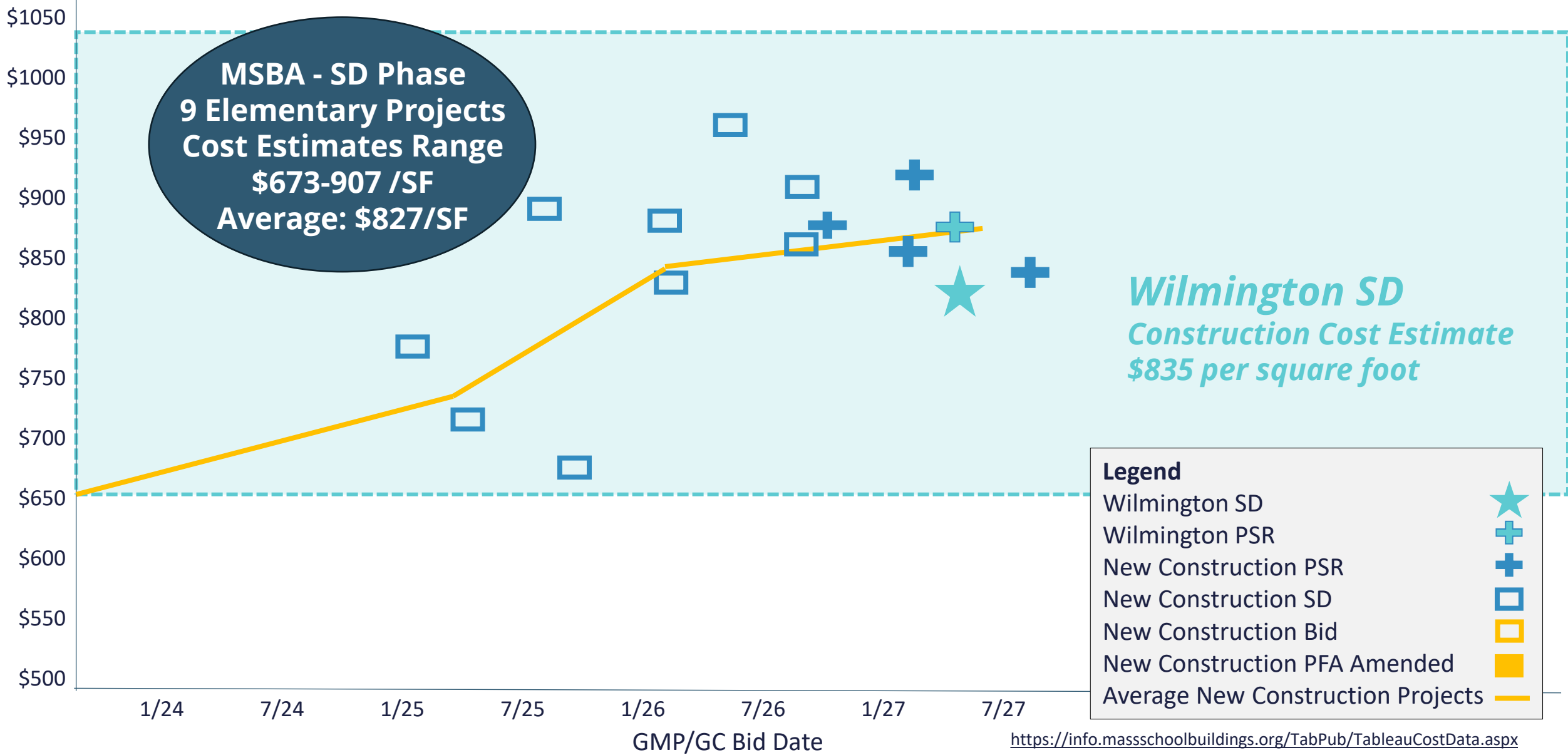
$137,743,666

$835/SF

On Budget!

MSBA Project – Construction Cost Data

Phase: SD Elementary Schools



https://info.massschoolbuildings.org/TabPub/TableauCostData.aspx

Community Outreach

Community Outreach Efforts

SBC Meetings
Community Forums
Water Bill Inserts
District Superintendent’s Newsletter
WCTV Wildcat Corner
Senior Center
Fun on the Fourth
School District Website
Project Specific Website with FAQs
Display Boards around Town
Town-Wide Communication of all project Information

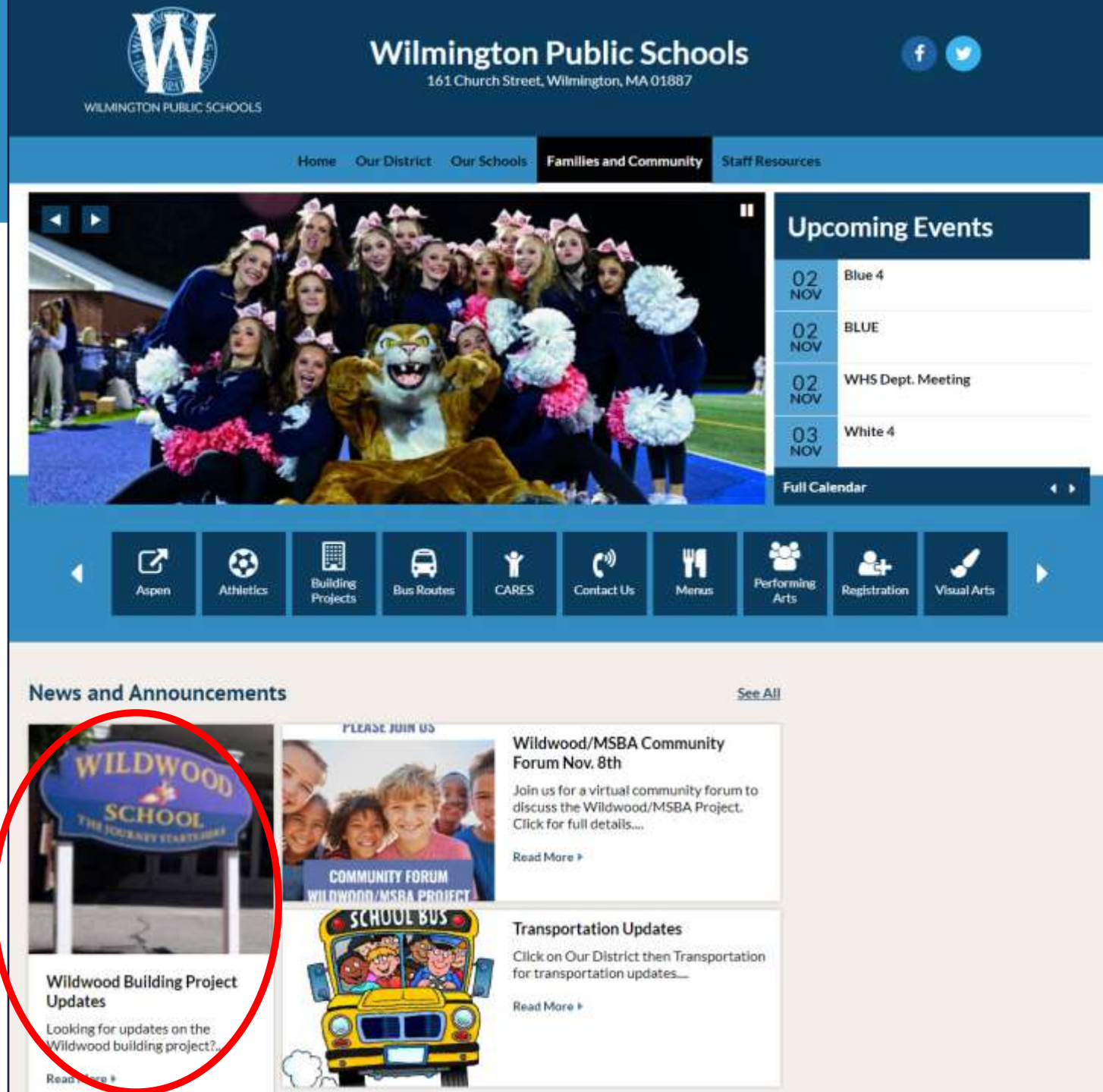
Stay Connected

Stay Connected

Find updates on the District website - click on Wildwood Building Project Updates

Email questions/comments:
wildwoodprojectquestions@wpsk12.com

WCTV WILMINGTON COMMUNITY TELEVISION



Stay
Connected

Upcoming Meeting

April 15th at 6:30 PM – School Building Committee

- Hybrid and In-person at Wilmington HS Large Group Instruction Room
- Authorization to Submit Schematic Design Report to MSBA

Questions & Answers

Thank You

Nitsch Engineering

Traffic Impact Study

North Intermediate School

320 Salem Street
Wilmington, MA

April 9, 2025

Prepared for:

Dore + Whittier Architects, Inc.
260 Merrimac Street
Newburyport, MA 01950

Submitted by:

Nitsch Engineering
2 Center Plaza, Suite 430
Boston, MA 02108

Nitsch Engineering Project #15428

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1.3 Conclusions and Recommendations 3

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1 Executive Summary

Nitsch Engineering (Nitsch) has completed a detailed Traffic Impact Study (TIS) to evaluate the potential impacts of redeveloping the North Intermediate elementary school on the existing site, combining the student population of the existing North Intermediate school, Woburn Street elementary school, and Wildwood Early Childhood Center to accommodate the larger student population.

The proposed school will provide enhancements to traffic circulation and controls such as providing a dedicated parent loop, extended bus loop with dedicated driveway to separate cars and buses, separate emergency access driveway, and increased parking.

1.1 Trip Generation and Access

The proposed school is anticipated to generate 243 weekday morning peak school hour (8:00 AM – 9:00 AM) trips and 403 weekday afternoon peak school hour (3:15 PM – 4:15 PM) trips. This represents a net increase of 172 trips during the morning peak hour and 285 trips during the afternoon peak hour compared to the existing North Intermediate school on site.

Access and egress to the site will be provided via two primary driveways. The driveway at the southern end of the parcel (south driveway) will provide access and egress to and from Salem Street. The driveway to the east of the site (east driveway) will allow access and egress to and from Ballardvale Street, to be located just north of the existing school driveway. The south driveway will be the designated visitor entrance and the east driveway will be used for deliveries. A staff parking lot at the east end of the site will be accessed by both driveways. There are two site layout alternatives, with Option A designating the south driveway for parent drop-off and pick-up and the east driveway for bus drop-off and pick-up. Option B swaps this arrangement, providing more queueing space for parents. With either site layout, buses and most passenger cars will have separate circulation routes that will minimize conflicts with each other and streamline the student arrival and dismissal patterns.

In addition to the two driveways, a proposed access road will be located west of the school leading to and from Arlene Avenue. This driveway will be designated for emergency access only.

1.2 Parking

A total of 193 parking spaces will be provided on-site. A dedicated parent pick-up/drop-off loop is proposed on-site so parents will be able to circulate through the site to queue in the loop instead of in the parking lot or the surrounding roadways.

1.3 Conclusions and Recommendations

After adding the expected new traffic to the existing traffic on the adjacent intersections, the proposed school is expected to worsen operations at the intersection of Salem Street at Middlesex Avenue and Route 62 at Middlesex Avenue/High Street. Our analysis shows that the expected operational issues can be mitigated through signal retiming at the intersection of Route 62 at Middlesex Avenue/High Street. It is recommended that further study be conducted by the Town of Wilmington to address the existing operational deficiencies at the intersection of Salem Street and Middlesex Avenue in a manner that also provides excess capacity for the projected new trips from the proposed school. No significant impact is expected at the other study intersections.

2 Introduction

Nitsch has prepared this Traffic Impact Study (TIS) for the proposed North Intermediate Elementary School redevelopment, located at 320 Salem Street, Wilmington, Massachusetts. This TIS will review existing roadway conditions, access/egress, crash data, and traffic volumes, and it will assess existing and future traffic conditions at intersections in the study area.

2.1 Existing Site

The site for the proposed redevelopment is located on an approximate twelve-acre lot located at 320 Salem Street, which currently holds the North Intermediate School and a playground, baseball fields, soccer fields, tennis courts, and a basketball court. The school is one of two intermediate schools in the Wilmington Public School system and serves the east region of the Town.

The existing North Intermediate School consists of a building with two stories for a total of 54,569 square feet. A paved play area and a parking lot are also present on the site. The North Intermediate School serves approximately 250 students in grades four and five.

Primary access to the North Intermediate School is provided by a loop on Salem Street, providing access to the main entrance at the south of the building. The loop accommodates one-way traffic, with an ingress driveway at the southeast corner of the building and an egress driveway at the southwest corner of the building. Bus drop-off and pick-up occurs at this loop. Additional access is located to the east of the building and is served by another pair of one-way driveways off Ballardvale Street. Parent drop-off and pick-up occurs in this area, which also provides approximately 52 parking spaces for school staff.

Figure 1 shows the Locus Map and Figure 2 shows the project area.

2.2 Proposed Development

The project consists of the construction of an approximate 163,573-square-foot, three-story elementary school building to replace the existing school facility at 320 Salem Street and will serve 855 students from pre-kindergarten through grade five. The redeveloped building will consolidate students from the Wildwood Early Childhood Center and the Woburn Street Elementary School with the students at the existing North Intermediate school. The Wildwood Early Childhood Center is located at 182 Wildwood Street and serves pre-kindergarten and kindergarten. The building at 182 Wildwood Street was closed in 2023 and the students are temporarily being housed between the West Intermediate School and the Wilmington Middle School. The Woburn Street School is located at 227 Woburn Street and currently serves grades one through three.

A total of 193 parking spaces will be provided on-site. A dedicated parent pick-up/drop-off loop is proposed on-site so parents will be able to circulate through the site to queue in the loop instead of in the parking lot or the surrounding roadways.

Access and egress to the site will be provided via three driveways. The driveway at the south of the parcel (south driveway) will provide access and egress to and from Salem Street. The driveway at the east of the parcel (east driveway) will provide access and egress to and from Ballardvale Street. The driveway at the west of the parcel will provide access and egress to and from Arlene Avenue for emergency use only.

2.3 Study Area

The study area includes seven roadways and five intersections as follows:

Roadways

1. Salem Street
2. Middlesex Avenue
3. Ballardvale Street
4. Baland Road
5. I-93 Southbound Ramps
6. Route 62
7. High Street

Intersections

1. Salem Street and Middlesex Avenue
2. Ballardvale Street and Salem Street
3. Ballardvale Street and Baland Road/School Driveway
4. Ballardvale Street and I-93 Southbound Ramps
5. Route 62 and Middlesex Avenue/High Street

2.4 Methodology

We have conducted this traffic assessment in three phases. The first phase involves an evaluation of existing traffic conditions within the study area, including an inventory of existing roadway and intersection geometry, observations of traffic volumes, review of vehicular crash data, and evaluation of parking utilization.

The second phase of the study establishes the framework for evaluating the transportation impacts of the proposed elementary school development project. We assessed travel demand forecasts for the project, along with future traffic demands on the study area intersections due to projected background traffic growth and other proposed area developments that will occur, independent of the proposed development. We used 2031 as the design year for analysis, reflecting a seven-year horizon. This phase also includes an evaluation of parking demand generated by the project.

The third and final phase involves conducting traffic analyses to evaluate both existing and projected future intersection operations. We used this analysis as the basis for determining the potential project impacts and potential mitigation measures for the elementary school development.

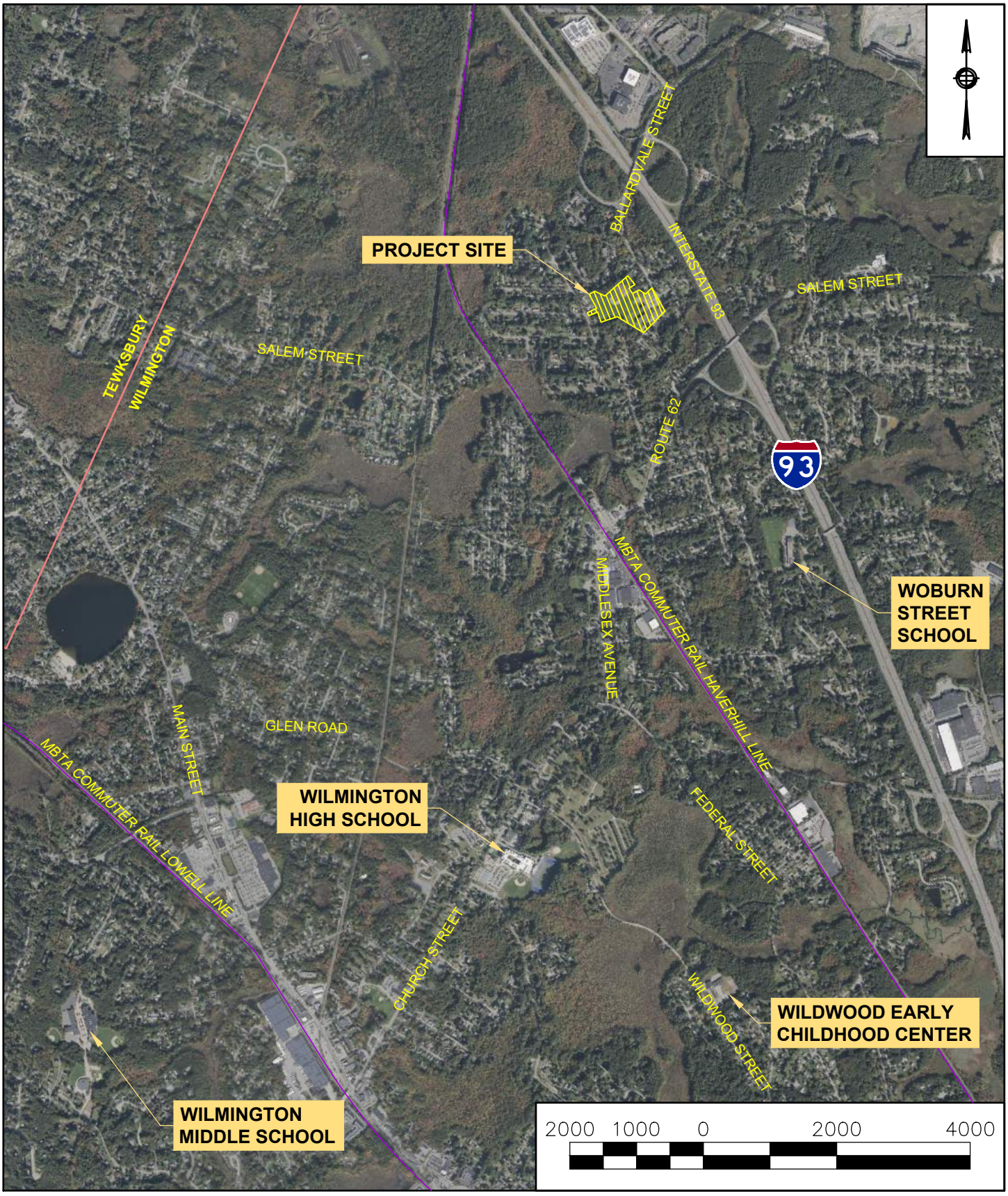

Figure 1 - Locus Map

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

Figure 2 - Study Area

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

3 Existing Conditions

Nitsch conducted a site visit on Wednesday, October 23, 2024 to observe the roadway conditions and existing traffic. The observations occurred during sunny conditions when school was in-session. The following is a summary of the existing roadways and intersections.

3.1 Roadways

Salem Street

Within the study area, Salem Street is an urban major collector that runs in the east-west direction from the Tewksbury town line east to a dead-end just past the intersection with Ballardvale Street. Salem Street is discontinuous, starting again on the opposite side of I-93 and running concurrently with Route 62 to the North Reading town line. Land use on Salem Street is primarily residential, with some industrial uses on the east segment.

Near the study area, Salem Street is approximately 26 feet wide and has a narrow sidewalk on the north side of the road. Directional travel is separated by a double-yellow center line and the speed limit is 25 mph. Salem Street is under the jurisdiction of the Town of Wilmington.

Middlesex Avenue

Middlesex Avenue is an urban minor arterial that generally runs north-south in Wilmington from the intersection with Salem Street approximately 2.3 miles south to its terminus at Main Street. A portion of Middlesex Avenue runs concurrent with Route 62. After branching off from Route 62 at Church Street, Middlesex Avenue becomes a local roadway until its southern terminus at Route 62. The width of Middlesex Avenue varies but typically measures around 34 feet. The roadway is under the jurisdiction of the town of Wilmington and features a speed limit of 25 mph. The land use along the corridor includes residential neighborhoods, commercial areas, and some recreational spaces. Sidewalks are present on one side of the street in most sections, and on-street parking is mainly restricted.

Ballardvale Street

Ballardvale Street runs north-south and spans approximately 2.5 miles, extending south from the Andover town line to the intersection with Salem Street. Between the Andover Town Line and Route 125, Ballardvale Street is an urban minor arterial that runs through an industrial park and is wide to accommodate large trucks, with two southbound lanes in some places. As it runs concurrently with Route 125, Ballardvale Street is an urban principal arterial that intersects the beginning of Route 125 and a pair of ramps to access Interstate 93 before approaching the study area. Within the study area, Ballardvale Street is an urban major collector that is approximately 24 feet wide, with one lane in each direction. Sidewalks are provided on the west side of Ballardvale Street near the school but terminate as the roadway approaches the I-93 ramps.

The speed limit on Ballardvale Street near the I-93 ramps is 35 mph but it decreases to 25 mph as it approaches the North Intermediate School. During school arrival and dismissal periods, a school zone speed limit of 20 mph is enforced with flashing beacons. Ballardvale Street is under the jurisdiction of the Town of Wilmington, apart from the bridge over I-93 and the ramp intersections, which are owned by MassDOT. Within the study area, land use is primarily residential, with a single institutional use being the North Intermediate School.

Baland Road

Baland Road is a local roadway that runs east-west in the study area. Baland Road begins across from the school driveway off Ballardvale Street and terminates as a dead-end approximately 500 feet to the east. There are several single-family homes on Baland Road, with sidewalks on both sides of the street and no pavement markings. Baland Road is approximately 28 feet wide and has no posted speed limit, assuming the statutory speed limit of 30 mph in thickly settled areas. The roadway is under the jurisdiction of the Town of Wilmington.

Interstate 93 Southbound Ramps

The Interstate 93 (I-93) Southbound Ramps are a pair of cloverleaf-style ramps connecting Ballardvale Street to I-93 southbound. To the north of I-93 are another pair of cloverleaf-style ramps connecting to I-93 northbound, but are outside of the study area. Directional travel on the ramps is separated by a six-foot raised median and bounded by guardrails on both sides of the roadway, with each travel lane being approximately 20 feet wide. There is no posted advisory speed on the ramps and guardrails are provided on both sides of the roadway. The ramps are under the jurisdiction of MassDOT.

Route 62

Route 62 runs east-west through Wilmington and is classified as an urban minor arterial. Extending from the Burlington town line to the North Reading town line, Route 62 spans approximately 4.5 miles. The roadway varies in width, averaging around 36 feet, and accommodates two-way traffic separated by a double-yellow center line. Route 62 has a posted speed limit of 35 miles per hour (mph) and the southbound approach in the study area under the jurisdiction of MassDOT and the northbound approach in the study area is under the jurisdiction of the Town of Wilmington. Near the study area, land use on Route 62 is primarily residential. Sidewalk availability is inconsistent, with some sections having well-maintained sidewalks on one or both sides, while other sections lack pedestrian pathways. On-street parking is generally restricted.

High Street

High Street is classified as a local road that runs primarily north-south from the intersection with Route 62 and Middlesex Avenue approximately two-thirds of a mile to the intersection with Woburn Street. At the intersection with Route 62 and Middlesex Avenue, High Street has an east-west orientation. High Street is approximately 22 feet wide, with directional travel separated by a double yellow centerline and a sidewalk provided on the west/south side of the roadway.

Land Use on High Street is primarily residential. The Woburn Street School is located at the southern end of High Street, as it intersects Woburn Street. The posted speed limit on High Street is 30 mph. The roadway is under the jurisdiction of the Town of Wilmington.

3.2 Study Intersections

Salem Street and Middlesex Avenue

Salem Street and Middlesex Avenue intersect to form a three-way unsignalized intersection, with Salem Street approaching from the west and north and Middlesex Avenue approaching from the south. The three roadways intersect in a triangular shape with several raised median islands and the control is atypical from that of a standard three-way intersection. There are no posted stop signs or yield signs.

The Salem Street eastbound approach is approximately 26 feet wide, providing for two lanes in the unmarked approach. The right-most lane is used as a right-turn lane, where vehicles must yield to southbound traffic. The left-most lane is used as a left-turn lane onto Salem Street heading northbound. From the north, the Salem Street southbound approach consists of a single 12-foot lane. The approach operates freely, with through-moving vehicles getting the right-of-way and right-turning vehicles diverging into a channelized departure lane. From the south, the Middlesex Avenue northbound approach consists of a single lane as it passes a conflict point where eastbound traffic passes through to turn left at the intersection. No right-of-way signs are posted, suggesting eastbound traffic must yield to northbound traffic. However, northbound vehicles in the field were frequently observed yielding to eastbound traffic turning left onto Salem Street, particularly during periods of congestion. North of this conflict point, the northbound approach opens into a 12-foot through lane and a 12-foot left-turn lane. Northbound left-turning vehicles must yield to southbound traffic.

The medians and multiple conflict points have the effect of a modified circular intersection, with eastbound-left and northbound-left turning vehicles yielding to oncoming traffic before entering the intersection and circulating around the median islands. The unusual geometry of the intersection presents multiple challenges including driver confusion, limited sight lines, and limited deflection promoting high speeds. Significant congestion was observed during field observations, particularly in the northbound direction. A sidewalk is present on the north side and west side of the intersection, with a single pedestrian crossing across the west Salem Street leg. There are no bicycle facilities present at the intersection.

Salem Street and Ballardvale Street

Salem Street and Ballardvale Street intersect to form a three-way unsignalized intersection, with Salem Street approaching from the west and east and Ballardvale Street approaching from the north. The Salem Street eastbound approach and the Ballardvale Street southbound approach are free movements, forming the main line of the intersection. The Salem Street westbound approach is under stop control.

The Salem Street eastbound approach and Ballardvale Street southbound approach both consist of a single 12-foot general purpose lane. The Salem Street westbound approach is approximately 20 feet wide and unmarked. A sidewalk is provided on the northwest side of the intersection and a three-foot paved shoulder is present on both sides of the main line. There are no marked crosswalks provided at the intersection.

Ballardvale Street and School Driveway/Baland Road

Ballardvale Street intersects with Baland Road and the North Intermediate School driveway to form a four-way unsignalized intersection, with Ballardvale Street approaching from the north and south, Baland Road approaching from the east, and the school driveway approaching from the west. The school driveway is divided into separate legs for the entrance and exit that are separated by a raised concrete sidewalk approximately 65 feet long. The school driveway entrance is located slightly north of Baland Road and is approximately 26 feet wide. The school driveway exit is located just south of Baland Road and is approximately 60 feet wide.

The Ballardvale Street northbound and southbound approaches each consist of a single 12-foot general purpose lane and operate free. Baland Road is approximately 26 feet wide and is unmarked. While no signs are explicitly posted, the Baland Road and school driveway approaches operate under stop control. Sidewalks are provided on the west side of the intersection. There are no marked crosswalks at the intersection.

Ballardvale Street and I-93 Southbound Ramps

Ballardvale Street intersects with the I-93 southbound ramps to form a three-way signalized intersection, with Ballardvale Street approaching from the north and south and the I-93 southbound ramps approaching from the west. The Ballardvale Street northbound approach consists of an 11-foot left-turn lane and an 11-foot through lane. The Ballardvale Street southbound approach consists of a 12-foot through lane and a 12-foot right-turn lane. The right-turn lane provides channelized access to the I-93 southbound ramp and vehicles must yield to oncoming traffic turning left from Ballardvale Street northbound as they merge onto the ramp. The I-93 southbound ramp eastbound approach consists of two 11-foot left-turn lanes and a 16-foot channelized right turn lane. Vehicles turning right must yield to oncoming traffic from Ballardvale Street southbound.

The intersection is controlled by a fully-actuated, uncoordinated traffic signal. The signal operates in three phases. The first phase serves the Ballardvale Street northbound and southbound through movements. The second phase serves the eastbound left-turn movements from the I-93 southbound ramp. The third phase provides a protected left-turn phase for northbound traffic. The Ballardvale Street southbound right and I-93 southbound ramp eastbound right movements are yield-controlled. There are no crosswalks, sidewalks, or bicycle facilities provided at the intersection.

Route 62 and Middlesex Avenue/High Street

Route 62 intersects Middlesex Avenue and High Street to form a four-way signalized intersection, with Route 62 approaching from the north, Middlesex Avenue approaching from the west and south, and High Street approaching from the east. The Route 62 southbound approach consists of an 11-foot left-turn lane, an 11-foot through lane, and an 11-foot right-turn lane. The Middlesex Avenue northbound approach consists of an 11-foot left-turn lane and a 12-foot shared through/right lane. The Middlesex Avenue eastbound approach consists of an 11-foot shared left/through lane and a 12-foot right-turn lane. The High Street westbound approach consists of an 11-foot shared left/through lane and an 11-foot right turn lane. The right turn lanes on the eastbound and westbound approaches are very short, providing storage for only one or two vehicles. The Middlesex Avenue west leg and High Street east leg both have a narrow street-level concrete median separating the approaches and departures. Crosswalks are provided across all four intersection legs and concrete sidewalks are provided on all intersection corners, although the northeast corner sidewalk ends just past the intersection.

The traffic signal is controlled by a fully-actuated, uncoordinated signal. The first phase serves the Route 62 southbound left turn movement, the Middlesex Avenue northbound left-turn movement, and the Middlesex Avenue eastbound right-turn overlap. The second phase serves the Route 62 southbound through and right movements and the Middlesex Avenue northbound through movement. The third phase serves the Middlesex Avenue eastbound and High Street westbound movements. The fourth phase is an exclusive pedestrian phase.

4 Existing Traffic Conditions

4.1 Traffic Count Data

Nitsch retained Precision Data Industries, Inc. (PDI) of Hudson, Massachusetts to collect traffic data within the study area, including both Automatic Traffic Recorder (ATR) counts and Turning Movement Counts (TMC).

ATR Data

PDI collected ATR counts for a continuous 48-hour period at three locations from Wednesday, October 23, 2024 to Thursday, October 24, 2024. The ATR volumes are summarized in Table 1 and the bi-directional average daily traffic (ADT) volumes are shown graphically in Figure 3. The ATR speeds are summarized in Table 1. The full ATR dataset is included in Appendix A.

Table 1 - Automatic Traffic Recorder (ATR) Volume Summary

Location	ADT[a]		Peak Hour Traffic			K Factor[e]
	Volumes (vpd)[b]	Directional Distribution[c]	Period	Volumes (vph)[d]	Directional Distribution[c]	
Ballardvale Street north of Salem Street	7,991	61% SB	Morning Afternoon	644 939	54% SB 69% SB	0.08 0.12
Middlesex Avenue south of Salem Street	12,533	55% SB	Morning Afternoon	902 1,172	67% SB 50% NB/SB	0.07 0.09
Route 62 north of High Street	17,779	55% SB	Morning Afternoon	1,308 1,494	54% NB 56% NB	0.07 0.08

[a]Average Daily Traffic; [b]Vehicles per day; [c]NB = Northbound, SB = Southbound [d]Vehicles per hour; [e]Proportion of daily traffic

Table 2 - Automatic Traffic Recorder (ATR) Speed Summary

ATR Location	2-Way Speed (MPH)		Directional Speed (MPH)		
	Average	85th Percentile	Direction	Average	85th Percentile
Ballardvale Street north of Salem Street	27	31	NB	28	29
			SB	30	32
Middlesex Avenue south of Salem Street	32	36	NB	34	34
			SB	34	36
Route 62 north of High Street	37	42	NB	40	40
			SB	38	40

TMC Data

PDI collected TMC data at the five study intersections on Thursday, October 24, 2024. TMC data was recorded from 8:00 AM to 10:00 AM and from 2:30 PM to 4:30 PM to capture the peak traffic hours during the school day. The counts included passenger vehicles, heavy vehicles, bicycles, and pedestrians.

The morning peak hour for the study area occurred from 8:00 AM to 9:00 AM and the afternoon vehicle peak hour occurred between 3:30 PM and 4:30 PM. However, the afternoon vehicle peak hour for the North Intermediate School driveway, which captures parents and buses entering and exiting the school for pick-up, occurred between 3:15 PM and 4:15 PM. Because of this, traffic volumes occurring between 3:15 PM and 4:15 PM were used for analysis purposes at the intersections of Ballardvale Street at Baland Road/School Driveway and Ballardvale Street at Salem Street to most accurately capture the traffic associated with the existing school during the afternoon peak hour. We used traffic volumes occurring between 3:30 PM and 4:30 PM to analyze the afternoon peak hour at all other study intersections.

Existing Queuing Observations

The Wilmington Department of Public Works (DPW) notes significant queuing issues southbound along Ballardvale Street through the Salem Street and Middlesex Avenue intersection Avenue intersection to the Route 62 and Middlesex Avenue/High Street intersection during morning commuting hours. The first ATR located at Ballardvale Street north of Salem Street captured northbound and southbound traffic in 15-minute increments. According to the ATR data the largest morning southbound 15-minute commuting spikes occurred at 7:00, 8:30, and 9:00 on Wednesday, October 23, 2024, and 7:30, 8:15, and 8:45 on Thursday, October 24, 2024. Notably, measured volumes were higher in the afternoon although the same issue was not noted by the DPW.

Queuing issues present before, during, and after the morning drop-off peak hour of the proposed development according to past DPW observations and the data collected for this study. Additional field observations and data collection would be required to analyze this existing queuing issue.

4.2 Seasonal Adjustment

Nitsch queried MassDOT traffic data for counts nearby that would establish a seasonal adjustment for the volumes we measured in November. No local data was available, so Nitsch used MassDOT's 2023 Weekday Seasonal Adjustment Factors, the most recent year of available data.

All study roadways fall in groups U4-U7 as Urban Minor Arterials, Urban Major Collectors, or Urban Local Roads. Counts within Groups U4-U7 collected during the month of October experience volumes that are 14% higher, respectively, than average counted volumes. To present a conservative approach, we did not seasonally adjust the counted volumes since it would result in lower traffic volumes. MassDOT's 2023 Weekday Seasonal Factors are included in Appendix B.

Figure 4 shows the 2024 existing peak-hour traffic volumes at the study intersections in the form of turning movements. The full TMC dataset is included in Appendix A. Figure 5 shows the 2024 existing peak hour pedestrian and bicycle volumes.

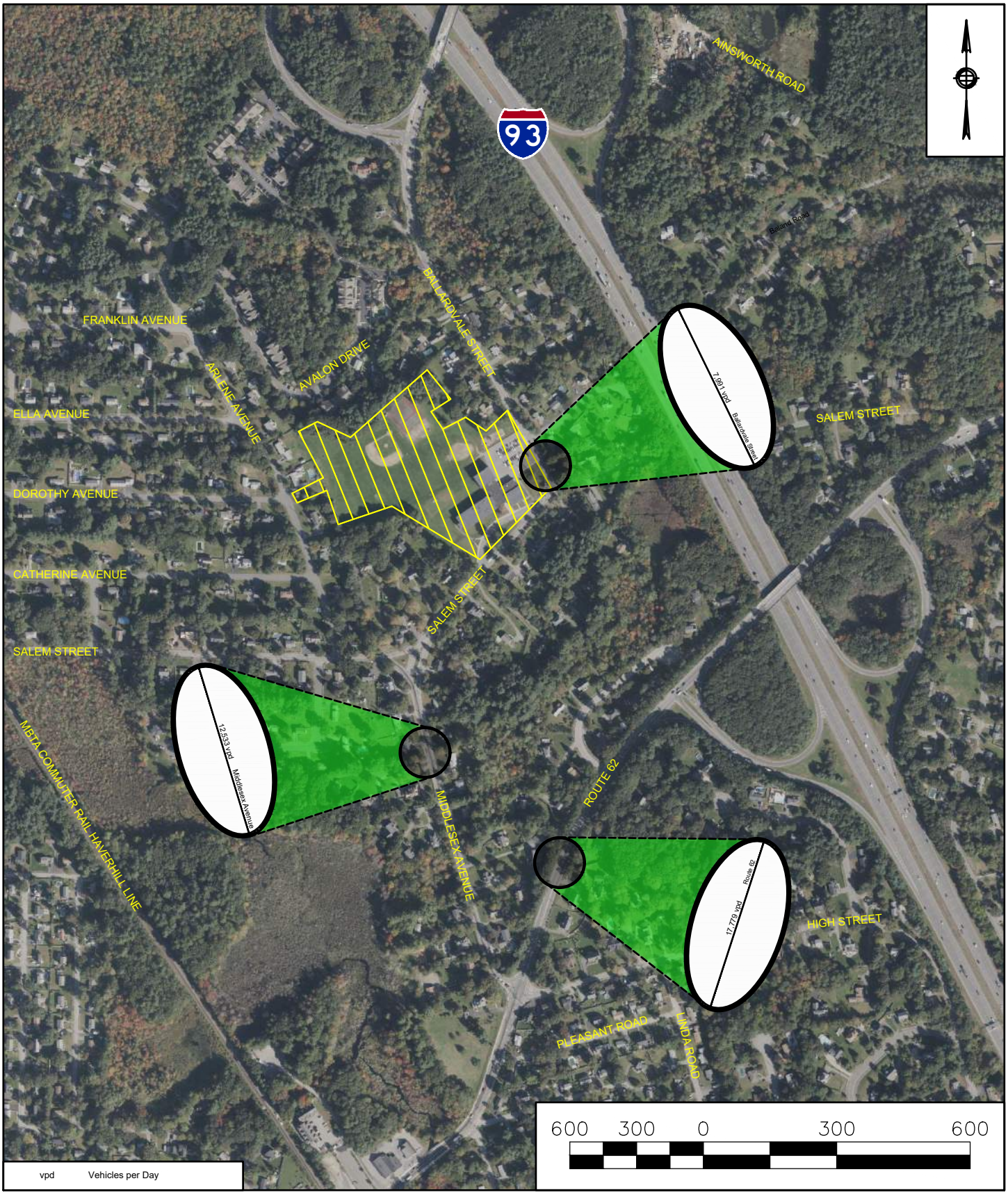

Figure 3 - 2024 Existing Weekday Daily Traffic Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

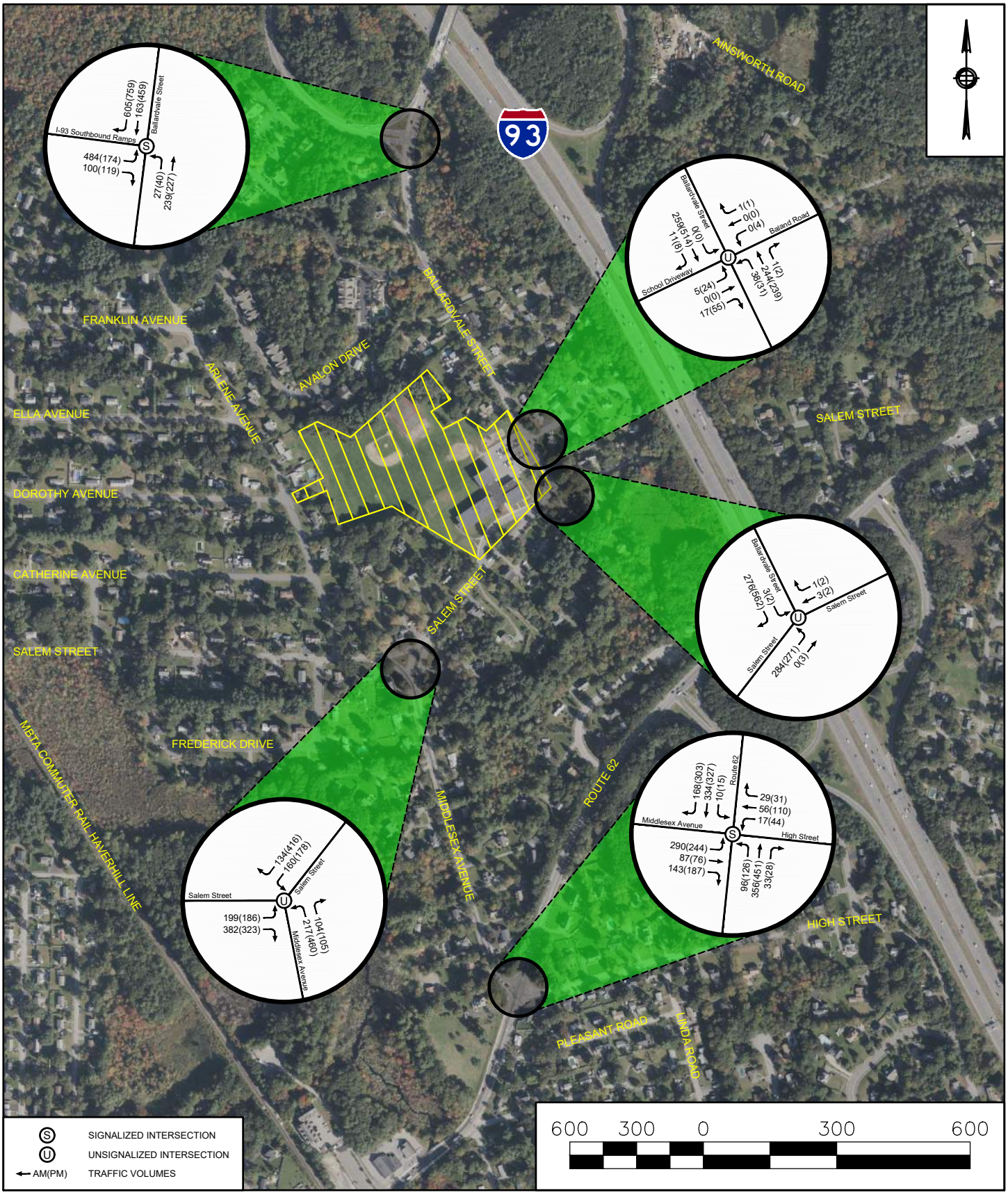

Figure 4 - 2024 Existing Weekday Peak Hour Traffic Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

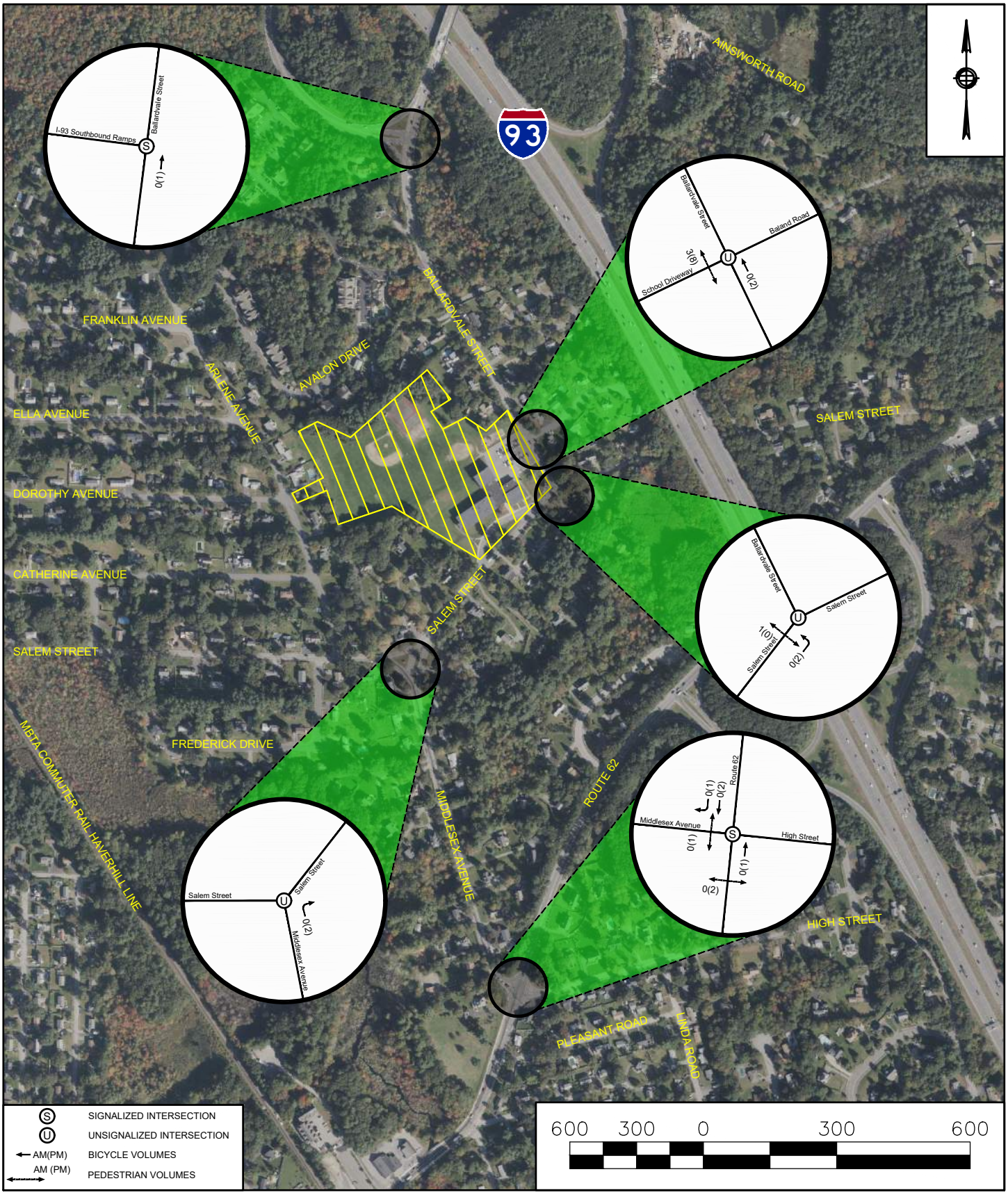

Figure 5 - 2024 Existing Weekday Peak Hour Pedestrian and Bicycle Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

5 Safety Analysis

5.1 Crash Data

We obtained crash data for the study intersections from MassDOT's IMPACT Crash Data Portal for the five most recent complete years of data, 2016-2020. Table 3 summarizes the crash statistics for the five study-area intersections.

A total of 45 crashes were reported within the study area from 2016 to 2020. Twenty-six crashes occurred at the intersection of Route 62 and Middlesex Avenue/High Street, nine crashes occurred at the intersection of Ballardvale Street and I-93 Southbound ramps, eight crashes occurred at the intersection of Salem Street and Middlesex Avenue, and two crashes occurred at the intersection of Ballardvale Street and Baland Road/School Driveway. No crashes occurred at the intersection of Ballardvale Street and Salem Street during the study period.

In terms of severity, eight crashes (18%) resulted in personal injury, and there were no crashes with fatalities. Rear-end crashes were the most frequent type of crash with a total of 26 crashes (58%), followed by angle crashes with 12 (27%), and single vehicle crashes with 4 (9%). One each crash (2% each) occurred of types head-on, same-direction sideswipe, and opposite-direction sideswipe. No crashes involved pedestrians or cyclists. Five crashes (11%) occurred during peak travel hours and seven crashes (16%) occurred during adverse weather or roadway conditions.

At the intersection of Route 62 and Middlesex Avenue/High Street, where 26 of the 45 (58%) crashes occurred, the most common crash type was rear-end, with 17 (65%). This is a common crash type at signalized intersections, and may be attributed to incorrectly timed clearance intervals, poor sight distance, stop-and-go traffic, high speeds, or roadway grades. Both minor street legs have limited stopping sight distance, with curved approaches near the intersection which may contribute to rear-end crashes. At the southbound approach, the speed limit is 45 mph, which can also contribute to rear-end crashes. While this intersection had the most crashes during the study period, only 3 (12%) resulted in personal injury.

Table 3 - Crash Statistics

Intersection	Ballardvale St at I-93 SB Ramps	Ballardvale St at Baland Rd/ School Driveway	Salem Street at Middlesex Ave	Route 62 at Middlesex Ave/ High St	Overall
Total Crashes	**9**	**2**	**8**	**26**	**45**
2016	1	0	2	6	***9***
2017	0	1	0	7	***8***
2018	1	1	2	4	***8***
2019	6	0	1	5	***12***
2020	1	0	3	4	***8***
Severity of Crash					
Property damage only (none injured)	5	1	8	23	***37***
Non-fatal injury	4	1	0	3	***8***
Fatal Injury	0	0	0	0	***0***
Unknown	0	0	0	0	***0***
Not Reported	0	0	0	0	***0***
Manner of Collision					
Angle	4	0	1	7	***12***
Rear-end	4	1	4	17	***26***
Sideswipe, same direction	1	0	0	0	***1***
Single vehicle crash	0	1	2	1	***4***
Sideswipe, opposite direction	0	0	0	1	***1***
Head-on	0	0	1	0	***1***
Involving Cyclists or Pedestrians					
Pedestrian	0	0	0	0	***0***
Cyclist	0	0	0	0	***0***
Percent Occurring During					
Peak Hours (7-9 AM, 4-6 PM)	11%	50%	13%	8%	***11%***
Adverse Weather/Roadway Conditions[a]	11%	0%	38%	12%	***16%***

[a] Rain, snow, sleet/hail/freezing rain/freezing drizzle, blowing sand/snow; Wet, icy, snowy, or slushy road surface

5.2 Intersection Crash Rates

The intersection crash rate is recognized as an effective tool to measure the safety of intersections. Crash rates for intersections are expressed by the number of crashes per million entering vehicles (MEV). Table 4 compares the crash rates for the study intersections with the Statewide and District 4 averages, as appropriate. The intersection crash rate calculations are included in Appendix C.

Table 4 - Crash Rate Summary

Location	Facility Type	Number of Crashes[a]	Crash Rate[b]	Average Rates[b,c]		Comparison to Average Rates	
				District 4	Statewide	District 5	Statewide
Ballardvale St at I-93 SB Ramps	Signalized Intersection	9	0.33	0.73	0.78	55% Lower	58% Lower
Ballardvale St at Baland Rd/ School Driveway	Unsignalized Intersection	2	0.14	0.57	0.57	57% Lower	57% Lower
Salem Street at Middlesex Ave	Unsignalized Intersection	8	0.25	0.57	0.57	68% Lower	68% Lower
Route 62 at Middlesex Ave/ High St	Signalized Intersection	26	0.62	0.73	0.78	16% Lower	21% Lower

[a] Based on 5-year crash history from MassDOT, 2016-2020
[b] Crashes per million entering vehicles (MEV),
[c] Based on the full set of MassDOT crash database entries as queried October 2024

Based on Table 4, crash rates at the five study intersections are all lower than both the district and statewide averages. No crashes occurred at the intersection of Ballardvale Street and Salem Street, so a crash rate was not calculated.

6 Future No-Build Traffic Conditions

Nitsch used the 2024 existing traffic volumes as the baseline for projecting traffic volumes to future 2031 No-Build conditions. To determine future 2031 conditions, the following steps are included:

- Project existing 2024 traffic volumes seven years in the future to the horizon year (2031) using an annual background traffic growth factor to account for regional growth;
- Add traffic volumes associated with any planned developments that may impact the study area;
- Include any planned roadway improvements that may affect traffic volumes; and
- Analyze the study area location to determine future traffic operations.

6.1 Background Growth

General economic shifts and population growth can drive increased traffic volumes in an area over time. Nitsch consulted with MassDOT's Office of Transportation Planning (OTP) to establish a background growth rate to apply to the seven-year planning horizon. Based on recent population trends and the current planning forecasts, OTP recommended an annual growth rate of 0.25 percent per year, which was applied to this study.

6.2 Additional Development

Nitsch contacted the Town of Wilmington's Planning Department to identify any planned developments that will potentially add traffic to the study area. The City identified four development projects that have the potential to impact traffic within the study area, and these projects are described below. The traffic assessments or studies received for these four projects are provided in Appendix D.

Nitsch also queried the MassDOT project information website to identify any planned roadway projects. There are no planned roadway projects in the study area.

181-187 Ballardvale Street

181-187 Ballardvale Street is an approximate 66,100 square-foot (sf) life science research and development building, to be located on the corner of Route 125 and Ballardvale Street, north of the study area. The site currently holds the Ballardvale Technology Center. The Traffic Memo provided by the Town for the project concludes that the project will have nominal impact to the intersection of Route 125 and Ballardvale Street and the intersection of Ballardvale Street and the I-93 Ramps. The trips shown in the Traffic Memo were distributed throughout the network and assigned to the study intersections accordingly.

800 Salem Street

A 237,880 sf warehouse building was recently constructed at 800 Salem Street, approximately 1.5 miles north of the intersection of Route 62 and Middlesex Avenue/High Street. At the time of this report, the building is not yet occupied, so the anticipated traffic from the development was not captured in the traffic counts. A traffic study was provided by the Town of Wilmington for this project and the additional trips estimated by the study were assigned to the intersection of Route 62 and Middlesex Avenue/High Street accordingly. No other study intersection is anticipated to be impacted by this development.

Jefferson Road Multifamily Development

A 108 unit residential development is approved to be located at the corner of Middlesex Avenue and Jefferson Road, approximately one-quarter mile south of the intersection of Route 62 and Middlesex Avenue/High Street. The traffic study received for this project identified the net vehicle trip generation during the weekday morning and weekday afternoon peak hours. We estimate that 50% of the new trips will travel north/south on Route 62 through the study intersection of Route 62 and Middlesex Avenue/High Street. The additional trips were assigned to the intersection accordingly.

Upton Park

Upton Park is a recently constructed office/warehouse development located at 36 and 38 Upton Drive, approximately 1.5 miles north of the project site. At the time of this report, the building is not yet occupied, so the anticipated traffic from the development was not captured in the traffic counts. The traffic study received for this project shows the anticipated new trips from this project at the study intersection of Ballardvale Street and I-93 Southbound ramps. These trips were distributed throughout the network and assigned to the study intersections accordingly.

6.3 2031 No-Build Traffic Volumes

We developed the 2031 No-Build volumes by applying annual growth rates for seven years to the 2024 Existing conditions volumes turning movements and then added the trips generated by the development projects described above. Figure 7 presents the peak hour traffic volumes for 2031 No-Build conditions.

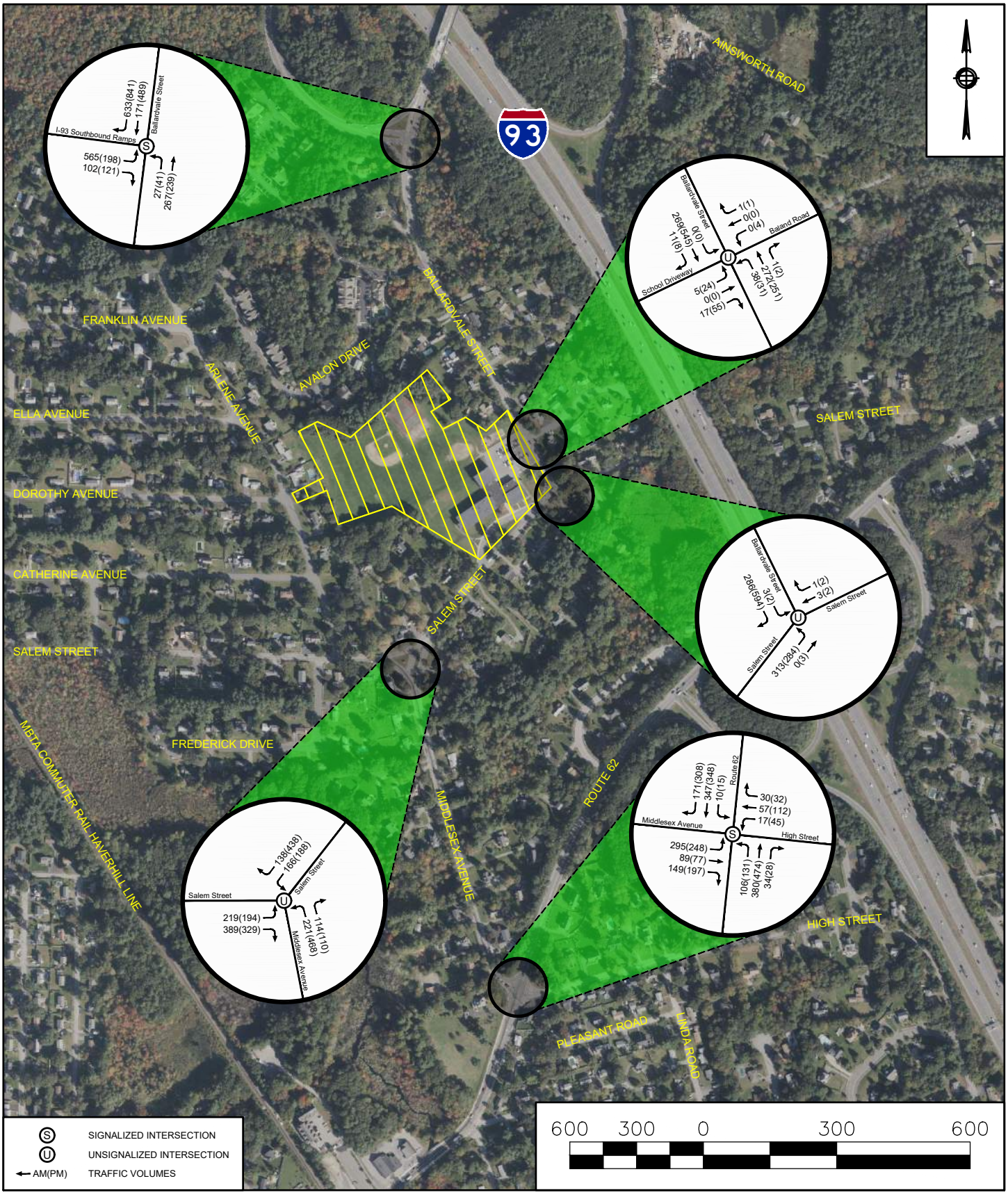

Figure 6 - 2031 No-Build Weekday Peak Hour Traffic Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

7 Proposed Future Conditions

7.1 Proposed Development

The existing school will be demolished and a new school will be constructed on the existing site. The new schoolhouse will have 3 stories and an approximate 163,573 square feet of gross floor area (gfa) to accommodate 855 students in Pre-K through 5th grade. The redeveloped building will consolidate three existing schools - the North Intermediate school located at the existing site, the Woburn Street school currently located at 227 Woburn Street, and the Wildwood Early Childhood Center formerly located at 182 Wildwood Street. Two different site layouts were considered during the design, each with their own circulation patterns which are described below. The site plans are provided in Appendix E.

Option A:

Option A provides two primary driveways for access and egress. The driveway at the southern end of the parcel (south driveway) will provide access and egress to and from Salem Street. This driveway will be located near the existing bus loop at the North Intermediate School and will be the designated entrance for visitors and parent-student drop-off and pick-up. The driveway to the east of the site (east driveway) will allow access and egress to and from Ballardvale Street, to be located just north of the existing school driveway. This will be the designated entrance and exit for buses, deliveries, and school staff. With this setup, buses and most passenger cars will have separate circulation routes that will minimize conflicts with each other and streamline the student arrival and dismissal patterns.

In addition to the two driveways, a proposed access road will be located west of the school leading to and from Arlene Avenue. This driveway will be designated for emergency access only.

The bus drop-off/pick-up will occur at the designated loading/unloading zone located at the northeast of the school. Buses will enter from Ballardvale Street and continue west around the school before utilizing the turn-around area at the northwest corner of the school and circling back to the east to stop at the loading/unloading zone. Parents will be directed to enter at the south driveway on Salem Street and drop-off/pick-up at the southeast corner of the school in the designated parent loop, exiting back onto Salem Street. Staff will park in the parking area east of the school accessed by both driveways.

Adjacent to Salem Street and Ballardvale Street, new sidewalks will be constructed as needed to tie into the pedestrian circulation within the site.

A total of 193 parking spaces will be provided on-site. Approximately 600 feet of queuing capacity (approximately 24 vehicles) is proposed on-site for parents, matching the existing amount of on-site queueing.

Option B:

Option B provides two primary driveways for access and egress at the same locations as Option A. However, the driveway at the southern end of the parcel (south driveway) will be the designated entrance and exit for buses and visitors. The east driveway will be the designated entrance and exit for parent-student drop-off and pick-up.

Buses will enter from Salem Street and park in the designated bus loop as they drop-off and pick-up students before circling around and exiting back out onto Salem Street. Parents will be directed to enter on Ballardvale Street near where the existing school entrance is located. They will continue west before utilizing the turn-around

area at the northwest corner of the school and circling back to the east to stop at the loading/unloading zone. The bus loop and driveway provides queuing space for 10 buses at a time and the parent loop provides over 1,700 feet of on-site queuing, enough for approximately 70 passenger vehicles at a time. This is expected to adequately accommodate the morning and afternoon demand due to the staggered arrival rates of parent vehicles.

Note: For the purposes of this traffic study, Option A was used as the preferred option and the analysis presented in this report reflects this driveway use. In follow-up meetings with the Town and discussions with the School Building Committee, Option B later emerged as the preferred alternative based on the additional queuing capacity. While the driveway uses are slightly different, the gross impacts to adjacent intersections under Option B will be the same as presented in the following sections of this study.

7.2 Proposed Trip Generation

Nitsch reviewed the Institute of Transportation Engineers' (ITE) publication *Trip Generation, 11th Edition* to estimate the vehicle trip rates for the existing and the proposed reconstructed school. ITE compiles studies based on similar land uses to establish average trip generation rates based on an independent variable.

Trip generation rates for the elementary school were based on Land Use Code (LUC) 520 (elementary school). The weekday morning drop-off and weekday afternoon pick-up trips are outlined in Table 5 and the ITE data is provided in Appendix F.

Table 5 - ITE Trip Generation

Time	Elementary School (LUC 520)	
	Existing with 250 Students	Redeveloped with 855 Students
Weekday Daily	568	1942
Entering	284	971
Exiting	284	971
Weekday Morning Peak	188	641
Entering	101	346
Exiting	87	295
Weekday Afternoon Peak	113	385
Entering	52	177
Exiting	61	208

Since the existing school driveway is used for staff and parent drop-off/pick-up, the actual number of peak-hour trips generated by the existing land use can be taken from the TMCs at the driveway. The existing land use serves 250 students, meaning the peak-hour trip generation for the proposed redevelopment serving 855 students can be extrapolated by multiplying the existing trip generation by a factor of 3.42, given in the equation:

$$\frac{Future\ Enrollment}{Current\ Enrollment} = \frac{855}{250} = 3.42$$

Table 6 shows the peak-hour trip generation based on the existing counts, the predicted trip generation for the redeveloped school, and the net increase.

Table 6 - Existing and Proposed Trip Generation (As Counted)

Time	Elementary School (LUC 520)		
	North Intermediate School		
	Existing with 250 Students	Redeveloped with 855 Students	Net Increase
Weekday Morning Peak	71	243	172
Entering	49	168	119
Exiting	22	75	53
Weekday Afternoon Peak	118	403	285
Entering	39	133	94
Exiting	79	270	191

As shown in Table 6, the proposed redeveloped School with 855 students would result in approximately 172 additional trips (119 trips in and 53 trips out) during the weekday morning drop-off time and 285 additional trips (94 trips in and 191 trips out) during the weekday afternoon pick-up time. Note that the weekday morning peak hour trips are lower than the ITE estimates, but the weekday afternoon peak hour trips are higher than the ITE estimates.

7.2.1 Bus Trips

Additionally, Nitsch reached out to the principal at the North Intermediate School for bus volumes. In the existing condition, 12 full-size buses are used for pick-up, and 10 full-size buses are used for drop-off. These buses currently serve both the Woburn Street school and North Intermediate School, dropping students off at North Intermediate in the morning before dropping off the remaining first through third graders at Woburn Street (and vice-versa in the afternoon). Since the proposed redevelopment consolidates these two schools, the bus volumes will remain the same as in the existing condition and buses will only need to stop at one school. Bus trips will have a separate distribution pattern than the trips described above, which will be referred to as Passenger Car Trips. Existing Wildwood Early Childhood Center bus trips were not considered separately and were consolidated with North Intermediate School and Woburn Street School routes to remain conservative with Passenger Car Trip distribution. Since the redeveloped school will serve the same catchment area as the existing school, there is expected to be minimal change to the school bus routes.

7.2.2 2031 No-Build (Without School) Traffic Volumes

Due to the relocation of the school driveways, the net trips cannot be directly applied to the existing traffic volumes. Before the new trips can be added into the network, all existing school trips must be removed from the network and then added back in heading to and from the proposed site driveways. We estimated the trip distribution for the existing North Intermediate school based on the school's catchment area (a process discussed in Section 7.3) and removed those trips from the network. Figure 7 shows the 2031 No-Build (Without School) Peak Hour traffic volumes.

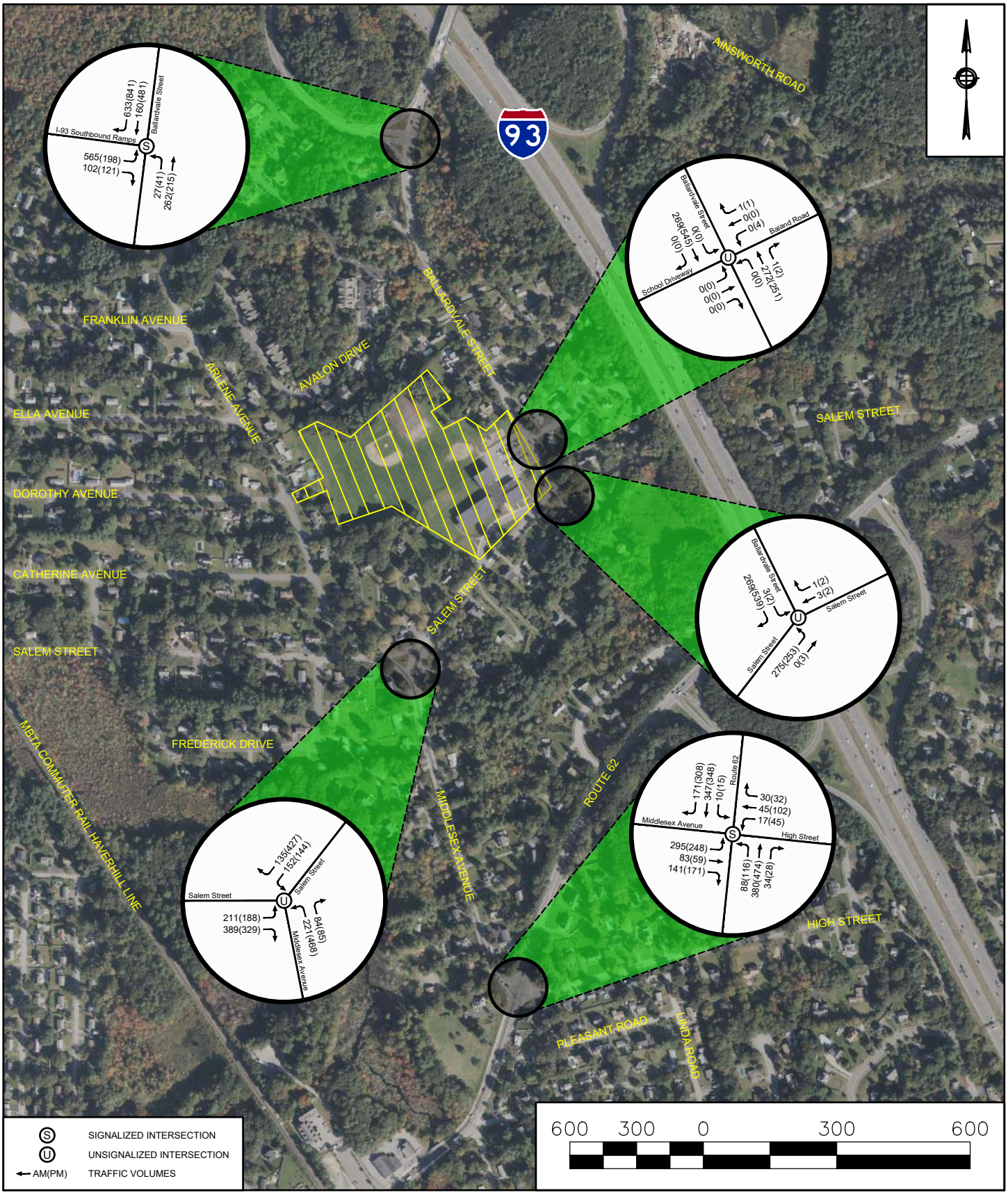

Figure 7 - 2031 No-Build (Without School) Weekday Peak Hour Traffic Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

7.3 Trip Distribution

The trips to/from the proposed school were distributed and assigned based on the logical travel routes through the existing roadway network within the town of Wilmington. Similar to trip generation, the distribution patterns were split between passenger car trips and bus trips.

Cropper GIS Consulting, LLC completed a Time and Distance Analysis for Wilmington Public Schools in 2023 as part of a long-range planning effort. To determine passenger car distributions, Nitsch used a map included in that analysis displaying the catchment area and student population density for the east school district, which the Wildwood, Woburn Street, and North Intermediate schools serve. Using this map, the catchment area was subdivided based on the most likely route to take to the school and a weight was assigned to it based on the student population density within the subdivision. These weights were then converted into percentages. The catchment map is provided in Appendix G. Table 7 shows the distribution of how passenger cars are predicted to enter and exit the network.

Table 7 - Passenger Car Distribution

Street and Direction	Distribution
Ballardvale Avenue, to/from the north	5%
Salem Street, to/from the west	15%
Middlesex Avenue to/from the southeast	50%
High Street, to/from the southwest	30%

These percentages were carried through the network based on the appropriate route the vehicles would take through the network. It is assumed all of these passenger cars will be entering and exiting through the south driveway on Salem Street. The passenger car trip distribution percentages are shown in Figure 8.

For the bus trips, a slightly different method was used. As discussed in section 7.2.1, the bus routes at the proposed school are not expected to change significantly from the routes at the existing school. As such, the existing school bus routes were converted into a distribution that was carried through the network. Table 8 shows the distribution of how buses are predicted to enter and exit the network.

Table 8 - Bus Distribution

Street and Direction	Distribution
Ballardvale Avenue, to/from the north	10%
Salem Street, to/from the west	20%
Middlesex Avenue to/from the southeast	50%
High Street, to/from the southwest	20%

It is assumed that all buses will enter and exit through the driveway on Ballardvale Street. The Bus Trip Distribution percentages are shown in Figure 9.

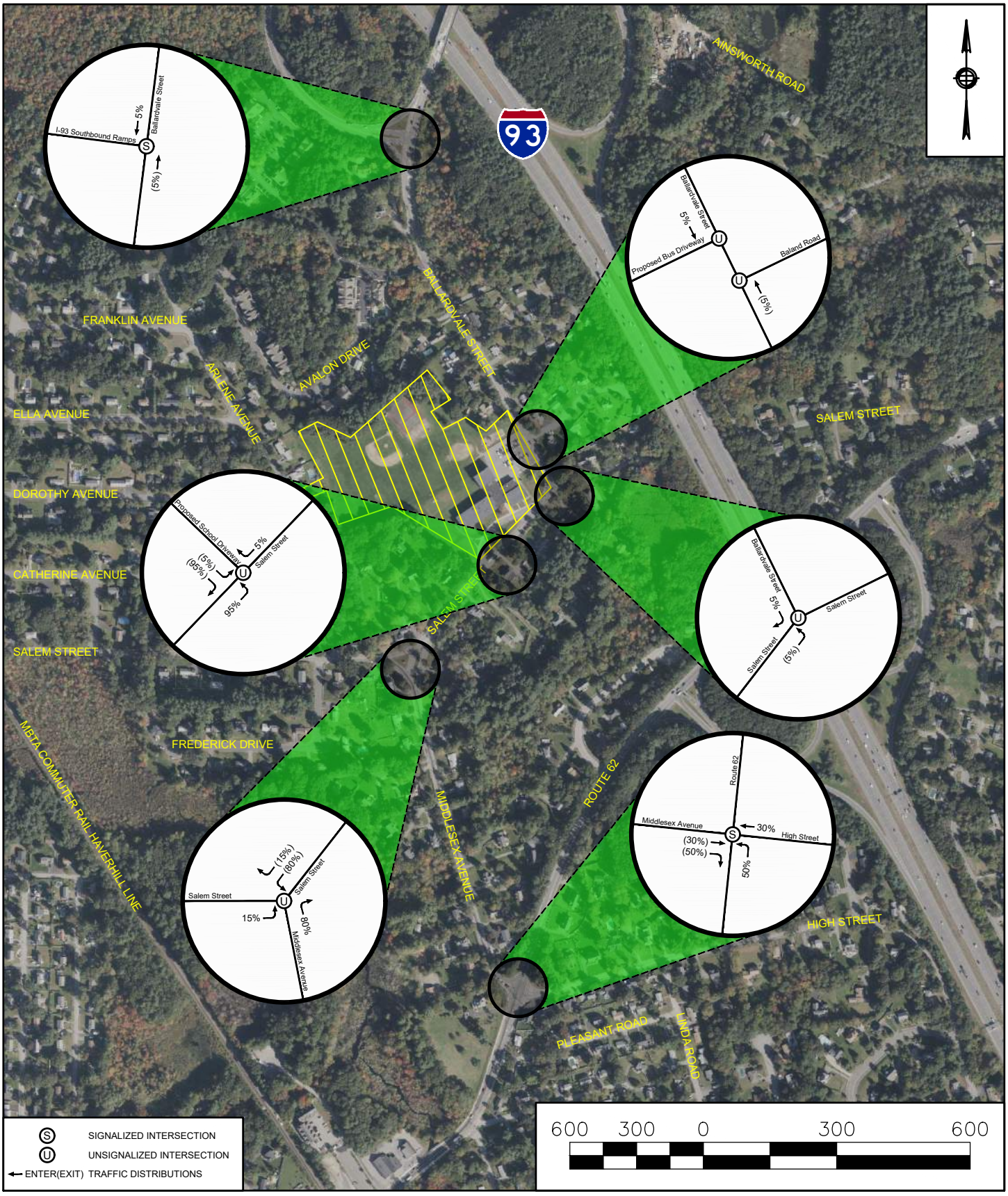

Figure 8 - Passenger Car Trip Distribution

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

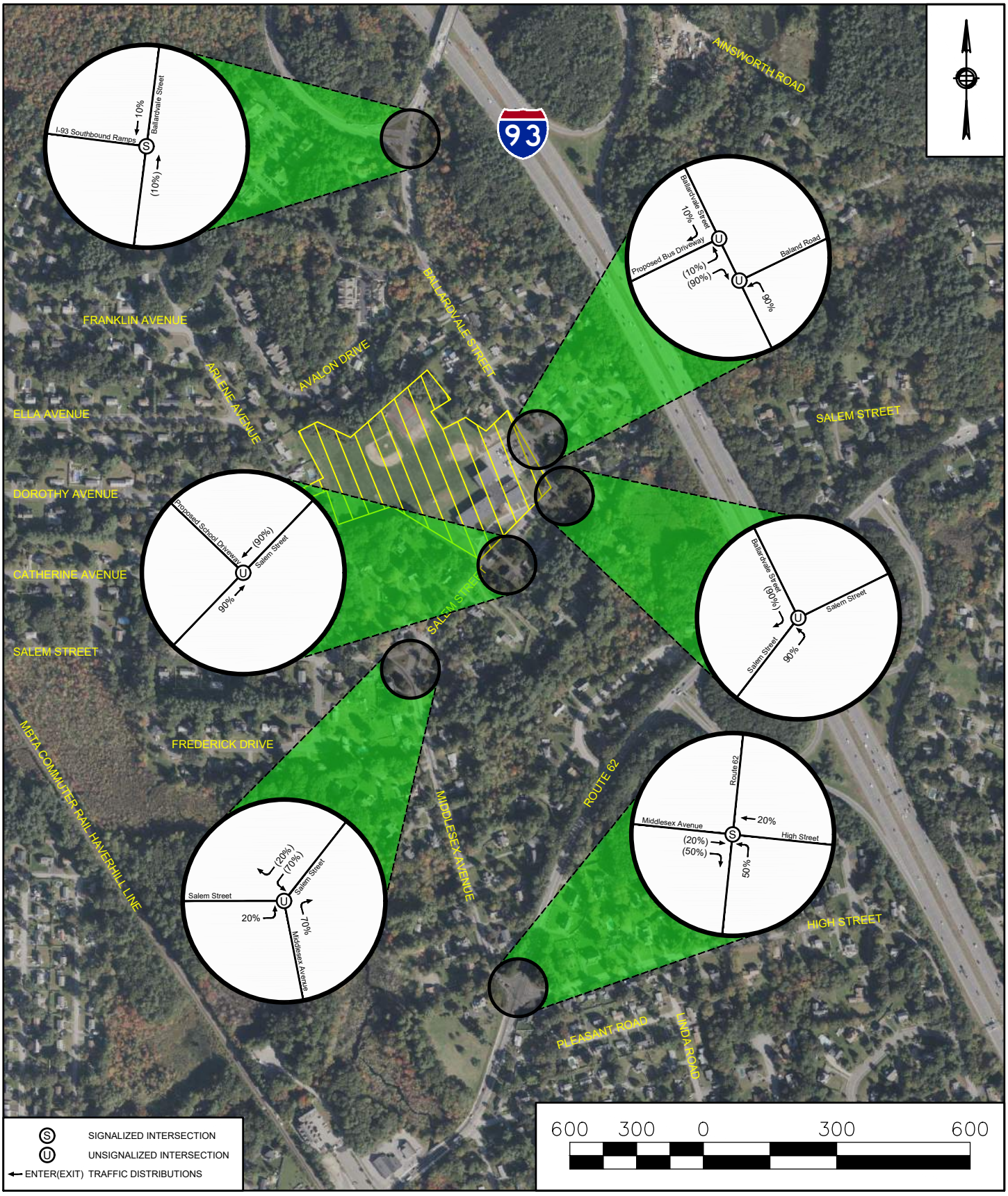

Figure 9 - Bus Trip Distribution

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

7.4 Mode Split and Assignment

To accurately determine the traffic impacts of the proposed school, alternative modes of transportation were considered in the trip assignment calculations. Since the school is located in a residential area, some students may walk to school. However, this is not expected to be a significant portion of the trips due to most students living outside of a 1/2 mile radius from the school. Based on information received from Wilmington Public Schools, approximately 5% of students (12 students) at the existing North Intermediate school walk to school, 65% take the bus, and the remaining 30% are picked up/dropped off by a parent or guardian.

The number of students walking to the proposed school is not expected to increase compared to existing, since the additional students the school serves will be younger and less likely to commute on foot. As discussed in earlier sections, the number of bus trips are not expected to increase since the current buses serve both the North Intermediate and Woburn Street schools. The passenger car trips, which were calculated based on the existing driveway counts, are expected to increase in proportion to the increase in number of students the school serves.

The peak hour trip generation includes the total amount of pre-kindergarten through fifth grade students (855) including all three schools. The specific mode split of the Wildwood Early Childhood Center was not indicated, therefore we proceeded using mode split information from the North Intermediate School principal. As the grades kindergarten through fifth grade are going to be the primary trip generation driver, it is deemed appropriate to maintain the existing mode split. Table 9 shows the project trips by mode for the proposed school.

Table 9 - Project Trips by Mode

Time	Mode		
	Walking Trips	Passenger Car Trips	Bus Trips
Weekday Morning Peak	24	243	24
Entering	12	168	12
Exiting	12	75	12
Weekday Afternoon Peak	24	403	20
Entering	12	133	10
Exiting	12	270	10

The passenger car and bus distributions were then applied to their respective trips shown in Table 9. The project trip assignment to the study intersections is shown in Figures 10, 11, 12, and 13.

7.5 Proposed 2031 Build Volumes

For the proposed school, the corresponding trip assignment volumes were added to the 2031 No-Build (Without School) Volumes that yield the 2031 Build Volumes. The 2031 Build Peak Hour Turning Movement Volumes are shown in Figure 14.

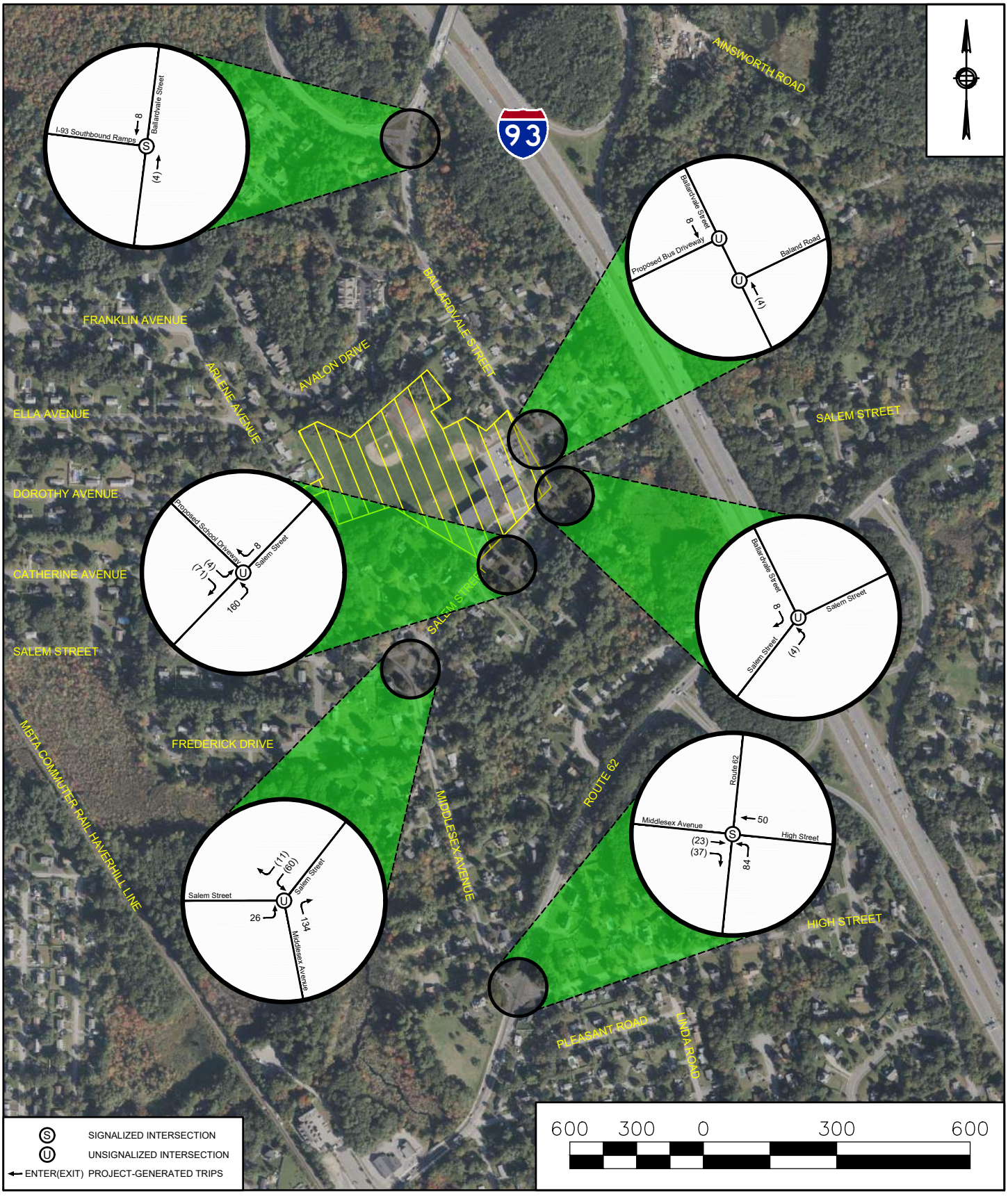

Figure 10 - AM Passenger Car Trip Assignment

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

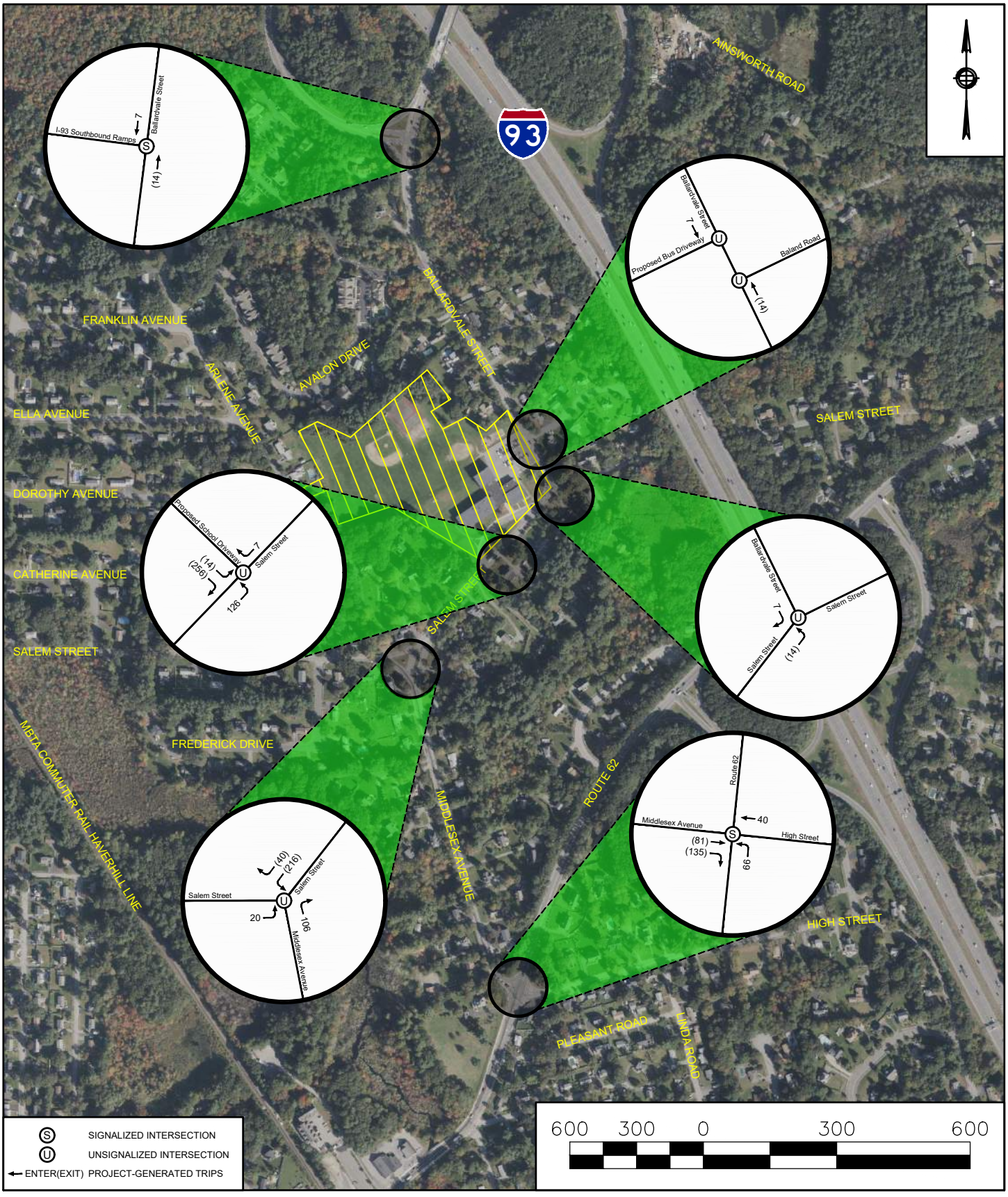

Figure 11 - PM Passenger Car Trip Assignment

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

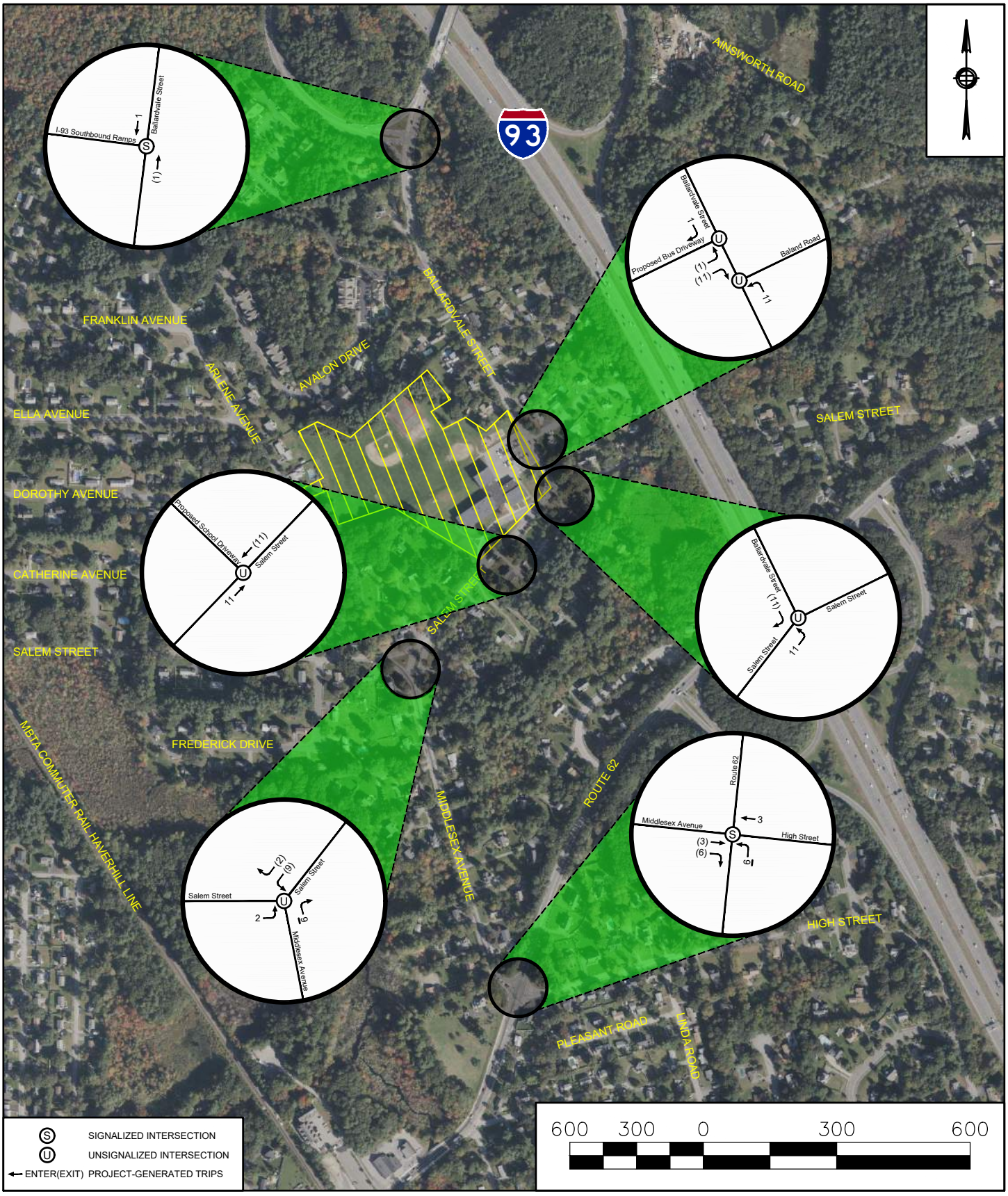

Figure 12 - AM Bus Trip Assignment

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

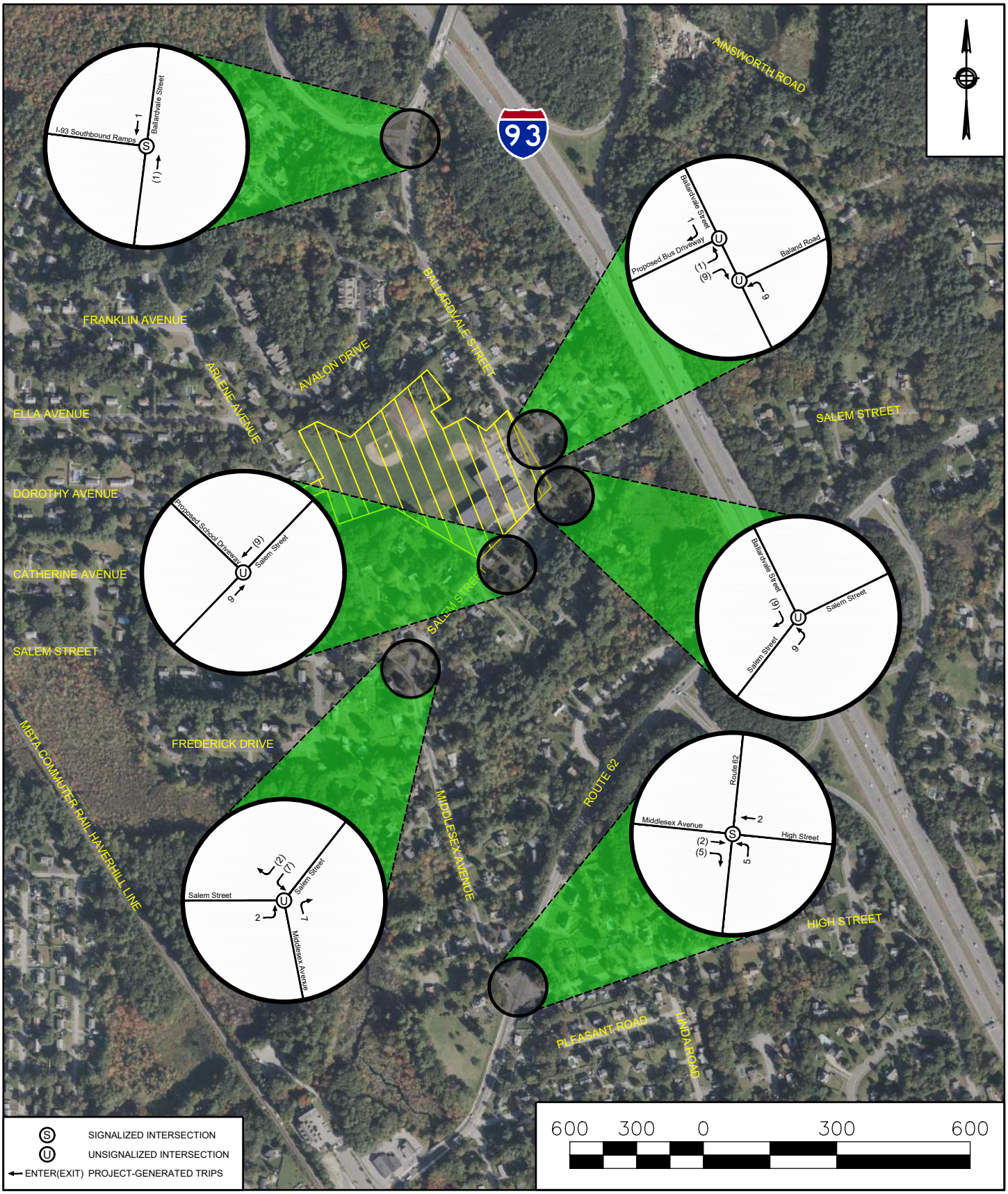

Figure 13 - PM Bus Trip Assignment

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

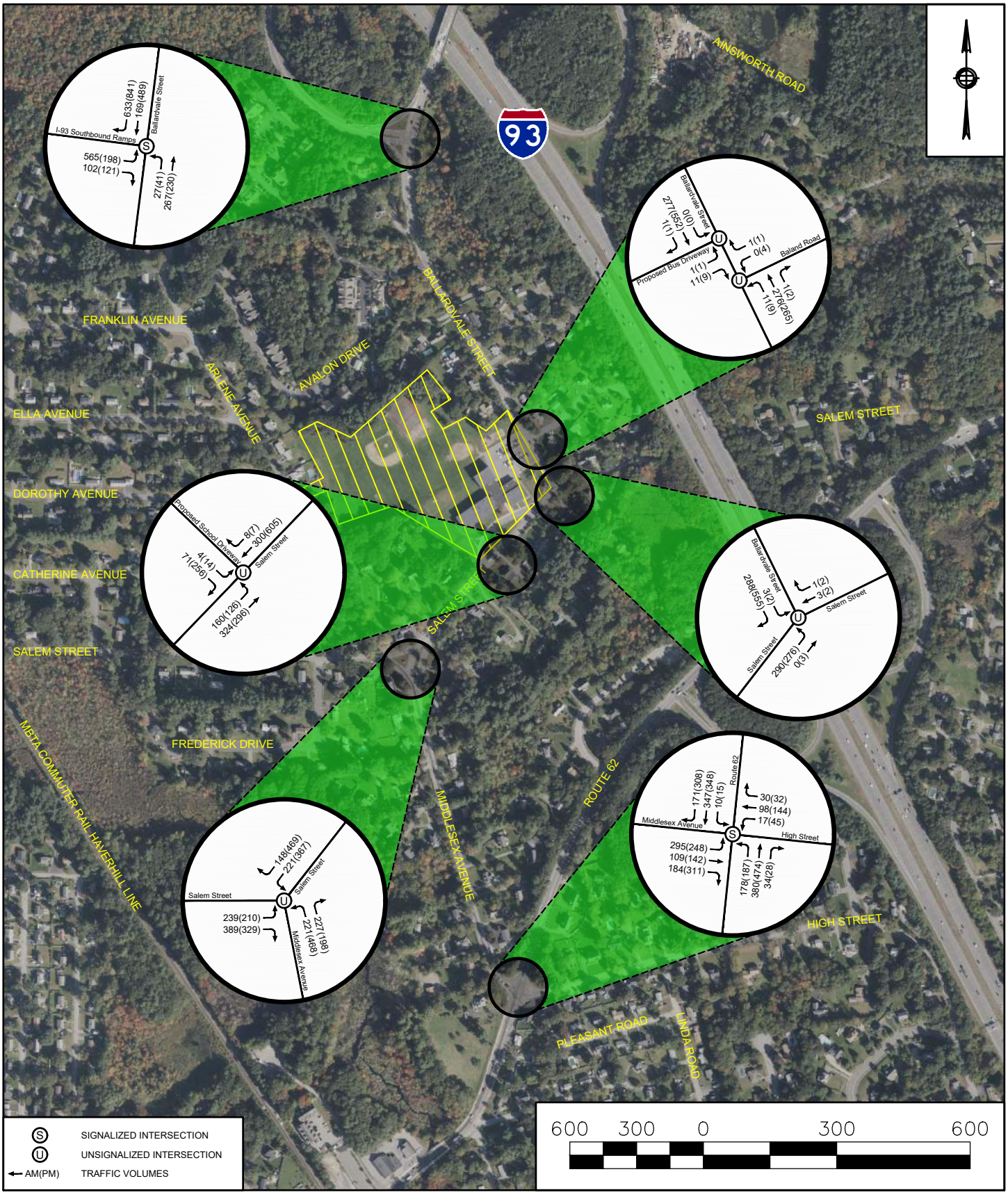

Figure 14 - 2031 Build Weekday Peak Hour Traffic Volumes

North Intermediate School
320 Salem Street
Wilmington, MA

Data Source: BingMaps
Nitsch Project #: 15428

Nitsch Engineering

7.6 Parking Generation and Adequacy

Nitsch used the Institute of Transportation Engineers' (ITE) publication *Parking Generation Manual, 6th Edition* to estimate the parking demand for the proposed development. Parking generation rates for the proposed school were based on Land Use Code (LUC) 520 (Elementary School). The calculated parking demand for the combined school with projected student population of 855 students is 120 spaces. The parking generation worksheet is provided in Appendix F.

As shown in Table 10, the 193 striped parking spaces exceed the 120 parking spaces recommended by ITE and thereby provide adequate capacity for the required parking demand.

Table 10 - Proposed Parking Summary

Parking Spaces Provided	ITE Parking Generation for LUC 520
193 Striped	120

8 Traffic Analysis

8.1 Evaluation Criteria

Traffic operations at intersections are evaluated using the performance measures of average vehicular delay, level of service (LOS), volume-to-capacity (v/c) ratio, and average and 95th percentile queue lengths.

LOS is a qualitative measure that describes operating conditions through letter designations, from A to F. It is defined for intersections in terms of average control delay per vehicle. LOS A indicates the most favorable condition, with minimum traffic delay. LOS F represents the worst condition where there is significant traffic delay. LOS D or better is typically considered desirable for peak-hour operation in urban and suburban settings. The delay designations for each LOS level differ slightly between signalized and unsignalized intersections due to driver expectations and behavior. Table 11 summarizes the LOS criteria for intersections as used in this analysis.

Table 11 - Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50
Source: HCM 6th Edition		

For signalized intersections, LOS is reported by lane group, by approach, and for the entire intersection. For unsignalized intersections, the analysis assumes that the traffic on the mainline is not affected by traffic on the side street. As such, an unsignalized intersection's LOS is generally reported for left-turns on the mainline and all side street movements, and an overall intersection LOS is not always determined.

The v/c ratio is a measure of congestion at an intersection approach. The capacity of a facility is the maximum hourly rate at which persons or vehicles can be expected to traverse a point or a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions. A v/c ratio below one indicates that the intersection approach has adequate capacity to serve the arriving traffic demand. A v/c ratio that approaches or exceeds 1.0 indicates traffic congestion or poor operating conditions. In that situation, vehicles arrive faster than they can be served, so queue lengths can theoretically grow indefinitely, which is the unstable condition.

Since arrival volumes fluctuate throughout the peak hour, queue lengths vary. The average (50th percentile) queue length represents the maximum back of queue on a typical cycle for a signalized intersection. Average queue lengths are not reported for unsignalized intersections. The 95th percentile queue, reported for both signalized and unsignalized intersections, occurs with 95th percentile traffic volumes, and its length commonly denotes the farthest extent of the vehicle queue.

8.2 Capacity Analyses

We performed capacity analyses for the study intersections under 2024 Existing conditions, 2031 No-Build conditions, and 2031 Build conditions during the weekday morning and afternoon peak hours using Trafficware's Synchro 11 software. Synchro uses, in part, the traffic operational analysis methodology of the Transportation Research Board's *Highway Capacity Manual* (HCM).[1] Since HCM 6th Edition does not support exclusive pedestrian phases, we generated the results of the capacity analyses using Synchro's Percentile Delay Method for delay, v/c ratio, and queue lengths, supported by HCM 2000 Edition methodology for unsignalized intersection analysis and Synchro's Lane, Volumes, and Timings for signalized intersection analysis. The Synchro output sheets for the capacity analyses are included in Appendix H.

8.2.1 2024 Existing Conditions Capacity Analysis

The first analysis evaluated traffic operations with 2024 existing traffic volumes under existing geometric conditions and signal timing/phasing. We derived peak hour factors (PHFs) and heavy vehicle percentages from the TMC data. We applied PHFs on an approach-by-approach basis, and we applied heavy vehicle percentages by lane group. Table 12 summarizes the capacity analysis results for the 2024 Existing conditions.

[1] *Highway Capacity Manual 6th Edition (HCM 6th)*, Transportation Research Board, Washington, D.C., 2016.

Table 12 - Capacity Analysis Summary: 2024 Existing Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Middlesex Avenue at Salem Street *[unsignalized]*	Salem St EB - L	0.13	6.6	A	-	11	1.21	140.5	F	-	534
	Middlesex Ave NB - L	0.26	7.7	A	-	26	0.90	45.7	E	-	268
	Overall	***-***	***5.3***	***A***	***-***	***-***	***-***	***58.6***	***F***	***-***	***-***
Salem Street at Ballardvale Street *[unsignalized]*	Salem St WB - LR	0.02	12.9	B	-	1	0.02	13.9	B	-	1
	Ballardvale St SB - L	0.00	0.1	A	-	0	0.00	0.0	A	-	0
	Overall	***-***	***0.2***	***A***	***-***	***-***	***-***	***0.1***	***A***	***-***	***-***
Ballardvale Street at School Driveway/ Baland Road *[unsignalized]*	School Driveway EB - LTR	0.14	12.1	B	-	12	0.42	22.4	C	-	51
	Baland Rd WB - LTR	0.01	9.9	A	-	0	0.04	25.3	D	-	3
	Ballardvale St NB - L	0.04	1.4	A	-	3	0.04	1.4	A	-	3
	Overall	***-***	***2.0***	***A***	***-***	***-***	***-***	***3.6***	***A***	***-***	***-***
Ballardvale Street at I-93 Southbound Ramps *[signalized]*	I-93 SB Ramp EB - L	0.25	8.1	A	72	117	0.30	19.6	B	16	61
	I-93 SB Ramp EB - R	0.06	0.1	A	0	0	0.07	0.1	A	0	0
	Ballardvale St NB - L	0.32	62.3	E	24	55	0.18	22.8	C	8	41
	Ballardvale St NB - T	0.79	57.1	E	203	259	0.29	6.7	A	33	61
	Ballardvale St SB - T	0.58	55.9	E	125	189	0.60	14.5	B	69	232
	Ballardvale St SB - R	0.37	0.6	A	0	0	0.49	1.0	A	0	0
	Overall	***0.76***	***18.5***	***B***	***-***	***-***	***0.60***	***7.5***	***A***	***-***	***-***
Route 62 at Middlesex Avenue/ High Street *[signalized]*	Middlesex Ave EB - LT	0.78	39.7	D	199	#695	0.85	46.8	D	160	#566
	Middlesex Ave EB - R	0.18	7.9	A	26	77	0.24	7.0	A	29	78
	High St WB - LT	0.18	24.9	C	40	97	0.37	26.5	C	65	193
	High St WB - R	0.07	5.0	A	0	0	0.06	3.3	A	0	4
	Middlesex Ave NB - L	0.59	60.3	E	63	164	0.59	50.7	D	64	178
	Middlesex Ave NB - TR	0.62	29.5	C	195	452	0.73	32.0	C	192	516
	Route 62 SB - L	0.15	61.2	E	7	33	0.17	53.1	D	7	37
	Route 62 SB - T	0.86	55.8	E	219	433	0.81	48.6	D	157	369
	Route 62 SB - R	0.40	15.6	B	35	110	0.57	12.9	B	28	138
	Overall	***0.81***	***34.8***	***C***	***-***	***-***	***0.85***	***32.1***	***C***	***-***	***-***

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

Under 2024 Existing conditions, the intersection of Middlesex Avenue and Salem Street operates overall at LOS A in the morning peak hour and LOS F in the afternoon peak hour. It is important to note that due to the atypical layout of this intersection, most modelling software and HCM methodology does not have the full capability to portray the actual operations of the intersection. However, the capacity issue shown in the weekday afternoon peak hour was confirmed in the field. Additionally, conversations with the DPW indicate the intersection experiences significant queues in the morning peak hour, primarily in the southbound direction, and operates below LOS A. Significant queues were observed for the northbound direction primarily in the afternoon peak hour.

Both the unsignalized intersections of Salem Street at Ballardvale Street and Ballardvale Street at School Driveway/Baland Road operate at LOS A during both peak hours in the existing condition. During the weekday afternoon peak hour, the Baland Road westbound movement operates at LOS D and the Driveway eastbound movement operates at LOS C. All other movements operate at LOS B or better.

The signalized intersection of Ballardvale Street at I-93 Southbound Ramps operates overall at LOS B during the weekday morning peak hour and LOS A during the weekday afternoon peak hour. The Ballardvale Street northbound left, northbound through, and southbound through movements operate at LOS E during the weekday morning peak hour. All other movements operate at LOS C or better during both peak hours and indicate no significant queueing.

The signalized intersection of Route 62 at Middlesex Avenue/High Street operates overall at LOS C during both peak hours. The Middlesex Avenue eastbound left/through movement operates at LOS D during both peak hours. According to conversations with the DPW, the Middlesex eastbound approaches may experience longer queues and a lower LOS than modeled. The 95th percentile volume exceeds capacity at this movement for both peak hours in the existing condition. The Middlesex Avenue northbound left and Route 62 southbound left turn movements both operate at LOS E during the weekday morning peak hour and LOS D during the weekday afternoon peak hour. The Route 62 southbound through movement operates at LOS E during the morning peak hour and D in the afternoon peak hour, and all other movements operate at LOS C or better.

8.2.2 2031 No-Build Conditions Capacity Analysis

Under future No-Build conditions, we kept lane geometry, traffic control, and signal timing parameters the same as existing and applied the future volumes determined in Section 6.3 with the same heavy vehicle percentages and PHFs as existing. Table 13 summarizes the analysis results for 2031 No-Build conditions.

Table 13 - Capacity Analysis Summary: 2031 No-Build Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Middlesex Avenue at Salem Street *[unsignalized]*	Salem St EB - L	0.13	6.7	A	-	11	4.71	*Err*	F	-	*Err*
	Middlesex Ave NB - L	0.27	7.7	A	-	27	0.97	61.9	F	-	323
	Overall	***-***	***5.4***	***A***	***-***	***-***	***-***	***3063.7***	***F***	***-***	***-***
Salem Street at Ballardvale Street *[unsignalized]*	Salem St WB - LR	0.02	13.4	B	-	1	0.02	14.5	B	-	2
	Ballardvale St SB - L	0.00	0.1	A	-	0	0.00	0.0	A	-	0
	Overall	***-***	***0.2***	***A***	***-***	***-***	***-***	***0.1***	***A***	***-***	***-***
Ballardvale Street at School Driveway/ Baland Road *[unsignalized]*	School Driveway EB - LTR	0.14	12.4	B	-	12	0.45	24.4	C	-	57
	Baland Rd WB - LTR	0.01	10.2	B	-	0	0.05	27.3	D	-	4
	Ballardvale St NB - L	0.04	1.3	A	-	3	0.04	1.4	A	-	3
	Overall	***-***	***2.0***	***A***	***-***	***-***	***-***	***3.8***	***A***	***-***	***-***
Ballardvale Street at I-93 Southbound Ramps *[signalized]*	I-93 SB Ramp EB - L	0.29	8.9	A	89	144	0.36	22.0	C	30	70
	I-93 SB Ramp EB - R	0.06	0.1	A	0	0	0.07	0.1	A	0	0
	Ballardvale St NB - L	0.32	62.3	E	24	55	0.19	25.3	C	13	43
	Ballardvale St NB - T	0.81	59.5	E	231	287	0.29	6.4	A	35	66
	Ballardvale St SB - T	0.57	54.1	D	131	195	0.67	17.3	B	140	258
	Ballardvale St SB - R	0.39	0.7	A	0	0	0.54	1.2	A	0	0
	Overall	***0.81***	***19.1***	***B***	***-***	***-***	***0.67***	***8.5***	***A***	***-***	***-***
Route 62 at Middlesex Avenue/ High Street *[signalized]*	Middlesex Ave EB - LT	0.81	43.5	D	217	#740	0.90	54.2	E	174	#599
	Middlesex Ave EB - R	0.18	8.4	A	28	83	0.26	7.5	A	33	87
	High St WB - LT	0.19	26.5	C	43	101	0.40	28.4	C	70	203
	High St WB - R	0.07	5.3	A	0	0	0.06	3.8	A	0	5
	Middlesex Ave NB - L	0.62	62.2	E	72	182	0.60	52.0	D	68	187
	Middlesex Ave NB - TR	0.64	29.5	C	212	486	0.73	31.8	C	204	546
	Route 62 SB - L	0.15	63.0	E	7	34	0.17	54.8	D	7	38
	Route 62 SB - T	0.86	55.4	E	234	457	0.82	48.9	D	172	398
	Route 62 SB - R	0.40	16.1	B	38	117	0.58	13.9	B	36	153
	Overall	***0.86***	***36.2***	***D***	***-***	***-***	***0.90***	***33.9***	***C***	***-***	***-***

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles
Err Volume significantly exceeds capacity

Under 2031 No-Build conditions, the intersection of Middlesex Avenue and Salem Street continues to operate overall at LOS A in the morning peak hour and LOS F in the afternoon peak hour. The capacity issues shown in the existing conditions analysis and observed in the field are expected to get slightly worse in the no-build condition.

Both the unsignalized intersections of Salem Street at Ballardvale Street and Ballardvale Street at School Driveway/Baland Road continue to operate at LOS A during both peak hours in the no-build condition. During the

weekday afternoon peak hour, the Baland Road westbound movement operates at LOS D and the Driveway eastbound movement operates at LOS C. All other movements continue to operate at LOS B or better.

Under 2031 No-Build conditions, the intersection of Ballardvale Street at I-93 Southbound Ramps continues to operate overall at LOS B during the weekday morning peak hour and LOS A during the weekday afternoon peak hour. The Ballardvale Street northbound left movement and northbound through movement both operate at LOS E during the weekday morning peak hour. The Ballardvale Street southbound through movement continues to operate at LOS D during the weekday morning peak hour, with all other movements operating at LOS C or better during both peak hours and no significant queueing. There are slight increases in delay at each movement due to the expected increase in vehicle traffic but no anticipated capacity issues.

The signalized intersection of Route 62 at Middlesex Avenue/High Street degrades from LOS C overall to LOS D overall during the weekday morning peak hour. The Middlesex Avenue eastbound left/through movement degrades from LOS D to LOS E during the weekday afternoon peak hour. The Middlesex Avenue northbound left and Route 62 southbound left turn and southbound through movements both operate at LOS E during the weekday morning peak hour and LOS D during the weekday afternoon peak hour. All other movements operate at LOS C or better.

8.2.3 2031 Build Conditions Capacity Analysis

We performed capacity analyses for the proposed Build conditions for the additional traffic generated by the proposed school. Under these future Build conditions, we kept lane geometry, traffic control, and signal timing parameters the same as existing for intersections, with the exception of the intersection of Ballardvale Street and Baland Road, where the existing school driveway leg will be removed. We applied the future volumes determined in Section 7.5 with the same heavy vehicle percentages and PHFs as existing. We also included the two new intersections with access driveways for the proposed school: Salem Street at Proposed School Driveway and Ballardvale Street at Proposed Bus Driveway. Table 14 summarizes the analysis results for the 2031 Build conditions.

Table 14 - Capacity Analysis Summary: 2031 Build Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Middlesex Avenue at Salem Street *[unsignalized]*	Salem St EB - L	0.17	6.9	A	-	15	Err	Err	F	-	Err
	Middlesex Ave NB - L	0.30	7.5	A	-	32	1.44	242.1	F	-	658
	Overall	***-***	***5.4***	***A***	***-***	***-***	***-***	***Err***	***F***	***-***	***-***
Salem Street at Ballardvale Street *[unsignalized]*	Salem St WB - LR	0.02	13.1	B	-	1	0.02	13.9	B	-	1
	Ballardvale St SB - L	0.00	0.1	A	-	0	0.00	0.0	A	-	0
	Overall	***-***	***0.2***	***A***	***-***	***-***	***-***	***0.1***	***A***	***-***	***-***
Ballardvale Street at School Driveway/ Baland Road *[unsignalized]*	Baland Rd WB - R	0.01	10.2	B	-	0	0.02	16.4	C	-	2
	Overall	***-***	***0.1***	***A***	***-***	***-***	***-***	***0.1***	***A***	***-***	***-***
Ballardvale Street at I-93 Southbound Ramps *[signalized]*	I-93 SB Ramp EB - L	0.29	8.9	A	89	144	0.36	22	C	30	70
	I-93 SB Ramp EB - R	0.06	0.1	A	0	0	0.07	0.1	A	0	0
	Ballardvale St NB - L	0.32	62.3	E	24	55	0.19	25.3	C	13	43
	Ballardvale St NB - T	0.81	59.7	E	231	287	0.28	6.4	A	33	64
	Ballardvale St SB - T	0.57	54.0	D	129	193	0.67	17.3	B	140	258
	Ballardvale St SB - R	0.39	0.7	A	0	0	0.54	1.2	A	0	0
	Overall	***0.81***	***19.1***	***B***	***-***	***-***	***0.67***	***8.5***	***A***	***-***	***-***
Route 62 at Middlesex Avenue/ High Street *[signalized]*	Middlesex Ave EB - LT	1.04	90.5	F	~307	#909	1.2	142.9	F	~304	#822
	Middlesex Ave EB - R	0.22	8.6	A	40	102	0.4	9.2	A	64	156
	High St WB - LT	0.34	32.9	C	84	166	0.62	37.7	D	105	#319
	High St WB - R	0.07	5.7	A	0	0	0.06	4.0	A	0	5
	Middlesex Ave NB - L	0.75	65.3	E	131	291	0.71	55.2	E	103	265
	Middlesex Ave NB - TR	0.61	28.6	C	212	480	0.68	28.7	C	204	540
	Route 62 SB - L	0.16	68.8	E	8	36	0.18	58.7	E	8	40
	Route 62 SB - T	0.87	60.1	E	257	502	0.81	50.5	D	183	425
	Route 62 SB - R	0.4	17.7	B	42	128	0.57	14.4	B	38	162
	Overall	***1.04***	***47.9***	***D***	***-***	***-***	***1.2***	***50.7***	***D***	***-***	***-***
Salem Street at South Driveway *[unsignalized]*	Salem St EB - L	0.17	4.1	A	-	15	0.16	4.3	A	-	15
	South Driveway SB - LR	0.13	11.6	B	-	11	0.71	32.8	D	-	136
	Overall	***-***	***3.4***	***A***	***-***	***-***	***-***	***8.0***	***A***	***-***	***-***
Ballardvale Street at East Driveway *[unsignalized]*	East Driveway EB - LR	0.03	12.2	B	-	2	0.04	17.0	C	-	3
	Ballardvale St NB - L	0.02	0.6	A	-	1	0.02	0.6	A	-	1
	Overall	***-***	***0.5***	***A***	***-***	***-***	***-***	***0.4***	***A***	***-***	***-***

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles
Err Volume significantly exceeds capacity

Under 2031 Build conditions, operations at the intersection of Middlesex Avenue and Salem Street are expected to further degrade due to the significant increase in trips traveling north and south through the intersection. The modeling software shows a capacity error in place of calculating a v/c ratio or delay values, further demonstrating the limitations of the software and HCM methodology at this non-traditional intersection.

Both the unsignalized intersections of Salem Street at Ballardvale Street and Ballardvale Street at Baland Road continue to operate at LOS A during both peak hours in the build condition, indicating no operational issues. Operations at the intersection of Ballardvale Street and Baland Road improve slightly due to the absence of the existing school driveway leg.

Under Build conditions, the intersection of Ballardvale Street at I-93 Southbound Ramps continues to operate overall at LOS B during the weekday morning peak hour and LOS A during the weekday afternoon peak hour. The Ballardvale Street northbound left movement and northbound through movement both operate at LOS E during the weekday morning peak hour. The Ballardvale Street southbound through movement continues to operate at LOS D during the weekday morning peak hour, with all other movements operating at LOS C or better during both peak hours and no significant queueing. The proposed school adds very few trips to the intersection and consequently has little to no impact on delay for each movement.

The signalized intersection of Route 62 at Middlesex Avenue/High Street degrades from LOS C to LOS D overall during the weekday afternoon peak hour. The Middlesex Avenue eastbound left/through movement degrades to LOS F during both peak hours. The Route 62 southbound left movement degrades from LOS D to LOS E during the weekday afternoon peak hour. The High Street westbound throughleft movement degrades from LOS C to LOS D during the weekday afternoon peak hour. All other movements operate at LOS C or better.

The two proposed intersections at the proposed school's driveway each operate overall at LOS A. The southbound movement at the south driveway onto Salem Street operates at LOS D during the weekday afternoon peak hour, which is typical during the busy dismissal period at a large school. Any queuing at this intersection will occur onsite, with no spillover to the surrounding local roadways.

This Build condition analysis indicates no issues at either proposed site driveway. However, existing capacity issues present at the intersection of Salem Street at Middlesex Avenue and Route 62 at Middlesex Avenue/High Street are expected to worsen under the proposed Build condition.

8.2.4 2031 Build Conditions (With Mitigation) Capacity Analysis

The 2031 Build Conditions capacity analysis indicated a capacity issue at the signalized intersection of Route 62 at Middlesex Avenue/High Street and at the unsignalized intersection of Salem Street at Middlesex Avenue during both peak hours. At the intersection of Salem Street at Middlesex Avenue, the 2024 Existing Conditions analysis shows that the capacity issue is a pre-existing condition and is not caused by additional traffic generated by the school so mitigation will not be included in this project.

Using 2031 Build Conditions volume inputs, we analyzed the intersection of Route 62 at Middlesex Avenue/High Street under a mitigated scenario using signal retiming. Signal retiming is a cost-effective way to reduce congestion and delays. This scenario keeps the existing geometry and phasing but adjusts phase splits and cycle length. Table 15 shows the 2031 Build Conditions (With Mitigation).

Table 15 - Capacity Analysis Summary: 2031 Build Conditions (With Mitigation)

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Route 62 at Middlesex Avenue/ High Street *[signalized]*	Middlesex Ave EB - LT	1.01	75.3	E	259	#624	1.00	71.4	E	260	#579
	Middlesex Ave EB - R	0.22	6.0	A	30	53	0.38	6.2	A	51	74
	High St WB - LT	0.32	23.9	C	72	113	0.46	24.6	C	97	190
	High St WB - R	0.07	0.2	A	0	0	0.05	0.1	A	0	0
	Middlesex Ave NB - L	0.85	73.2	E	120	#310	0.87	76.7	E	117	#320
	Middlesex Ave NB - TR	0.63	29.1	C	198	#531	0.75	35.9	D	251	#701
	Route 62 SB - L	0.17	55.5	E	7	29	0.23	58.2	E	9	35
	Route 62 SB - T	0.92	64.1	E	233	#513	0.91	66.7	E	207	#508
	Route 62 SB - R	0.40	13.1	B	24	92	0.59	13.3	B	28	138
	Overall	***1.01***	***44.7***	***D***	***-***	***-***	***1.00***	***41.2***	***D***	***-***	***-***

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

As shown above, the optimized signal timing at the intersection of Route 62 at Middlesex Avenue/High Street indicates an improvement in operations compared to the 2031 Build Conditions. During the weekday morning peak hour, the intersection remains overall at LOS D, with delay reduced by three seconds. The Middlesex Avenue eastbound shared left/through movement improves from LOS F to LOS E, with delay reduced by 15 seconds. All other movements remain at the same LOS as in the 2031 Build Conditions.

During the weekday afternoon peak hour, the intersection remains overall at LOS D, with delay reduced by nine seconds. The Middlesex Avenue eastbound shared left/though movement improves from LOS F to LOS E, with a significant decrease in delay. The High Street westbound left/though movement improves from LOS D to LOS C, with delay reduced by 13 seconds. All other movements operate at LOS E or better.

The analysis suggests that potential capacity issues from the increased trips due to the proposed development can be mitigated at the intersection of Route 62 and Middlesex Avenue/High Street through signal retiming.

9 Sight Distance

Stopping Sight Distance (SSD) is the length of the roadway ahead that is visible to the driver and should be long enough to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path. Stopping sight distance is the sum of the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied, and the distance needed to stop the vehicle from the instant brake application begins.

According to Case B1 in Section 9 from *AASHTO: A Policy on Geometric Design of Highways and Streets 6th edition*, Intersection Sight Distance (ISD) is the recommended length of the leg of the departure sight triangle along the major road in both directions for a vehicle stopped on the minor road waiting to depart that would cause a vehicle on the major roadway to slow down to 70% of its speed. The critical departure sight triangles for the Site Driveway(s) at Ballardvale Street and Salem Street are for traffic approaching from either the left or right. The SSD and ISD values associated with a given design speed are shown in Table 16.

Table 16 – Sight Distance Criteria

Design Speed (mph)	Design Stopping Sight Distance[1] (feet)	Recommended Intersection Sight Distance[2] (feet)
15	80	170
20	115	225
25	155	280
30	200	335
35	250	390
40	305	445
45	360	500
50	425	555
55	495	610
60	570	665
65	645	720
70	730	775
75	820	830
80	910	885

Source: *A Policy on Geometric Design of Highways and Streets, AASHTO, Washington DC (2011)*

[1]Design value based on a grade of less than 3%, a brake reaction distance predicted on a time of 2.5 seconds and a deceleration rate of 11.2 feet per second squared

[2]Recommended value based on Case B1 - a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less

Standard practice is to use the 85th percentile speed or 5 MPH over the posted speed limit as the design speed. The posted speed limit for Ballardvale Street and Salem Street is 25 mph. Just north of the intersection of Ballardvale Stret and Salem Street, there is a 20 mph posted speed limit for the southbound direction. However, a posted speed limit of 25 mph was assumed for sight distance purposes to be conservative. According to their respective speed limit, the sight distances were selected for comparison between the site-measured and the

calculated. For both streets, sight distance was measured at approximately 10 feet from the edge of pavement based on observed driving behavior. Table 17 summarizes the sight distance evaluation.

Table 17 – Sight Distance Evaluation

Intersecting Street	Stopping Sight Distance (SSD)			Intersection Sight Distance (ISD)		
	Traveling	Calculated	Measured	Looking	Calculated	Measured
Ballardvale Street and Proposed Bus Driveway	NB	200’	375’	Left	335’	>500’
	SB	200’	> 500’	Right	335’	375’
Salem Street and Proposed School Driveway	EB	200’	> 500’	Left	335’	425’
	WB	200’	425’	Right	335’	350’

As shown in Table 17, the geometries of the adjacent roadways provide ample sight distance. The SSD is adequate for both the northbound and southbound traffic on Ballardvale Street and the eastbound and westbound traffic on Salem Street, and the ISD is also adequate for vehicles exiting the Site Driveways onto Ballardvale Street and Salem Street.

10 Conclusions and Recommendations

10.1 Conclusions

Nitsch has prepared this Traffic Impact Study (TIS) for the proposed redevelopment of the North Intermediate school at 320 Salem Street in Wilmington, MA.

We studied five existing intersections, two signalized and three unsignalized, to establish the impact the proposed school would have on intersection traffic operations.

The crash data over the last five years available from MassDOT indicates that all five study intersections have crash rates below the District 4 and statewide averages. No fatalities occurred amongst the crashes identified.

For future conditions, we projected the existing traffic volumes within the study area over a 7-year period to the horizon year 2031 using an annual growth rate of 0.25%, based on expected regional growth and added vehicle trips expected to be generated by four development projects in the study area.

We used the projected student enrollment to estimate the volume of vehicle trips the proposed school would generate based on the traffic data we collected at the existing school driveway. We distributed the new vehicle trips through the roadway network using the assumed travel routes based on a student population density map and applied a separate distribution to buses based on their existing routes.

We performed a vehicle capacity analysis to compare the weekday morning and afternoon peak hours of the 2024 Existing conditions, 2031 No-Build conditions, and 2031 Build Conditions for each of the study intersections. Under existing conditions, our analysis indicates operational issues at the intersection of Salem Street and Middlesex Avenue. The delay and v/c ratios for the study intersections are expected to increase under 2031 No-Build Conditions, and they would continue to increase under 2031 Build Conditions. At the intersection of Route 62 and Middlesex Avenue/High Street, traffic generated from the proposed development causes the Middlesex Avenue eastbound shared through/left movement to operate at LOS F during both peak hours under the 2031 Build Conditions. The proposed site driveways are both expected to operate well at LOS D or better.

While our analysis was based on site layout Option A, the gross impacts to adjacent intersections will be the same as the current preferred alternative, Option B. Option B will also provide significantly more on-site queueing capacity so that the additional school traffic will not spill over onto local roadways.

Stopping sight distance and intersection sight distance was evaluated at the proposed driveways, with all driveways meeting or exceeding the minimum required sight distance.

10.2 Recommendations

The proposed school is expected to cause operational issues at the intersection of Route 62 and Middlesex Avenue/High Street. We performed a vehicle capacity analysis at that intersection under 2031 Build Conditions using optimized signal timing, which shows all movements operating at LOS E or better and the intersection improving to an overall LOS D during both peak hours. Nitsch recommends that this intersection be retimed as part of the project to minimize delay from the added traffic.

The existing conditions analysis indicates a capacity issue at the intersection of Salem Street and Middlesex Avenue. Based off an initial review, a roundabout may be an appropriate control strategy to increase capacity at this intersection. Nitsch recommends that the town explore this and other potential strategies to reconfigure the intersection and alleviate the existing operational deficiencies.

APPENDIX CONTENTS

Appendix	Description
A	Traffic Count Data
B	MassDOT's 2023 Weekday Seasonal Adjustment Factors
C	Crash Rate Worksheets
D	Additional Developments' Traffic Studies
E	Site Plan Alternatives
F	Trip and Parking Generation Worksheets
G	School Catchment Map
H	Capacity Analysis

Appendix A: Traffic Count Data

Ballardvale Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-A

Count Date: **Wednesday, October 23, 2024**
Direction: **NB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	2	0	0	0	2
12:15 AM	0	0	2	0	0	0	2
12:30 AM	0	0	3	0	0	0	3
12:45 AM	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0
1:15 AM	0	0	1	0	0	0	1
1:30 AM	0	0	2	0	0	0	2
1:45 AM	0	0	1	0	0	0	1
2:00 AM	0	0	0	0	0	0	0
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	1	0	0	0	1
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	0	0	0	0	0
3:15 AM	0	0	3	0	0	0	3
3:30 AM	0	0	3	0	0	0	3
3:45 AM	0	0	5	0	0	0	5
4:00 AM	0	0	5	0	0	0	5
4:15 AM	0	0	7	0	0	0	7
4:30 AM	0	0	5	0	0	0	5
4:45 AM	0	0	9	0	0	0	9
5:00 AM	0	0	6	0	2	0	8
5:15 AM	0	0	8	0	1	0	9
5:30 AM	0	0	21	0	2	0	23
5:45 AM	0	0	32	0	1	0	33
6:00 AM	0	0	20	1	0	0	21
6:15 AM	0	0	28	0	0	0	28
6:30 AM	0	1	35	0	0	0	36
6:45 AM	0	0	59	0	1	0	60
7:00 AM	0	1	55	0	0	0	56
7:15 AM	0	0	95	0	1	2	98
7:30 AM	0	0	75	1	1	0	77
7:45 AM	0	2	99	0	0	0	101
8:00 AM	0	0	74	0	2	0	76
8:15 AM	0	0	71	1	1	0	73
8:30 AM	1	1	72	0	3	0	77
8:45 AM	0	0	96	0	4	0	100
9:00 AM	0	0	68	0	3	0	71
9:15 AM	0	1	43	0	2	0	46
9:30 AM	0	0	37	0	2	0	39
9:45 AM	0	0	35	0	6	0	41
10:00 AM	0	0	24	0	1	0	25
10:15 AM	0	0	32	0	2	0	34
10:30 AM	0	0	27	0	2	0	29
10:45 AM	0	1	34	0	2	1	38
11:00 AM	0	0	36	0	1	0	37
11:15 AM	0	0	40	0	2	0	42
11:30 AM	0	1	34	0	0	0	35
11:45 AM	0	0	38	0	0	0	38
AM Total	**1**	**8**	**1346**	**3**	**42**	**3**	**1403**
Percentage	**0.07%**	**0.57%**	**95.94%**	**0.21%**	**2.99%**	**0.21%**	
AM Peak	**7:45 AM**	**7:00 AM**	**7:15 AM**	**7:30 AM**	**9:00 AM**	**6:30 AM**	**7:15 AM**
Volume	**1**	**3**	**343**	**2**	**13**	**2**	**352**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	45	0	2	0	47
12:15 PM	0	1	35	1	3	1	41
12:30 PM	0	1	54	0	0	1	56
12:45 PM	0	0	54	0	1	0	55
1:00 PM	0	0	41	0	1	0	42
1:15 PM	0	2	39	0	3	0	44
1:30 PM	0	0	40	1	1	0	42
1:45 PM	0	0	41	0	0	0	41
2:00 PM	0	1	33	0	1	0	35
2:15 PM	0	0	44	1	1	0	46
2:30 PM	0	0	51	0	2	0	53
2:45 PM	0	0	66	0	1	0	67
3:00 PM	0	1	52	0	2	0	55
3:15 PM	0	1	79	1	2	0	83
3:30 PM	0	0	67	0	1	0	68
3:45 PM	0	0	66	0	0	1	67
4:00 PM	0	0	70	0	1	0	71
4:15 PM	0	0	60	0	1	0	61
4:30 PM	1	1	69	0	0	0	71
4:45 PM	0	0	72	0	0	0	72
5:00 PM	0	1	71	0	0	0	72
5:15 PM	0	0	67	0	0	0	67
5:30 PM	0	1	68	0	0	0	69
5:45 PM	0	0	56	0	0	1	57
6:00 PM	0	0	57	0	2	0	59
6:15 PM	0	1	45	0	1	0	47
6:30 PM	0	0	29	0	0	0	29
6:45 PM	0	0	31	0	0	0	31
7:00 PM	0	0	26	0	0	0	26
7:15 PM	0	1	27	0	0	0	28
7:30 PM	0	0	24	0	0	0	24
7:45 PM	0	0	22	0	0	0	22
8:00 PM	0	0	14	0	0	1	15
8:15 PM	0	0	28	0	0	0	28
8:30 PM	0	0	22	0	0	0	22
8:45 PM	0	0	15	0	0	0	15
9:00 PM	0	0	10	0	0	0	10
9:15 PM	0	0	12	0	0	0	12
9:30 PM	0	0	6	0	0	0	6
9:45 PM	0	0	11	0	0	0	11
10:00 PM	0	0	9	0	0	0	9
10:15 PM	0	0	7	0	0	0	7
10:30 PM	0	0	3	0	0	0	3
10:45 PM	0	0	4	0	0	0	4
11:00 PM	0	0	1	0	0	0	1
11:15 PM	0	0	9	0	0	0	9
11:30 PM	0	0	3	0	0	0	3
11:45 PM	0	0	1	0	0	0	1
PM Total	**1**	**12**	**1756**	**4**	**26**	**5**	**1804**
Percentage	**0.06%**	**0.67%**	**97.34%**	**0.22%**	**1.44%**	**0.28%**	
PM Peak	**3:45 PM**	**12:30 PM**	**3:15 PM**	**1:30 PM**	**2:30 PM**	**12:00 PM**	**3:15 PM**
Volume	**1**	**3**	**282**	**2**	**7**	**2**	**289**
Day Total	**2**	**20**	**3102**	**7**	**68**	**8**	**3207**
Percentage	**0.06%**	**0.62%**	**96.73%**	**0.22%**	**2.12%**	**0.25%**	

Ballardvale Street
north of Salem Street
City, State: Wilmington, MA
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Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-A

Count Date: **Thursday, October 24, 2024**
Direction: **NB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	4	0	0	0	4
12:15 AM	0	0	1	0	0	0	1
12:30 AM	0	0	1	0	0	0	1
12:45 AM	0	0	2	0	0	0	2
1:00 AM	0	0	1	0	0	0	1
1:15 AM	0	0	0	0	0	0	0
1:30 AM	0	0	1	0	0	0	1
1:45 AM	0	0	1	0	0	0	1
2:00 AM	0	0	1	0	0	0	1
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	1	0	0	0	1
2:45 AM	0	0	1	0	0	0	1
3:00 AM	0	0	1	0	0	0	1
3:15 AM	0	0	0	0	0	0	0
3:30 AM	0	0	1	0	0	0	1
3:45 AM	0	0	6	0	0	0	6
4:00 AM	0	0	1	0	0	0	1
4:15 AM	0	0	4	0	0	0	4
4:30 AM	0	0	2	0	0	0	2
4:45 AM	0	0	8	0	0	0	8
5:00 AM	0	1	4	0	0	0	5
5:15 AM	0	0	14	0	0	0	14
5:30 AM	0	0	18	0	0	0	18
5:45 AM	0	0	26	0	1	0	27
6:00 AM	0	0	22	0	0	0	22
6:15 AM	0	0	30	0	0	0	30
6:30 AM	0	0	34	0	0	0	34
6:45 AM	0	0	52	0	0	0	52
7:00 AM	0	1	62	0	0	0	63
7:15 AM	0	0	71	0	0	0	71
7:30 AM	0	1	77	0	2	0	80
7:45 AM	0	1	89	0	2	0	92
8:00 AM	0	0	56	0	2	1	59
8:15 AM	0	0	73	0	0	0	73
8:30 AM	0	0	56	0	2	0	58
8:45 AM	0	0	92	0	1	0	93
9:00 AM	0	0	49	0	1	0	50
9:15 AM	0	1	40	0	1	0	42
9:30 AM	0	0	49	1	2	0	52
9:45 AM	0	0	32	0	1	0	33
10:00 AM	0	0	44	0	3	0	47
10:15 AM	0	1	22	1	3	0	27
10:30 AM	0	0	19	0	1	0	20
10:45 AM	0	0	29	0	3	0	32
11:00 AM	0	0	45	0	2	0	47
11:15 AM	0	0	27	0	2	0	29
11:30 AM	0	1	31	0	1	0	33
11:45 AM	0	0	37	0	0	0	37
AM Total	**0**	**7**	**1238**	**2**	**30**	**1**	**1278**
Percentage	**0.00%**	**0.55%**	**96.87%**	**0.16%**	**2.35%**	**0.08%**	
AM Peak	**12:00 AM**	**7:00 AM**	**7:00 AM**	**9:30 AM**	**10:00 AM**	**7:15 AM**	**7:00 AM**
Volume	**0**	**3**	**299**	**2**	**10**	**1**	**306**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	36	0	0	0	36
12:15 PM	0	0	50	0	0	0	50
12:30 PM	0	0	46	0	1	0	47
12:45 PM	0	0	48	0	0	0	48
1:00 PM	0	0	43	0	3	0	46
1:15 PM	0	0	51	0	1	0	52
1:30 PM	0	0	48	1	4	0	53
1:45 PM	0	1	43	0	1	0	45
2:00 PM	0	0	35	0	3	0	38
2:15 PM	0	0	41	1	0	0	42
2:30 PM	0	0	45	0	1	0	46
2:45 PM	0	0	55	0	0	0	55
3:00 PM	0	0	63	0	3	0	66
3:15 PM	0	0	67	0	2	0	69
3:30 PM	0	0	83	0	1	0	84
3:45 PM	0	0	54	1	0	0	55
4:00 PM	0	0	64	0	0	0	64
4:15 PM	0	0	79	0	1	1	81
4:30 PM	0	0	67	0	4	0	71
4:45 PM	0	0	79	0	0	0	79
5:00 PM	0	0	76	0	0	0	76
5:15 PM	0	0	65	1	0	0	66
5:30 PM	0	0	72	0	0	0	72
5:45 PM	0	0	72	0	1	0	73
6:00 PM	0	1	46	0	0	0	47
6:15 PM	0	0	42	0	0	0	42
6:30 PM	0	0	34	0	0	0	34
6:45 PM	0	0	23	0	0	0	23
7:00 PM	0	0	26	0	0	0	26
7:15 PM	0	0	27	0	0	0	27
7:30 PM	0	0	25	0	0	0	25
7:45 PM	0	0	30	0	0	0	30
8:00 PM	0	0	18	0	0	0	18
8:15 PM	0	0	22	0	0	0	22
8:30 PM	0	0	29	0	0	0	29
8:45 PM	0	0	19	0	0	0	19
9:00 PM	0	0	13	0	0	0	13
9:15 PM	0	0	9	0	0	0	9
9:30 PM	0	0	7	0	0	0	7
9:45 PM	0	0	4	0	0	0	4
10:00 PM	0	0	6	0	0	0	6
10:15 PM	0	0	7	0	0	0	7
10:30 PM	0	0	4	0	0	0	4
10:45 PM	0	0	7	0	0	0	7
11:00 PM	0	0	3	0	0	0	3
11:15 PM	0	0	3	0	0	0	3
11:30 PM	0	0	4	0	0	0	4
11:45 PM	0	0	1	0	0	0	1
PM Total	**0**	**2**	**1791**	**4**	**26**	**1**	**1824**
Percentage	**0.00%**	**0.11%**	**98.19%**	**0.22%**	**1.43%**	**0.05%**	
PM Peak	**12:00 PM**	**1:00 PM**	**4:15 PM**	**1:30 PM**	**1:00 PM**	**3:30 PM**	**4:15 PM**
Volume	**0**	**1**	**301**	**2**	**9**	**1**	**307**
Day Total	**0**	**9**	**3029**	**6**	**56**	**2**	**3102**
Percentage	**0.00%**	**0.29%**	**97.65%**	**0.19%**	**1.81%**	**0.06%**	

Ballardvale Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-A

Count Date: **Wednesday, October 23, 2024**
Direction: **SB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	2	0	0	0	2
12:15 AM	0	0	5	0	1	0	6
12:30 AM	0	0	2	0	0	0	2
12:45 AM	0	0	3	0	0	0	3
1:00 AM	0	0	1	0	0	0	1
1:15 AM	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0
1:45 AM	0	0	6	0	0	0	6
2:00 AM	0	0	5	0	0	0	5
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	2	0	0	0	2
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	5	0	0	0	5
3:15 AM	0	0	1	0	0	0	1
3:30 AM	0	0	3	0	0	0	3
3:45 AM	0	0	5	0	0	0	5
4:00 AM	0	0	2	0	0	0	2
4:15 AM	0	0	6	0	0	0	6
4:30 AM	0	0	1	0	0	0	1
4:45 AM	0	0	5	0	0	0	5
5:00 AM	0	0	2	0	0	0	2
5:15 AM	0	0	6	0	0	0	6
5:30 AM	0	0	9	0	1	0	10
5:45 AM	0	0	16	0	1	0	17
6:00 AM	0	1	17	1	1	0	20
6:15 AM	0	0	29	0	1	0	30
6:30 AM	0	0	51	1	1	0	53
6:45 AM	0	0	74	0	1	0	75
7:00 AM	0	1	115	2	2	0	120
7:15 AM	0	1	87	0	0	1	89
7:30 AM	0	0	76	1	4	0	81
7:45 AM	0	0	76	0	0	0	76
8:00 AM	0	0	65	0	1	2	68
8:15 AM	0	0	73	0	3	1	77
8:30 AM	0	0	136	1	3	0	140
8:45 AM	0	0	94	0	2	1	97
9:00 AM	0	0	115	1	5	2	123
9:15 AM	0	0	42	0	1	0	43
9:30 AM	0	0	45	0	5	1	51
9:45 AM	0	0	50	0	4	0	54
10:00 AM	0	0	42	0	4	0	46
10:15 AM	0	0	31	0	2	0	33
10:30 AM	0	0	35	0	4	0	39
10:45 AM	0	0	37	0	2	1	40
11:00 AM	0	0	52	0	1	0	53
11:15 AM	0	0	49	0	4	0	53
11:30 AM	0	0	67	0	2	0	69
11:45 AM	0	0	67	0	1	0	68
AM Total	**0**	**3**	**1615**	**7**	**57**	**9**	**1691**
Percentage	**0.00%**	**0.18%**	**95.51%**	**0.41%**	**3.37%**	**0.53%**	
AM Peak	**12:00 AM**	**6:30 AM**	**8:15 AM**	**6:15 AM**	**9:00 AM**	**8:00 AM**	**8:15 AM**
Volume	**0**	**2**	**418**	**3**	**15**	**4**	**437**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	77	0	3	0	81
12:15 PM	0	0	74	0	2	0	76
12:30 PM	0	0	67	0	0	0	67
12:45 PM	0	1	52	0	0	0	53
1:00 PM	0	0	63	0	2	1	66
1:15 PM	0	0	55	0	2	0	57
1:30 PM	0	0	86	0	2	0	88
1:45 PM	1	0	75	1	1	0	78
2:00 PM	0	2	107	0	4	0	113
2:15 PM	0	0	73	0	1	0	74
2:30 PM	0	0	89	0	1	0	90
2:45 PM	0	0	82	0	0	0	82
3:00 PM	0	0	85	2	0	0	87
3:15 PM	0	1	131	0	3	0	135
3:30 PM	0	1	115	1	2	0	119
3:45 PM	0	2	142	0	1	0	145
4:00 PM	0	0	140	0	1	2	143
4:15 PM	1	0	167	1	2	0	171
4:30 PM	0	3	169	0	0	0	172
4:45 PM	0	1	130	0	3	0	134
5:00 PM	1	1	162	0	0	1	165
5:15 PM	0	1	143	0	1	0	145
5:30 PM	0	1	95	0	0	0	96
5:45 PM	0	2	99	0	1	0	102
6:00 PM	0	0	85	0	1	0	86
6:15 PM	0	2	66	0	0	0	68
6:30 PM	0	2	72	0	1	1	76
6:45 PM	0	0	53	1	0	0	54
7:00 PM	0	0	39	0	0	2	41
7:15 PM	0	0	49	0	1	0	50
7:30 PM	0	0	42	0	1	0	43
7:45 PM	0	0	50	0	0	0	50
8:00 PM	0	0	38	0	0	0	38
8:15 PM	0	0	33	0	0	0	33
8:30 PM	0	1	24	0	0	0	25
8:45 PM	0	1	33	0	0	0	34
9:00 PM	0	0	29	0	0	0	29
9:15 PM	0	1	24	0	0	0	25
9:30 PM	0	0	16	0	0	0	16
9:45 PM	0	0	11	0	0	0	11
10:00 PM	0	0	9	0	0	0	9
10:15 PM	0	0	11	0	0	0	11
10:30 PM	0	0	9	0	0	0	9
10:45 PM	0	0	11	0	0	0	11
11:00 PM	0	0	13	0	0	0	13
11:15 PM	0	0	3	0	0	0	3
11:30 PM	0	0	11	0	0	0	11
11:45 PM	0	0	4	0	0	0	4
PM Total	**3**	**24**	**3213**	**6**	**36**	**7**	**3289**
Percentage	**0.09%**	**0.73%**	**97.69%**	**0.18%**	**1.09%**	**0.21%**	
PM Peak	**4:15 PM**	**4:30 PM**	**4:15 PM**	**2:45 PM**	**1:15 PM**	**6:15 PM**	**4:15 PM**
Volume	**2**	**6**	**628**	**3**	**9**	**3**	**642**
Day Total	**3**	**27**	**4828**	**13**	**93**	**16**	**4980**
Percentage	**0.06%**	**0.54%**	**96.95%**	**0.26%**	**1.87%**	**0.32%**	

Ballardvale Street
north of Salem Street
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PDI File #: 2540244 ATR-A

Count Date: **Thursday, October 24, 2024**
Direction: **SB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	5	0	0	0	5
12:15 AM	0	0	3	0	0	0	3
12:30 AM	0	0	2	0	0	0	2
12:45 AM	0	0	2	0	0	0	2
1:00 AM	0	0	2	0	0	0	2
1:15 AM	0	0	2	0	0	0	2
1:30 AM	0	0	1	0	0	0	1
1:45 AM	0	0	0	0	0	0	0
2:00 AM	0	0	4	0	0	0	4
2:15 AM	0	0	2	0	0	0	2
2:30 AM	0	0	1	0	0	0	1
2:45 AM	0	0	0	0	0	0	0
3:00 AM	0	0	5	0	0	0	5
3:15 AM	0	0	0	0	0	0	0
3:30 AM	0	0	3	0	0	0	3
3:45 AM	0	0	1	0	0	0	1
4:00 AM	0	0	3	0	0	0	3
4:15 AM	0	0	3	0	1	0	4
4:30 AM	0	0	3	0	0	0	3
4:45 AM	0	0	4	0	0	0	4
5:00 AM	0	0	2	0	0	0	2
5:15 AM	0	0	5	0	0	0	5
5:30 AM	0	0	13	1	2	0	16
5:45 AM	0	0	17	0	1	0	18
6:00 AM	0	0	16	1	0	0	17
6:15 AM	0	0	25	0	1	0	26
6:30 AM	0	0	46	0	1	0	47
6:45 AM	0	0	68	1	2	0	71
7:00 AM	0	0	53	1	1	0	55
7:15 AM	0	0	66	0	0	0	66
7:30 AM	0	0	73	1	2	0	76
7:45 AM	0	0	67	0	1	0	68
8:00 AM	0	1	67	0	1	0	69
8:15 AM	0	1	70	0	4	1	76
8:30 AM	0	0	57	0	1	0	58
8:45 AM	0	0	73	2	0	0	75
9:00 AM	0	0	45	0	1	0	46
9:15 AM	0	0	45	0	0	0	45
9:30 AM	0	0	44	0	2	1	47
9:45 AM	0	0	33	0	0	0	33
10:00 AM	0	0	33	0	7	0	40
10:15 AM	0	1	37	0	2	0	40
10:30 AM	0	1	41	0	5	0	47
10:45 AM	0	0	47	0	2	1	50
11:00 AM	0	1	44	0	2	0	47
11:15 AM	0	0	66	0	5	1	72
11:30 AM	0	0	55	0	3	0	58
11:45 AM	0	1	71	0	0	0	72
AM Total	**0**	**6**	**1325**	**7**	**47**	**4**	**1389**
Percentage	**0.00%**	**0.43%**	**95.39%**	**0.50%**	**3.38%**	**0.29%**	
AM Peak	**12:00 AM**	**10:15 AM**	**7:30 AM**	**6:45 AM**	**10:00 AM**	**10:30 AM**	**7:30 AM**
Volume	**0**	**3**	**277**	**3**	**16**	**2**	**289**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	82	0	2	0	85
12:15 PM	0	0	74	0	4	0	78
12:30 PM	0	0	72	0	3	0	75
12:45 PM	0	0	61	0	2	0	63
1:00 PM	0	0	63	0	2	0	65
1:15 PM	0	0	67	1	1	0	69
1:30 PM	0	1	81	0	1	0	83
1:45 PM	0	0	66	1	0	0	67
2:00 PM	0	1	73	1	0	0	75
2:15 PM	0	0	74	0	1	0	75
2:30 PM	1	0	83	0	0	0	84
2:45 PM	0	1	73	0	0	0	74
3:00 PM	0	0	100	2	1	1	104
3:15 PM	0	0	133	0	1	0	134
3:30 PM	0	0	131	0	3	0	134
3:45 PM	0	0	154	1	1	1	157
4:00 PM	0	1	134	1	1	0	137
4:15 PM	0	1	169	1	0	0	171
4:30 PM	0	0	170	0	3	0	173
4:45 PM	0	1	146	0	0	0	147
5:00 PM	0	1	159	0	2	0	162
5:15 PM	0	1	110	0	2	0	113
5:30 PM	0	1	106	0	0	0	107
5:45 PM	0	1	93	0	0	0	94
6:00 PM	0	0	87	1	0	0	88
6:15 PM	0	0	86	0	0	0	86
6:30 PM	0	0	58	0	0	1	59
6:45 PM	0	0	57	0	1	0	58
7:00 PM	0	0	48	0	0	0	48
7:15 PM	0	0	36	0	1	0	37
7:30 PM	0	0	47	0	2	0	49
7:45 PM	0	0	41	0	0	0	41
8:00 PM	0	0	47	0	0	0	47
8:15 PM	0	0	36	0	0	0	36
8:30 PM	0	0	40	0	0	0	40
8:45 PM	0	0	21	0	0	0	21
9:00 PM	0	0	23	0	0	0	23
9:15 PM	0	0	29	0	0	0	29
9:30 PM	0	0	16	0	0	0	16
9:45 PM	0	0	13	0	0	0	13
10:00 PM	0	0	27	0	0	0	27
10:15 PM	0	0	8	0	0	0	8
10:30 PM	0	0	9	0	0	0	9
10:45 PM	0	0	9	0	0	0	9
11:00 PM	0	0	10	0	0	0	10
11:15 PM	0	0	8	0	0	0	8
11:30 PM	0	0	11	0	0	0	11
11:45 PM	0	0	4	0	0	0	4
PM Total	**1**	**11**	**3245**	**9**	**34**	**3**	**3303**
Percentage	**0.03%**	**0.33%**	**98.24%**	**0.27%**	**1.03%**	**0.09%**	
PM Peak	**1:45 PM**	**4:45 PM**	**4:15 PM**	**1:15 PM**	**12:00 PM**	**3:00 PM**	**4:15 PM**
Volume	**1**	**4**	**644**	**3**	**11**	**2**	**653**
Day Total	**1**	**17**	**4570**	**16**	**81**	**7**	**4692**
Percentage	**0.02%**	**0.36%**	**97.40%**	**0.34%**	**1.73%**	**0.15%**	

Ballardvale Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # **2540244 ATR-A**

Direction: **NB**

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	2	47	4	36	0	0	0	0	0	0	0	0	0	0	3	42
12:15	2	41	1	50	0	0	0	0	0	0	0	0	0	0	2	46
12:30	3	56	1	47	0	0	0	0	0	0	0	0	0	0	2	52
12:45	0	55	2	48	0	0	0	0	0	0	0	0	0	0	1	52
1:00	0	42	1	46	0	0	0	0	0	0	0	0	0	0	1	44
1:15	1	44	0	52	0	0	0	0	0	0	0	0	0	0	1	48
1:30	2	42	1	53	0	0	0	0	0	0	0	0	0	0	2	48
1:45	1	41	1	45	0	0	0	0	0	0	0	0	0	0	1	43
2:00	0	35	1	38	0	0	0	0	0	0	0	0	0	0	1	37
2:15	1	46	1	42	0	0	0	0	0	0	0	0	0	0	1	44
2:30	1	53	1	46	0	0	0	0	0	0	0	0	0	0	1	50
2:45	2	67	1	55	0	0	0	0	0	0	0	0	0	0	2	61
3:00	0	55	1	66	0	0	0	0	0	0	0	0	0	0	1	61
3:15	3	83	0	69	0	0	0	0	0	0	0	0	0	0	2	76
3:30	3	68	1	84	0	0	0	0	0	0	0	0	0	0	2	76
3:45	5	67	6	55	0	0	0	0	0	0	0	0	0	0	6	61
4:00	5	71	1	64	0	0	0	0	0	0	0	0	0	0	3	68
4:15	7	61	4	81	0	0	0	0	0	0	0	0	0	0	6	71
4:30	5	71	2	71	0	0	0	0	0	0	0	0	0	0	4	71
4:45	9	72	8	79	0	0	0	0	0	0	0	0	0	0	9	76
5:00	8	72	5	76	0	0	0	0	0	0	0	0	0	0	7	74
5:15	9	67	14	66	0	0	0	0	0	0	0	0	0	0	12	67
5:30	23	69	18	72	0	0	0	0	0	0	0	0	0	0	21	71
5:45	33	57	27	73	0	0	0	0	0	0	0	0	0	0	30	65
6:00	21	59	22	47	0	0	0	0	0	0	0	0	0	0	22	53
6:15	28	47	30	42	0	0	0	0	0	0	0	0	0	0	29	45
6:30	36	29	34	34	0	0	0	0	0	0	0	0	0	0	35	32
6:45	60	31	52	23	0	0	0	0	0	0	0	0	0	0	56	27
7:00	56	26	63	26	0	0	0	0	0	0	0	0	0	0	60	26
7:15	98	28	71	27	0	0	0	0	0	0	0	0	0	0	85	28
7:30	77	24	80	25	0	0	0	0	0	0	0	0	0	0	79	25
7:45	101	22	92	30	0	0	0	0	0	0	0	0	0	0	97	26
8:00	76	15	59	18	0	0	0	0	0	0	0	0	0	0	68	17
8:15	73	28	73	22	0	0	0	0	0	0	0	0	0	0	73	25
8:30	77	22	58	29	0	0	0	0	0	0	0	0	0	0	68	26
8:45	100	15	93	19	0	0	0	0	0	0	0	0	0	0	97	17
9:00	71	10	50	13	0	0	0	0	0	0	0	0	0	0	61	12
9:15	46	12	42	9	0	0	0	0	0	0	0	0	0	0	44	11
9:30	39	6	52	7	0	0	0	0	0	0	0	0	0	0	46	7
9:45	41	11	33	4	0	0	0	0	0	0	0	0	0	0	37	8
10:00	25	9	47	6	0	0	0	0	0	0	0	0	0	0	36	8
10:15	34	7	27	7	0	0	0	0	0	0	0	0	0	0	31	7
10:30	29	3	20	4	0	0	0	0	0	0	0	0	0	0	25	4
10:45	38	4	32	7	0	0	0	0	0	0	0	0	0	0	35	6
11:00	37	1	47	3	0	0	0	0	0	0	0	0	0	0	42	2
11:15	42	9	29	3	0	0	0	0	0	0	0	0	0	0	36	6
11:30	35	3	33	4	0	0	0	0	0	0	0	0	0	0	34	4
11:45	38	1	37	1	0	0	0	0	0	0	0	0	0	0	38	1
Total	**1403**	**1804**	**1278**	**1824**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1341**	**1814**
Day Total	**3207**		**3102**		**0**		**0**		**0**		**0**		**0**		**3155**	
Peak HR	**7:15 AM**	**3:15 PM**	**7:00 AM**	**4:15 PM**											**7:15 AM**	**4:15 PM**
Volume	**352**	**289**	**306**	**307**											**327**	**292**

Ballardvale Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # 2540244 ATR-A

Direction: SB

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	2	81	5	85	0	0	0	0	0	0	0	0	0	0	4	83
12:15	6	76	3	78	0	0	0	0	0	0	0	0	0	0	5	77
12:30	2	67	2	75	0	0	0	0	0	0	0	0	0	0	2	71
12:45	3	53	2	63	0	0	0	0	0	0	0	0	0	0	3	58
1:00	1	66	2	65	0	0	0	0	0	0	0	0	0	0	2	66
1:15	0	57	2	69	0	0	0	0	0	0	0	0	0	0	1	63
1:30	0	88	1	83	0	0	0	0	0	0	0	0	0	0	1	86
1:45	6	78	0	67	0	0	0	0	0	0	0	0	0	0	3	73
2:00	5	113	4	75	0	0	0	0	0	0	0	0	0	0	5	94
2:15	1	74	2	75	0	0	0	0	0	0	0	0	0	0	2	75
2:30	2	90	1	84	0	0	0	0	0	0	0	0	0	0	2	87
2:45	2	82	0	74	0	0	0	0	0	0	0	0	0	0	1	78
3:00	5	87	5	104	0	0	0	0	0	0	0	0	0	0	5	96
3:15	1	135	0	134	0	0	0	0	0	0	0	0	0	0	1	135
3:30	3	119	3	134	0	0	0	0	0	0	0	0	0	0	3	127
3:45	5	145	1	157	0	0	0	0	0	0	0	0	0	0	3	151
4:00	2	143	3	137	0	0	0	0	0	0	0	0	0	0	3	140
4:15	6	171	4	171	0	0	0	0	0	0	0	0	0	0	5	171
4:30	1	172	3	173	0	0	0	0	0	0	0	0	0	0	2	173
4:45	5	134	4	147	0	0	0	0	0	0	0	0	0	0	5	141
5:00	2	165	2	162	0	0	0	0	0	0	0	0	0	0	2	164
5:15	6	145	5	113	0	0	0	0	0	0	0	0	0	0	6	129
5:30	10	96	16	107	0	0	0	0	0	0	0	0	0	0	13	102
5:45	17	102	18	94	0	0	0	0	0	0	0	0	0	0	18	98
6:00	20	86	17	88	0	0	0	0	0	0	0	0	0	0	19	87
6:15	30	68	26	86	0	0	0	0	0	0	0	0	0	0	28	77
6:30	53	76	47	59	0	0	0	0	0	0	0	0	0	0	50	68
6:45	75	54	71	58	0	0	0	0	0	0	0	0	0	0	73	56
7:00	120	41	55	48	0	0	0	0	0	0	0	0	0	0	88	45
7:15	89	50	66	37	0	0	0	0	0	0	0	0	0	0	78	44
7:30	81	43	76	49	0	0	0	0	0	0	0	0	0	0	79	46
7:45	76	50	68	41	0	0	0	0	0	0	0	0	0	0	72	46
8:00	68	38	69	47	0	0	0	0	0	0	0	0	0	0	69	43
8:15	77	33	76	36	0	0	0	0	0	0	0	0	0	0	77	35
8:30	140	25	58	40	0	0	0	0	0	0	0	0	0	0	99	33
8:45	97	34	75	21	0	0	0	0	0	0	0	0	0	0	86	28
9:00	123	29	46	23	0	0	0	0	0	0	0	0	0	0	85	26
9:15	43	25	45	29	0	0	0	0	0	0	0	0	0	0	44	27
9:30	51	16	47	16	0	0	0	0	0	0	0	0	0	0	49	16
9:45	54	11	33	13	0	0	0	0	0	0	0	0	0	0	44	12
10:00	46	9	40	27	0	0	0	0	0	0	0	0	0	0	43	18
10:15	33	11	40	8	0	0	0	0	0	0	0	0	0	0	37	10
10:30	39	9	47	9	0	0	0	0	0	0	0	0	0	0	43	9
10:45	40	11	50	9	0	0	0	0	0	0	0	0	0	0	45	10
11:00	53	13	47	10	0	0	0	0	0	0	0	0	0	0	50	12
11:15	53	3	72	8	0	0	0	0	0	0	0	0	0	0	63	6
11:30	69	11	58	11	0	0	0	0	0	0	0	0	0	0	64	11
11:45	68	4	72	4	0	0	0	0	0	0	0	0	0	0	70	4
Total	**1691**	**3289**	**1389**	**3303**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1540**	**3296**
Day Total	**4980**		**4692**		**0**		**0**		**0**		**0**		**0**		**4836**	
Peak HR	**8:15 AM**	**4:15 PM**	**7:30 AM**	**4:15 PM**											**8:15 AM**	**4:15 PM**
Volume	**437**	**642**	**289**	**653**											**346**	**648**

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-B

Count Date: **Wednesday, October 23, 2024**
Direction: **NB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	14	0	0	0	14
12:15 AM	0	0	7	0	0	0	7
12:30 AM	0	0	5	0	0	0	5
12:45 AM	0	0	2	0	0	0	2
1:00 AM	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0
1:30 AM	0	0	3	0	0	0	3
1:45 AM	0	0	2	0	0	0	2
2:00 AM	0	0	3	0	0	0	3
2:15 AM	0	0	4	0	0	0	4
2:30 AM	0	0	3	0	0	0	3
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	1	0	0	0	1
3:15 AM	0	0	2	0	0	0	2
3:30 AM	0	0	2	0	0	0	2
3:45 AM	0	0	5	0	0	0	5
4:00 AM	0	0	2	0	1	0	3
4:15 AM	0	0	4	0	0	0	4
4:30 AM	0	0	1	0	0	0	1
4:45 AM	0	0	3	0	0	0	3
5:00 AM	0	0	2	0	0	0	2
5:15 AM	0	0	4	0	0	0	4
5:30 AM	0	0	7	0	0	0	7
5:45 AM	0	0	20	0	1	0	21
6:00 AM	0	0	27	0	0	0	27
6:15 AM	0	0	21	0	1	0	22
6:30 AM	0	0	28	0	0	0	28
6:45 AM	0	0	45	0	0	1	46
7:00 AM	0	0	44	1	1	0	46
7:15 AM	1	0	56	0	0	0	57
7:30 AM	0	0	59	0	2	0	61
7:45 AM	0	0	75	0	0	0	75
8:00 AM	0	0	90	0	3	1	94
8:15 AM	0	0	83	0	3	1	87
8:30 AM	0	0	82	0	2	1	85
8:45 AM	0	0	68	5	2	0	75
9:00 AM	0	0	75	4	2	0	81
9:15 AM	0	2	66	0	5	0	73
9:30 AM	0	0	67	0	4	0	71
9:45 AM	0	0	49	0	1	0	50
10:00 AM	0	0	55	0	0	0	55
10:15 AM	0	0	63	0	3	0	66
10:30 AM	0	0	61	0	1	0	62
10:45 AM	0	0	58	0	4	0	62
11:00 AM	0	0	66	0	0	0	66
11:15 AM	0	0	68	0	6	0	74
11:30 AM	0	0	53	0	1	0	54
11:45 AM	0	0	81	0	1	0	82
AM Total	**1**	**2**	**1538**	**10**	**44**	**4**	**1599**
Percentage	**0.06%**	**0.13%**	**96.19%**	**0.63%**	**2.75%**	**0.25%**	
AM Peak	**6:30 AM**	**8:30 AM**	**7:45 AM**	**8:15 AM**	**8:45 AM**	**7:45 AM**	**7:45 AM**
Volume	**1**	**2**	**330**	**9**	**13**	**3**	**341**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	97	0	3	0	101
12:15 PM	0	0	76	1	5	0	82
12:30 PM	0	1	89	0	2	0	92
12:45 PM	0	0	82	0	2	0	84
1:00 PM	0	0	77	0	3	0	80
1:15 PM	1	1	75	0	3	0	80
1:30 PM	0	0	69	0	1	0	70
1:45 PM	0	0	87	0	3	0	90
2:00 PM	0	1	90	0	0	0	91
2:15 PM	0	0	127	0	1	0	128
2:30 PM	0	0	110	0	3	0	113
2:45 PM	0	0	141	0	1	0	142
3:00 PM	0	1	169	2	2	0	174
3:15 PM	0	1	134	4	1	0	140
3:30 PM	0	2	147	1	4	0	154
3:45 PM	1	0	144	1	0	0	146
4:00 PM	0	1	153	0	2	0	156
4:15 PM	0	0	146	0	0	0	146
4:30 PM	0	0	141	0	0	0	141
4:45 PM	0	2	164	0	0	0	166
5:00 PM	0	2	159	0	0	0	161
5:15 PM	0	1	149	0	1	0	151
5:30 PM	1	1	141	0	1	0	144
5:45 PM	0	1	126	0	0	0	127
6:00 PM	0	1	97	1	2	0	101
6:15 PM	0	1	105	0	0	0	106
6:30 PM	0	1	81	0	0	0	82
6:45 PM	0	0	82	0	0	0	82
7:00 PM	0	0	59	0	0	0	59
7:15 PM	0	0	76	0	0	0	76
7:30 PM	0	1	77	0	0	0	78
7:45 PM	0	0	64	0	0	0	64
8:00 PM	0	0	63	0	0	0	63
8:15 PM	0	0	67	0	0	0	67
8:30 PM	0	0	46	0	0	0	46
8:45 PM	0	2	45	0	0	0	47
9:00 PM	0	0	45	0	0	1	46
9:15 PM	0	0	39	0	0	0	39
9:30 PM	0	0	19	0	0	0	19
9:45 PM	0	1	17	0	0	0	18
10:00 PM	0	0	18	0	0	0	18
10:15 PM	0	0	20	0	0	0	20
10:30 PM	0	0	25	0	0	0	25
10:45 PM	0	0	13	0	0	0	13
11:00 PM	0	0	21	0	0	1	22
11:15 PM	0	0	26	0	0	0	26
11:30 PM	0	0	8	0	0	0	8
11:45 PM	0	0	11	0	0	0	11
PM Total	**3**	**23**	**4017**	**10**	**40**	**2**	**4095**
Percentage	**0.07%**	**0.56%**	**98.10%**	**0.24%**	**0.98%**	**0.05%**	
PM Peak	**12:30 PM**	**4:45 PM**	**4:30 PM**	**3:00 PM**	**12:00 PM**	**8:15 PM**	**4:45 PM**
Volume	**1**	**6**	**613**	**8**	**12**	**1**	**622**
Day Total	**4**	**25**	**5555**	**20**	**84**	**6**	**5694**
Percentage	**0.07%**	**0.44%**	**97.56%**	**0.35%**	**1.48%**	**0.11%**	

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-B

Count Date: **Thursday, October 24, 2024**
Direction: **NB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	13	0	0	0	13
12:15 AM	0	0	7	0	0	0	7
12:30 AM	0	0	5	0	0	0	5
12:45 AM	0	0	4	0	0	0	4
1:00 AM	0	0	2	0	0	0	2
1:15 AM	0	0	0	0	0	0	0
1:30 AM	0	0	5	0	0	0	5
1:45 AM	0	0	2	0	0	0	2
2:00 AM	0	0	2	0	0	0	2
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	2	0	0	0	2
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	2	0	0	0	2
3:15 AM	0	0	1	0	0	0	1
3:30 AM	0	0	3	0	0	0	3
3:45 AM	0	0	4	0	0	0	4
4:00 AM	0	0	3	0	1	0	4
4:15 AM	0	0	0	0	0	0	0
4:30 AM	0	0	4	0	0	0	4
4:45 AM	0	0	3	0	0	0	3
5:00 AM	0	1	7	0	0	0	8
5:15 AM	0	0	8	0	0	0	8
5:30 AM	0	0	17	0	0	0	17
5:45 AM	0	0	17	1	1	1	20
6:00 AM	0	0	15	0	0	0	15
6:15 AM	0	0	21	0	0	0	21
6:30 AM	0	0	31	0	0	0	31
6:45 AM	0	0	40	0	0	0	40
7:00 AM	0	0	43	0	0	0	43
7:15 AM	0	0	54	1	0	0	55
7:30 AM	0	1	58	0	1	0	60
7:45 AM	0	0	73	0	1	0	74
8:00 AM	0	0	64	0	1	0	65
8:15 AM	0	0	84	0	0	0	84
8:30 AM	0	0	80	0	1	0	81
8:45 AM	0	0	84	5	1	0	90
9:00 AM	0	0	68	3	0	0	71
9:15 AM	0	1	52	0	5	0	58
9:30 AM	0	0	58	0	2	0	60
9:45 AM	0	0	50	1	1	0	52
10:00 AM	0	0	59	0	0	0	59
10:15 AM	0	0	55	0	4	0	59
10:30 AM	0	0	44	0	1	0	45
10:45 AM	0	0	51	0	1	0	52
11:00 AM	0	1	74	0	3	0	78
11:15 AM	0	0	60	0	2	0	62
11:30 AM	0	0	78	0	2	0	80
11:45 AM	0	0	56	0	3	0	59
AM Total	**0**	**4**	**1466**	**11**	**31**	**1**	**1513**
Percentage	**0.00%**	**0.26%**	**96.89%**	**0.73%**	**2.05%**	**0.07%**	
AM Peak	**12:00 AM**	**4:15 AM**	**8:15 AM**	**8:15 AM**	**11:00 AM**	**5:00 AM**	**8:15 AM**
Volume	**0**	**1**	**316**	**8**	**10**	**1**	**326**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	83	0	3	0	86
12:15 PM	1	0	87	0	2	0	90
12:30 PM	0	0	72	0	2	0	74
12:45 PM	0	0	76	0	2	0	78
1:00 PM	0	0	76	0	3	0	79
1:15 PM	0	0	81	0	0	0	81
1:30 PM	0	0	76	1	1	0	78
1:45 PM	0	0	106	0	4	0	110
2:00 PM	0	0	111	0	1	0	112
2:15 PM	0	0	118	0	2	0	120
2:30 PM	0	0	118	1	1	0	120
2:45 PM	0	0	144	1	1	0	146
3:00 PM	0	0	130	2	1	0	133
3:15 PM	0	0	150	4	2	0	156
3:30 PM	0	1	140	2	0	0	143
3:45 PM	1	0	140	0	0	0	141
4:00 PM	0	0	129	0	0	0	129
4:15 PM	0	0	144	0	1	0	145
4:30 PM	0	0	118	1	3	0	122
4:45 PM	0	0	135	1	0	0	136
5:00 PM	0	0	150	0	0	0	150
5:15 PM	0	0	145	0	0	0	145
5:30 PM	0	0	145	0	0	0	145
5:45 PM	0	2	150	0	0	0	152
6:00 PM	0	1	105	0	1	0	107
6:15 PM	0	0	107	1	0	0	108
6:30 PM	0	1	96	0	1	0	98
6:45 PM	0	0	86	0	0	0	86
7:00 PM	0	0	79	0	0	0	79
7:15 PM	0	0	66	0	0	0	66
7:30 PM	0	0	80	0	0	0	80
7:45 PM	0	0	67	1	1	0	69
8:00 PM	0	0	64	0	1	0	65
8:15 PM	0	0	62	0	0	0	62
8:30 PM	0	0	49	0	1	0	50
8:45 PM	0	0	48	0	0	0	48
9:00 PM	0	0	35	0	0	0	35
9:15 PM	0	0	41	0	0	0	41
9:30 PM	0	0	28	0	0	0	28
9:45 PM	0	0	26	0	0	0	26
10:00 PM	0	0	34	0	0	0	34
10:15 PM	0	0	26	0	0	0	26
10:30 PM	0	0	27	0	0	0	27
10:45 PM	0	0	21	0	0	0	21
11:00 PM	0	0	13	0	1	0	14
11:15 PM	0	0	16	0	0	0	16
11:30 PM	0	0	19	0	0	0	19
11:45 PM	0	0	16	0	0	1	17
PM Total	**2**	**5**	**4035**	**15**	**35**	**1**	**4093**
Percentage	**0.05%**	**0.12%**	**98.58%**	**0.37%**	**0.86%**	**0.02%**	
PM Peak	**12:00 PM**	**5:45 PM**	**5:00 PM**	**2:45 PM**	**12:00 PM**	**11:00 PM**	**5:00 PM**
Volume	**1**	**4**	**590**	**9**	**9**	**1**	**592**
Day Total	**2**	**9**	**5501**	**26**	**66**	**2**	**5606**
Percentage	**0.04%**	**0.16%**	**98.13%**	**0.46%**	**1.18%**	**0.04%**	

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-B

Count Date: **Wednesday, October 23, 2024**
Direction: **SB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	4	0	0	0	4
12:15 AM	0	0	6	0	1	0	7
12:30 AM	0	0	2	0	0	0	2
12:45 AM	0	0	1	0	0	0	1
1:00 AM	0	0	3	0	0	0	3
1:15 AM	0	0	0	1	0	0	1
1:30 AM	0	0	2	0	0	0	2
1:45 AM	0	0	4	0	0	0	4
2:00 AM	0	0	3	0	0	0	3
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	3	0	0	0	3
2:45 AM	0	0	3	0	0	0	3
3:00 AM	0	0	3	0	0	0	3
3:15 AM	0	0	2	0	0	0	2
3:30 AM	0	0	6	0	0	0	6
3:45 AM	0	0	3	0	0	0	3
4:00 AM	0	0	7	0	0	0	7
4:15 AM	0	0	17	0	0	0	17
4:30 AM	0	0	21	0	1	0	22
4:45 AM	0	0	34	0	0	0	34
5:00 AM	0	0	36	0	0	0	36
5:15 AM	0	0	47	0	0	0	47
5:30 AM	0	0	95	0	0	0	95
5:45 AM	0	0	109	0	3	0	112
6:00 AM	0	0	108	0	3	0	111
6:15 AM	0	0	122	0	4	0	126
6:30 AM	0	0	148	0	1	0	149
6:45 AM	0	0	179	1	2	0	182
7:00 AM	0	1	177	0	2	0	180
7:15 AM	0	2	162	0	2	0	166
7:30 AM	0	0	172	1	3	0	176
7:45 AM	0	1	157	1	2	0	161
8:00 AM	0	0	125	0	4	2	131
8:15 AM	0	0	131	1	5	2	139
8:30 AM	0	0	151	1	2	0	154
8:45 AM	0	0	143	5	3	0	151
9:00 AM	0	0	121	1	6	0	128
9:15 AM	0	0	112	0	3	0	115
9:30 AM	0	0	96	0	3	0	99
9:45 AM	0	0	105	0	2	0	107
10:00 AM	0	0	92	1	4	0	97
10:15 AM	0	1	72	0	1	0	74
10:30 AM	0	0	100	0	2	0	102
10:45 AM	0	0	82	0	0	0	82
11:00 AM	0	1	86	0	2	0	89
11:15 AM	0	0	98	0	1	0	99
11:30 AM	0	0	94	0	2	0	96
11:45 AM	0	0	76	0	4	1	81
AM Total	**0**	**6**	**3321**	**13**	**68**	**5**	**3413**
Percentage	**0.00%**	**0.18%**	**97.30%**	**0.38%**	**1.99%**	**0.15%**	
AM Peak	**12:00 AM**	**7:00 AM**	**6:45 AM**	**8:15 AM**	**8:15 AM**	**7:30 AM**	**6:45 AM**
Volume	**0**	**4**	**690**	**8**	**16**	**4**	**704**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	82	0	1	1	85
12:15 PM	0	0	107	0	2	0	109
12:30 PM	0	1	100	0	3	0	104
12:45 PM	0	1	68	0	0	0	69
1:00 PM	0	0	81	0	4	1	86
1:15 PM	0	0	84	0	3	0	87
1:30 PM	0	0	119	1	2	0	122
1:45 PM	0	0	93	0	1	0	94
2:00 PM	0	1	108	0	1	0	110
2:15 PM	0	0	87	0	0	0	87
2:30 PM	0	0	91	0	0	0	91
2:45 PM	0	0	85	0	1	0	86
3:00 PM	0	0	85	1	2	1	89
3:15 PM	0	0	125	2	4	0	131
3:30 PM	1	0	112	7	3	0	123
3:45 PM	0	1	116	0	1	1	119
4:00 PM	0	0	109	2	3	1	115
4:15 PM	1	0	135	1	1	0	138
4:30 PM	0	0	132	0	1	1	134
4:45 PM	0	1	141	0	2	0	144
5:00 PM	0	3	135	0	1	0	139
5:15 PM	0	1	140	1	0	1	143
5:30 PM	0	1	105	0	0	0	106
5:45 PM	1	2	102	1	0	0	106
6:00 PM	0	1	109	0	2	0	112
6:15 PM	0	1	103	0	0	0	104
6:30 PM	1	2	96	0	1	0	100
6:45 PM	0	0	69	0	1	0	70
7:00 PM	0	0	59	0	0	0	59
7:15 PM	0	0	56	0	1	0	57
7:30 PM	0	0	56	0	0	0	56
7:45 PM	0	0	59	0	0	0	59
8:00 PM	0	0	39	0	0	0	39
8:15 PM	0	0	49	0	0	0	49
8:30 PM	0	0	42	0	0	0	42
8:45 PM	0	2	38	0	1	0	41
9:00 PM	0	0	42	0	0	0	42
9:15 PM	0	0	36	0	0	0	36
9:30 PM	0	0	25	0	0	0	25
9:45 PM	0	1	18	0	0	0	19
10:00 PM	0	0	10	0	0	0	10
10:15 PM	0	0	17	0	0	0	17
10:30 PM	0	0	9	0	0	0	9
10:45 PM	0	0	7	0	0	0	7
11:00 PM	0	0	5	0	0	0	5
11:15 PM	0	0	4	0	0	0	4
11:30 PM	0	0	5	0	0	0	5
11:45 PM	0	0	2	0	0	0	2
PM Total	**4**	**20**	**3497**	**16**	**42**	**7**	**3586**
Percentage	**0.11%**	**0.56%**	**97.52%**	**0.45%**	**1.17%**	**0.20%**	
PM Peak	**3:30 PM**	**5:00 PM**	**4:30 PM**	**3:15 PM**	**3:15 PM**	**3:45 PM**	**4:30 PM**
Volume	**2**	**7**	**548**	**11**	**11**	**3**	**560**
Day Total	**4**	**26**	**6818**	**29**	**110**	**12**	**6999**
Percentage	**0.06%**	**0.37%**	**97.41%**	**0.41%**	**1.57%**	**0.17%**	

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-B

Count Date: **Thursday, October 24, 2024**
Direction: **SB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	3	0	0	0	3
12:15 AM	0	0	2	0	0	0	2
12:30 AM	0	0	3	0	0	0	3
12:45 AM	0	0	1	0	0	0	1
1:00 AM	0	0	1	0	0	0	1
1:15 AM	0	0	1	0	0	0	1
1:30 AM	0	0	2	0	1	0	3
1:45 AM	0	0	1	0	0	0	1
2:00 AM	0	0	2	0	0	0	2
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	4	0	0	0	4
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	3	0	0	0	3
3:15 AM	0	0	0	0	0	0	0
3:30 AM	0	0	4	0	0	0	4
3:45 AM	0	0	9	0	0	0	9
4:00 AM	0	0	10	0	0	0	10
4:15 AM	0	0	16	0	1	0	17
4:30 AM	0	0	30	0	0	0	30
4:45 AM	0	0	38	0	0	0	38
5:00 AM	0	0	43	0	0	0	43
5:15 AM	0	0	55	0	0	0	55
5:30 AM	0	0	87	0	3	0	90
5:45 AM	0	0	97	0	2	0	99
6:00 AM	0	0	86	1	0	0	87
6:15 AM	0	0	89	0	0	0	89
6:30 AM	0	0	99	1	1	0	101
6:45 AM	0	0	176	1	4	1	182
7:00 AM	0	0	165	0	2	0	167
7:15 AM	0	0	140	0	0	0	140
7:30 AM	0	0	160	1	5	0	166
7:45 AM	0	1	138	0	2	0	141
8:00 AM	0	0	143	0	2	0	145
8:15 AM	0	3	135	0	6	1	145
8:30 AM	0	0	116	0	1	0	117
8:45 AM	0	0	131	7	1	0	139
9:00 AM	0	0	92	1	0	0	93
9:15 AM	0	0	87	0	1	1	89
9:30 AM	0	0	82	0	1	0	83
9:45 AM	0	0	83	0	3	0	86
10:00 AM	0	0	72	0	7	0	79
10:15 AM	0	0	75	0	1	0	76
10:30 AM	0	1	81	0	5	0	87
10:45 AM	0	0	61	0	2	0	63
11:00 AM	0	2	68	0	2	0	72
11:15 AM	0	0	110	0	5	0	115
11:30 AM	0	0	86	0	3	1	90
11:45 AM	0	0	96	1	1	0	98
AM Total	**0**	**7**	**2986**	**13**	**62**	**4**	**3072**
Percentage	**0.00%**	**0.23%**	**97.20%**	**0.42%**	**2.02%**	**0.13%**	
AM Peak	**12:00 AM**	**7:30 AM**	**6:45 AM**	**8:15 AM**	**9:45 AM**	**6:00 AM**	**6:45 AM**
Volume	**0**	**4**	**641**	**8**	**16**	**1**	**655**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	1	0	103	0	1	0	105
12:15 PM	0	0	91	0	3	0	94
12:30 PM	0	0	99	0	1	0	100
12:45 PM	0	0	103	0	0	0	103
1:00 PM	0	0	79	0	0	0	79
1:15 PM	0	0	93	0	2	0	95
1:30 PM	0	1	94	1	2	0	98
1:45 PM	0	0	85	0	0	0	85
2:00 PM	0	0	84	1	0	0	85
2:15 PM	0	0	94	0	1	0	95
2:30 PM	0	1	86	0	1	0	88
2:45 PM	0	0	97	0	1	0	98
3:00 PM	0	0	103	1	0	0	104
3:15 PM	0	0	121	3	3	0	127
3:30 PM	0	0	106	5	1	0	112
3:45 PM	0	0	132	1	0	0	133
4:00 PM	0	0	111	0	0	0	111
4:15 PM	0	1	141	1	0	0	143
4:30 PM	0	0	161	0	2	0	163
4:45 PM	0	0	149	0	2	0	151
5:00 PM	0	1	156	0	0	0	157
5:15 PM	0	1	138	0	2	0	141
5:30 PM	0	1	115	0	1	0	117
5:45 PM	0	0	97	0	0	0	97
6:00 PM	0	0	108	0	2	0	110
6:15 PM	0	0	106	0	1	1	108
6:30 PM	0	0	102	0	0	0	102
6:45 PM	0	0	68	0	0	0	68
7:00 PM	0	0	57	0	0	0	57
7:15 PM	0	0	51	0	1	0	52
7:30 PM	0	0	48	0	0	1	49
7:45 PM	0	0	56	0	0	0	56
8:00 PM	0	0	51	0	0	0	51
8:15 PM	0	1	53	1	0	0	55
8:30 PM	0	0	42	0	1	0	43
8:45 PM	0	0	32	0	2	0	34
9:00 PM	0	0	37	0	0	0	37
9:15 PM	0	0	39	0	0	0	39
9:30 PM	0	0	21	0	0	0	21
9:45 PM	0	0	24	0	0	0	24
10:00 PM	0	0	22	0	0	0	22
10:15 PM	0	0	19	0	0	0	19
10:30 PM	0	0	15	0	0	0	15
10:45 PM	0	0	10	0	0	0	10
11:00 PM	0	0	14	0	0	0	14
11:15 PM	0	0	8	0	0	0	8
11:30 PM	0	0	10	0	0	0	10
11:45 PM	0	0	9	0	0	0	9
PM Total	**1**	**7**	**3640**	**14**	**30**	**2**	**3694**
Percentage	**0.03%**	**0.19%**	**98.54%**	**0.38%**	**0.81%**	**0.05%**	
PM Peak	**12:00 PM**	**4:45 PM**	**4:15 PM**	**3:00 PM**	**4:30 PM**	**5:30 PM**	**4:15 PM**
Volume	**1**	**3**	**607**	**10**	**6**	**1**	**614**
Day Total	**1**	**14**	**6626**	**27**	**92**	**6**	**6766**
Percentage	**0.01%**	**0.21%**	**97.93%**	**0.40%**	**1.36%**	**0.09%**	

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # **2540244 ATR-B**

Direction: **NB**

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	14	101	13	86	0	0	0	0	0	0	0	0	0	0	14	94
12:15	7	82	7	90	0	0	0	0	0	0	0	0	0	0	7	86
12:30	5	92	5	74	0	0	0	0	0	0	0	0	0	0	5	83
12:45	2	84	4	78	0	0	0	0	0	0	0	0	0	0	3	81
1:00	0	80	2	79	0	0	0	0	0	0	0	0	0	0	1	80
1:15	0	80	0	81	0	0	0	0	0	0	0	0	0	0	0	81
1:30	3	70	5	78	0	0	0	0	0	0	0	0	0	0	4	74
1:45	2	90	2	110	0	0	0	0	0	0	0	0	0	0	2	100
2:00	3	91	2	112	0	0	0	0	0	0	0	0	0	0	3	102
2:15	4	128	1	120	0	0	0	0	0	0	0	0	0	0	3	124
2:30	3	113	2	120	0	0	0	0	0	0	0	0	0	0	3	117
2:45	2	142	2	146	0	0	0	0	0	0	0	0	0	0	2	144
3:00	1	174	2	133	0	0	0	0	0	0	0	0	0	0	2	154
3:15	2	140	1	156	0	0	0	0	0	0	0	0	0	0	2	148
3:30	2	154	3	143	0	0	0	0	0	0	0	0	0	0	3	149
3:45	5	146	4	141	0	0	0	0	0	0	0	0	0	0	5	144
4:00	3	156	4	129	0	0	0	0	0	0	0	0	0	0	4	143
4:15	4	146	0	145	0	0	0	0	0	0	0	0	0	0	2	146
4:30	1	141	4	122	0	0	0	0	0	0	0	0	0	0	3	132
4:45	3	166	3	136	0	0	0	0	0	0	0	0	0	0	3	151
5:00	2	161	8	150	0	0	0	0	0	0	0	0	0	0	5	156
5:15	4	151	8	145	0	0	0	0	0	0	0	0	0	0	6	148
5:30	7	144	17	145	0	0	0	0	0	0	0	0	0	0	12	145
5:45	21	127	20	152	0	0	0	0	0	0	0	0	0	0	21	140
6:00	27	101	15	107	0	0	0	0	0	0	0	0	0	0	21	104
6:15	22	106	21	108	0	0	0	0	0	0	0	0	0	0	22	107
6:30	28	82	31	98	0	0	0	0	0	0	0	0	0	0	30	90
6:45	46	82	40	86	0	0	0	0	0	0	0	0	0	0	43	84
7:00	46	59	43	79	0	0	0	0	0	0	0	0	0	0	45	69
7:15	57	76	55	66	0	0	0	0	0	0	0	0	0	0	56	71
7:30	61	78	60	80	0	0	0	0	0	0	0	0	0	0	61	79
7:45	75	64	74	69	0	0	0	0	0	0	0	0	0	0	75	67
8:00	94	63	65	65	0	0	0	0	0	0	0	0	0	0	80	64
8:15	87	67	84	62	0	0	0	0	0	0	0	0	0	0	86	65
8:30	85	46	81	50	0	0	0	0	0	0	0	0	0	0	83	48
8:45	75	47	90	48	0	0	0	0	0	0	0	0	0	0	83	48
9:00	81	46	71	35	0	0	0	0	0	0	0	0	0	0	76	41
9:15	73	39	58	41	0	0	0	0	0	0	0	0	0	0	66	40
9:30	71	19	60	28	0	0	0	0	0	0	0	0	0	0	66	24
9:45	50	18	52	26	0	0	0	0	0	0	0	0	0	0	51	22
10:00	55	18	59	34	0	0	0	0	0	0	0	0	0	0	57	26
10:15	66	20	59	26	0	0	0	0	0	0	0	0	0	0	63	23
10:30	62	25	45	27	0	0	0	0	0	0	0	0	0	0	54	26
10:45	62	13	52	21	0	0	0	0	0	0	0	0	0	0	57	17
11:00	66	22	78	14	0	0	0	0	0	0	0	0	0	0	72	18
11:15	74	26	62	16	0	0	0	0	0	0	0	0	0	0	68	21
11:30	54	8	80	19	0	0	0	0	0	0	0	0	0	0	67	14
11:45	82	11	59	17	0	0	0	0	0	0	0	0	0	0	71	14
Total	**1599**	**4095**	**1513**	**4093**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1556**	**4094**
Day Total	**5694**		**5606**		**0**		**0**		**0**		**0**		**0**		**5650**	
Peak HR	**7:45 AM**	**4:45 PM**	**8:15 AM**	**5:00 PM**											**8:00 AM**	**4:45 PM**
Volume	**341**	**622**	**326**	**592**											**331**	**599**

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # **2540244 ATR-B**

Direction: **SB**

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	4	85	3	105	0	0	0	0	0	0	0	0	0	0	4	95
12:15	7	109	2	94	0	0	0	0	0	0	0	0	0	0	5	102
12:30	2	104	3	100	0	0	0	0	0	0	0	0	0	0	3	102
12:45	1	69	1	103	0	0	0	0	0	0	0	0	0	0	1	86
1:00	3	86	1	79	0	0	0	0	0	0	0	0	0	0	2	83
1:15	1	87	1	95	0	0	0	0	0	0	0	0	0	0	1	91
1:30	2	122	3	98	0	0	0	0	0	0	0	0	0	0	3	110
1:45	4	94	1	85	0	0	0	0	0	0	0	0	0	0	3	90
2:00	3	110	2	85	0	0	0	0	0	0	0	0	0	0	3	98
2:15	1	87	1	95	0	0	0	0	0	0	0	0	0	0	1	91
2:30	3	91	4	88	0	0	0	0	0	0	0	0	0	0	4	90
2:45	3	86	2	98	0	0	0	0	0	0	0	0	0	0	3	92
3:00	3	89	3	104	0	0	0	0	0	0	0	0	0	0	3	97
3:15	2	131	0	127	0	0	0	0	0	0	0	0	0	0	1	129
3:30	6	123	4	112	0	0	0	0	0	0	0	0	0	0	5	118
3:45	3	119	9	133	0	0	0	0	0	0	0	0	0	0	6	126
4:00	7	115	10	111	0	0	0	0	0	0	0	0	0	0	9	113
4:15	17	138	17	143	0	0	0	0	0	0	0	0	0	0	17	141
4:30	22	134	30	163	0	0	0	0	0	0	0	0	0	0	26	149
4:45	34	144	38	151	0	0	0	0	0	0	0	0	0	0	36	148
5:00	36	139	43	157	0	0	0	0	0	0	0	0	0	0	40	148
5:15	47	143	55	141	0	0	0	0	0	0	0	0	0	0	51	142
5:30	95	106	90	117	0	0	0	0	0	0	0	0	0	0	93	112
5:45	112	106	99	97	0	0	0	0	0	0	0	0	0	0	106	102
6:00	111	112	87	110	0	0	0	0	0	0	0	0	0	0	99	111
6:15	126	104	89	108	0	0	0	0	0	0	0	0	0	0	108	106
6:30	149	100	101	102	0	0	0	0	0	0	0	0	0	0	125	101
6:45	182	70	182	68	0	0	0	0	0	0	0	0	0	0	182	69
7:00	180	59	167	57	0	0	0	0	0	0	0	0	0	0	174	58
7:15	166	57	140	52	0	0	0	0	0	0	0	0	0	0	153	55
7:30	176	56	166	49	0	0	0	0	0	0	0	0	0	0	171	53
7:45	161	59	141	56	0	0	0	0	0	0	0	0	0	0	151	58
8:00	131	39	145	51	0	0	0	0	0	0	0	0	0	0	138	45
8:15	139	49	145	55	0	0	0	0	0	0	0	0	0	0	142	52
8:30	154	42	117	43	0	0	0	0	0	0	0	0	0	0	136	43
8:45	151	41	139	34	0	0	0	0	0	0	0	0	0	0	145	38
9:00	128	42	93	37	0	0	0	0	0	0	0	0	0	0	111	40
9:15	115	36	89	39	0	0	0	0	0	0	0	0	0	0	102	38
9:30	99	25	83	21	0	0	0	0	0	0	0	0	0	0	91	23
9:45	107	19	86	24	0	0	0	0	0	0	0	0	0	0	97	22
10:00	97	10	79	22	0	0	0	0	0	0	0	0	0	0	88	16
10:15	74	17	76	19	0	0	0	0	0	0	0	0	0	0	75	18
10:30	102	9	87	15	0	0	0	0	0	0	0	0	0	0	95	12
10:45	82	7	63	10	0	0	0	0	0	0	0	0	0	0	73	9
11:00	89	5	72	14	0	0	0	0	0	0	0	0	0	0	81	10
11:15	99	4	115	8	0	0	0	0	0	0	0	0	0	0	107	6
11:30	96	5	90	10	0	0	0	0	0	0	0	0	0	0	93	8
11:45	81	2	98	9	0	0	0	0	0	0	0	0	0	0	90	6
Total	**3413**	**3586**	**3072**	**3694**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3243**	**3640**
Day Total	**6999**		**6766**		**0**		**0**		**0**		**0**		**0**		**6883**	
Peak HR	**6:45 AM**	**4:30 PM**	**6:45 AM**	**4:15 PM**											**6:45 AM**	**4:30 PM**
Volume	**704**	**560**	**655**	**614**											**680**	**586**

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-C

Count Date: Wednesday, October 23, 2024
Direction: NB

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	11	0	0	0	11
12:15 AM	0	0	3	0	0	0	3
12:30 AM	0	0	6	0	0	0	6
12:45 AM	0	0	2	0	0	1	3
1:00 AM	0	0	4	0	0	0	4
1:15 AM	0	0	2	0	0	0	2
1:30 AM	0	0	4	0	2	0	6
1:45 AM	0	0	5	0	0	0	5
2:00 AM	0	0	4	1	0	0	5
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	4	0	0	0	4
2:45 AM	0	0	9	0	0	0	9
3:00 AM	0	0	5	0	0	0	5
3:15 AM	0	0	10	0	0	0	10
3:30 AM	0	0	6	0	0	0	6
3:45 AM	0	0	10	0	0	0	10
4:00 AM	0	0	9	0	0	0	9
4:15 AM	0	0	21	0	0	0	21
4:30 AM	0	0	27	0	1	0	28
4:45 AM	0	0	48	0	1	0	49
5:00 AM	0	0	47	0	3	1	51
5:15 AM	0	0	55	0	2	0	57
5:30 AM	0	0	113	0	0	0	113
5:45 AM	0	0	124	0	3	0	127
6:00 AM	0	0	127	0	1	0	128
6:15 AM	0	0	138	0	1	0	139
6:30 AM	0	0	145	0	1	0	146
6:45 AM	0	0	168	1	2	1	172
7:00 AM	0	0	119	0	3	0	122
7:15 AM	0	2	161	1	4	0	168
7:30 AM	0	0	187	0	4	0	191
7:45 AM	0	0	181	0	6	1	188
8:00 AM	0	0	184	0	12	1	197
8:15 AM	0	0	164	4	10	0	178
8:30 AM	0	0	132	1	3	1	137
8:45 AM	0	0	125	0	1	1	127
9:00 AM	0	0	146	0	4	1	151
9:15 AM	0	0	149	0	3	1	153
9:30 AM	0	0	122	0	8	2	132
9:45 AM	0	0	131	0	9	2	142
10:00 AM	0	0	119	0	15	3	137
10:15 AM	0	0	137	0	8	0	145
10:30 AM	0	0	157	0	3	0	160
10:45 AM	0	0	136	0	8	2	146
11:00 AM	0	1	121	0	4	2	128
11:15 AM	0	0	141	0	7	3	151
11:30 AM	0	0	153	0	3	0	156
11:45 AM	0	0	112	0	16	6	134
AM Total	**0**	**3**	**3985**	**8**	**148**	**29**	**4173**
Percentage	**0.00%**	**0.07%**	**95.49%**	**0.19%**	**3.55%**	**0.69%**	
AM Peak	**12:00 AM**	**6:30 AM**	**7:30 AM**	**7:45 AM**	**9:30 AM**	**11:00 AM**	**7:30 AM**
Volume	**0**	**2**	**716**	**5**	**40**	**11**	**754**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	127	0	4	1	133
12:15 PM	0	0	143	1	3	0	147
12:30 PM	0	0	146	0	4	3	153
12:45 PM	0	1	129	0	2	1	133
1:00 PM	0	1	141	0	10	1	153
1:15 PM	0	1	140	1	5	0	147
1:30 PM	0	0	132	0	5	1	138
1:45 PM	0	0	146	0	4	3	153
2:00 PM	0	1	132	0	3	1	137
2:15 PM	0	0	118	0	5	0	123
2:30 PM	0	1	129	0	5	0	135
2:45 PM	0	0	155	2	2	1	160
3:00 PM	0	0	169	0	5	2	176
3:15 PM	0	0	165	0	4	0	169
3:30 PM	0	0	167	1	1	0	169
3:45 PM	0	1	160	0	1	0	162
4:00 PM	0	0	192	0	4	2	198
4:15 PM	0	1	190	2	4	1	198
4:30 PM	0	0	178	0	4	1	183
4:45 PM	0	1	221	0	3	1	226
5:00 PM	0	1	187	0	1	1	190
5:15 PM	0	1	208	0	1	1	211
5:30 PM	0	2	196	0	2	0	200
5:45 PM	0	1	175	1	0	0	177
6:00 PM	0	1	166	0	1	0	168
6:15 PM	0	0	150	0	2	0	152
6:30 PM	0	1	143	0	0	0	144
6:45 PM	0	0	91	0	0	0	91
7:00 PM	1	0	112	0	1	0	114
7:15 PM	0	0	90	0	1	1	92
7:30 PM	0	0	82	0	2	0	84
7:45 PM	0	0	76	0	0	0	76
8:00 PM	0	0	67	0	1	0	68
8:15 PM	0	0	82	0	0	0	82
8:30 PM	0	0	62	0	0	0	62
8:45 PM	0	0	41	0	1	1	43
9:00 PM	0	1	61	0	0	0	62
9:15 PM	0	1	47	0	0	0	48
9:30 PM	0	0	35	0	0	0	35
9:45 PM	0	0	31	0	0	0	31
10:00 PM	0	0	24	0	0	0	24
10:15 PM	0	0	23	0	0	0	23
10:30 PM	0	0	17	0	0	0	17
10:45 PM	0	0	11	0	0	0	11
11:00 PM	0	0	25	0	0	0	25
11:15 PM	0	0	14	0	0	0	14
11:30 PM	0	0	7	0	0	0	7
11:45 PM	0	0	3	0	0	0	3
PM Total	**1**	**18**	**5306**	**8**	**91**	**23**	**5447**
Percentage	**0.02%**	**0.33%**	**97.41%**	**0.15%**	**1.67%**	**0.42%**	
PM Peak	**6:15 PM**	**4:45 PM**	**4:45 PM**	**2:45 PM**	**1:00 PM**	**12:00 PM**	**4:45 PM**
Volume	**1**	**5**	**812**	**3**	**24**	**5**	**827**
Day Total	**1**	**21**	**9291**	**16**	**239**	**52**	**9620**
Percentage	**0.01%**	**0.22%**	**96.58%**	**0.17%**	**2.48%**	**0.54%**	

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-C

Count Date: Thursday, October 24, 2024
Direction: NB

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	4	0	0	1	5
12:15 AM	0	0	3	0	0	0	3
12:30 AM	0	0	4	0	0	0	4
12:45 AM	0	0	7	0	0	0	7
1:00 AM	0	0	0	0	0	0	0
1:15 AM	0	0	1	0	0	0	1
1:30 AM	0	0	5	0	1	0	6
1:45 AM	0	1	2	0	0	0	3
2:00 AM	0	0	2	0	0	0	2
2:15 AM	0	0	3	0	0	0	3
2:30 AM	0	0	6	0	0	0	6
2:45 AM	0	0	4	0	0	0	4
3:00 AM	0	0	5	0	0	0	5
3:15 AM	0	0	4	0	1	0	5
3:30 AM	0	0	7	0	1	0	8
3:45 AM	0	0	11	0	2	0	13
4:00 AM	0	0	13	0	0	0	13
4:15 AM	0	0	20	0	0	0	20
4:30 AM	0	0	31	0	1	0	32
4:45 AM	0	1	44	0	1	0	46
5:00 AM	0	1	54	0	2	0	57
5:15 AM	0	0	69	0	0	2	71
5:30 AM	0	0	108	0	1	0	109
5:45 AM	0	0	114	0	1	0	115
6:00 AM	0	0	131	0	2	0	133
6:15 AM	0	0	163	0	0	0	163
6:30 AM	0	0	153	0	1	0	154
6:45 AM	0	0	172	1	7	1	181
7:00 AM	0	0	153	0	2	0	155
7:15 AM	0	0	182	1	3	1	187
7:30 AM	0	0	167	0	6	2	175
7:45 AM	1	0	186	0	9	1	197
8:00 AM	0	0	180	0	8	0	188
8:15 AM	0	2	170	3	8	0	183
8:30 AM	0	0	147	1	4	0	152
8:45 AM	0	0	152	0	6	0	158
9:00 AM	0	0	127	0	6	3	136
9:15 AM	0	0	134	0	5	2	141
9:30 AM	0	0	140	0	4	6	150
9:45 AM	0	0	133	0	9	1	143
10:00 AM	1	0	107	0	6	2	116
10:15 AM	0	0	106	0	5	4	115
10:30 AM	0	0	130	0	8	1	139
10:45 AM	0	0	100	1	9	3	113
11:00 AM	0	1	128	0	7	2	138
11:15 AM	0	0	142	0	8	6	156
11:30 AM	0	0	151	0	4	1	156
11:45 AM	0	0	133	0	3	0	136
AM Total	**2**	**6**	**4008**	**7**	**141**	**39**	**4203**
Percentage	**0.05%**	**0.14%**	**95.36%**	**0.17%**	**3.35%**	**0.93%**	
AM Peak	**7:00 AM**	**4:15 AM**	**7:15 AM**	**7:45 AM**	**10:30 AM**	**9:30 AM**	**7:15 AM**
Volume	**1**	**2**	**715**	**4**	**32**	**13**	**747**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	159	0	2	1	162
12:15 PM	0	0	127	0	2	2	131
12:30 PM	0	0	144	0	3	0	147
12:45 PM	0	1	157	0	7	2	167
1:00 PM	0	1	157	0	5	4	167
1:15 PM	0	0	139	1	4	0	144
1:30 PM	0	0	158	0	3	1	162
1:45 PM	0	0	128	0	2	1	131
2:00 PM	0	0	155	0	4	1	160
2:15 PM	0	1	175	0	10	1	187
2:30 PM	1	0	151	0	6	1	159
2:45 PM	0	0	138	1	5	2	146
3:00 PM	0	0	176	0	1	2	179
3:15 PM	0	0	148	0	2	0	150
3:30 PM	0	0	176	2	2	0	180
3:45 PM	0	0	184	1	2	1	188
4:00 PM	0	0	180	0	1	0	181
4:15 PM	0	1	187	1	2	0	191
4:30 PM	0	2	207	0	4	0	213
4:45 PM	0	0	217	0	2	0	219
5:00 PM	0	2	185	0	1	0	188
5:15 PM	0	0	203	0	4	1	208
5:30 PM	0	0	214	0	5	0	219
5:45 PM	0	0	157	0	0	0	157
6:00 PM	0	0	155	0	2	0	157
6:15 PM	0	0	139	0	1	1	141
6:30 PM	0	1	136	0	2	0	139
6:45 PM	0	0	113	1	1	0	115
7:00 PM	0	0	101	0	4	0	105
7:15 PM	0	1	104	0	0	0	105
7:30 PM	0	0	90	0	1	1	92
7:45 PM	0	0	78	0	1	0	79
8:00 PM	0	0	76	0	0	0	76
8:15 PM	0	0	76	1	0	0	77
8:30 PM	0	0	68	0	1	0	69
8:45 PM	0	0	52	0	2	0	54
9:00 PM	0	0	64	0	0	0	64
9:15 PM	0	0	54	0	0	0	54
9:30 PM	0	0	33	0	0	0	33
9:45 PM	0	0	26	0	1	0	27
10:00 PM	0	0	38	0	0	0	38
10:15 PM	0	0	38	0	0	0	38
10:30 PM	0	0	26	0	0	0	26
10:45 PM	0	0	26	0	0	0	26
11:00 PM	0	0	28	0	0	0	28
11:15 PM	0	0	14	0	0	0	14
11:30 PM	0	0	14	0	0	0	14
11:45 PM	0	0	16	0	0	0	16
PM Total	**1**	**10**	**5587**	**8**	**95**	**22**	**5723**
Percentage	**0.02%**	**0.17%**	**97.62%**	**0.14%**	**1.66%**	**0.38%**	
PM Peak	**1:45 PM**	**4:15 PM**	**4:45 PM**	**3:30 PM**	**2:00 PM**	**12:15 PM**	**4:45 PM**
Volume	**1**	**5**	**819**	**4**	**25**	**8**	**834**
Day Total	**3**	**16**	**9595**	**15**	**236**	**61**	**9926**
Percentage	**0.03%**	**0.16%**	**96.67%**	**0.15%**	**2.38%**	**0.61%**	

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 2540244 ATR-C

Count Date: Wednesday, October 23, 2024
Direction: SB

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	13	0	0	0	13
12:15 AM	0	0	8	0	0	0	8
12:30 AM	0	0	6	0	0	1	7
12:45 AM	0	0	3	0	0	0	3
1:00 AM	0	0	3	0	0	0	3
1:15 AM	0	0	1	0	0	0	1
1:30 AM	0	0	5	0	0	0	5
1:45 AM	0	0	3	0	0	1	4
2:00 AM	0	0	5	0	0	0	5
2:15 AM	0	0	5	0	0	0	5
2:30 AM	0	0	3	0	0	0	3
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	3	0	0	0	3
3:15 AM	0	0	6	0	0	1	7
3:30 AM	0	0	7	0	0	0	7
3:45 AM	0	0	7	0	0	0	7
4:00 AM	0	0	2	0	1	0	3
4:15 AM	0	0	7	0	1	0	8
4:30 AM	0	0	3	0	0	0	3
4:45 AM	0	0	12	0	1	1	14
5:00 AM	0	0	16	0	0	0	16
5:15 AM	0	0	22	0	0	0	22
5:30 AM	0	0	18	0	3	0	21
5:45 AM	0	0	44	0	2	0	46
6:00 AM	0	0	40	0	1	0	41
6:15 AM	0	0	57	0	5	0	62
6:30 AM	0	0	60	0	2	0	62
6:45 AM	0	0	110	1	5	1	117
7:00 AM	0	0	132	1	5	0	138
7:15 AM	0	0	105	0	1	0	106
7:30 AM	0	0	118	1	3	1	123
7:45 AM	0	1	118	0	4	1	124
8:00 AM	0	0	139	0	4	1	144
8:15 AM	0	0	153	0	4	0	157
8:30 AM	0	0	204	0	6	2	212
8:45 AM	0	0	190	0	7	1	198
9:00 AM	0	0	149	0	6	2	157
9:15 AM	0	1	121	0	7	0	129
9:30 AM	0	0	107	0	7	0	114
9:45 AM	0	0	88	0	7	3	98
10:00 AM	0	0	106	0	4	2	112
10:15 AM	0	2	91	0	8	2	103
10:30 AM	0	0	92	0	9	2	103
10:45 AM	0	0	104	0	4	2	110
11:00 AM	0	0	95	0	7	1	103
11:15 AM	0	1	89	0	8	3	101
11:30 AM	0	0	104	1	4	4	113
11:45 AM	0	0	100	0	3	0	103
AM Total	**0**	**5**	**2876**	**4**	**129**	**32**	**3046**
Percentage	**0.00%**	**0.16%**	**94.42%**	**0.13%**	**4.24%**	**1.05%**	
AM Peak	**12:00 AM**	**9:30 AM**	**8:15 AM**	**6:45 AM**	**9:45 AM**	**10:45 AM**	**8:15 AM**
Volume	**0**	**2**	**696**	**3**	**28**	**10**	**724**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	1	136	1	8	1	147
12:15 PM	0	0	107	0	17	0	124
12:30 PM	0	1	134	0	8	3	146
12:45 PM	0	0	116	0	3	0	119
1:00 PM	0	0	97	0	8	0	105
1:15 PM	0	1	112	0	6	0	119
1:30 PM	0	0	108	1	5	0	114
1:45 PM	0	0	122	0	6	1	129
2:00 PM	0	0	120	0	3	0	123
2:15 PM	0	0	159	0	1	0	160
2:30 PM	0	0	133	2	1	1	137
2:45 PM	0	0	148	0	5	1	154
3:00 PM	1	1	168	0	3	0	173
3:15 PM	0	1	125	0	2	0	128
3:30 PM	0	1	162	1	4	0	168
3:45 PM	0	1	165	1	1	0	168
4:00 PM	0	1	171	0	3	0	175
4:15 PM	0	3	168	0	0	0	171
4:30 PM	0	3	138	0	1	0	142
4:45 PM	0	1	196	0	0	0	197
5:00 PM	0	1	158	0	0	2	161
5:15 PM	0	1	154	0	3	0	158
5:30 PM	0	0	147	0	1	0	148
5:45 PM	0	1	144	0	1	0	146
6:00 PM	0	1	137	0	1	0	139
6:15 PM	1	0	125	0	0	1	127
6:30 PM	0	0	98	0	0	0	98
6:45 PM	0	1	104	0	0	0	105
7:00 PM	0	0	79	1	0	0	80
7:15 PM	0	0	87	0	2	0	89
7:30 PM	0	0	88	0	0	0	88
7:45 PM	0	0	85	0	1	0	86
8:00 PM	0	0	83	0	0	0	83
8:15 PM	0	0	83	0	2	0	85
8:30 PM	0	0	65	0	1	0	66
8:45 PM	0	2	62	0	1	0	65
9:00 PM	0	0	50	0	1	0	51
9:15 PM	0	0	54	0	0	0	54
9:30 PM	0	0	34	0	0	1	35
9:45 PM	0	1	21	0	0	1	23
10:00 PM	0	0	33	0	0	0	33
10:15 PM	0	0	24	0	0	0	24
10:30 PM	0	0	38	0	0	0	38
10:45 PM	0	0	27	0	0	0	27
11:00 PM	0	0	31	0	1	0	32
11:15 PM	0	0	29	0	0	0	29
11:30 PM	0	0	23	0	0	0	23
11:45 PM	0	0	19	0	0	0	19
PM Total	**2**	**23**	**4867**	**7**	**100**	**12**	**5011**
Percentage	**0.04%**	**0.46%**	**97.13%**	**0.14%**	**2.00%**	**0.24%**	
PM Peak	**2:15 PM**	**3:45 PM**	**4:00 PM**	**1:45 PM**	**12:00 PM**	**12:00 PM**	**4:00 PM**
Volume	**1**	**8**	**673**	**2**	**36**	**4**	**685**
Day Total	**2**	**28**	**7743**	**11**	**229**	**44**	**8057**
Percentage	**0.02%**	**0.35%**	**96.10%**	**0.14%**	**2.84%**	**0.55%**	

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PDI File #: 2540244 ATR-C

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Count Date: Thursday, October 24, 2024
Direction: SB

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	12	0	0	0	12
12:15 AM	0	0	10	0	0	0	10
12:30 AM	0	0	4	0	1	0	5
12:45 AM	0	0	4	0	0	0	4
1:00 AM	0	0	5	0	0	0	5
1:15 AM	0	0	3	0	0	0	3
1:30 AM	0	0	7	0	0	0	7
1:45 AM	0	0	2	0	0	0	2
2:00 AM	0	0	3	0	0	0	3
2:15 AM	0	0	1	0	0	0	1
2:30 AM	0	0	3	0	0	0	3
2:45 AM	0	0	4	0	0	0	4
3:00 AM	0	0	4	0	0	0	4
3:15 AM	0	0	4	0	1	0	5
3:30 AM	0	0	8	0	0	0	8
3:45 AM	0	0	5	0	2	0	7
4:00 AM	0	0	5	0	1	0	6
4:15 AM	0	0	4	0	0	0	4
4:30 AM	0	0	9	0	0	0	9
4:45 AM	0	0	10	0	0	0	10
5:00 AM	0	1	18	0	0	0	19
5:15 AM	0	0	23	0	0	0	23
5:30 AM	0	0	30	0	1	0	31
5:45 AM	0	0	39	1	2	0	42
6:00 AM	0	0	39	0	1	1	41
6:15 AM	0	0	75	0	1	0	76
6:30 AM	0	0	67	0	2	1	70
6:45 AM	0	0	82	1	4	2	89
7:00 AM	0	0	97	1	6	0	104
7:15 AM	0	0	105	0	4	4	113
7:30 AM	0	0	120	1	2	0	123
7:45 AM	0	0	146	0	7	1	154
8:00 AM	0	0	119	0	4	1	124
8:15 AM	0	0	122	0	4	2	128
8:30 AM	0	0	149	0	3	1	153
8:45 AM	0	0	108	1	6	0	115
9:00 AM	0	0	106	0	4	3	113
9:15 AM	0	1	89	0	5	2	97
9:30 AM	0	0	84	0	5	3	92
9:45 AM	0	0	96	0	11	5	112
10:00 AM	0	0	75	0	2	1	78
10:15 AM	0	0	99	0	4	1	104
10:30 AM	0	1	92	0	1	1	95
10:45 AM	0	0	102	0	6	5	113
11:00 AM	0	0	98	1	7	1	107
11:15 AM	0	0	89	0	5	1	95
11:30 AM	0	0	105	0	3	1	109
11:45 AM	0	1	112	1	6	1	121
AM Total	**0**	**4**	**2593**	**7**	**111**	**38**	**2753**
Percentage	**0.00%**	**0.15%**	**94.19%**	**0.25%**	**4.03%**	**1.38%**	
AM Peak	**12:00 AM**	**4:15 AM**	**7:45 AM**	**6:45 AM**	**9:00 AM**	**9:00 AM**	**7:45 AM**
Volume	**0**	**1**	**536**	**3**	**25**	**13**	**559**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	128	0	11	3	142
12:15 PM	0	0	106	0	4	1	111
12:30 PM	0	0	119	0	9	1	129
12:45 PM	0	0	119	0	5	2	126
1:00 PM	0	0	129	0	7	0	136
1:15 PM	0	0	135	0	2	0	137
1:30 PM	0	1	127	2	6	1	137
1:45 PM	0	1	150	0	5	1	157
2:00 PM	0	0	140	0	6	1	147
2:15 PM	0	0	153	0	11	2	166
2:30 PM	0	0	146	1	1	2	150
2:45 PM	0	0	151	1	7	1	160
3:00 PM	0	0	144	1	0	0	145
3:15 PM	0	0	159	1	2	0	162
3:30 PM	1	0	154	0	0	2	157
3:45 PM	1	1	165	1	1	1	170
4:00 PM	0	0	156	2	1	1	160
4:15 PM	1	0	167	0	4	0	172
4:30 PM	0	0	147	1	0	0	148
4:45 PM	0	0	153	0	1	1	155
5:00 PM	0	0	150	0	1	0	151
5:15 PM	0	0	186	0	1	0	187
5:30 PM	1	0	166	0	2	1	170
5:45 PM	0	0	179	0	0	0	179
6:00 PM	0	0	131	0	0	1	132
6:15 PM	0	1	128	1	0	0	130
6:30 PM	0	0	115	0	1	0	116
6:45 PM	0	0	106	1	0	0	107
7:00 PM	0	0	105	0	0	0	105
7:15 PM	1	0	88	0	0	0	89
7:30 PM	0	0	96	0	0	0	96
7:45 PM	0	0	90	0	1	0	91
8:00 PM	0	0	73	0	2	0	75
8:15 PM	0	0	61	0	0	0	61
8:30 PM	0	0	61	0	1	0	62
8:45 PM	0	0	59	0	1	0	60
9:00 PM	0	0	43	0	0	0	43
9:15 PM	0	0	56	0	0	0	56
9:30 PM	0	0	39	0	0	0	39
9:45 PM	0	0	40	0	0	0	40
10:00 PM	0	0	51	0	1	0	52
10:15 PM	0	0	42	0	0	0	42
10:30 PM	0	0	38	0	0	0	38
10:45 PM	0	0	31	0	0	0	31
11:00 PM	0	0	17	0	1	0	18
11:15 PM	0	0	18	0	0	0	18
11:30 PM	0	0	31	0	0	0	31
11:45 PM	0	0	15	0	1	0	16
PM Total	**5**	**4**	**5063**	**12**	**96**	**22**	**5202**
Percentage	**0.10%**	**0.08%**	**97.33%**	**0.23%**	**1.85%**	**0.42%**	
PM Peak	**3:30 PM**	**1:00 PM**	**5:00 PM**	**2:30 PM**	**12:00 PM**	**12:00 PM**	**5:00 PM**
Volume	**3**	**2**	**681**	**4**	**29**	**7**	**687**
Day Total	**5**	**8**	**7656**	**19**	**207**	**60**	**7955**
Percentage	**0.06%**	**0.10%**	**96.24%**	**0.24%**	**2.60%**	**0.75%**	

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # **2540244 ATR-C**

Direction: **NB**

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	11	133	5	162	0	0	0	0	0	0	0	0	0	0	8	148
12:15	3	147	3	131	0	0	0	0	0	0	0	0	0	0	3	139
12:30	6	153	4	147	0	0	0	0	0	0	0	0	0	0	5	150
12:45	3	133	7	167	0	0	0	0	0	0	0	0	0	0	5	150
1:00	4	153	0	167	0	0	0	0	0	0	0	0	0	0	2	160
1:15	2	147	1	144	0	0	0	0	0	0	0	0	0	0	2	146
1:30	6	138	6	162	0	0	0	0	0	0	0	0	0	0	6	150
1:45	5	153	3	131	0	0	0	0	0	0	0	0	0	0	4	142
2:00	5	137	2	160	0	0	0	0	0	0	0	0	0	0	4	149
2:15	1	123	3	187	0	0	0	0	0	0	0	0	0	0	2	155
2:30	4	135	6	159	0	0	0	0	0	0	0	0	0	0	5	147
2:45	9	160	4	146	0	0	0	0	0	0	0	0	0	0	7	153
3:00	5	176	5	179	0	0	0	0	0	0	0	0	0	0	5	178
3:15	10	169	5	150	0	0	0	0	0	0	0	0	0	0	8	160
3:30	6	169	8	180	0	0	0	0	0	0	0	0	0	0	7	175
3:45	10	162	13	188	0	0	0	0	0	0	0	0	0	0	12	175
4:00	9	198	13	181	0	0	0	0	0	0	0	0	0	0	11	190
4:15	21	198	20	191	0	0	0	0	0	0	0	0	0	0	21	195
4:30	28	183	32	213	0	0	0	0	0	0	0	0	0	0	30	198
4:45	49	226	46	219	0	0	0	0	0	0	0	0	0	0	48	223
5:00	51	190	57	188	0	0	0	0	0	0	0	0	0	0	54	189
5:15	57	211	71	208	0	0	0	0	0	0	0	0	0	0	64	210
5:30	113	200	109	219	0	0	0	0	0	0	0	0	0	0	111	210
5:45	127	177	115	157	0	0	0	0	0	0	0	0	0	0	121	167
6:00	128	168	133	157	0	0	0	0	0	0	0	0	0	0	131	163
6:15	139	152	163	141	0	0	0	0	0	0	0	0	0	0	151	147
6:30	146	144	154	139	0	0	0	0	0	0	0	0	0	0	150	142
6:45	172	91	181	115	0	0	0	0	0	0	0	0	0	0	177	103
7:00	122	114	155	105	0	0	0	0	0	0	0	0	0	0	139	110
7:15	168	92	187	105	0	0	0	0	0	0	0	0	0	0	178	99
7:30	191	84	175	92	0	0	0	0	0	0	0	0	0	0	183	88
7:45	188	76	197	79	0	0	0	0	0	0	0	0	0	0	193	78
8:00	197	68	188	76	0	0	0	0	0	0	0	0	0	0	193	72
8:15	178	82	183	77	0	0	0	0	0	0	0	0	0	0	181	80
8:30	137	62	152	69	0	0	0	0	0	0	0	0	0	0	145	66
8:45	127	43	158	54	0	0	0	0	0	0	0	0	0	0	143	49
9:00	151	62	136	64	0	0	0	0	0	0	0	0	0	0	144	63
9:15	153	48	141	54	0	0	0	0	0	0	0	0	0	0	147	51
9:30	132	35	150	33	0	0	0	0	0	0	0	0	0	0	141	34
9:45	142	31	143	27	0	0	0	0	0	0	0	0	0	0	143	29
10:00	137	24	116	38	0	0	0	0	0	0	0	0	0	0	127	31
10:15	145	23	115	38	0	0	0	0	0	0	0	0	0	0	130	31
10:30	160	17	139	26	0	0	0	0	0	0	0	0	0	0	150	22
10:45	146	11	113	26	0	0	0	0	0	0	0	0	0	0	130	19
11:00	128	25	138	28	0	0	0	0	0	0	0	0	0	0	133	27
11:15	151	14	156	14	0	0	0	0	0	0	0	0	0	0	154	14
11:30	156	7	156	14	0	0	0	0	0	0	0	0	0	0	156	11
11:45	134	3	136	16	0	0	0	0	0	0	0	0	0	0	135	10
Total	**4173**	**5447**	**4203**	**5723**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4188**	**5585**
Day Total	**9620**		**9926**		**0**		**0**		**0**		**0**		**0**		**9773**	
Peak HR	**7:30 AM**	**4:45 PM**	**7:15 AM**	**4:45 PM**											**7:30 AM**	**4:45 PM**
Volume	**754**	**827**	**747**	**834**											**749**	**831**

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File # **2540244 ATR-C**

Direction: **SB**

Weekly Report

Day	Wednesday		Thursday												Week	
Date	10/23/24		10/24/24												Ave	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	13	147	12	142	0	0	0	0	0	0	0	0	0	0	13	145
12:15	8	124	10	111	0	0	0	0	0	0	0	0	0	0	9	118
12:30	7	146	5	129	0	0	0	0	0	0	0	0	0	0	6	138
12:45	3	119	4	126	0	0	0	0	0	0	0	0	0	0	4	123
1:00	3	105	5	136	0	0	0	0	0	0	0	0	0	0	4	121
1:15	1	119	3	137	0	0	0	0	0	0	0	0	0	0	2	128
1:30	5	114	7	137	0	0	0	0	0	0	0	0	0	0	6	126
1:45	4	129	2	157	0	0	0	0	0	0	0	0	0	0	3	143
2:00	5	123	3	147	0	0	0	0	0	0	0	0	0	0	4	135
2:15	5	160	1	166	0	0	0	0	0	0	0	0	0	0	3	163
2:30	3	137	3	150	0	0	0	0	0	0	0	0	0	0	3	144
2:45	2	154	4	160	0	0	0	0	0	0	0	0	0	0	3	157
3:00	3	173	4	145	0	0	0	0	0	0	0	0	0	0	4	159
3:15	7	128	5	162	0	0	0	0	0	0	0	0	0	0	6	145
3:30	7	168	8	157	0	0	0	0	0	0	0	0	0	0	8	163
3:45	7	168	7	170	0	0	0	0	0	0	0	0	0	0	7	169
4:00	3	175	6	160	0	0	0	0	0	0	0	0	0	0	5	168
4:15	8	171	4	172	0	0	0	0	0	0	0	0	0	0	6	172
4:30	3	142	9	148	0	0	0	0	0	0	0	0	0	0	6	145
4:45	14	197	10	155	0	0	0	0	0	0	0	0	0	0	12	176
5:00	16	161	19	151	0	0	0	0	0	0	0	0	0	0	18	156
5:15	22	158	23	187	0	0	0	0	0	0	0	0	0	0	23	173
5:30	21	148	31	170	0	0	0	0	0	0	0	0	0	0	26	159
5:45	46	146	42	179	0	0	0	0	0	0	0	0	0	0	44	163
6:00	41	139	41	132	0	0	0	0	0	0	0	0	0	0	41	136
6:15	62	127	76	130	0	0	0	0	0	0	0	0	0	0	69	129
6:30	62	98	70	116	0	0	0	0	0	0	0	0	0	0	66	107
6:45	117	105	89	107	0	0	0	0	0	0	0	0	0	0	103	106
7:00	138	80	104	105	0	0	0	0	0	0	0	0	0	0	121	93
7:15	106	89	113	89	0	0	0	0	0	0	0	0	0	0	110	89
7:30	123	88	123	96	0	0	0	0	0	0	0	0	0	0	123	92
7:45	124	86	154	91	0	0	0	0	0	0	0	0	0	0	139	89
8:00	144	83	124	75	0	0	0	0	0	0	0	0	0	0	134	79
8:15	157	85	128	61	0	0	0	0	0	0	0	0	0	0	143	73
8:30	212	66	153	62	0	0	0	0	0	0	0	0	0	0	183	64
8:45	198	65	115	60	0	0	0	0	0	0	0	0	0	0	157	63
9:00	157	51	113	43	0	0	0	0	0	0	0	0	0	0	135	47
9:15	129	54	97	56	0	0	0	0	0	0	0	0	0	0	113	55
9:30	114	35	92	39	0	0	0	0	0	0	0	0	0	0	103	37
9:45	98	23	112	40	0	0	0	0	0	0	0	0	0	0	105	32
10:00	112	33	78	52	0	0	0	0	0	0	0	0	0	0	95	43
10:15	103	24	104	42	0	0	0	0	0	0	0	0	0	0	104	33
10:30	103	38	95	38	0	0	0	0	0	0	0	0	0	0	99	38
10:45	110	27	113	31	0	0	0	0	0	0	0	0	0	0	112	29
11:00	103	32	107	18	0	0	0	0	0	0	0	0	0	0	105	25
11:15	101	29	95	18	0	0	0	0	0	0	0	0	0	0	98	24
11:30	113	23	109	31	0	0	0	0	0	0	0	0	0	0	111	27
11:45	103	19	121	16	0	0	0	0	0	0	0	0	0	0	112	18
Total	**3046**	**5011**	**2753**	**5202**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2900**	**5107**
Day Total	**8057**		**7955**		**0**		**0**		**0**		**0**		**0**		**8006**	
Peak HR	**8:15 AM**	**4:00 PM**	**7:45 AM**	**5:00 PM**											**8:15 AM**	**3:30 PM**
Volume	**724**	**685**	**559**	**687**											**617**	**671**

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	37	40	0	77	14	52	0	66	104	51	0	155	298
8:15 AM	34	41	0	75	27	58	0	85	105	52	1	158	318
8:30 AM	33	31	0	64	17	63	0	80	83	38	0	121	265
8:45 AM	30	48	0	78	46	44	0	90	90	57	0	147	315
Total	134	160	0	294	104	217	0	321	382	198	1	581	1196
9:00 AM	26	30	0	56	20	50	0	70	64	32	0	96	222
9:15 AM	25	16	0	41	10	46	0	56	77	33	0	110	207
9:30 AM	22	25	0	47	16	44	0	60	72	37	0	109	216
9:45 AM	19	15	0	34	12	39	0	51	73	22	0	95	180
Total	92	86	0	178	58	179	0	237	286	124	0	410	825
Grand Total	226	246	0	472	162	396	0	558	668	322	1	991	2021
Approach %	47.9	52.1	0.0		29.0	71.0	0.0		67.4	32.5	0.1		
Total %	11.2	12.2	0.0	23.4	8.0	19.6	0.0	27.6	33.1	15.9	0.0	49.0	
Exiting Leg Total				484				914				623	2021
Cars	216	233	0	449	151	388	0	539	658	312	1	971	1959
% Cars	95.6	94.7	0.0	95.1	93.2	98.0	0.0	96.6	98.5	96.9	100.0	98.0	96.9
Exiting Leg Total				463				891				605	1959
Heavy Vehicles	10	13	0	23	11	8	0	19	10	10	0	20	62
% Heavy Vehicles	4.4	5.3	0.0	4.9	6.8	2.0	0.0	3.4	1.5	3.1	0.0	2.0	3.1
Exiting Leg Total				21				23				18	62

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	37	40	0	77	14	52	0	66	104	51	0	155	298
8:15 AM	34	41	0	75	27	58	0	85	105	52	1	158	318
8:30 AM	33	31	0	64	17	63	0	80	83	38	0	121	265
8:45 AM	30	48	0	78	46	44	0	90	90	57	0	147	315
Total Volume	134	160	0	294	104	217	0	321	382	198	1	581	1196
% Approach Total	45.6	54.4	0.0		32.4	67.6	0.0		65.7	34.1	0.2		
PHF	0.905	0.833	0.000	0.942	0.565	0.861	0.000	0.892	0.910	0.868	0.250	0.919	0.940
Cars	132	148	0	280	97	215	0	312	375	190	1	566	1158
Cars %	98.5	92.5	0.0	95.2	93.3	99.1	0.0	97.2	98.2	96.0	100.0	97.4	96.8
Heavy Vehicles	2	12	0	14	7	2	0	9	7	8	0	15	38
Heavy Vehicles %	1.5	7.5	0.0	4.8	6.7	0.9	0.0	2.8	1.8	4.0	0.0	2.6	3.2
Cars Enter Leg	132	148	0	280	97	215	0	312	375	190	1	566	1158
Heavy Enter Leg	2	12	0	14	7	2	0	9	7	8	0	15	38
Total Entering Leg	134	160	0	294	104	217	0	321	382	198	1	581	1196
Cars Exiting Leg				287				523				348	1158
Heavy Exiting Leg				15				19				4	38
Total Exiting Leg				302				542				352	1196

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	36	40	0	76	14	51	0	65	102	48	0	150	291
8:15 AM	34	37	0	71	27	58	0	85	102	52	1	155	311
8:30 AM	32	30	0	62	17	62	0	79	82	36	0	118	259
8:45 AM	30	41	0	71	39	44	0	83	89	54	0	143	297
Total	132	148	0	280	97	215	0	312	375	190	1	566	1158
9:00 AM	21	29	0	50	17	50	0	67	64	31	0	95	212
9:15 AM	25	16	0	41	10	42	0	52	76	33	0	109	202
9:30 AM	19	25	0	44	15	44	0	59	72	36	0	108	211
9:45 AM	19	15	0	34	12	37	0	49	71	22	0	93	176
Total	84	85	0	169	54	173	0	227	283	122	0	405	801
Grand Total	216	233	0	449	151	388	0	539	658	312	1	971	1959
Approach %	48.1	51.9	0.0		28.0	72.0	0.0		67.8	32.1	0.1		
Total %	11.0	11.9	0.0	22.9	7.7	19.8	0.0	27.5	33.6	15.9	0.1	49.6	
Exiting Leg Total				463				891				605	1959

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	36	40	0	76	14	51	0	65	102	48	0	150	291
8:15 AM	34	37	0	71	27	58	0	85	102	52	1	155	311
8:30 AM	32	30	0	62	17	62	0	79	82	36	0	118	259
8:45 AM	30	41	0	71	39	44	0	83	89	54	0	143	297
Total Volume	132	148	0	280	97	215	0	312	375	190	1	566	1158
% Approach Total	47.1	52.9	0.0		31.1	68.9	0.0		66.3	33.6	0.2		
PHF	0.917	0.902	0.000	0.921	0.622	0.867	0.000	0.918	0.919	0.880	0.250	0.913	0.931
Entering Leg	132	148	0	280	97	215	0	312	375	190	1	566	1158
Exiting Leg				287				523				348	1158
Total				567				835				914	2316

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	1	0	1	2	3	0	5	7
8:15 AM	0	4	0	4	0	0	0	0	3	0	0	3	7
8:30 AM	1	1	0	2	0	1	0	1	1	2	0	3	6
8:45 AM	0	7	0	7	7	0	0	7	1	3	0	4	18
Total	2	12	0	14	7	2	0	9	7	8	0	15	38
9:00 AM	5	1	0	6	3	0	0	3	0	1	0	1	10
9:15 AM	0	0	0	0	0	4	0	4	1	0	0	1	5
9:30 AM	3	0	0	3	1	0	0	1	0	1	0	1	5
9:45 AM	0	0	0	0	0	2	0	2	2	0	0	2	4
Total	8	1	0	9	4	6	0	10	3	2	0	5	24
Grand Total	10	13	0	23	11	8	0	19	10	10	0	20	62
Approach %	43.5	56.5	0.0		57.9	42.1	0.0		50.0	50.0	0.0		
Total %	16.1	21.0	0.0	37.1	17.7	12.9	0.0	30.6	16.1	16.1	0.0	32.3	
Exiting Leg Total				21				23				18	62
Buses	4	8	0	12	8	0	0	8	0	2	0	2	22
% Buses	40.0	61.5	0.0	52.2	72.7	0.0	0.0	42.1	0.0	20.0	0.0	10.0	35.5
Exiting Leg Total				10				8				4	22
Single-Unit Trucks	6	4	0	10	3	6	0	9	9	7	0	16	35
% Single-Unit	60.0	30.8	0.0	43.5	27.3	75.0	0.0	47.4	90.0	70.0	0.0	80.0	56.5
Exiting Leg Total				10				13				12	35
Articulated Trucks	0	1	0	1	0	2	0	2	1	1	0	2	5
% Articulated	0.0	7.7	0.0	4.3	0.0	25.0	0.0	10.5	10.0	10.0	0.0	10.0	8.1
Exiting Leg Total				1				2				2	5

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:15 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:15 AM	0	4	0	4	0	0	0	0	3	0	0	3	7
8:30 AM	1	1	0	2	0	1	0	1	1	2	0	3	6
8:45 AM	0	7	0	7	7	0	0	7	1	3	0	4	18
9:00 AM	5	1	0	6	3	0	0	3	0	1	0	1	10
Total Volume	6	13	0	19	10	1	0	11	5	6	0	11	41
% Approach Total	31.6	68.4	0.0		90.9	9.1	0.0		45.5	54.5	0.0		
PHF	0.300	0.464	0.000	0.679	0.357	0.250	0.000	0.393	0.417	0.500	0.000	0.688	0.569
Buses	4	8	0	12	8	0	0	8	0	2	0	2	22
Buses %	66.7	61.5	0.0	63.2	80.0	0.0	0.0	72.7	0.0	33.3	0.0	18.2	53.7
Single-Unit Trucks	2	4	0	6	2	0	0	2	5	4	0	9	17
Single-Unit %	33.3	30.8	0.0	31.6	20.0	0.0	0.0	18.2	100.0	66.7	0.0	81.8	41.5
Articulated Trucks	0	1	0	1	0	1	0	1	0	0	0	0	2
Articulated %	0.0	7.7	0.0	5.3	0.0	100.0	0.0	9.1	0.0	0.0	0.0	0.0	4.9
Buses	4	8	0	12	8	0	0	8	0	2	0	2	22
Single-Unit Trucks	2	4	0	6	2	0	0	2	5	4	0	9	17
Articulated Trucks	0	1	0	1	0	1	0	1	0	0	0	0	2
Total Entering Leg	6	13	0	19	10	1	0	11	5	6	0	11	41
Buses				10				8				4	22
Single-Unit Trucks				6				9				2	17
Articulated Trucks				0				1				1	2
Total Exiting Leg				16				18				7	41

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	7	0	7	5	0	0	5	0	2	0	2	14
Total	0	7	0	7	5	0	0	5	0	2	0	2	14
9:00 AM	4	1	0	5	3	0	0	3	0	0	0	0	8
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	1	0	5	3	0	0	3	0	0	0	0	8
Grand Total	4	8	0	12	8	0	0	8	0	2	0	2	22
Approach %	33.3	66.7	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	18.2	36.4	0.0	54.5	36.4	0.0	0.0	36.4	0.0	9.1	0.0	9.1	
Exiting Leg Total				10				8				4	22

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:15 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	7	0	7	5	0	0	5	0	2	0	2	14
9:00 AM	4	1	0	5	3	0	0	3	0	0	0	0	8
Total Volume	4	8	0	12	8	0	0	8	0	2	0	2	22
% Approach Total	33.3	66.7	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.286	0.000	0.429	0.400	0.000	0.000	0.400	0.000	0.250	0.000	0.250	0.393
Entering Leg	4	8	0	12	8	0	0	8	0	2	0	2	22
Exiting Leg				10				8				4	22
Total				22				16				6	44

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	1	0	1	2	2	0	4	6
8:15 AM	0	3	0	3	0	0	0	0	3	0	0	3	6
8:30 AM	1	1	0	2	0	0	0	0	1	2	0	3	5
8:45 AM	0	0	0	0	2	0	0	2	1	1	0	2	4
Total	2	4	0	6	2	1	0	3	7	5	0	12	21
9:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
9:15 AM	0	0	0	0	0	3	0	3	1	0	0	1	4
9:30 AM	3	0	0	3	1	0	0	1	0	1	0	1	5
9:45 AM	0	0	0	0	0	2	0	2	1	0	0	1	3
Total	4	0	0	4	1	5	0	6	2	2	0	4	14
Grand Total	6	4	0	10	3	6	0	9	9	7	0	16	35
Approach %	60.0	40.0	0.0		33.3	66.7	0.0		56.3	43.8	0.0		
Total %	17.1	11.4	0.0	28.6	8.6	17.1	0.0	25.7	25.7	20.0	0.0	45.7	
Exiting Leg Total				10				13				12	35

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	1	0	1	2	2	0	4	6
8:15 AM	0	3	0	3	0	0	0	0	3	0	0	3	6
8:30 AM	1	1	0	2	0	0	0	0	1	2	0	3	5
8:45 AM	0	0	0	0	2	0	0	2	1	1	0	2	4
Total Volume	2	4	0	6	2	1	0	3	7	5	0	12	21
% Approach Total	33.3	66.7	0.0		66.7	33.3	0.0		58.3	41.7	0.0		
PHF	0.500	0.333	0.000	0.500	0.250	0.250	0.000	0.375	0.583	0.625	0.000	0.750	0.875
Entering Leg	2	4	0	6	2	1	0	3	7	5	0	12	21
Exiting Leg				7				11				3	21
Total				13				14				15	42

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Articulated Trucks

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	1	0	1	0	1	0	1	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	1	0	1	1	0	0	1	2
Grand Total	0	1	0	1	0	2	0	2	1	1	0	2	5
Approach %	0.0	100.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
Total %	0.0	20.0	0.0	20.0	0.0	40.0	0.0	40.0	20.0	20.0	0.0	40.0	
Exiting Leg Total				1				2				2	5

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	1	0	1	0	1	0	1	3
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.750
Entering Leg	0	1	0	1	0	1	0	1	0	1	0	1	3
Exiting Leg				1				1				1	3
Total				2				2				2	6

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						1						0						0	1

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:30 AM	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Exiting Leg						1						0						0	1
Total						1						1						0	2

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	100		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	
Exiting Leg Total						0						0						1	1

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:30 AM	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Exiting Leg						0						0						1	1
Total						0						0						2	2

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	67	19	0	86	15	104	0	119	69	34	1	104	309
2:45 PM	42	26	0	68	22	126	0	148	76	36	0	112	328
Total	109	45	0	154	37	230	0	267	145	70	1	216	637
3:00 PM	73	30	0	103	33	104	0	137	76	36	0	112	352
3:15 PM	87	49	0	136	35	113	0	148	74	41	0	115	399
3:30 PM	102	39	0	141	30	120	0	150	75	54	0	129	420
3:45 PM	108	40	0	148	21	119	0	140	92	36	0	128	416
Total	370	158	0	528	119	456	0	575	317	167	0	484	1587
4:00 PM	106	41	0	147	19	104	0	123	70	45	0	115	385
4:15 PM	100	58	0	158	35	117	0	152	86	51	0	137	447
Total	206	99	0	305	54	221	0	275	156	96	0	252	832
Grand Total	685	302	0	987	210	907	0	1117	618	333	1	952	3056
Approach %	69.4	30.6	0.0		18.8	81.2	0.0		64.9	35.0	0.1		
Total %	22.4	9.9	0.0	32.3	6.9	29.7	0.0	36.6	20.2	10.9	0.0	31.2	
Exiting Leg Total				543				920				1593	3056
Cars	675	292	0	967	200	899	0	1099	613	324	1	938	3004
% Cars	98.5	96.7	0.0	98.0	95.2	99.1	0.0	98.4	99.2	97.3	100.0	98.5	98.3
Exiting Leg Total				524				905				1575	3056
Heavy Vehicles	10	10	0	20	10	8	0	18	5	9	0	14	52
% Heavy Vehicles	1.5	3.3	0.0	2.0	4.8	0.9	0.0	1.6	0.8	2.7	0.0	1.5	1.7
Exiting Leg Total				19				15				18	52

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:30 PM	102	39	0	141	30	120	0	150	75	54	0	129	420
3:45 PM	108	40	0	148	21	119	0	140	92	36	0	128	416
4:00 PM	106	41	0	147	19	104	0	123	70	45	0	115	385
4:15 PM	100	58	0	158	35	117	0	152	86	51	0	137	447
Total Volume	416	178	0	594	105	460	0	565	323	186	0	509	1668
% Approach Total	70.0	30.0	0.0		18.6	81.4	0.0		63.5	36.5	0.0		
PHF	0.963	0.767	0.000	0.940	0.750	0.958	0.000	0.929	0.878	0.861	0.000	0.929	0.933
Cars	409	172	0	581	103	458	0	561	322	182	0	504	1646
Cars %	98.3	96.6	0.0	97.8	98.1	99.6	0.0	99.3	99.7	97.8	0.0	99.0	98.7
Heavy Vehicles	7	6	0	13	2	2	0	4	1	4	0	5	22
Heavy Vehicles %	1.7	3.4	0.0	2.2	1.9	0.4	0.0	0.7	0.3	2.2	0.0	1.0	1.3
Cars Enter Leg	409	172	0	581	103	458	0	561	322	182	0	504	1646
Heavy Enter Leg	7	6	0	13	2	2	0	4	1	4	0	5	22
Total Entering Leg	416	178	0	594	105	460	0	565	323	186	0	509	1668
Cars Exiting Leg				285				494				867	1646
Heavy Exiting Leg				6				7				9	22
Total Exiting Leg				291				501				876	1668

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	66	19	0	85	15	102	0	117	68	33	1	102	304
2:45 PM	42	26	0	68	22	123	0	145	75	36	0	111	324
Total	108	45	0	153	37	225	0	262	143	69	1	213	628
3:00 PM	72	30	0	102	30	104	0	134	75	34	0	109	345
3:15 PM	86	45	0	131	30	112	0	142	73	39	0	112	385
3:30 PM	98	34	0	132	29	119	0	148	74	52	0	126	406
3:45 PM	107	40	0	147	21	118	0	139	92	35	0	127	413
Total	363	149	0	512	110	453	0	563	314	160	0	474	1549
4:00 PM	104	40	0	144	19	104	0	123	70	45	0	115	382
4:15 PM	100	58	0	158	34	117	0	151	86	50	0	136	445
Total	204	98	0	302	53	221	0	274	156	95	0	251	827
Grand Total	675	292	0	967	200	899	0	1099	613	324	1	938	3004
Approach %	69.8	30.2	0.0		18.2	81.8	0.0		65.4	34.5	0.1		
Total %	22.5	9.7	0.0	32.2	6.7	29.9	0.0	36.6	20.4	10.8	0.0	31.2	
Exiting Leg Total				524				905				1575	3004

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:30 PM	98	34	0	132	29	119	0	148	74	52	0	126	406
3:45 PM	107	40	0	147	21	118	0	139	92	35	0	127	413
4:00 PM	104	40	0	144	19	104	0	123	70	45	0	115	382
4:15 PM	100	58	0	158	34	117	0	151	86	50	0	136	445
Total Volume	409	172	0	581	103	458	0	561	322	182	0	504	1646
% Approach Total	70.4	29.6	0.0		18.4	81.6	0.0		63.9	36.1	0.0		
PHF	0.956	0.741	0.000	0.919	0.757	0.962	0.000	0.929	0.875	0.875	0.000	0.926	0.925
Entering Leg	409	172	0	581	103	458	0	561	322	182	0	504	1646
Exiting Leg				285				494				867	1646
Total				866				1055				1371	3292

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	1	0	0	1	0	2	0	2	1	1	0	2	5
2:45 PM	0	0	0	0	0	3	0	3	1	0	0	1	4
Total	1	0	0	1	0	5	0	5	2	1	0	3	9
3:00 PM	1	0	0	1	3	0	0	3	1	2	0	3	7
3:15 PM	1	4	0	5	5	1	0	6	1	2	0	3	14
3:30 PM	4	5	0	9	1	1	0	2	1	2	0	3	14
3:45 PM	1	0	0	1	0	1	0	1	0	1	0	1	3
Total	7	9	0	16	9	3	0	12	3	7	0	10	38
4:00 PM	2	1	0	3	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
Total	2	1	0	3	1	0	0	1	0	1	0	1	5
Grand Total	10	10	0	20	10	8	0	18	5	9	0	14	52
Approach %	50.0	50.0	0.0		55.6	44.4	0.0		35.7	64.3	0.0		
Total %	19.2	19.2	0.0	38.5	19.2	15.4	0.0	34.6	9.6	17.3	0.0	26.9	
Exiting Leg Total				19				15				18	52
Buses	3	8	0	11	6	4	0	10	2	3	0	5	26
% Buses	30.0	80.0	0.0	55.0	60.0	50.0	0.0	55.6	40.0	33.3	0.0	35.7	50.0
Exiting Leg Total				9				10				7	26
Single-Unit Trucks	7	2	0	9	4	4	0	8	3	4	0	7	24
% Single-Unit	70.0	20.0	0.0	45.0	40.0	50.0	0.0	44.4	60.0	44.4	0.0	50.0	46.2
Exiting Leg Total				8				5				11	24
Articulated Trucks	0	0	0	0	0	0	0	0	0	2	0	2	2
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.2	0.0	14.3	3.8
Exiting Leg Total				2				0				0	2

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	0	0	0	0	0	3	0	3	1	0	0	1	4
3:00 PM	1	0	0	1	3	0	0	3	1	2	0	3	7
3:15 PM	1	4	0	5	5	1	0	6	1	2	0	3	14
3:30 PM	4	5	0	9	1	1	0	2	1	2	0	3	14
Total Volume	6	9	0	15	9	5	0	14	4	6	0	10	39
% Approach Total	40.0	60.0	0.0		64.3	35.7	0.0		40.0	60.0	0.0		
PHF	0.375	0.450	0.000	0.417	0.450	0.417	0.000	0.583	1.000	0.750	0.000	0.833	0.696
Buses	3	7	0	10	6	3	0	9	2	3	0	5	24
Buses %	50.0	77.8	0.0	66.7	66.7	60.0	0.0	64.3	50.0	50.0	0.0	50.0	61.5
Single-Unit Trucks	3	2	0	5	3	2	0	5	2	2	0	4	14
Single-Unit %	50.0	22.2	0.0	33.3	33.3	40.0	0.0	35.7	50.0	33.3	0.0	40.0	35.9
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	10.0	2.6
Buses	3	7	0	10	6	3	0	9	2	3	0	5	24
Single-Unit Trucks	3	2	0	5	3	2	0	5	2	2	0	4	14
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Entering Leg	6	9	0	15	9	5	0	14	4	6	0	10	39
Buses				9				9				6	24
Single-Unit Trucks				5				4				5	14
Articulated Trucks				1				0				0	1
Total Exiting Leg				15				13				11	39

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
2:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
3:00 PM	1	0	0	1	2	0	0	2	1	0	0	1	4
3:15 PM	0	3	0	3	3	1	0	4	0	1	0	1	8
3:30 PM	2	4	0	6	1	1	0	2	1	2	0	3	11
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	7	0	10	6	2	0	8	2	3	0	5	23
4:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	3	8	0	11	6	4	0	10	2	3	0	5	26
Approach %	27.3	72.7	0.0		60.0	40.0	0.0		40.0	60.0	0.0		
Total %	11.5	30.8	0.0	42.3	23.1	15.4	0.0	38.5	7.7	11.5	0.0	19.2	
Exiting Leg Total				9				10				7	26

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
3:00 PM	1	0	0	1	2	0	0	2	1	0	0	1	4
3:15 PM	0	3	0	3	3	1	0	4	0	1	0	1	8
3:30 PM	2	4	0	6	1	1	0	2	1	2	0	3	11
Total Volume	3	7	0	10	6	3	0	9	2	3	0	5	24
% Approach Total	30.0	70.0	0.0		66.7	33.3	0.0		40.0	60.0	0.0		
PHF	0.375	0.438	0.000	0.417	0.500	0.750	0.000	0.563	0.500	0.375	0.000	0.417	0.545
Entering Leg	3	7	0	10	6	3	0	9	2	3	0	5	24
Exiting Leg				9				9				6	24
Total				19				18				11	48

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	1	0	0	1	0	1	0	1	1	1	0	2	4
2:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
Total	1	0	0	1	0	3	0	3	2	1	0	3	7
3:00 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
3:15 PM	1	1	0	2	2	0	0	2	1	1	0	2	6
3:30 PM	2	1	0	3	0	0	0	0	0	0	0	0	3
3:45 PM	1	0	0	1	0	1	0	1	0	1	0	1	3
Total	4	2	0	6	3	1	0	4	1	3	0	4	14
4:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	2	0	0	2	1	0	0	1	0	0	0	0	3
Grand Total	7	2	0	9	4	4	0	8	3	4	0	7	24
Approach %	77.8	22.2	0.0		50.0	50.0	0.0		42.9	57.1	0.0		
Total %	29.2	8.3	0.0	37.5	16.7	16.7	0.0	33.3	12.5	16.7	0.0	29.2	
Exiting Leg Total				8				5				11	24

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	1	0	0	1	0	1	0	1	1	1	0	2	4
2:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
3:00 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
3:15 PM	1	1	0	2	2	0	0	2	1	1	0	2	6
Total Volume	2	1	0	3	3	3	0	6	3	3	0	6	15
% Approach Total	66.7	33.3	0.0		50.0	50.0	0.0		50.0	50.0	0.0		
PHF	0.500	0.250	0.000	0.375	0.375	0.375	0.000	0.750	0.750	0.750	0.000	0.750	0.625
Entering Leg	2	1	0	3	3	3	0	6	3	3	0	6	15
Exiting Leg				6				4				5	15
Total				9				10				11	30

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Articulated Trucks**

	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	2	0	2	2
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	
Exiting Leg Total				2				0				0	2

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Salem Street from North				Middlesex Avenue from South				Salem Street from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg				1				0				0	1
Total				1				0				1	2

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	3
Approach %	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	33.3	0.0	0.0	0.0	33.3	66.7	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						2						1						0	3

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
Exiting Leg						2						0						0	2
Total						2						2						0	4

PDI File #: **240268 A**
Location: **N: Salem Street S: Middlesex Avenue**
Location: **W: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Salem Street from North						Middlesex Avenue from South						Salem Street from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	69	0	0	69	0	0	0	0	0	59	0	59	128
8:15 AM	76	0	0	76	0	1	0	1	0	76	0	76	153
8:30 AM	58	0	0	58	1	1	0	2	0	57	0	57	117
8:45 AM	73	2	1	76	0	1	0	1	0	92	0	92	169
Total	276	2	1	279	1	3	0	4	0	284	0	284	567
9:00 AM	46	0	0	46	0	0	0	0	0	50	0	50	96
9:15 AM	45	0	0	45	0	0	0	0	0	43	0	43	88
9:30 AM	47	0	0	47	1	0	0	1	1	52	0	53	101
9:45 AM	32	1	0	33	0	1	0	1	0	33	0	33	67
Total	170	1	0	171	1	1	0	2	1	178	0	179	352
Grand Total	446	3	1	450	2	4	0	6	1	462	0	463	919
Approach %	99.1	0.7	0.2		33.3	66.7	0.0		0.2	99.8	0.0		
Total %	48.5	0.3	0.1	49.0	0.2	0.4	0.0	0.7	0.1	50.3	0.0	50.4	
Exiting Leg Total				465				4				450	919
Cars	433	3	1	437	2	4	0	6	1	447	0	448	891
% Cars	97.1	100.0	100.0	97.1	100.0	100.0	0.0	100.0	100.0	96.8	0.0	96.8	97.0
Exiting Leg Total				450				4				437	891
Heavy Vehicles	13	0	0	13	0	0	0	0	0	15	0	15	28
% Heavy Vehicles	2.9	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	3.2	0.0	3.2	3.0
Exiting Leg Total				15				0				13	28

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	69	0	0	69	0	0	0	0	0	59	0	59	128
8:15 AM	76	0	0	76	0	1	0	1	0	76	0	76	153
8:30 AM	58	0	0	58	1	1	0	2	0	57	0	57	117
8:45 AM	73	2	1	76	0	1	0	1	0	92	0	92	169
Total Volume	276	2	1	279	1	3	0	4	0	284	0	284	567
% Approach Total	98.9	0.7	0.4		25.0	75.0	0.0		0.0	100.0	0.0		
PHF	0.908	0.250	0.250	0.918	0.250	0.750	0.000	0.500	0.000	0.772	0.000	0.772	0.839
Cars	267	2	1	270	1	3	0	4	0	275	0	275	549
Cars %	96.7	100.0	100.0	96.8	100.0	100.0	0.0	100.0	0.0	96.8	0.0	96.8	96.8
Heavy Vehicles	9	0	0	9	0	0	0	0	0	9	0	9	18
Heavy Vehicles %	3.3	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	3.2	0.0	3.2	3.2
Cars Enter Leg	267	2	1	270	1	3	0	4	0	275	0	275	549
Heavy Enter Leg	9	0	0	9	0	0	0	0	0	9	0	9	18
Total Entering Leg	276	2	1	279	1	3	0	4	0	284	0	284	567
Cars Exiting Leg				277				2				270	549
Heavy Exiting Leg				9				0				9	18
Total Exiting Leg				286				2				279	567

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	68	0	0	68	0	0	0	0	0	56	0	56	124
8:15 AM	71	0	0	71	0	1	0	1	0	75	0	75	147
8:30 AM	57	0	0	57	1	1	0	2	0	55	0	55	114
8:45 AM	71	2	1	74	0	1	0	1	0	89	0	89	164
Total	267	2	1	270	1	3	0	4	0	275	0	275	549
9:00 AM	45	0	0	45	0	0	0	0	0	48	0	48	93
9:15 AM	45	0	0	45	0	0	0	0	0	42	0	42	87
9:30 AM	44	0	0	44	1	0	0	1	1	50	0	51	96
9:45 AM	32	1	0	33	0	1	0	1	0	32	0	32	66
Total	166	1	0	167	1	1	0	2	1	172	0	173	342
Grand Total	433	3	1	437	2	4	0	6	1	447	0	448	891
Approach %	99.1	0.7	0.2		33.3	66.7	0.0		0.2	99.8	0.0		
Total %	48.6	0.3	0.1	49.0	0.2	0.4	0.0	0.7	0.1	50.2	0.0	50.3	
Exiting Leg Total				450				4				437	891

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	68	0	0	68	0	0	0	0	0	56	0	56	124
8:15 AM	71	0	0	71	0	1	0	1	0	75	0	75	147
8:30 AM	57	0	0	57	1	1	0	2	0	55	0	55	114
8:45 AM	71	2	1	74	0	1	0	1	0	89	0	89	164
Total Volume	267	2	1	270	1	3	0	4	0	275	0	275	549
% Approach Total	98.9	0.7	0.4		25.0	75.0	0.0		0.0	100.0	0.0		
PHF	0.940	0.250	0.250	0.912	0.250	0.750	0.000	0.500	0.000	0.772	0.000	0.772	0.837
Entering Leg	267	2	1	270	1	3	0	4	0	275	0	275	549
Exiting Leg				277				2				270	549
Total				547				6				545	1098

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
8:15 AM	5	0	0	5	0	0	0	0	0	1	0	1	6
8:30 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:45 AM	2	0	0	2	0	0	0	0	0	3	0	3	5
Total	9	0	0	9	0	0	0	0	0	9	0	9	18
9:00 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
9:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
9:30 AM	3	0	0	3	0	0	0	0	0	2	0	2	5
9:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	4	0	0	4	0	0	0	0	0	6	0	6	10
Grand Total	13	0	0	13	0	0	0	0	0	15	0	15	28
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	46.4	0.0	0.0	46.4	0.0	0.0	0.0	0.0	0.0	53.6	0.0	53.6	
Exiting Leg Total				15				0				13	28
Buses	2	0	0	2	0	0	0	0	0	0	0	0	2
% Buses	15.4	0.0	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1
Exiting Leg Total				0				0				2	2
Single-Unit Trucks	10	0	0	10	0	0	0	0	0	12	0	12	22
% Single-Unit	76.9	0.0	0.0	76.9	0.0	0.0	0.0	0.0	0.0	80.0	0.0	80.0	78.6
Exiting Leg Total				12				0				10	22
Articulated Trucks	1	0	0	1	0	0	0	0	0	3	0	3	4
% Articulated	7.7	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	20.0	0.0	20.0	14.3
Exiting Leg Total				3				0				1	4

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
8:15 AM	5	0	0	5	0	0	0	0	0	1	0	1	6
8:30 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:45 AM	2	0	0	2	0	0	0	0	0	3	0	3	5
Total Volume	9	0	0	9	0	0	0	0	0	9	0	9	18
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.450	0.000	0.000	0.450	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.750	0.750
Buses	2	0	0	2	0	0	0	0	0	0	0	0	2
Buses %	22.2	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Single-Unit Trucks	6	0	0	6	0	0	0	0	0	6	0	6	12
Single-Unit %	66.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	66.7	0.0	66.7	66.7
Articulated Trucks	1	0	0	1	0	0	0	0	0	3	0	3	4
Articulated %	11.1	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	22.2
Buses	2	0	0	2	0	0	0	0	0	0	0	0	2
Single-Unit Trucks	6	0	0	6	0	0	0	0	0	6	0	6	12
Articulated Trucks	1	0	0	1	0	0	0	0	0	3	0	3	4
Total Entering Leg	9	0	0	9	0	0	0	0	0	9	0	9	18
Buses				0				0				2	2
Single-Unit Trucks				6				0				6	12
Articulated Trucks				3				0				1	4
Total Exiting Leg				9				0				9	18

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total	2	0	0	2	0	0	0	0	0	0	0	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	0	0	2	0	0	0	0	0	0	0	0	2
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				2	2

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	2
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	2	0	0	2	0	0	0	0	0	0	0	0	2
Exiting Leg				0				0				2	2
Total				2				0				2	4

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:15 AM	4	0	0	4	0	0	0	0	0	0	0	0	4
8:30 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	6	0	0	6	0	0	0	0	0	6	0	6	12
9:00 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
9:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
9:30 AM	3	0	0	3	0	0	0	0	0	2	0	2	5
9:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	4	0	0	4	0	0	0	0	0	6	0	6	10
Grand Total	10	0	0	10	0	0	0	0	0	12	0	12	22
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	45.5	0.0	0.0	45.5	0.0	0.0	0.0	0.0	0.0	54.5	0.0	54.5	
Exiting Leg Total				12				0				10	22

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:15 AM	4	0	0	4	0	0	0	0	0	0	0	0	4
8:30 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	6	0	0	6	0	0	0	0	0	6	0	6	12
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.750	0.750
Entering Leg	6	0	0	6	0	0	0	0	0	6	0	6	12
Exiting Leg				6				0				6	12
Total				12				0				12	24

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Articulated Trucks**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:15 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	1	0	0	1	0	0	0	0	0	3	0	3	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	1	0	0	0	0	0	3	0	3	4
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	75.0	
Exiting Leg Total				3				0				1	4

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:15 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	1	0	0	1	0	0	0	0	0	3	0	3	4
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.750	0.500
Entering Leg	1	0	0	1	0	0	0	0	0	3	0	3	4
Exiting Leg				3				0				1	4
Total				4				0				4	8

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	
Exiting Leg Total						0						0						1	1

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg						0						0						1	1
Total						0						0						2	2

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	84	0	0	84	1	0	0	1	1	45	0	46	131
2:45 PM	74	0	0	74	0	0	0	0	1	57	0	58	132
Total	158	0	0	158	1	0	0	1	2	102	0	104	263
3:00 PM	105	0	0	105	0	1	0	1	0	66	0	66	172
3:15 PM	133	0	0	133	0	1	0	1	1	69	0	70	204
3:30 PM	132	0	0	132	2	0	0	2	1	82	0	83	217
3:45 PM	155	1	0	156	0	0	0	0	1	55	0	56	212
Total	525	1	0	526	2	2	0	4	3	272	0	275	805
4:00 PM	142	1	0	143	0	1	0	1	0	65	0	65	209
4:15 PM	173	0	0	173	0	0	0	0	0	81	0	81	254
Total	315	1	0	316	0	1	0	1	0	146	0	146	463
Grand Total	998	2	0	1000	3	3	0	6	5	520	0	525	1531
Approach %	99.8	0.2	0.0		50.0	50.0	0.0		1.0	99.0	0.0		
Total %	65.2	0.1	0.0	65.3	0.2	0.2	0.0	0.4	0.3	34.0	0.0	34.3	
Exiting Leg Total				523				7				1001	1531
Cars	985	2	0	987	3	3	0	6	5	509	0	514	1507
% Cars	98.7	100.0	0.0	98.7	100.0	100.0	0.0	100.0	100.0	97.9	0.0	97.9	98.4
Exiting Leg Total				512				7				988	1507
Heavy Vehicles	13	0	0	13	0	0	0	0	0	11	0	11	24
% Heavy Vehicles	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	2.1	0.0	2.1	1.6
Exiting Leg Total				11				0				13	24

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:30 PM	132	0	0	132	2	0	0	2	1	82	0	83	217
3:45 PM	155	1	0	156	0	0	0	0	1	55	0	56	212
4:00 PM	142	1	0	143	0	1	0	1	0	65	0	65	209
4:15 PM	173	0	0	173	0	0	0	0	0	81	0	81	254
Total Volume	602	2	0	604	2	1	0	3	2	283	0	285	892
% Approach Total	99.7	0.3	0.0		66.7	33.3	0.0		0.7	99.3	0.0		
PHF	0.870	0.500	0.000	0.873	0.250	0.250	0.000	0.375	0.500	0.863	0.000	0.858	0.878
Cars	594	2	0	596	2	1	0	3	2	280	0	282	881
Cars %	98.7	100.0	0.0	98.7	100.0	100.0	0.0	100.0	100.0	98.9	0.0	98.9	98.8
Heavy Vehicles	8	0	0	8	0	0	0	0	0	3	0	3	11
Heavy Vehicles %	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	1.2
Cars Enter Leg	594	2	0	596	2	1	0	3	2	280	0	282	881
Heavy Enter Leg	8	0	0	8	0	0	0	0	0	3	0	3	11
Total Entering Leg	602	2	0	604	2	1	0	3	2	283	0	285	892
Cars Exiting Leg				282				4				595	881
Heavy Exiting Leg				3				0				8	11
Total Exiting Leg				285				4				603	892

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	84	0	0	84	1	0	0	1	1	44	0	45	130
2:45 PM	74	0	0	74	0	0	0	0	1	57	0	58	132
Total	158	0	0	158	1	0	0	1	2	101	0	103	262
3:00 PM	101	0	0	101	0	1	0	1	0	63	0	63	165
3:15 PM	132	0	0	132	0	1	0	1	1	65	0	66	199
3:30 PM	129	0	0	129	2	0	0	2	1	82	0	83	214
3:45 PM	153	1	0	154	0	0	0	0	1	54	0	55	209
Total	515	1	0	516	2	2	0	4	3	264	0	267	787
4:00 PM	139	1	0	140	0	1	0	1	0	65	0	65	206
4:15 PM	173	0	0	173	0	0	0	0	0	79	0	79	252
Total	312	1	0	313	0	1	0	1	0	144	0	144	458
Grand Total	985	2	0	987	3	3	0	6	5	509	0	514	1507
Approach %	99.8	0.2	0.0		50.0	50.0	0.0		1.0	99.0	0.0		
Total %	65.4	0.1	0.0	65.5	0.2	0.2	0.0	0.4	0.3	33.8	0.0	34.1	
Exiting Leg Total				512				7				988	1507

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:30 PM	129	0	0	129	2	0	0	2	1	82	0	83	214
3:45 PM	153	1	0	154	0	0	0	0	1	54	0	55	209
4:00 PM	139	1	0	140	0	1	0	1	0	65	0	65	206
4:15 PM	173	0	0	173	0	0	0	0	0	79	0	79	252
Total Volume	594	2	0	596	2	1	0	3	2	280	0	282	881
% Approach Total	99.7	0.3	0.0		66.7	33.3	0.0		0.7	99.3	0.0		
PHF	0.858	0.500	0.000	0.861	0.250	0.250	0.000	0.375	0.500	0.854	0.000	0.849	0.874
Entering Leg	594	2	0	596	2	1	0	3	2	280	0	282	881
Exiting Leg				282				4				595	881
Total				878				7				877	1762

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
3:00 PM	4	0	0	4	0	0	0	0	0	3	0	3	7
3:15 PM	1	0	0	1	0	0	0	0	0	4	0	4	5
3:30 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
3:45 PM	2	0	0	2	0	0	0	0	0	1	0	1	3
Total	10	0	0	10	0	0	0	0	0	8	0	8	18
4:00 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	3	0	0	3	0	0	0	0	0	2	0	2	5
Grand Total	13	0	0	13	0	0	0	0	0	11	0	11	24
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	54.2	0.0	0.0	54.2	0.0	0.0	0.0	0.0	0.0	45.8	0.0	45.8	
Exiting Leg Total				11				0				13	24
Buses	4	0	0	4	0	0	0	0	0	0	0	0	4
% Buses	30.8	0.0	0.0	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
Exiting Leg Total				0				0				4	4
Single-Unit Trucks	8	0	0	8	0	0	0	0	0	8	0	8	16
% Single-Unit	61.5	0.0	0.0	61.5	0.0	0.0	0.0	0.0	0.0	72.7	0.0	72.7	66.7
Exiting Leg Total				8				0				8	16
Articulated Trucks	1	0	0	1	0	0	0	0	0	3	0	3	4
% Articulated	7.7	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	27.3	0.0	27.3	16.7
Exiting Leg Total				3				0				1	4

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:00 PM	4	0	0	4	0	0	0	0	0	3	0	3	7
3:15 PM	1	0	0	1	0	0	0	0	0	4	0	4	5
3:30 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
3:45 PM	2	0	0	2	0	0	0	0	0	1	0	1	3
Total Volume	10	0	0	10	0	0	0	0	0	8	0	8	18
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.625	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.643
Buses	3	0	0	3	0	0	0	0	0	0	0	0	3
Buses %	30.0	0.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
Single-Unit Trucks	6	0	0	6	0	0	0	0	0	6	0	6	12
Single-Unit %	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	75.0	66.7
Articulated Trucks	1	0	0	1	0	0	0	0	0	2	0	2	3
Articulated %	10.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	25.0	16.7
Buses	3	0	0	3	0	0	0	0	0	0	0	0	3
Single-Unit Trucks	6	0	0	6	0	0	0	0	0	6	0	6	12
Articulated Trucks	1	0	0	1	0	0	0	0	0	2	0	2	3
Total Entering Leg	10	0	0	10	0	0	0	0	0	8	0	8	18
Buses				0				0				3	3
Single-Unit Trucks				6				0				6	12
Articulated Trucks				2				0				1	3
Total Exiting Leg				8				0				10	18

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	3	0	0	3	0	0	0	0	0	0	0	0	3
4:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	0	0	0	1
Grand Total	4	0	0	4	0	0	0	0	0	0	0	0	4
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				4	4

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	3	0	0	3	0	0	0	0	0	0	0	0	3
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	3	0	0	3	0	0	0	0	0	0	0	0	3
Exiting Leg				0				0				3	3
Total				3				0				3	6

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
3:00 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
3:15 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
3:30 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
3:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total	6	0	0	6	0	0	0	0	0	6	0	6	12
4:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	2	0	0	2	0	0	0	0	0	1	0	1	3
Grand Total	8	0	0	8	0	0	0	0	0	8	0	8	16
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	
Exiting Leg Total				8				0				8	16

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:00 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
3:15 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
3:30 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
3:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	6	0	0	6	0	0	0	0	0	6	0	6	12
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.750
Entering Leg	6	0	0	6	0	0	0	0	0	6	0	6	12
Exiting Leg				6				0				6	12
Total				12				0				12	24

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Articulated Trucks

	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
3:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	2	0	2	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	1	0	0	1	0	0	0	0	0	3	0	3	4
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	75.0	
Exiting Leg Total				3				0				1	4

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North				Salem Street from East				Salem Street from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
3:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	1	0	0	1	0	0	0	0	0	2	0	2	3
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.375
Entering Leg	1	0	0	1	0	0	0	0	0	2	0	2	3
Exiting Leg				2				0				1	3
Total				3				0				3	6

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

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Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
2:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	3
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	33.3	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	66.7	
Exiting Leg Total						2						0						1	3

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Exiting Leg						2						0						0	2
Total						2						0						2	4

PDI File #: **240268 B**
Location: **N: Ballardvale Street S: Salem Street**
Location: **E: Salem Street**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
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Pedestrians

	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North						Salem Street from East						Salem Street from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PRECISION DATA INDUSTRIES, LLC

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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Cars and Heavy Vehicles (Combined)

	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	0	69	0	0	71	0	0	0	0	0	0	1	56	2	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0	130
8:15 AM	1	0	74	0	0	75	1	0	0	0	0	1	0	74	2	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	152
8:30 AM	3	0	58	0	0	61	0	0	0	0	0	0	0	46	11	1	0	58	1	0	1	0	0	2	0	0	0	0	0	0	121
8:45 AM	5	0	58	0	0	63	0	0	0	0	0	0	0	68	22	0	0	90	16	0	4	0	0	20	0	0	0	0	0	0	173
Total	11	0	259	0	0	270	1	0	0	0	0	1	1	244	37	1	0	283	17	0	5	0	0	22	0	0	0	0	0	0	576
9:00 AM	2	0	37	0	0	39	0	0	0	0	0	0	0	45	8	0	0	53	9	0	3	0	0	12	0	0	0	0	0	0	104
9:15 AM	0	0	44	0	0	44	1	0	0	0	0	1	0	43	0	0	0	43	1	0	0	0	0	1	0	0	0	0	0	0	89
9:30 AM	1	0	45	0	0	46	0	0	0	0	0	0	0	53	1	0	0	54	1	0	0	0	0	1	0	0	0	0	0	0	101
9:45 AM	1	0	32	0	0	33	0	0	0	0	0	0	0	30	1	0	0	31	1	0	0	0	0	1	0	0	0	0	0	0	65
Total	4	0	158	0	0	162	1	0	0	0	0	1	0	171	10	0	0	181	12	0	3	0	0	15	0	0	0	0	0	0	359
Grand Total	15	0	417	0	0	432	2	0	0	0	0	2	1	415	47	1	0	464	29	0	8	0	0	37	0	0	0	0	0	0	935
Approach %	3.5	0.0	96.5	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.2	89.4	10.1	0.2	0.0		78.4	0.0	21.6	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	1.6	0.0	44.6	0.0	0.0	46.2	0.2	0.0	0.0	0.0	0.0	0.2	0.1	44.4	5.0	0.1	0.0	49.6	3.1	0.0	0.9	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						425						1						446						1						62	935
Cars	15	0	404	0	0	419	2	0	0	0	0	2	1	402	46	1	0	450	29	0	8	0	0	37	0	0	0	0	0	0	908
% Cars	100.0	0.0	96.9	0.0	0.0	97.0	100.0	0.0	0.0	0.0	0.0	100.0	100.0	96.9	97.9	100.0	0.0	97.0	100.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	97.1
Exiting Leg Total						412						1						433						1						61	908
Heavy Vehicles	0	0	13	0	0	13	0	0	0	0	0	0	0	13	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	27
% Heavy Vehicles	0.0	0.0	3.1	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	2.1	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9
Exiting Leg Total						13						0						13						0						1	27

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	0	69	0	0	71	0	0	0	0	0	0	1	56	2	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0	130
8:15 AM	1	0	74	0	0	75	1	0	0	0	0	1	0	74	2	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	152
8:30 AM	3	0	58	0	0	61	0	0	0	0	0	0	0	46	11	1	0	58	1	0	1	0	0	2	0	0	0	0	0	0	121
8:45 AM	5	0	58	0	0	63	0	0	0	0	0	0	0	68	22	0	0	90	16	0	4	0	0	20	0	0	0	0	0	0	173
Total Volume	11	0	259	0	0	270	1	0	0	0	0	1	1	244	37	1	0	283	17	0	5	0	0	22	0	0	0	0	0	0	576
% Approach Total	4.1	0.0	95.9	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.4	86.2	13.1	0.4	0.0		77.3	0.0	22.7	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.550	0.000	0.875	0.000	0.000	0.900	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.824	0.420	0.250	0.000	0.786	0.266	0.000	0.313	0.000	0.000	0.275	0.000	0.000	0.000	0.000	0.000	0.000	0.832
Cars	11	0	250	0	0	261	1	0	0	0	0	1	1	236	37	1	0	275	17	0	5	0	0	22	0	0	0	0	0	0	559
Cars %	100.0	0.0	96.5	0.0	0.0	96.7	100.0	0.0	0.0	0.0	0.0	100.0	100.0	96.7	100.0	100.0	0.0	97.2	100.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	97.0
Heavy Vehicles	0	0	9	0	0	9	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	17
Heavy Vehicles %	0.0	0.0	3.5	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Cars Enter Leg	11	0	250	0	0	261	1	0	0	0	0	1	1	236	37	1	0	275	17	0	5	0	0	22	0	0	0	0	0	0	559
Heavy Enter Leg	0	0	9	0	0	9	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	17
Total Entering Leg	11	0	259	0	0	270	1	0	0	0	0	1	1	244	37	1	0	283	17	0	5	0	0	22	0	0	0	0	0	0	576
Cars Exiting Leg						242						1						267						1						48	559
Heavy Exiting Leg						8						0						9						0						0	17
Total Exiting Leg						250						1						276						1						48	576

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Cars

	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	0	68	0	0	70	0	0	0	0	0	0	1	53	2	0	0	56	0	0	0	0	0	0	0	0	0	0	0	0	126
8:15 AM	1	0	69	0	0	70	1	0	0	0	0	1	0	74	2	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	147
8:30 AM	3	0	57	0	0	60	0	0	0	0	0	0	0	44	11	1	0	56	1	0	1	0	0	2	0	0	0	0	0	0	118
8:45 AM	5	0	56	0	0	61	0	0	0	0	0	0	0	65	22	0	0	87	16	0	4	0	0	20	0	0	0	0	0	0	168
Total	11	0	250	0	0	261	1	0	0	0	0	1	1	236	37	1	0	275	17	0	5	0	0	22	0	0	0	0	0	0	559
9:00 AM	2	0	36	0	0	38	0	0	0	0	0	0	0	43	8	0	0	51	9	0	3	0	0	12	0	0	0	0	0	0	101
9:15 AM	0	0	44	0	0	44	1	0	0	0	0	1	0	42	0	0	0	42	1	0	0	0	0	1	0	0	0	0	0	0	88
9:30 AM	1	0	42	0	0	43	0	0	0	0	0	0	0	52	0	0	0	52	1	0	0	0	0	1	0	0	0	0	0	0	96
9:45 AM	1	0	32	0	0	33	0	0	0	0	0	0	0	29	1	0	0	30	1	0	0	0	0	1	0	0	0	0	0	0	64
Total	4	0	154	0	0	158	1	0	0	0	0	1	0	166	9	0	0	175	12	0	3	0	0	15	0	0	0	0	0	0	349
Grand Total	15	0	404	0	0	419	2	0	0	0	0	2	1	402	46	1	0	450	29	0	8	0	0	37	0	0	0	0	0	0	908
Approach %	3.6	0.0	96.4	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.2	89.3	10.2	0.2	0.0		78.4	0.0	21.6	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	1.7	0.0	44.5	0.0	0.0	46.1	0.2	0.0	0.0	0.0	0.0	0.2	0.1	44.3	5.1	0.1	0.0	49.6	3.2	0.0	0.9	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						412						1						433						1						61	908

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	0	68	0	0	70	0	0	0	0	0	0	1	53	2	0	0	56	0	0	0	0	0	0	0	0	0	0	0	0	126
8:15 AM	1	0	69	0	0	70	1	0	0	0	0	1	0	74	2	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	147
8:30 AM	3	0	57	0	0	60	0	0	0	0	0	0	0	44	11	1	0	56	1	0	1	0	0	2	0	0	0	0	0	0	118
8:45 AM	5	0	56	0	0	61	0	0	0	0	0	0	0	65	22	0	0	87	16	0	4	0	0	20	0	0	0	0	0	0	168
Total Volume	11	0	250	0	0	261	1	0	0	0	0	1	1	236	37	1	0	275	17	0	5	0	0	22	0	0	0	0	0	0	559
% Approach Total	4.2	0.0	95.8	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.4	85.8	13.5	0.4	0.0		77.3	0.0	22.7	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.550	0.000	0.906	0.000	0.000	0.932	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.797	0.420	0.250	0.000	0.790	0.266	0.000	0.313	0.000	0.000	0.275	0.000	0.000	0.000	0.000	0.000	0.000	0.832
Entering Leg	11	0	250	0	0	261	1	0	0	0	0	1	1	236	37	1	0	275	17	0	5	0	0	22	0	0	0	0	0	0	559
Exiting Leg						242						1						267						1						48	559
Total						503						2						542						23						48	1118

PRECISION DATA INDUSTRIES, LLC
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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	2	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	9	0	0	9	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	17
9:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9:30 AM	0	0	3	0	0	3	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	4	0	0	4	0	0	0	0	0	0	0	5	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	10
Grand Total	0	0	13	0	0	13	0	0	0	0	0	0	0	13	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	27
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	92.9	7.1	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	48.1	0.0	0.0	48.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.1	3.7	0.0	0.0	51.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						13						0						13						0						1	27
Buses	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Buses	0.0	0.0	15.4	0.0	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4
Exiting Leg Total						0						0						2						0						0	2
Single-Unit Trucks	0	0	10	0	0	10	0	0	0	0	0	0	0	11	1	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	22
% Single-Unit	0.0	0.0	76.9	0.0	0.0	76.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.6	100.0	0.0	0.0	85.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.5
Exiting Leg Total						11						0						10						0						1	22
Articulated Trucks	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
% Articulated	0.0	0.0	7.7	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Exiting Leg Total						2						0						1						0						0	3

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	2	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
Total Volume	0	0	9	0	0	9	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	17
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.450	0.000	0.000	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.000	0.000	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.850
Buses	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Buses %	0.0	0.0	22.2	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Single-Unit Trucks	0	0	6	0	0	6	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12
Single-Unit %	0.0	0.0	66.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.6
Articulated Trucks	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Articulated %	0.0	0.0	11.1	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6
Buses	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Single-Unit Trucks	0	0	6	0	0	6	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12
Articulated Trucks	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Entering Leg	0	0	9	0	0	9	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	17
Buses						0						0						2						0						0	2
Single-Unit Trucks						6						0						6						0						0	12
Articulated Trucks						2						0						1						0						0	3
Total Exiting Leg						8						0						9						0						0	17

PRECISION DATA INDUSTRIES, LLC

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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Buses

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						2						0						0	2

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Exiting Leg						0						0						2						0						0	2
Total						2						0						2						0						0	4

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	6	0	0	6	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12
9:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9:30 AM	0	0	3	0	0	3	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	4	0	0	4	0	0	0	0	0	0	0	5	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	10
Grand Total	0	0	10	0	0	10	0	0	0	0	0	0	0	11	1	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	22
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	91.7	8.3	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	45.5	0.0	0.0	45.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	4.5	0.0	0.0	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						11						0						10						0						1	22

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	6	0	0	6	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	0	6	0	0	6	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12
Exiting Leg						6						0						6						0						0	12
Total						12						0						12						0						0	24

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						2						0						1						0						0	3

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Exiting Leg						2						0						1						0						0	3
Total						3						0						3						0						0	6

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total								0								0								0								0								0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg								0								0								0								0								0	0
Total								0								0								0								0								0	0

PRECISION DATA INDUSTRIES, LLC

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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

Pedestrians

	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	3	3	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0	0	0	0	4	4	8
Approach %	0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	50	50		0	0	0	0	0	0	100		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	50	0	0	0	0	0	0	50	50	
Exiting Leg Total								0								0								0								4								4	8

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	3	3	6
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	66.7	33.3		0.0	0.0	0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.375	0.750
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	3	3	6
Exiting Leg								0								0								0								3								3	6
Total								0								0								0								6								6	12

PRECISION DATA INDUSTRIES, LLC

157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Cars and Heavy Vehicles (Combined)

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	2	0	77	0	0	79	0	0	0	0	0	0	1	42	4	0	0	47	4	0	1	0	0	5	0	0	0	0	0	0	131
2:45 PM	2	0	72	0	0	74	0	0	0	0	0	0	0	52	4	1	0	57	2	0	1	0	0	3	0	0	0	0	0	0	134
Total	4	0	149	0	0	153	0	0	0	0	0	0	1	94	8	1	0	104	6	0	2	0	0	8	0	0	0	0	0	0	265
3:00 PM	2	0	104	0	0	106	0	0	0	0	0	0	0	51	15	0	0	66	1	0	0	0	0	1	0	0	0	0	0	0	173
3:15 PM	2	0	100	0	0	102	0	0	0	1	0	1	0	54	14	0	0	68	32	0	5	0	0	37	0	0	0	0	0	0	208
3:30 PM	2	0	128	0	0	130	1	0	0	0	0	1	0	77	8	0	0	85	10	0	11	0	0	21	0	0	0	0	0	0	237
3:45 PM	3	0	149	0	0	152	0	0	0	2	0	2	2	49	4	0	0	55	5	0	4	0	0	9	0	0	0	0	0	0	218
Total	9	0	481	0	0	490	1	0	0	3	0	4	2	231	41	0	0	274	48	0	20	0	0	68	0	0	0	0	0	0	836
4:00 PM	0	1	137	0	0	138	0	0	0	1	0	1	0	59	5	0	0	64	7	0	4	0	0	11	0	1	0	0	0	1	215
4:15 PM	2	0	156	0	0	158	0	0	0	1	0	1	0	71	10	0	0	81	17	0	1	0	0	18	0	0	0	0	0	0	258
Total	2	1	293	0	0	296	0	0	0	2	0	2	0	130	15	0	0	145	24	0	5	0	0	29	0	1	0	0	0	1	473
Grand Total	15	1	923	0	0	939	1	0	0	5	0	6	3	455	64	1	0	523	78	0	27	0	0	105	0	1	0	0	0	1	1574
Approach %	1.6	0.1	98.3	0.0	0.0		16.7	0.0	0.0	83.3	0.0		0.6	87.0	12.2	0.2	0.0		74.3	0.0	25.7	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	1.0	0.1	58.6	0.0	0.0	59.7	0.1	0.0	0.0	0.3	0.0	0.4	0.2	28.9	4.1	0.1	0.0	33.2	5.0	0.0	1.7	0.0	0.0	6.7	0.0	0.1	0.0	0.0	0.0	0.1	
Exiting Leg Total						483						3						1007						2						79	1574
Cars	15	1	910	0	0	926	1	0	0	5	0	6	3	445	63	1	0	512	77	0	27	0	0	104	0	1	0	0	0	1	1549
% Cars	100.0	100.0	98.6	0.0	0.0	98.6	100.0	0.0	0.0	100.0	0.0	100.0	100.0	97.8	98.4	100.0	0.0	97.9	98.7	0.0	100.0	0.0	0.0	99.0	0.0	100.0	0.0	0.0	0.0	100.0	98.4
Exiting Leg Total						473						3						993						2						78	1549
Heavy Vehicles	0	0	13	0	0	13	0	0	0	0	0	0	0	10	1	0	0	11	1	0	0	0	0	1	0	0	0	0	0	0	25
% Heavy Vehicles	0.0	0.0	1.4	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.6	0.0	0.0	2.1	1.3	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Exiting Leg Total						10						0						14						0						1	25

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:30 PM	2	0	128	0	0	130	1	0	0	0	0	1	0	77	8	0	0	85	10	0	11	0	0	21	0	0	0	0	0	0	237
3:45 PM	3	0	149	0	0	152	0	0	0	2	0	2	2	49	4	0	0	55	5	0	4	0	0	9	0	0	0	0	0	0	218
4:00 PM	0	1	137	0	0	138	0	0	0	1	0	1	0	59	5	0	0	64	7	0	4	0	0	11	0	1	0	0	0	1	215
4:15 PM	2	0	156	0	0	158	0	0	0	1	0	1	0	71	10	0	0	81	17	0	1	0	0	18	0	0	0	0	0	0	258
Total Volume	7	1	570	0	0	578	1	0	0	4	0	5	2	256	27	0	0	285	39	0	20	0	0	59	0	1	0	0	0	1	928
% Approach Total	1.2	0.2	98.6	0.0	0.0		20.0	0.0	0.0	80.0	0.0		0.7	89.8	9.5	0.0	0.0		66.1	0.0	33.9	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.583	0.250	0.913	0.000	0.000	0.915	0.250	0.000	0.000	0.500	0.000	0.625	0.250	0.831	0.675	0.000	0.000	0.838	0.574	0.000	0.455	0.000	0.000	0.702	0.000	0.250	0.000	0.000	0.000	0.250	0.899
Cars	7	1	561	0	0	569	1	0	0	4	0	5	2	253	27	0	0	282	39	0	20	0	0	59	0	1	0	0	0	1	916
Cars %	100.0	100.0	98.4	0.0	0.0	98.4	100.0	0.0	0.0	100.0	0.0	100.0	100.0	98.8	100.0	0.0	0.0	98.9	100.0	0.0	100.0	0.0	0.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0	98.7
Heavy Vehicles	0	0	9	0	0	9	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	12
Heavy Vehicles %	0.0	0.0	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Cars Enter Leg	7	1	561	0	0	569	1	0	0	4	0	5	2	253	27	0	0	282	39	0	20	0	0	59	0	1	0	0	0	1	916
Heavy Enter Leg	0	0	9	0	0	9	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	12
Total Entering Leg	7	1	570	0	0	578	1	0	0	4	0	5	2	256	27	0	0	285	39	0	20	0	0	59	0	1	0	0	0	1	928
Cars Exiting Leg						274						2						605						1						34	916
Heavy Exiting Leg						3						0						9						0						0	12
Total Exiting Leg						277						2						614						1						34	928

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Cars

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	2	0	77	0	0	79	0	0	0	0	0	0	1	41	4	0	0	46	4	0	1	0	0	5	0	0	0	0	0	0	130
2:45 PM	2	0	72	0	0	74	0	0	0	0	0	0	0	52	4	1	0	57	2	0	1	0	0	3	0	0	0	0	0	0	134
Total	4	0	149	0	0	153	0	0	0	0	0	0	1	93	8	1	0	103	6	0	2	0	0	8	0	0	0	0	0	0	264
3:00 PM	2	0	100	0	0	102	0	0	0	0	0	0	0	48	15	0	0	63	1	0	0	0	0	1	0	0	0	0	0	0	166
3:15 PM	2	0	100	0	0	102	0	0	0	1	0	1	0	51	13	0	0	64	31	0	5	0	0	36	0	0	0	0	0	0	203
3:30 PM	2	0	124	0	0	126	1	0	0	0	0	1	0	77	8	0	0	85	10	0	11	0	0	21	0	0	0	0	0	0	233
3:45 PM	3	0	146	0	0	149	0	0	0	2	0	2	2	48	4	0	0	54	5	0	4	0	0	9	0	0	0	0	0	0	214
Total	9	0	470	0	0	479	1	0	0	3	0	4	2	224	40	0	0	266	47	0	20	0	0	67	0	0	0	0	0	0	816
4:00 PM	0	1	135	0	0	136	0	0	0	1	0	1	0	59	5	0	0	64	7	0	4	0	0	11	0	1	0	0	0	1	213
4:15 PM	2	0	156	0	0	158	0	0	0	1	0	1	0	69	10	0	0	79	17	0	1	0	0	18	0	0	0	0	0	0	256
Total	2	1	291	0	0	294	0	0	0	2	0	2	0	128	15	0	0	143	24	0	5	0	0	29	0	1	0	0	0	1	469
Grand Total	15	1	910	0	0	926	1	0	0	5	0	6	3	445	63	1	0	512	77	0	27	0	0	104	0	1	0	0	0	1	1549
Approach %	1.6	0.1	98.3	0.0	0.0		16.7	0.0	0.0	83.3	0.0		0.6	86.9	12.3	0.2	0.0		74.0	0.0	26.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	1.0	0.1	58.7	0.0	0.0	59.8	0.1	0.0	0.0	0.3	0.0	0.4	0.2	28.7	4.1	0.1	0.0	33.1	5.0	0.0	1.7	0.0	0.0	6.7	0.0	0.1	0.0	0.0	0.0	0.1	
Exiting Leg Total						473						3						993						2						78	1549

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:30 PM	2	0	124	0	0	126	1	0	0	0	0	1	0	77	8	0	0	85	10	0	11	0	0	21	0	0	0	0	0	0	233
3:45 PM	3	0	146	0	0	149	0	0	0	2	0	2	2	48	4	0	0	54	5	0	4	0	0	9	0	0	0	0	0	0	214
4:00 PM	0	1	135	0	0	136	0	0	0	1	0	1	0	59	5	0	0	64	7	0	4	0	0	11	0	1	0	0	0	1	213
4:15 PM	2	0	156	0	0	158	0	0	0	1	0	1	0	69	10	0	0	79	17	0	1	0	0	18	0	0	0	0	0	0	256
Total Volume	7	1	561	0	0	569	1	0	0	4	0	5	2	253	27	0	0	282	39	0	20	0	0	59	0	1	0	0	0	1	916
% Approach Total	1.2	0.2	98.6	0.0	0.0		20.0	0.0	0.0	80.0	0.0		0.7	89.7	9.6	0.0	0.0		66.1	0.0	33.9	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.583	0.250	0.899	0.000	0.000	0.900	0.250	0.000	0.000	0.500	0.000	0.625	0.250	0.821	0.675	0.000	0.000	0.829	0.574	0.000	0.455	0.000	0.000	0.702	0.000	0.250	0.000	0.000	0.000	0.250	0.895
Entering Leg	7	1	561	0	0	569	1	0	0	4	0	5	2	253	27	0	0	282	39	0	20	0	0	59	0	1	0	0	0	1	916
Exiting Leg						274						2						605						1						34	916
Total						843						7						887						60						35	1832

PRECISION DATA INDUSTRIES, LLC

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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	7
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	1	0	0	0	0	1	0	0	0	0	0	0	5
3:30 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
3:45 PM	0	0	3	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	11	0	0	11	0	0	0	0	0	0	0	7	1	0	0	8	1	0	0	0	0	1	0	0	0	0	0	0	20
4:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	0	13	0	0	13	0	0	0	0	0	0	0	10	1	0	0	11	1	0	0	0	0	1	0	0	0	0	0	0	25
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	90.9	9.1	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	52.0	0.0	0.0	52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	4.0	0.0	0.0	44.0	4.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						10						0						14						0						1	25
Buses	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Buses	0.0	0.0	23.1	0.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
Exiting Leg Total						0						0						3						0						0	3
Single-Unit Trucks	0	0	8	0	0	8	0	0	0	0	0	0	0	7	1	0	0	8	1	0	0	0	0	1	0	0	0	0	0	0	17
% Single-Unit	0.0	0.0	61.5	0.0	0.0	61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	100.0	0.0	0.0	72.7	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0
Exiting Leg Total						7						0						9						0						1	17
Articulated Trucks	0	0	2	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
% Articulated	0.0	0.0	15.4	0.0	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0	27.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
Exiting Leg Total						3						0						2						0						0	5

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North						Baland Road from East						Ballardvale Street from South						School Lot South Drive from Southwest						School Lot North Drive from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	7
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	1	0	0	0	0	1	0	0	0	0	0	0	5
3:30 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
3:45 PM	0	0	3	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	11	0	0	11	0	0	0	0	0	0	0	7	1	0	0	8	1	0	0	0	0	1	0	0	0	0	0	0	20
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	87.5	12.5	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.688	0.000	0.000	0.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.250	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.714
Buses	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Buses %	0.0	0.0	27.3	0.0	0.0	27.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
Single-Unit Trucks	0	0	6	0	0	6	0	0	0	0	0	0	0	5	1	0	0	6	1	0	0	0	0	1	0	0	0	0	0	0	13
Single-Unit %	0.0	0.0	54.5	0.0	0.0	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.4	100.0	0.0	0.0	75.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	65.0
Articulated Trucks	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Articulated %	0.0	0.0	18.2	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
Buses	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Single-Unit Trucks	0	0	6	0	0	6	0	0	0	0	0	0	0	5	1	0	0	6	1	0	0	0	0	1	0	0	0	0	0	0	13
Articulated Trucks	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Entering Leg	0	0	11	0	0	11	0	0	0	0	0	0	0	7	1	0	0	8	1	0	0	0	0	1	0	0	0	0	0	0	20
Buses						0						0						3						0						0	3
Single-Unit Trucks						5						0						7						0						1	13
Articulated Trucks						2						0						2						0						0	4
Total Exiting Leg						7						0						12						0						1	20

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Buses

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						3						0						0	3

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Exiting Leg						0						0						3						0						0	3
Total						3						0						3						0						0	6

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Single-Unit Trucks

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	4
3:30 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	6	0	0	6	0	0	0	0	0	0	0	5	1	0	0	6	1	0	0	0	0	1	0	0	0	0	0	0	13
4:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
Grand Total	0	0	8	0	0	8	0	0	0	0	0	0	0	7	1	0	0	8	1	0	0	0	0	1	0	0	0	0	0	0	17
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	87.5	12.5	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	47.1	0.0	0.0	47.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.2	5.9	0.0	0.0	47.1	5.9	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						7						0						9						0						1	17

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	4
3:30 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	6	0	0	6	0	0	0	0	0	0	0	5	1	0	0	6	1	0	0	0	0	1	0	0	0	0	0	0	13
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	83.3	16.7	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.250	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.813
Entering Leg	0	0	6	0	0	6	0	0	0	0	0	0	0	5	1	0	0	6	1	0	0	0	0	1	0	0	0	0	0	0	13
Exiting Leg						5						0						7						0						1	13
Total						11						0						13						1						1	26

PRECISION DATA INDUSTRIES, LLC
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PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Articulated Trucks

	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	2	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						3						0						2						0						0	5

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street						Baland Road						Ballardvale Street						School Lot South Drive						School Lot North Drive						
	from North						from East						from South						from Southwest						from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
% Approach Total	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Exiting Leg						2						0						2						0						0	4
Total						4						0						4						0						0	8

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Approach %	0.0	0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	0.0	33.3	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total								2								0								1								0								0	3

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Exiting Leg								2								0								0								0								0	2
Total								2								0								2								0								0	4

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: **240268 C**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **E: Baland Road W: School Lot North Drive SW: School Lot South Drive**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

Pedestrians

	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	8	0	0	0	0	0	5	1	6	14
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	8	0	0	0	0	0	5	1	6	14
Approach %	0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	88	13		0	0	0	0	0	83	17		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	7.1	57	0	0	0	0	0	36	7.1	43	
Exiting Leg Total								0								0								0								8								6	14

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:00 PM	Ballardvale Street from North								Baland Road from East								Ballardvale Street from South								School Lot South Drive from Southwest								School Lot North Drive from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	8	0	0	0	0	0	5	1	6	14
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	87.5	12.5		0.0	0.0	0.0	0.0	0.0	83.3	16.7		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.250	0.400	0.000	0.000	0.000	0.000	0.000	0.313	0.250	0.375	0.389
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	8	0	0	0	0	0	5	1	6	14
Exiting Leg								0								0								0								8								6	14
Total								0								0								0								16								12	28

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	154	42	0	196	55	6	0	61	27	106	0	133	390
8:15 AM	149	40	0	189	64	7	0	71	32	118	0	150	410
8:30 AM	152	36	0	188	49	7	0	56	23	133	1	157	401
8:45 AM	150	45	0	195	71	7	0	78	18	127	0	145	418
Total	605	163	0	768	239	27	0	266	100	484	1	585	1619
9:00 AM	129	25	0	154	43	8	0	51	12	106	0	118	323
9:15 AM	158	23	0	181	42	4	0	46	10	92	0	102	329
9:30 AM	134	35	0	169	48	3	0	51	13	76	0	89	309
9:45 AM	134	27	0	161	35	4	0	39	6	68	0	74	274
Total	555	110	0	665	168	19	0	187	41	342	0	383	1235
Grand Total	1160	273	0	1433	407	46	0	453	141	826	1	968	2854
Approach %	80.9	19.1	0.0		89.8	10.2	0.0		14.6	85.3	0.1		
Total %	40.6	9.6	0.0	50.2	14.3	1.6	0.0	15.9	4.9	28.9	0.0	33.9	
Exiting Leg Total				1233				414				1207	2854
Cars	990	259	0	1249	395	45	0	440	141	721	1	863	2552
% Cars	85.3	94.9	0.0	87.2	97.1	97.8	0.0	97.1	100.0	87.3	100.0	89.2	89.4
Exiting Leg Total				1116				400				1036	2552
Heavy Vehicles	170	14	0	184	12	1	0	13	0	105	0	105	302
% Heavy Vehicles	14.7	5.1	0.0	12.8	2.9	2.2	0.0	2.9	0.0	12.7	0.0	10.8	10.6
Exiting Leg Total				117				14				171	302

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	154	42	0	196	55	6	0	61	27	106	0	133	390
8:15 AM	149	40	0	189	64	7	0	71	32	118	0	150	410
8:30 AM	152	36	0	188	49	7	0	56	23	133	1	157	401
8:45 AM	150	45	0	195	71	7	0	78	18	127	0	145	418
Total Volume	605	163	0	768	239	27	0	266	100	484	1	585	1619
% Approach Total	78.8	21.2	0.0		89.8	10.2	0.0		17.1	82.7	0.2		
PHF	0.982	0.906	0.000	0.980	0.842	0.964	0.000	0.853	0.781	0.910	0.250	0.932	0.968
Cars	556	154	0	710	233	26	0	259	100	438	1	539	1508
Cars %	91.9	94.5	0.0	92.4	97.5	96.3	0.0	97.4	100.0	90.5	100.0	92.1	93.1
Heavy Vehicles	49	9	0	58	6	1	0	7	0	46	0	46	111
Heavy Vehicles %	8.1	5.5	0.0	7.6	2.5	3.7	0.0	2.6	0.0	9.5	0.0	7.9	6.9
Cars Enter Leg	556	154	0	710	233	26	0	259	100	438	1	539	1508
Heavy Enter Leg	49	9	0	58	6	1	0	7	0	46	0	46	111
Total Entering Leg	605	163	0	768	239	27	0	266	100	484	1	585	1619
Cars Exiting Leg				671				254				583	1508
Heavy Exiting Leg				52				9				50	111
Total Exiting Leg				723				263				633	1619

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	143	41	0	184	53	5	0	58	27	99	0	126	368
8:15 AM	134	35	0	169	64	7	0	71	32	107	0	139	379
8:30 AM	140	35	0	175	47	7	0	54	23	115	1	139	368
8:45 AM	139	43	0	182	69	7	0	76	18	117	0	135	393
Total	556	154	0	710	233	26	0	259	100	438	1	539	1508
9:00 AM	112	24	0	136	41	8	0	49	12	92	0	104	289
9:15 AM	129	22	0	151	40	4	0	44	10	74	0	84	279
9:30 AM	101	32	0	133	47	3	0	50	13	65	0	78	261
9:45 AM	92	27	0	119	34	4	0	38	6	52	0	58	215
Total	434	105	0	539	162	19	0	181	41	283	0	324	1044
Grand Total	990	259	0	1249	395	45	0	440	141	721	1	863	2552
Approach %	79.3	20.7	0.0		89.8	10.2	0.0		16.3	83.5	0.1		
Total %	38.8	10.1	0.0	48.9	15.5	1.8	0.0	17.2	5.5	28.3	0.0	33.8	
Exiting Leg Total				1116				400				1036	2552

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	143	41	0	184	53	5	0	58	27	99	0	126	368
8:15 AM	134	35	0	169	64	7	0	71	32	107	0	139	379
8:30 AM	140	35	0	175	47	7	0	54	23	115	1	139	368
8:45 AM	139	43	0	182	69	7	0	76	18	117	0	135	393
Total Volume	556	154	0	710	233	26	0	259	100	438	1	539	1508
% Approach Total	78.3	21.7	0.0		90.0	10.0	0.0		18.6	81.3	0.2		
PHF	0.972	0.895	0.000	0.965	0.844	0.929	0.000	0.852	0.781	0.936	0.250	0.969	0.959
Entering Leg	556	154	0	710	233	26	0	259	100	438	1	539	1508
Exiting Leg				671				254				583	1508
Total				1381				513				1122	3016

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	11	1	0	12	2	1	0	3	0	7	0	7	22
8:15 AM	15	5	0	20	0	0	0	0	0	11	0	11	31
8:30 AM	12	1	0	13	2	0	0	2	0	18	0	18	33
8:45 AM	11	2	0	13	2	0	0	2	0	10	0	10	25
Total	49	9	0	58	6	1	0	7	0	46	0	46	111
9:00 AM	17	1	0	18	2	0	0	2	0	14	0	14	34
9:15 AM	29	1	0	30	2	0	0	2	0	18	0	18	50
9:30 AM	33	3	0	36	1	0	0	1	0	11	0	11	48
9:45 AM	42	0	0	42	1	0	0	1	0	16	0	16	59
Total	121	5	0	126	6	0	0	6	0	59	0	59	191
Grand Total	170	14	0	184	12	1	0	13	0	105	0	105	302
Approach %	92.4	7.6	0.0		92.3	7.7	0.0		0.0	100.0	0.0		
Total %	56.3	4.6	0.0	60.9	4.0	0.3	0.0	4.3	0.0	34.8	0.0	34.8	
Exiting Leg Total				117				14				171	302
Buses	1	2	0	3	0	0	0	0	0	0	0	0	3
% Buses	0.6	14.3	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Exiting Leg Total				0				2				1	3
Single-Unit Trucks	130	11	0	141	12	0	0	12	0	48	0	48	201
% Single-Unit	76.5	78.6	0.0	76.6	100.0	0.0	0.0	92.3	0.0	45.7	0.0	45.7	66.6
Exiting Leg Total				60				11				130	201
Articulated Trucks	39	1	0	40	0	1	0	1	0	57	0	57	98
% Articulated	22.9	7.1	0.0	21.7	0.0	100.0	0.0	7.7	0.0	54.3	0.0	54.3	32.5
Exiting Leg Total				57				1				40	98

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

9:00 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
9:00 AM	17	1	0	18	2	0	0	2	0	14	0	14	34
9:15 AM	29	1	0	30	2	0	0	2	0	18	0	18	50
9:30 AM	33	3	0	36	1	0	0	1	0	11	0	11	48
9:45 AM	42	0	0	42	1	0	0	1	0	16	0	16	59
Total Volume	121	5	0	126	6	0	0	6	0	59	0	59	191
% Approach Total	96.0	4.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.720	0.417	0.000	0.750	0.750	0.000	0.000	0.750	0.000	0.819	0.000	0.819	0.809
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	102	5	0	107	6	0	0	6	0	28	0	28	141
Single-Unit %	84.3	100.0	0.0	84.9	100.0	0.0	0.0	100.0	0.0	47.5	0.0	47.5	73.8
Articulated Trucks	19	0	0	19	0	0	0	0	0	31	0	31	50
Articulated %	15.7	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	52.5	0.0	52.5	26.2
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	102	5	0	107	6	0	0	6	0	28	0	28	141
Articulated Trucks	19	0	0	19	0	0	0	0	0	31	0	31	50
Total Entering Leg	121	5	0	126	6	0	0	6	0	59	0	59	191
Buses				0				0				0	0
Single-Unit Trucks				34				5				102	141
Articulated Trucks				31				0				19	50
Total Exiting Leg				65				5				121	191

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	1	2	0	3	0	0	0	0	0	0	0	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	2	0	3	0	0	0	0	0	0	0	0	3
Approach %	33.3	66.7	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	33.3	66.7	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				2				1	3

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total Volume	1	2	0	3	0	0	0	0	0	0	0	0	3
% Approach Total	33.3	66.7	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.250	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	1	2	0	3	0	0	0	0	0	0	0	0	3
Exiting Leg				0				2				1	3
Total				3				2				1	6

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	5	1	0	6	2	0	0	2	0	4	0	4	12
8:15 AM	9	4	0	13	0	0	0	0	0	5	0	5	18
8:30 AM	6	1	0	7	2	0	0	2	0	4	0	4	13
8:45 AM	8	0	0	8	2	0	0	2	0	7	0	7	17
Total	28	6	0	34	6	0	0	6	0	20	0	20	60
9:00 AM	12	1	0	13	2	0	0	2	0	7	0	7	22
9:15 AM	27	1	0	28	2	0	0	2	0	9	0	9	39
9:30 AM	27	3	0	30	1	0	0	1	0	5	0	5	36
9:45 AM	36	0	0	36	1	0	0	1	0	7	0	7	44
Total	102	5	0	107	6	0	0	6	0	28	0	28	141
Grand Total	130	11	0	141	12	0	0	12	0	48	0	48	201
Approach %	92.2	7.8	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	64.7	5.5	0.0	70.1	6.0	0.0	0.0	6.0	0.0	23.9	0.0	23.9	
Exiting Leg Total				60				11				130	201

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

9:00 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
9:00 AM	12	1	0	13	2	0	0	2	0	7	0	7	22
9:15 AM	27	1	0	28	2	0	0	2	0	9	0	9	39
9:30 AM	27	3	0	30	1	0	0	1	0	5	0	5	36
9:45 AM	36	0	0	36	1	0	0	1	0	7	0	7	44
Total Volume	102	5	0	107	6	0	0	6	0	28	0	28	141
% Approach Total	95.3	4.7	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.708	0.417	0.000	0.743	0.750	0.000	0.000	0.750	0.000	0.778	0.000	0.778	0.801
Entering Leg	102	5	0	107	6	0	0	6	0	28	0	28	141
Exiting Leg				34				5				102	141
Total				141				11				130	282

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	5	0	0	5	0	1	0	1	0	3	0	3	9
8:15 AM	6	1	0	7	0	0	0	0	0	6	0	6	13
8:30 AM	6	0	0	6	0	0	0	0	0	14	0	14	20
8:45 AM	3	0	0	3	0	0	0	0	0	3	0	3	6
Total	20	1	0	21	0	1	0	1	0	26	0	26	48
9:00 AM	5	0	0	5	0	0	0	0	0	7	0	7	12
9:15 AM	2	0	0	2	0	0	0	0	0	9	0	9	11
9:30 AM	6	0	0	6	0	0	0	0	0	6	0	6	12
9:45 AM	6	0	0	6	0	0	0	0	0	9	0	9	15
Total	19	0	0	19	0	0	0	0	0	31	0	31	50
Grand Total	39	1	0	40	0	1	0	1	0	57	0	57	98
Approach %	97.5	2.5	0.0		0.0	100.0	0.0		0.0	100.0	0.0		
Total %	39.8	1.0	0.0	40.8	0.0	1.0	0.0	1.0	0.0	58.2	0.0	58.2	
Exiting Leg Total				57				1				40	98

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:15 AM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:15 AM	6	1	0	7	0	0	0	0	0	6	0	6	13
8:30 AM	6	0	0	6	0	0	0	0	0	14	0	14	20
8:45 AM	3	0	0	3	0	0	0	0	0	3	0	3	6
9:00 AM	5	0	0	5	0	0	0	0	0	7	0	7	12
Total Volume	20	1	0	21	0	0	0	0	0	30	0	30	51
% Approach Total	95.2	4.8	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.833	0.250	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.536	0.000	0.536	0.638
Entering Leg	20	1	0	21	0	0	0	0	0	30	0	30	51
Exiting Leg				30				1				20	51
Total				51				1				50	102

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	149	57	0	206	38	4	0	42	27	41	0	68	316
2:45 PM	129	46	0	175	52	1	0	53	30	72	0	102	330
Total	278	103	0	381	90	5	0	95	57	113	0	170	646
3:00 PM	149	80	0	229	50	7	0	57	25	42	0	67	353
3:15 PM	170	77	0	247	46	5	0	51	26	56	0	82	380
3:30 PM	170	107	0	277	63	16	0	79	27	45	0	72	428
3:45 PM	150	126	0	276	37	11	0	48	32	48	0	80	404
Total	639	390	0	1029	196	39	0	235	110	191	0	301	1565
4:00 PM	226	96	0	322	61	7	0	68	27	41	0	68	458
4:15 PM	213	130	0	343	66	6	0	72	33	40	0	73	488
Total	439	226	0	665	127	13	0	140	60	81	0	141	946
Grand Total	1356	719	0	2075	413	57	0	470	227	385	0	612	3157
Approach %	65.3	34.7	0.0		87.9	12.1	0.0		37.1	62.9	0.0		
Total %	43.0	22.8	0.0	65.7	13.1	1.8	0.0	14.9	7.2	12.2	0.0	19.4	
Exiting Leg Total				798				946				1413	3157
Cars	1297	709	0	2006	405	53	0	458	225	326	0	551	3015
% Cars	95.6	98.6	0.0	96.7	98.1	93.0	0.0	97.4	99.1	84.7	0.0	90.0	95.5
Exiting Leg Total				731				934				1350	3015
Heavy Vehicles	59	10	0	69	8	4	0	12	2	59	0	61	142
% Heavy Vehicles	4.4	1.4	0.0	3.3	1.9	7.0	0.0	2.6	0.9	15.3	0.0	10.0	4.5
Exiting Leg Total				67				12				63	142

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:30 PM	170	107	0	277	63	16	0	79	27	45	0	72	428
3:45 PM	150	126	0	276	37	11	0	48	32	48	0	80	404
4:00 PM	226	96	0	322	61	7	0	68	27	41	0	68	458
4:15 PM	213	130	0	343	66	6	0	72	33	40	0	73	488
Total Volume	759	459	0	1218	227	40	0	267	119	174	0	293	1778
% Approach Total	62.3	37.7	0.0		85.0	15.0	0.0		40.6	59.4	0.0		
PHF	0.840	0.883	0.000	0.888	0.860	0.625	0.000	0.845	0.902	0.906	0.000	0.916	0.911
Cars	732	452	0	1184	223	38	0	261	118	150	0	268	1713
Cars %	96.4	98.5	0.0	97.2	98.2	95.0	0.0	97.8	99.2	86.2	0.0	91.5	96.3
Heavy Vehicles	27	7	0	34	4	2	0	6	1	24	0	25	65
Heavy Vehicles %	3.6	1.5	0.0	2.8	1.8	5.0	0.0	2.2	0.8	13.8	0.0	8.5	3.7
Cars Enter Leg	732	452	0	1184	223	38	0	261	118	150	0	268	1713
Heavy Enter Leg	27	7	0	34	4	2	0	6	1	24	0	25	65
Total Entering Leg	759	459	0	1218	227	40	0	267	119	174	0	293	1778
Cars Exiting Leg				373				570				770	1713
Heavy Exiting Leg				28				8				29	65
Total Exiting Leg				401				578				799	1778

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	137	57	0	194	37	3	0	40	27	35	0	62	296
2:45 PM	120	46	0	166	52	1	0	53	30	61	0	91	310
Total	257	103	0	360	89	4	0	93	57	96	0	153	606
3:00 PM	142	77	0	219	48	6	0	54	25	35	0	60	333
3:15 PM	166	77	0	243	45	5	0	50	25	45	0	70	363
3:30 PM	163	104	0	267	62	15	0	77	27	40	0	67	411
3:45 PM	146	124	0	270	37	10	0	47	32	41	0	73	390
Total	617	382	0	999	192	36	0	228	109	161	0	270	1497
4:00 PM	217	95	0	312	60	7	0	67	26	35	0	61	440
4:15 PM	206	129	0	335	64	6	0	70	33	34	0	67	472
Total	423	224	0	647	124	13	0	137	59	69	0	128	912
Grand Total	1297	709	0	2006	405	53	0	458	225	326	0	551	3015
Approach %	64.7	35.3	0.0		88.4	11.6	0.0		40.8	59.2	0.0		
Total %	43.0	23.5	0.0	66.5	13.4	1.8	0.0	15.2	7.5	10.8	0.0	18.3	
Exiting Leg Total				731				934				1350	3015

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:30 PM	163	104	0	267	62	15	0	77	27	40	0	67	411
3:45 PM	146	124	0	270	37	10	0	47	32	41	0	73	390
4:00 PM	217	95	0	312	60	7	0	67	26	35	0	61	440
4:15 PM	206	129	0	335	64	6	0	70	33	34	0	67	472
Total Volume	732	452	0	1184	223	38	0	261	118	150	0	268	1713
% Approach Total	61.8	38.2	0.0		85.4	14.6	0.0		44.0	56.0	0.0		
PHF	0.843	0.876	0.000	0.884	0.871	0.633	0.000	0.847	0.894	0.915	0.000	0.918	0.907
Entering Leg	732	452	0	1184	223	38	0	261	118	150	0	268	1713
Exiting Leg				373				570				770	1713
Total				1557				831				1038	3426

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	12	0	0	12	1	1	0	2	0	6	0	6	20
2:45 PM	9	0	0	9	0	0	0	0	0	11	0	11	20
Total	21	0	0	21	1	1	0	2	0	17	0	17	40
3:00 PM	7	3	0	10	2	1	0	3	0	7	0	7	20
3:15 PM	4	0	0	4	1	0	0	1	1	11	0	12	17
3:30 PM	7	3	0	10	1	1	0	2	0	5	0	5	17
3:45 PM	4	2	0	6	0	1	0	1	0	7	0	7	14
Total	22	8	0	30	4	3	0	7	1	30	0	31	68
4:00 PM	9	1	0	10	1	0	0	1	1	6	0	7	18
4:15 PM	7	1	0	8	2	0	0	2	0	6	0	6	16
Total	16	2	0	18	3	0	0	3	1	12	0	13	34
Grand Total	59	10	0	69	8	4	0	12	2	59	0	61	142
Approach %	85.5	14.5	0.0		66.7	33.3	0.0		3.3	96.7	0.0		
Total %	41.5	7.0	0.0	48.6	5.6	2.8	0.0	8.5	1.4	41.5	0.0	43.0	
Exiting Leg Total				67				12				63	142
Buses	0	3	0	3	1	0	0	1	0	0	0	0	4
% Buses	0.0	30.0	0.0	4.3	12.5	0.0	0.0	8.3	0.0	0.0	0.0	0.0	2.8
Exiting Leg Total				1				3				0	4
Single-Unit Trucks	36	6	0	42	4	4	0	8	2	30	0	32	82
% Single-Unit	61.0	60.0	0.0	60.9	50.0	100.0	0.0	66.7	100.0	50.8	0.0	52.5	57.7
Exiting Leg Total				34				8				40	82
Articulated Trucks	23	1	0	24	3	0	0	3	0	29	0	29	56
% Articulated	39.0	10.0	0.0	34.8	37.5	0.0	0.0	25.0	0.0	49.2	0.0	47.5	39.4
Exiting Leg Total				32				1				23	56

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	12	0	0	12	1	1	0	2	0	6	0	6	20
2:45 PM	9	0	0	9	0	0	0	0	0	11	0	11	20
3:00 PM	7	3	0	10	2	1	0	3	0	7	0	7	20
3:15 PM	4	0	0	4	1	0	0	1	1	11	0	12	17
Total Volume	32	3	0	35	4	2	0	6	1	35	0	36	77
% Approach Total	91.4	8.6	0.0		66.7	33.3	0.0		2.8	97.2	0.0		
PHF	0.667	0.250	0.000	0.729	0.500	0.500	0.000	0.500	0.250	0.795	0.000	0.750	0.963
Buses	0	2	0	2	1	0	0	1	0	0	0	0	3
Buses %	0.0	66.7	0.0	5.7	25.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	3.9
Single-Unit Trucks	18	0	0	18	1	2	0	3	1	16	0	17	38
Single-Unit %	56.3	0.0	0.0	51.4	25.0	100.0	0.0	50.0	100.0	45.7	0.0	47.2	49.4
Articulated Trucks	14	1	0	15	2	0	0	2	0	19	0	19	36
Articulated %	43.8	33.3	0.0	42.9	50.0	0.0	0.0	33.3	0.0	54.3	0.0	52.8	46.8
Buses	0	2	0	2	1	0	0	1	0	0	0	0	3
Single-Unit Trucks	18	0	0	18	1	2	0	3	1	16	0	17	38
Articulated Trucks	14	1	0	15	2	0	0	2	0	19	0	19	36
Total Entering Leg	32	3	0	35	4	2	0	6	1	35	0	36	77
Buses				1				2				0	3
Single-Unit Trucks				17				1				20	38
Articulated Trucks				21				1				14	36
Total Exiting Leg				39				4				34	77

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
3:00 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	3	0	3	0	0	0	0	0	0	0	0	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	3	0	3	1	0	0	1	0	0	0	0	4
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	75.0	0.0	75.0	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				1				3				0	4

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	1	0	0	1	0	0	0	0	3
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	2	0	2	1	0	0	1	0	0	0	0	3
Exiting Leg				1				2				0	3
Total				3				3				0	6

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	5	0	0	5	0	1	0	1	0	2	0	2	8
2:45 PM	6	0	0	6	0	0	0	0	0	7	0	7	13
Total	11	0	0	11	0	1	0	1	0	9	0	9	21
3:00 PM	6	0	0	6	1	1	0	2	0	0	0	0	8
3:15 PM	1	0	0	1	0	0	0	0	1	7	0	8	9
3:30 PM	4	3	0	7	1	1	0	2	0	3	0	3	12
3:45 PM	3	1	0	4	0	1	0	1	0	4	0	4	9
Total	14	4	0	18	2	3	0	5	1	14	0	15	38
4:00 PM	7	1	0	8	1	0	0	1	1	3	0	4	13
4:15 PM	4	1	0	5	1	0	0	1	0	4	0	4	10
Total	11	2	0	13	2	0	0	2	1	7	0	8	23
Grand Total	36	6	0	42	4	4	0	8	2	30	0	32	82
Approach %	85.7	14.3	0.0		50.0	50.0	0.0		6.3	93.8	0.0		
Total %	43.9	7.3	0.0	51.2	4.9	4.9	0.0	9.8	2.4	36.6	0.0	39.0	
Exiting Leg Total				34				8				40	82

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:30 PM	4	3	0	7	1	1	0	2	0	3	0	3	12
3:45 PM	3	1	0	4	0	1	0	1	0	4	0	4	9
4:00 PM	7	1	0	8	1	0	0	1	1	3	0	4	13
4:15 PM	4	1	0	5	1	0	0	1	0	4	0	4	10
Total Volume	18	6	0	24	3	2	0	5	1	14	0	15	44
% Approach Total	75.0	25.0	0.0		60.0	40.0	0.0		6.7	93.3	0.0		
PHF	0.643	0.500	0.000	0.750	0.750	0.500	0.000	0.625	0.250	0.875	0.000	0.938	0.846
Entering Leg	18	6	0	24	3	2	0	5	1	14	0	15	44
Exiting Leg				17				7				20	44
Total				41				12				35	88

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Articulated Trucks

	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	7	0	0	7	0	0	0	0	0	4	0	4	11
2:45 PM	3	0	0	3	0	0	0	0	0	4	0	4	7
Total	10	0	0	10	0	0	0	0	0	8	0	8	18
3:00 PM	1	1	0	2	1	0	0	1	0	7	0	7	10
3:15 PM	3	0	0	3	1	0	0	1	0	4	0	4	8
3:30 PM	3	0	0	3	0	0	0	0	0	2	0	2	5
3:45 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
Total	8	1	0	9	2	0	0	2	0	16	0	16	27
4:00 PM	2	0	0	2	0	0	0	0	0	3	0	3	5
4:15 PM	3	0	0	3	1	0	0	1	0	2	0	2	6
Total	5	0	0	5	1	0	0	1	0	5	0	5	11
Grand Total	23	1	0	24	3	0	0	3	0	29	0	29	56
Approach %	95.8	4.2	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	41.1	1.8	0.0	42.9	5.4	0.0	0.0	5.4	0.0	51.8	0.0	51.8	
Exiting Leg Total				32				1				23	56

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North				Ballardvale Street from South				I-93 SB Ramps from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:30 PM	7	0	0	7	0	0	0	0	0	4	0	4	11
2:45 PM	3	0	0	3	0	0	0	0	0	4	0	4	7
3:00 PM	1	1	0	2	1	0	0	1	0	7	0	7	10
3:15 PM	3	0	0	3	1	0	0	1	0	4	0	4	8
Total Volume	14	1	0	15	2	0	0	2	0	19	0	19	36
% Approach Total	93.3	6.7	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.250	0.000	0.536	0.500	0.000	0.000	0.500	0.000	0.679	0.000	0.679	0.818
Entering Leg	14	1	0	15	2	0	0	2	0	19	0	19	36
Exiting Leg				21				1				14	36
Total				36				3				33	72

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						1						0						0	1

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Exiting Leg						1						0						0	1
Total						1						1						0	2

PDI File #: **240268 D**
Location: **N: Ballardvale Street S: Ballardvale Street**
Location: **W: I-93 SB Ramps**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Ballardvale Street from North						Ballardvale Street from South						I-93 SB Ramps from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	41	77	0	0	118	4	7	2	0	13	4	94	18	0	116	34	24	89	0	147	394
8:15 AM	39	85	6	0	130	7	17	3	0	27	3	89	26	0	118	45	16	85	0	146	421
8:30 AM	56	92	3	0	151	7	10	3	0	20	11	85	15	0	111	36	18	59	0	113	395
8:45 AM	32	80	1	0	113	11	22	9	0	42	15	88	37	0	140	28	29	57	0	114	409
Total	168	334	10	0	512	29	56	17	0	102	33	356	96	0	485	143	87	290	0	520	1619
9:00 AM	31	80	1	0	112	7	18	12	0	37	7	65	19	0	91	35	14	65	0	114	354
9:15 AM	30	65	3	0	98	6	8	3	0	17	7	76	20	0	103	27	7	59	0	93	311
9:30 AM	29	62	4	0	95	7	6	3	0	16	7	85	24	0	116	30	8	58	0	96	323
9:45 AM	37	74	1	0	112	7	4	7	0	18	8	80	15	0	103	23	8	56	0	87	320
Total	127	281	9	0	417	27	36	25	0	88	29	306	78	0	413	115	37	238	0	390	1308
Grand Total	295	615	19	0	929	56	92	42	0	190	62	662	174	0	898	258	124	528	0	910	2927
Approach %	31.8	66.2	2.0	0.0		29.5	48.4	22.1	0.0		6.9	73.7	19.4	0.0		28.4	13.6	58.0	0.0		
Total %	10.1	21.0	0.6	0.0	31.7	1.9	3.1	1.4	0.0	6.5	2.1	22.6	5.9	0.0	30.7	8.8	4.2	18.0	0.0	31.1	
Exiting Leg Total					1246					205					915					561	2927
Cars	287	566	18	0	871	55	86	41	0	182	61	608	165	0	834	250	116	520	0	886	2773
% Cars	97.3	92.0	94.7	0.0	93.8	98.2	93.5	97.6	0.0	95.8	98.4	91.8	94.8	0.0	92.9	96.9	93.5	98.5	0.0	97.4	94.7
Exiting Leg Total					1183					195					857					538	2773
Heavy Vehicles	8	49	1	0	58	1	6	1	0	8	1	54	9	0	64	8	8	8	0	24	154
% Heavy Vehicles	2.7	8.0	5.3	0.0	6.2	1.8	6.5	2.4	0.0	4.2	1.6	8.2	5.2	0.0	7.1	3.1	6.5	1.5	0.0	2.6	5.3
Exiting Leg Total					63					10					58					23	154

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	41	77	0	0	118	4	7	2	0	13	4	94	18	0	116	34	24	89	0	147	394
8:15 AM	39	85	6	0	130	7	17	3	0	27	3	89	26	0	118	45	16	85	0	146	421
8:30 AM	56	92	3	0	151	7	10	3	0	20	11	85	15	0	111	36	18	59	0	113	395
8:45 AM	32	80	1	0	113	11	22	9	0	42	15	88	37	0	140	28	29	57	0	114	409
Total Volume	168	334	10	0	512	29	56	17	0	102	33	356	96	0	485	143	87	290	0	520	1619
% Approach Total	32.8	65.2	2.0	0.0		28.4	54.9	16.7	0.0		6.8	73.4	19.8	0.0		27.5	16.7	55.8	0.0		
PHF	0.750	0.908	0.417	0.000	0.848	0.659	0.636	0.472	0.000	0.607	0.550	0.947	0.649	0.000	0.866	0.794	0.750	0.815	0.000	0.884	0.961
Cars	164	318	10	0	492	28	53	16	0	97	32	335	91	0	458	137	80	284	0	501	1548
Cars %	97.6	95.2	100.0	0.0	96.1	96.6	94.6	94.1	0.0	95.1	97.0	94.1	94.8	0.0	94.4	95.8	92.0	97.9	0.0	96.3	95.6
Heavy Vehicles	4	16	0	0	20	1	3	1	0	5	1	21	5	0	27	6	7	6	0	19	71
Heavy Vehicles %	2.4	4.8	0.0	0.0	3.9	3.4	5.4	5.9	0.0	4.9	3.0	5.9	5.2	0.0	5.6	4.2	8.0	2.1	0.0	3.7	4.4
Cars Enter Leg	164	318	10	0	492	28	53	16	0	97	32	335	91	0	458	137	80	284	0	501	1548
Heavy Enter Leg	4	16	0	0	20	1	3	1	0	5	1	21	5	0	27	6	7	6	0	19	71
Total Entering Leg	168	334	10	0	512	29	56	17	0	102	33	356	96	0	485	143	87	290	0	520	1619
Cars Exiting Leg					647					122					471					308	1548
Heavy Exiting Leg					28					8					23					12	71
Total Exiting Leg					675					130					494					320	1619

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	39	72	0	0	111	4	7	2	0	13	4	90	18	0	112	34	24	86	0	144	380
8:15 AM	39	80	6	0	125	7	17	3	0	27	2	80	25	0	107	40	16	83	0	139	398
8:30 AM	54	91	3	0	148	7	10	3	0	20	11	81	15	0	107	35	18	58	0	111	386
8:45 AM	32	75	1	0	108	10	19	8	0	37	15	84	33	0	132	28	22	57	0	107	384
Total	164	318	10	0	492	28	53	16	0	97	32	335	91	0	458	137	80	284	0	501	1548
9:00 AM	31	74	1	0	106	7	16	12	0	35	7	56	19	0	82	34	14	65	0	113	336
9:15 AM	28	60	3	0	91	6	7	3	0	16	7	70	19	0	96	27	6	58	0	91	294
9:30 AM	29	55	3	0	87	7	6	3	0	16	7	75	22	0	104	29	8	58	0	95	302
9:45 AM	35	59	1	0	95	7	4	7	0	18	8	72	14	0	94	23	8	55	0	86	293
Total	123	248	8	0	379	27	33	25	0	85	29	273	74	0	376	113	36	236	0	385	1225
Grand Total	287	566	18	0	871	55	86	41	0	182	61	608	165	0	834	250	116	520	0	886	2773
Approach %	33.0	65.0	2.1	0.0		30.2	47.3	22.5	0.0		7.3	72.9	19.8	0.0		28.2	13.1	58.7	0.0		
Total %	10.3	20.4	0.6	0.0	31.4	2.0	3.1	1.5	0.0	6.6	2.2	21.9	6.0	0.0	30.1	9.0	4.2	18.8	0.0	32.0	
Exiting Leg Total					1183					195					857					538	2773

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	39	72	0	0	111	4	7	2	0	13	4	90	18	0	112	34	24	86	0	144	380
8:15 AM	39	80	6	0	125	7	17	3	0	27	2	80	25	0	107	40	16	83	0	139	398
8:30 AM	54	91	3	0	148	7	10	3	0	20	11	81	15	0	107	35	18	58	0	111	386
8:45 AM	32	75	1	0	108	10	19	8	0	37	15	84	33	0	132	28	22	57	0	107	384
Total Volume	164	318	10	0	492	28	53	16	0	97	32	335	91	0	458	137	80	284	0	501	1548
% Approach Total	33.3	64.6	2.0	0.0		28.9	54.6	16.5	0.0		7.0	73.1	19.9	0.0		27.3	16.0	56.7	0.0		
PHF	0.759	0.874	0.417	0.000	0.831	0.700	0.697	0.500	0.000	0.655	0.533	0.931	0.689	0.000	0.867	0.856	0.833	0.826	0.000	0.870	0.972
Entering Leg	164	318	10	0	492	28	53	16	0	97	32	335	91	0	458	137	80	284	0	501	1548
Exiting Leg					647					122					471					308	1548
Total					1139					219					929					809	3096

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	5	0	0	7	0	0	0	0	0	0	4	0	0	4	0	0	3	0	3	14
8:15 AM	0	5	0	0	5	0	0	0	0	0	1	9	1	0	11	5	0	2	0	7	23
8:30 AM	2	1	0	0	3	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	9
8:45 AM	0	5	0	0	5	1	3	1	0	5	0	4	4	0	8	0	7	0	0	7	25
Total	4	16	0	0	20	1	3	1	0	5	1	21	5	0	27	6	7	6	0	19	71
9:00 AM	0	6	0	0	6	0	2	0	0	2	0	9	0	0	9	1	0	0	0	1	18
9:15 AM	2	5	0	0	7	0	1	0	0	1	0	6	1	0	7	0	1	1	0	2	17
9:30 AM	0	7	1	0	8	0	0	0	0	0	0	10	2	0	12	1	0	0	0	1	21
9:45 AM	2	15	0	0	17	0	0	0	0	0	0	8	1	0	9	0	0	1	0	1	27
Total	4	33	1	0	38	0	3	0	0	3	0	33	4	0	37	2	1	2	0	5	83
Grand Total	8	49	1	0	58	1	6	1	0	8	1	54	9	0	64	8	8	8	0	24	154
Approach %	13.8	84.5	1.7	0.0		12.5	75.0	12.5	0.0		1.6	84.4	14.1	0.0		33.3	33.3	33.3	0.0		
Total %	5.2	31.8	0.6	0.0	37.7	0.6	3.9	0.6	0.0	5.2	0.6	35.1	5.8	0.0	41.6	5.2	5.2	5.2	0.0	15.6	
Exiting Leg Total					63					10					58					23	154
Buses	0	1	0	0	1	0	5	1	0	6	0	4	3	0	7	1	7	0	0	8	22
% Buses	0.0	2.0	0.0	0.0	1.7	0.0	83.3	100.0	0.0	75.0	0.0	7.4	33.3	0.0	10.9	12.5	87.5	0.0	0.0	33.3	14.3
Exiting Leg Total					4					7					3					8	22
Single-Unit Trucks	6	32	1	0	39	1	0	0	0	1	1	38	6	0	45	6	0	8	0	14	99
% Single-Unit	75.0	65.3	100.0	0.0	67.2	100.0	0.0	0.0	0.0	12.5	100.0	70.4	66.7	0.0	70.3	75.0	0.0	100.0	0.0	58.3	64.3
Exiting Leg Total					47					2					38					12	99
Articulated Trucks	2	16	0	0	18	0	1	0	0	1	0	12	0	0	12	1	1	0	0	2	33
% Articulated	25.0	32.7	0.0	0.0	31.0	0.0	16.7	0.0	0.0	12.5	0.0	22.2	0.0	0.0	18.8	12.5	12.5	0.0	0.0	8.3	21.4
Exiting Leg Total					12					1					17					3	33

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

9:00 AM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
9:00 AM	0	6	0	0	6	0	2	0	0	2	0	9	0	0	9	1	0	0	0	1	18
9:15 AM	2	5	0	0	7	0	1	0	0	1	0	6	1	0	7	0	1	1	0	2	17
9:30 AM	0	7	1	0	8	0	0	0	0	0	0	10	2	0	12	1	0	0	0	1	21
9:45 AM	2	15	0	0	17	0	0	0	0	0	0	8	1	0	9	0	0	1	0	1	27
Total Volume	4	33	1	0	38	0	3	0	0	3	0	33	4	0	37	2	1	2	0	5	83
% Approach Total	10.5	86.8	2.6	0.0		0.0	100.0	0.0	0.0		0.0	89.2	10.8	0.0		40.0	20.0	40.0	0.0		
PHF	0.500	0.550	0.250	0.000	0.559	0.000	0.375	0.000	0.000	0.375	0.000	0.825	0.500	0.000	0.771	0.500	0.250	0.500	0.000	0.625	0.769
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	3
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	20.0	3.6
Single-Unit Trucks	4	21	1	0	26	0	0	0	0	0	0	21	4	0	25	1	0	2	0	3	54
Single-Unit %	100.0	63.6	100.0	0.0	68.4	0.0	0.0	0.0	0.0	0.0	0.0	63.6	100.0	0.0	67.6	50.0	0.0	100.0	0.0	60.0	65.1
Articulated Trucks	0	12	0	0	12	0	1	0	0	1	0	12	0	0	12	0	1	0	0	1	26
Articulated %	0.0	36.4	0.0	0.0	31.6	0.0	33.3	0.0	0.0	33.3	0.0	36.4	0.0	0.0	32.4	0.0	100.0	0.0	0.0	20.0	31.3
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	3
Single-Unit Trucks	4	21	1	0	26	0	0	0	0	0	0	21	4	0	25	1	0	2	0	3	54
Articulated Trucks	0	12	0	0	12	0	1	0	0	1	0	12	0	0	12	0	1	0	0	1	26
Total Entering Leg	4	33	1	0	38	0	3	0	0	3	0	33	4	0	37	2	1	2	0	5	83
Buses					0					0					1					2	3
Single-Unit Trucks					23					1					22					8	54
Articulated Trucks					12					1					12					1	26
Total Exiting Leg					35					2					35					11	83

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
8:45 AM	0	1	0	0	1	0	3	1	0	4	0	0	3	0	3	0	7	0	0	7	15
Total	0	1	0	0	1	0	3	1	0	4	0	4	3	0	7	0	7	0	0	7	19
9:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	3
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	3
Grand Total	0	1	0	0	1	0	5	1	0	6	0	4	3	0	7	1	7	0	0	8	22
Approach %	0.0	100.0	0.0	0.0		0.0	83.3	16.7	0.0		0.0	57.1	42.9	0.0		12.5	87.5	0.0	0.0		
Total %	0.0	4.5	0.0	0.0	4.5	0.0	22.7	4.5	0.0	27.3	0.0	18.2	13.6	0.0	31.8	4.5	31.8	0.0	0.0	36.4	
Exiting Leg Total					4					7					3					8	22

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:15 AM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
8:45 AM	0	1	0	0	1	0	3	1	0	4	0	0	3	0	3	0	7	0	0	7	15
9:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	3
Total Volume	0	1	0	0	1	0	5	1	0	6	0	4	3	0	7	1	7	0	0	8	22
% Approach Total	0.0	100.0	0.0	0.0		0.0	83.3	16.7	0.0		0.0	57.1	42.9	0.0		12.5	87.5	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.000	0.417	0.250	0.000	0.375	0.000	0.333	0.250	0.000	0.583	0.250	0.250	0.000	0.000	0.286	0.367
Entering Leg	0	1	0	0	1	0	5	1	0	6	0	4	3	0	7	1	7	0	0	8	22
Exiting Leg					4					7					3					8	22
Total					5					13					10					16	44

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	2	3	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0	3	0	3	12
8:15 AM	0	3	0	0	3	0	0	0	0	0	1	6	1	0	8	4	0	2	0	6	17
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	6
8:45 AM	0	4	0	0	4	1	0	0	0	1	0	4	1	0	5	0	0	0	0	0	10
Total	2	11	0	0	13	1	0	0	0	1	1	17	2	0	20	5	0	6	0	11	45
9:00 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9
9:15 AM	2	3	0	0	5	0	0	0	0	0	0	4	1	0	5	0	0	1	0	1	11
9:30 AM	0	5	1	0	6	0	0	0	0	0	0	4	2	0	6	1	0	0	0	1	13
9:45 AM	2	10	0	0	12	0	0	0	0	0	0	7	1	0	8	0	0	1	0	1	21
Total	4	21	1	0	26	0	0	0	0	0	0	21	4	0	25	1	0	2	0	3	54
Grand Total	6	32	1	0	39	1	0	0	0	1	1	38	6	0	45	6	0	8	0	14	99
Approach %	15.4	82.1	2.6	0.0		100.0	0.0	0.0	0.0		2.2	84.4	13.3	0.0		42.9	0.0	57.1	0.0		
Total %	6.1	32.3	1.0	0.0	39.4	1.0	0.0	0.0	0.0	1.0	1.0	38.4	6.1	0.0	45.5	6.1	0.0	8.1	0.0	14.1	
Exiting Leg Total					47					2					38					12	99

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

9:00 AM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
9:00 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9
9:15 AM	2	3	0	0	5	0	0	0	0	0	0	4	1	0	5	0	0	1	0	1	11
9:30 AM	0	5	1	0	6	0	0	0	0	0	0	4	2	0	6	1	0	0	0	1	13
9:45 AM	2	10	0	0	12	0	0	0	0	0	0	7	1	0	8	0	0	1	0	1	21
Total Volume	4	21	1	0	26	0	0	0	0	0	0	21	4	0	25	1	0	2	0	3	54
% Approach Total	15.4	80.8	3.8	0.0		0.0	0.0	0.0	0.0		0.0	84.0	16.0	0.0		33.3	0.0	66.7	0.0		
PHF	0.500	0.525	0.250	0.000	0.542	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.500	0.000	0.781	0.250	0.000	0.500	0.000	0.750	0.643
Entering Leg	4	21	1	0	26	0	0	0	0	0	0	21	4	0	25	1	0	2	0	3	54
Exiting Leg					23					1					22					8	54
Total					49					1					47					11	108

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
8:30 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	7
9:00 AM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
9:15 AM	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	6
9:30 AM	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	8
9:45 AM	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	6
Total	0	12	0	0	12	0	1	0	0	1	0	12	0	0	12	0	1	0	0	1	26
Grand Total	2	16	0	0	18	0	1	0	0	1	0	12	0	0	12	1	1	0	0	2	33
Approach %	11.1	88.9	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		50.0	50.0	0.0	0.0		
Total %	6.1	48.5	0.0	0.0	54.5	0.0	3.0	0.0	0.0	3.0	0.0	36.4	0.0	0.0	36.4	3.0	3.0	0.0	0.0	6.1	
Exiting Leg Total					12					1					17					3	33

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

9:00 AM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
9:00 AM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
9:15 AM	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	6
9:30 AM	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	8
9:45 AM	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	6
Total Volume	0	12	0	0	12	0	1	0	0	1	0	12	0	0	12	0	1	0	0	1	26
% Approach Total	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.600	0.000	0.000	0.600	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.000	0.000	0.500	0.000	0.250	0.000	0.000	0.250	0.813
Entering Leg	0	12	0	0	12	0	1	0	0	1	0	12	0	0	12	0	1	0	0	1	26
Exiting Leg					12					1					12					1	26
Total					24					2					24					2	52

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **8:00 AM**
End Time: **10:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 08:00 AM to 10:00 AM begins at:

8:00 AM	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	84	66	1	0	151	7	17	7	0	31	5	92	19	0	116	27	11	59	0	97	395
2:45 PM	79	75	4	0	158	10	31	6	0	47	9	86	36	0	131	31	16	47	0	94	430
Total	163	141	5	0	309	17	48	13	0	78	14	178	55	0	247	58	27	106	0	191	825
3:00 PM	61	77	5	0	143	13	29	4	0	46	14	126	41	0	181	38	14	54	0	106	476
3:15 PM	88	70	4	0	162	9	31	4	0	44	12	91	34	0	137	27	14	52	0	93	436
3:30 PM	67	82	4	0	153	9	33	20	0	62	4	117	32	0	153	38	25	47	0	110	478
3:45 PM	80	82	4	0	166	7	29	11	0	47	8	98	25	0	131	44	24	85	0	153	497
Total	296	311	17	0	624	38	122	39	0	199	38	432	132	0	602	147	77	238	0	462	1887
4:00 PM	76	81	4	0	161	10	19	7	0	36	9	118	34	0	161	50	8	47	0	105	463
4:15 PM	80	82	3	0	165	5	29	6	0	40	7	118	35	0	160	55	19	65	0	139	504
Total	156	163	7	0	326	15	48	13	0	76	16	236	69	0	321	105	27	112	0	244	967
Grand Total	615	615	29	0	1259	70	218	65	0	353	68	846	256	0	1170	310	131	456	0	897	3679
Approach %	48.8	48.8	2.3	0.0		19.8	61.8	18.4	0.0		5.8	72.3	21.9	0.0		34.6	14.6	50.8	0.0		
Total %	16.7	16.7	0.8	0.0	34.2	1.9	5.9	1.8	0.0	9.6	1.8	23.0	7.0	0.0	31.8	8.4	3.6	12.4	0.0	24.4	
Exiting Leg Total					1372					228					990					1089	3679
Cars	609	593	27	0	1229	69	210	63	0	342	66	823	251	0	1140	302	122	451	0	875	3586
% Cars	99.0	96.4	93.1	0.0	97.6	98.6	96.3	96.9	0.0	96.9	97.1	97.3	98.0	0.0	97.4	97.4	93.1	98.9	0.0	97.5	97.5
Exiting Leg Total					1343					215					958					1070	3586
Heavy Vehicles	6	22	2	0	30	1	8	2	0	11	2	23	5	0	30	8	9	5	0	22	93
% Heavy Vehicles	1.0	3.6	6.9	0.0	2.4	1.4	3.7	3.1	0.0	3.1	2.9	2.7	2.0	0.0	2.6	2.6	6.9	1.1	0.0	2.5	2.5
Exiting Leg Total					29					13					32					19	93

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:30 PM	67	82	4	0	153	9	33	20	0	62	4	117	32	0	153	38	25	47	0	110	478
3:45 PM	80	82	4	0	166	7	29	11	0	47	8	98	25	0	131	44	24	85	0	153	497
4:00 PM	76	81	4	0	161	10	19	7	0	36	9	118	34	0	161	50	8	47	0	105	463
4:15 PM	80	82	3	0	165	5	29	6	0	40	7	118	35	0	160	55	19	65	0	139	504
Total Volume	303	327	15	0	645	31	110	44	0	185	28	451	126	0	605	187	76	244	0	507	1942
% Approach Total	47.0	50.7	2.3	0.0		16.8	59.5	23.8	0.0		4.6	74.5	20.8	0.0		36.9	15.0	48.1	0.0		
PHF	0.947	0.997	0.938	0.000	0.971	0.775	0.833	0.550	0.000	0.746	0.778	0.956	0.900	0.000	0.939	0.850	0.760	0.718	0.000	0.828	0.963
Cars	303	314	14	0	631	31	109	43	0	183	27	441	124	0	592	179	68	242	0	489	1895
Cars %	100.0	96.0	93.3	0.0	97.8	100.0	99.1	97.7	0.0	98.9	96.4	97.8	98.4	0.0	97.9	95.7	89.5	99.2	0.0	96.4	97.6
Heavy Vehicles	0	13	1	0	14	0	1	1	0	2	1	10	2	0	13	8	8	2	0	18	47
Heavy Vehicles %	0.0	4.0	6.7	0.0	2.2	0.0	0.9	2.3	0.0	1.1	3.6	2.2	1.6	0.0	2.1	4.3	10.5	0.8	0.0	3.6	2.4
Cars Enter Leg	303	314	14	0	631	31	109	43	0	183	27	441	124	0	592	179	68	242	0	489	1895
Heavy Enter Leg	0	13	1	0	14	0	1	1	0	2	1	10	2	0	13	8	8	2	0	18	47
Total Entering Leg	303	327	15	0	645	31	110	44	0	185	28	451	126	0	605	187	76	244	0	507	1942
Cars Exiting Leg					714					109					536					536	1895
Heavy Exiting Leg					12					10					22					3	47
Total Exiting Leg					726					119					558					539	1942

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	83	63	1	0	147	7	15	7	0	29	5	88	19	0	112	27	11	58	0	96	384
2:45 PM	77	70	4	0	151	9	31	5	0	45	9	81	36	0	126	31	16	46	0	93	415
Total	160	133	5	0	298	16	46	12	0	74	14	169	55	0	238	58	27	104	0	189	799
3:00 PM	61	77	4	0	142	13	27	4	0	44	14	124	40	0	178	38	13	54	0	105	469
3:15 PM	85	69	4	0	158	9	28	4	0	41	11	89	32	0	132	27	14	51	0	92	423
3:30 PM	67	80	3	0	150	9	32	19	0	60	4	115	31	0	150	32	18	45	0	95	455
3:45 PM	80	79	4	0	163	7	29	11	0	47	8	95	25	0	128	44	23	85	0	152	490
Total	293	305	15	0	613	38	116	38	0	192	37	423	128	0	588	141	68	235	0	444	1837
4:00 PM	76	77	4	0	157	10	19	7	0	36	9	116	34	0	159	49	8	47	0	104	456
4:15 PM	80	78	3	0	161	5	29	6	0	40	6	115	34	0	155	54	19	65	0	138	494
Total	156	155	7	0	318	15	48	13	0	76	15	231	68	0	314	103	27	112	0	242	950
Grand Total	609	593	27	0	1229	69	210	63	0	342	66	823	251	0	1140	302	122	451	0	875	3586
Approach %	49.6	48.3	2.2	0.0		20.2	61.4	18.4	0.0		5.8	72.2	22.0	0.0		34.5	13.9	51.5	0.0		
Total %	17.0	16.5	0.8	0.0	34.3	1.9	5.9	1.8	0.0	9.5	1.8	23.0	7.0	0.0	31.8	8.4	3.4	12.6	0.0	24.4	
Exiting Leg Total					1343					215					958					1070	3586

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:30 PM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:30 PM	67	80	3	0	150	9	32	19	0	60	4	115	31	0	150	32	18	45	0	95	455
3:45 PM	80	79	4	0	163	7	29	11	0	47	8	95	25	0	128	44	23	85	0	152	490
4:00 PM	76	77	4	0	157	10	19	7	0	36	9	116	34	0	159	49	8	47	0	104	456
4:15 PM	80	78	3	0	161	5	29	6	0	40	6	115	34	0	155	54	19	65	0	138	494
Total Volume	303	314	14	0	631	31	109	43	0	183	27	441	124	0	592	179	68	242	0	489	1895
% Approach Total	48.0	49.8	2.2	0.0		16.9	59.6	23.5	0.0		4.6	74.5	20.9	0.0		36.6	13.9	49.5	0.0		
PHF	0.947	0.981	0.875	0.000	0.968	0.775	0.852	0.566	0.000	0.763	0.750	0.950	0.912	0.000	0.931	0.829	0.739	0.712	0.000	0.804	0.959
Entering Leg	303	314	14	0	631	31	109	43	0	183	27	441	124	0	592	179	68	242	0	489	1895
Exiting Leg					714					109					536					536	1895
Total					1345					292					1128					1025	3790

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	1	3	0	0	4	0	2	0	0	2	0	4	0	0	4	0	0	1	0	1	11
2:45 PM	2	5	0	0	7	1	0	1	0	2	0	5	0	0	5	0	0	1	0	1	15
Total	3	8	0	0	11	1	2	1	0	4	0	9	0	0	9	0	0	2	0	2	26
3:00 PM	0	0	1	0	1	0	2	0	0	2	0	2	1	0	3	0	1	0	0	1	7
3:15 PM	3	1	0	0	4	0	3	0	0	3	1	2	2	0	5	0	0	1	0	1	13
3:30 PM	0	2	1	0	3	0	1	1	0	2	0	2	1	0	3	6	7	2	0	15	23
3:45 PM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	7
Total	3	6	2	0	11	0	6	1	0	7	1	9	4	0	14	6	9	3	0	18	50
4:00 PM	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	7
4:15 PM	0	4	0	0	4	0	0	0	0	0	1	3	1	0	5	1	0	0	0	1	10
Total	0	8	0	0	8	0	0	0	0	0	1	5	1	0	7	2	0	0	0	2	17
Grand Total	6	22	2	0	30	1	8	2	0	11	2	23	5	0	30	8	9	5	0	22	93
Approach %	20.0	73.3	6.7	0.0		9.1	72.7	18.2	0.0		6.7	76.7	16.7	0.0		36.4	40.9	22.7	0.0		
Total %	6.5	23.7	2.2	0.0	32.3	1.1	8.6	2.2	0.0	11.8	2.2	24.7	5.4	0.0	32.3	8.6	9.7	5.4	0.0	23.7	
Exiting Leg Total					29					13					32					19	93
Buses	2	4	1	0	7	0	5	1	0	6	0	3	3	0	6	2	8	1	0	11	30
% Buses	33.3	18.2	50.0	0.0	23.3	0.0	62.5	50.0	0.0	54.5	0.0	13.0	60.0	0.0	20.0	25.0	88.9	20.0	0.0	50.0	32.3
Exiting Leg Total					4					9					7					10	30
Single-Unit Trucks	4	10	0	0	14	1	3	1	0	5	2	15	2	0	19	6	0	4	0	10	48
% Single-Unit	66.7	45.5	0.0	0.0	46.7	100.0	37.5	50.0	0.0	45.5	100.0	65.2	40.0	0.0	63.3	75.0	0.0	80.0	0.0	45.5	51.6
Exiting Leg Total					20					2					17					9	48
Articulated Trucks	0	8	1	0	9	0	0	0	0	0	0	5	0	0	5	0	1	0	0	1	15
% Articulated	0.0	36.4	50.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7	0.0	0.0	16.7	0.0	11.1	0.0	0.0	4.5	16.1
Exiting Leg Total					5					2					8					0	15

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Route 62 from North					High Street from East					Middlesex Avenue (Route 62) from South					Middlesex Avenue from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:45 PM	2	5	0	0	7	1	0	1	0	2	0	5	0	0	5	0	0	1	0	1	15
3:00 PM	0	0	1	0	1	0	2	0	0	2	0	2	1	0	3	0	1	0	0	1	7
3:15 PM	3	1	0	0	4	0	3	0	0	3	1	2	2	0	5	0	0	1	0	1	13
3:30 PM	0	2	1	0	3	0	1	1	0	2	0	2	1	0	3	6	7	2	0	15	23
Total Volume	5	8	2	0	15	1	6	2	0	9	1	11	4	0	16	6	8	4	0	18	58
% Approach Total	33.3	53.3	13.3	0.0		11.1	66.7	22.2	0.0		6.3	68.8	25.0	0.0		33.3	44.4	22.2	0.0		
PHF	0.417	0.400	0.500	0.000	0.536	0.250	0.500	0.500	0.000	0.750	0.250	0.550	0.500	0.000	0.800	0.250	0.286	0.500	0.000	0.300	0.630
Buses	2	0	1	0	3	0	4	1	0	5	0	2	3	0	5	1	8	1	0	10	23
Buses %	40.0	0.0	50.0	0.0	20.0	0.0	66.7	50.0	0.0	55.6	0.0	18.2	75.0	0.0	31.3	16.7	100.0	25.0	0.0	55.6	39.7
Single-Unit Trucks	3	5	0	0	8	1	2	1	0	4	1	5	1	0	7	5	0	3	0	8	27
Single-Unit %	60.0	62.5	0.0	0.0	53.3	100.0	33.3	50.0	0.0	44.4	100.0	45.5	25.0	0.0	43.8	83.3	0.0	75.0	0.0	44.4	46.6
Articulated Trucks	0	3	1	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
Articulated %	0.0	37.5	50.0	0.0	26.7	0.0	0.0	0.0	0.0	0.0	0.0	36.4	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	13.8
Buses	2	0	1	0	3	0	4	1	0	5	0	2	3	0	5	1	8	1	0	10	23
Single-Unit Trucks	3	5	0	0	8	1	2	1	0	4	1	5	1	0	7	5	0	3	0	8	27
Articulated Trucks	0	3	1	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
Total Entering Leg	5	8	2	0	15	1	6	2	0	9	1	11	4	0	16	6	8	4	0	18	58
Buses					3					9					2					9	23
Single-Unit Trucks					9					1					11					6	27
Articulated Trucks					4					1					3					0	8
Total Exiting Leg					16					11					16					15	58

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	1	1	0	0	2	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	4
3:00 PM	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	4
3:15 PM	1	0	0	0	1	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	5
3:30 PM	0	0	0	0	0	0	0	1	0	1	0	1	1	0	2	1	7	1	0	9	12
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	1	1	0	3	0	4	1	0	5	0	1	3	0	4	1	8	1	0	10	22
4:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
Grand Total	2	4	1	0	7	0	5	1	0	6	0	3	3	0	6	2	8	1	0	11	30
Approach %	28.6	57.1	14.3	0.0		0.0	83.3	16.7	0.0		0.0	50.0	50.0	0.0		18.2	72.7	9.1	0.0		
Total %	6.7	13.3	3.3	0.0	23.3	0.0	16.7	3.3	0.0	20.0	0.0	10.0	10.0	0.0	20.0	6.7	26.7	3.3	0.0	36.7	
Exiting Leg Total					4					9					7					10	30

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:45 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
3:00 PM	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	4
3:15 PM	1	0	0	0	1	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	5
3:30 PM	0	0	0	0	0	0	0	1	0	1	0	1	1	0	2	1	7	1	0	9	12
Total Volume	2	0	1	0	3	0	4	1	0	5	0	2	3	0	5	1	8	1	0	10	23
% Approach Total	66.7	0.0	33.3	0.0		0.0	80.0	20.0	0.0		0.0	40.0	60.0	0.0		10.0	80.0	10.0	0.0		
PHF	0.500	0.000	0.250	0.000	0.750	0.000	0.333	0.250	0.000	0.417	0.000	0.500	0.750	0.000	0.625	0.250	0.286	0.250	0.000	0.278	0.479
Entering Leg	2	0	1	0	3	0	4	1	0	5	0	2	3	0	5	1	8	1	0	10	23
Exiting Leg					3					9					2					9	23
Total					6					14					7					19	46

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Single-Unit Trucks

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	1	0	0	0	1	0	1	0	0	1	0	4	0	0	4	0	0	1	0	1	7
2:45 PM	1	3	0	0	4	1	0	1	0	2	0	1	0	0	1	0	0	1	0	1	8
Total	2	3	0	0	5	1	1	1	0	3	0	5	0	0	5	0	0	2	0	2	15
3:00 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
3:15 PM	2	1	0	0	3	0	0	0	0	0	1	2	1	0	4	0	0	1	0	1	8
3:30 PM	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	5	0	1	0	6	9
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
Total	2	3	0	0	5	0	2	0	0	2	1	6	1	0	8	5	0	2	0	7	22
4:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
4:15 PM	0	3	0	0	3	0	0	0	0	0	1	2	1	0	4	1	0	0	0	1	8
Total	0	4	0	0	4	0	0	0	0	0	1	4	1	0	6	1	0	0	0	1	11
Grand Total	4	10	0	0	14	1	3	1	0	5	2	15	2	0	19	6	0	4	0	10	48
Approach %	28.6	71.4	0.0	0.0		20.0	60.0	20.0	0.0		10.5	78.9	10.5	0.0		60.0	0.0	40.0	0.0		
Total %	8.3	20.8	0.0	0.0	29.2	2.1	6.3	2.1	0.0	10.4	4.2	31.3	4.2	0.0	39.6	12.5	0.0	8.3	0.0	20.8	
Exiting Leg Total					20					2					17					9	48

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:45 PM	1	3	0	0	4	1	0	1	0	2	0	1	0	0	1	0	0	1	0	1	8
3:00 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
3:15 PM	2	1	0	0	3	0	0	0	0	0	1	2	1	0	4	0	0	1	0	1	8
3:30 PM	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	5	0	1	0	6	9
Total Volume	3	5	0	0	8	1	2	1	0	4	1	5	1	0	7	5	0	3	0	8	27
% Approach Total	37.5	62.5	0.0	0.0		25.0	50.0	25.0	0.0		14.3	71.4	14.3	0.0		62.5	0.0	37.5	0.0		
PHF	0.375	0.417	0.000	0.000	0.500	0.250	0.500	0.250	0.000	0.500	0.250	0.625	0.250	0.000	0.438	0.250	0.000	0.750	0.000	0.333	0.750
Entering Leg	3	5	0	0	8	1	2	1	0	4	1	5	1	0	7	5	0	3	0	8	27
Exiting Leg					9					1					11					6	27
Total					17					5					18					14	54

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
Total	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	7
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	3
Total	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	6
4:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	8	1	0	9	0	0	0	0	0	0	5	0	0	5	0	1	0	0	1	15
Approach %	0.0	88.9	11.1	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	53.3	6.7	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	6.7	0.0	0.0	6.7	
Exiting Leg Total					5					2					8					0	15

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:30 PM	Route 62					High Street					Middlesex Avenue (Route 62)					Middlesex Avenue					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.333	0.000	0.000	0.000	0.000	0.000	0.400
Entering Leg	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
Exiting Leg					4					0					4					0	8
Total					8					0					8					0	16

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Grand Total	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	5
Approach %	50.0	50.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	66.7	33.3		
Total %	20.0	20.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	20.0	60.0	
Exiting Leg Total							0							0							1							4	5

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

3:15 PM	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4
% Approach Total	50.0	50.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	50.0	50.0		
PHF	0.250	0.250	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.500
Entering Leg	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4
Exiting Leg							0							0							1							3	4
Total							2							0							1							5	8

PDI File #: **240268 E**
Location: **N: Route 62 S: Middlesex Avenue (Route 62)**
Location: **E: High Street W: Middlesex Avenue**
City, State: **Wilimngton, MA**
Client: **Nitsch/ B. Zimolka**
Site Code: **15428**
Count Date: **Thursday, October 24, 2024**
Start Time: **2:30 PM**
End Time: **4:30 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	1	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	1	3
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	100		0	0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66.7	66.7	0	0	0	0	33.3	0	33.3	
Exiting Leg Total							0							0							2							1	3

Peak Hour Analysis from 02:30 PM to 04:30 PM begins at:

2:45 PM	Route 62 from North							High Street from East							Middlesex Avenue (Route 62) from South							Middlesex Avenue from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	1	3
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.375
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	1	3
Exiting Leg							0							0							2							1	3
Total							0							0							4							2	6

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION D A T A INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 240268 ATR-A (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	2	1	0	0	0	0	0	0	0	0	4	30.2	27.8
1:00 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	4	27.1	25.3
2:00 AM	0	0	1	2	1	0	0	0	0	0	0	0	0	4	31.3	28.0
3:00 AM	0	0	0	8	2	1	0	0	0	0	0	0	0	11	30.0	28.6
4:00 AM	0	0	8	14	2	0	0	0	0	0	0	0	0	24	27.0	25.4
5:00 AM	3	1	13	39	5	1	0	0	0	0	0	0	0	62	29.0	25.6
6:00 AM	1	3	29	71	9	0	0	0	0	0	0	0	0	113	29.0	25.7
7:00 AM	2	3	36	153	29	0	0	0	0	0	0	0	0	223	29.0	26.5
8:00 AM	3	5	39	97	26	2	0	0	0	0	0	0	0	172	30.0	26.1
9:00 AM	0	6	24	76	12	1	0	0	0	0	0	0	0	119	29.0	26.0
10:00 AM	1	1	25	64	13	1	0	0	0	0	0	0	0	105	29.0	26.2
11:00 AM	2	1	21	74	17	1	0	0	0	0	0	0	0	116	29.8	26.6
12:00 PM	3	5	32	85	22	1	0	0	0	0	0	0	0	148	30.0	26.5
1:00 PM	2	2	25	68	20	3	0	0	0	0	0	0	0	120	30.0	26.3
2:00 PM	2	4	26	78	19	2	0	0	0	0	0	0	0	131	30.0	26.4
3:00 PM	5	9	52	71	18	2	0	0	0	0	0	0	0	157	29.0	25.0
4:00 PM	3	2	32	101	33	2	0	0	0	0	1	0	0	174	30.0	27.0
5:00 PM	5	2	40	98	34	1	1	0	0	0	0	0	0	181	30.0	26.6
6:00 PM	1	0	18	98	13	1	0	0	0	0	0	0	0	131	29.0	26.7
7:00 PM	1	1	7	51	17	4	0	0	0	0	0	0	0	81	31.0	27.5
8:00 PM	0	1	10	46	10	1	0	0	0	0	0	0	0	68	30.0	27.0
9:00 PM	0	0	7	16	10	0	0	0	0	0	0	0	0	33	31.0	27.6
10:00 PM	1	0	4	14	3	1	0	0	0	0	0	0	0	23	29.7	26.8
11:00 PM	0	0	4	5	3	0	0	0	0	0	0	0	0	12	31.4	27.8
Total	35	46	456	1333	319	25	1	0	0	0	1	0	0	2216	30.0	26.4
Percent	1.58%	2.08%	20.58%	60.15%	14.40%	1.13%	0.05%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%			
AM Peak	5:00 AM	9:00 AM	8:00 AM	7:00 AM	7:00 AM	8:00 AM								7:00 AM		
Volume	3	6	39	153	29	2	0	0	0	0	0	0	0	223		
PM Peak	3:00 PM	3:00 PM	3:00 PM	4:00 PM	5:00 PM	7:00 PM	5:00 PM				4:00 PM			5:00 PM		
Volume	5	9	52	101	34	4	1	0	0	0	1	0	0	181		

15th Percentile:	23.0 MPH	Average Speed:	26.4 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	27.0 MPH	10 MPH Pace:	22 to 31 MPH	Number of Vehicles > 25 MPH:	1444
85th Percentile:	30.0 MPH	Number in Pace:	1949	Percent of Vehicles > 25 MPH:	65.2%
95th Percentile:	32.0 MPH	Percent in Pace:	88.0%		

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-A (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	3	7	1	1	0	0	0	0	0	0	12	33.8	32.1
1:00 AM	0	0	1	2	3	1	0	0	0	0	0	0	0	7	34.1	29.4
2:00 AM	0	0	0	5	4	1	0	0	0	0	0	0	0	10	33.3	30.3
3:00 AM	0	0	2	8	1	3	0	0	0	0	0	0	0	14	35.0	28.8
4:00 AM	0	0	0	9	5	0	0	0	0	0	0	0	0	14	31.0	28.9
5:00 AM	0	2	4	18	9	0	1	0	0	0	0	0	0	34	31.1	28.1
6:00 AM	1	0	25	93	46	6	0	0	0	0	0	0	0	171	31.5	27.9
7:00 AM	2	8	41	157	83	17	0	2	0	0	0	0	0	310	32.0	28.0
8:00 AM	14	6	19	107	86	12	1	0	0	0	0	0	0	245	32.0	27.8
9:00 AM	17	21	22	77	41	5	1	1	0	0	0	0	0	185	32.0	25.3
10:00 AM	0	3	22	73	44	10	0	0	0	0	0	0	0	152	31.0	28.2
11:00 AM	1	6	33	85	80	3	1	1	0	0	0	0	0	210	32.0	28.1
12:00 PM	1	3	32	121	71	9	1	1	0	0	0	0	0	239	32.0	28.1
1:00 PM	1	6	39	129	61	5	0	1	0	0	0	0	0	242	31.0	27.5
2:00 PM	2	9	51	143	81	9	0	0	0	0	0	0	0	295	31.0	27.5
3:00 PM	7	36	57	176	73	5	3	0	0	0	0	0	0	357	31.0	26.1
4:00 PM	2	21	56	219	138	11	3	0	0	0	0	0	0	450	32.0	27.7
5:00 PM	1	14	62	184	109	16	2	0	0	0	0	0	0	388	32.0	27.8
6:00 PM	2	3	22	144	75	6	1	0	0	0	0	0	0	253	32.0	28.2
7:00 PM	0	0	26	81	51	8	0	1	0	0	0	0	0	167	32.0	28.4
8:00 PM	0	0	12	62	41	7	0	0	0	0	0	0	0	122	32.0	28.8
9:00 PM	1	1	8	38	26	5	2	0	0	0	0	0	0	81	33.0	28.8
10:00 PM	0	0	3	14	17	4	0	0	0	0	0	0	0	38	33.0	30.1
11:00 PM	0	0	5	9	14	3	0	0	0	0	0	0	0	31	32.0	29.0
Total	52	139	542	1957	1166	147	17	7	0	0	0	0	0	4027	32.0	27.7
Percent	1.29%	3.45%	13.46%	48.60%	28.95%	3.65%	0.42%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak	9:00 AM	9:00 AM	7:00 AM	7:00 AM	8:00 AM	7:00 AM	12:00 AM	7:00 AM						7:00 AM		
Volume	17	21	41	157	86	17	1	2	0	0	0	0	0	310		
PM Peak	3:00 PM	3:00 PM	5:00 PM	4:00 PM	4:00 PM	5:00 PM	3:00 PM	12:00 PM						4:00 PM		
Volume	7	36	62	219	138	16	3	1	0	0	0	0	0	450		

15th Percentile:	24.0 MPH	Average Speed:	27.7 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	28.0 MPH	10 MPH Pace:	24 to 33 MPH	Number of Vehicles > 25 MPH:	3028
85th Percentile:	32.0 MPH	Number in Pace:	3256	Percent of Vehicles > 25 MPH:	75.2%
95th Percentile:	34.0 MPH	Percent in Pace:	80.9%		

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-A (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	5	8	1	1	0	0	0	0	0	0	16	32.0	31.0
1:00 AM	0	0	3	4	3	1	0	0	0	0	0	0	0	11	33.0	27.9
2:00 AM	0	0	1	7	5	1	0	0	0	0	0	0	0	14	34.0	29.6
3:00 AM	0	0	2	16	3	4	0	0	0	0	0	0	0	25	33.2	28.7
4:00 AM	0	0	8	23	7	0	0	0	0	0	0	0	0	38	30.0	26.7
5:00 AM	3	3	17	57	14	1	1	0	0	0	0	0	0	96	30.0	26.5
6:00 AM	2	3	54	164	55	6	0	0	0	0	0	0	0	284	30.6	27.0
7:00 AM	4	11	77	310	112	17	0	2	0	0	0	0	0	533	31.0	27.4
8:00 AM	17	11	58	204	112	14	1	0	0	0	0	0	0	417	32.0	27.1
9:00 AM	17	27	46	153	53	6	1	1	0	0	0	0	0	304	30.6	25.6
10:00 AM	1	4	47	137	57	11	0	0	0	0	0	0	0	257	31.0	27.4
11:00 AM	3	7	54	159	97	4	1	1	0	0	0	0	0	326	31.0	27.6
12:00 PM	4	8	64	206	93	10	1	1	0	0	0	0	0	387	31.0	27.5
1:00 PM	3	8	64	197	81	8	0	1	0	0	0	0	0	362	31.0	27.1
2:00 PM	4	13	77	221	100	11	0	0	0	0	0	0	0	426	31.0	27.1
3:00 PM	12	45	109	247	91	7	3	0	0	0	0	0	0	514	30.0	25.8
4:00 PM	5	23	88	320	171	13	3	0	0	0	1	0	0	624	31.0	27.5
5:00 PM	6	16	102	282	143	17	3	0	0	0	0	0	0	569	32.0	27.4
6:00 PM	3	3	40	242	88	7	1	0	0	0	0	0	0	384	31.0	27.7
7:00 PM	1	1	33	132	68	12	0	1	0	0	0	0	0	248	32.0	28.1
8:00 PM	0	1	22	108	51	8	0	0	0	0	0	0	0	190	31.0	28.1
9:00 PM	1	1	15	54	36	5	2	0	0	0	0	0	0	114	32.0	28.4
10:00 PM	1	0	7	28	20	5	0	0	0	0	0	0	0	61	33.0	28.8
11:00 PM	0	0	9	14	17	3	0	0	0	0	0	0	0	43	32.0	28.6
Total	87	185	998	3290	1485	172	18	7	0	0	1	0	0	6243	31.0	27.2
Percent	1.39%	2.96%	15.99%	52.70%	23.79%	2.76%	0.29%	0.11%	0.00%	0.00%	0.02%	0.00%	0.00%			
AM Peak	8:00 AM	9:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	12:00 AM	7:00 AM						7:00 AM		
Volume	17	27	77	310	112	17	1	2	0	0	0	0	0	533		
PM Peak	3:00 PM	3:00 PM	3:00 PM	4:00 PM	4:00 PM	5:00 PM	3:00 PM	12:00 PM			4:00 PM			4:00 PM		
Volume	12	45	109	320	171	17	3	1	0	0	1	0	0	624		

15th Percentile:	24.0 MPH	Average Speed:	27.2 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	28.0 MPH	10 MPH Pace:	23 to 32 MPH	Number of Vehicles > 25 MPH:	4472
85th Percentile:	31.0 MPH	Number in Pace:	5155	Percent of Vehicles > 25 MPH:	71.6%
95th Percentile:	33.0 MPH	Percent in Pace:	82.6%		

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-A (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	4	3	0	0	0	0	0	0	0	0	8	32.0	28.9
1:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	26.7	26.0
2:00 AM	0	1	2	2	0	0	0	0	0	0	0	0	0	5	25.0	22.8
3:00 AM	0	0	1	3	2	0	0	0	0	0	0	0	0	6	30.0	27.3
4:00 AM	0	0	3	11	1	0	1	0	0	0	0	0	0	16	28.8	26.9
5:00 AM	1	1	11	39	7	1	0	0	0	0	0	0	0	60	29.0	26.4
6:00 AM	4	2	37	64	11	1	0	0	0	0	0	0	0	119	28.0	25.2
7:00 AM	3	4	45	139	31	1	0	0	0	0	0	0	0	223	29.0	26.3
8:00 AM	6	3	72	96	28	2	1	0	0	0	0	0	0	208	29.0	25.5
9:00 AM	3	3	40	78	21	0	0	0	0	0	0	0	0	145	29.0	25.9
10:00 AM	1	2	26	69	10	1	0	0	0	0	0	0	0	109	28.8	26.2
11:00 AM	2	1	25	74	15	0	0	0	0	0	0	0	0	117	29.0	26.1
12:00 PM	2	2	23	76	24	1	0	0	0	0	0	0	0	128	30.0	26.8
1:00 PM	2	1	32	76	37	2	0	0	0	0	0	0	0	150	30.0	27.1
2:00 PM	3	4	24	92	18	2	0	0	0	0	0	0	0	143	29.0	26.4
3:00 PM	6	4	64	96	11	0	0	0	0	0	0	0	0	181	28.0	24.6
4:00 PM	3	4	25	121	31	1	0	0	0	0	0	0	0	185	30.0	26.9
5:00 PM	2	1	21	129	43	2	0	0	0	0	0	0	0	198	31.0	27.5
6:00 PM	0	1	23	75	13	0	0	0	0	0	0	0	0	112	29.0	26.6
7:00 PM	0	1	13	67	12	0	0	0	0	0	0	0	0	93	29.0	26.9
8:00 PM	1	0	10	51	13	2	0	0	0	0	0	0	0	77	30.0	27.2
9:00 PM	0	2	5	14	5	1	0	0	0	0	0	0	0	27	30.1	26.5
10:00 PM	0	0	1	16	3	0	0	0	0	0	0	0	0	20	29.3	27.8
11:00 PM	0	0	1	8	1	0	0	0	0	0	0	0	0	10	29.0	27.3
Total	39	37	505	1402	340	17	2	0	0	0	0	0	0	2342	30.0	26.3
Percent	1.67%	1.58%	21.56%	59.86%	14.52%	0.73%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak	8:00 AM	7:00 AM	8:00 AM	7:00 AM	7:00 AM	8:00 AM	4:00 AM							7:00 AM		
Volume	6	4	72	139	31	2	1	0	0	0	0	0	0	223		
PM Peak	3:00 PM	2:00 PM	3:00 PM	5:00 PM	5:00 PM	1:00 PM								5:00 PM		
Volume	6	4	64	129	43	2	0	0	0	0	0	0	0	198		

15th Percentile:	23.0 MPH	Average Speed:	26.3 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	27.0 MPH	10 MPH Pace:	22 to 31 MPH	Number of Vehicles > 25 MPH:	1511
85th Percentile:	30.0 MPH	Number in Pace:	2111	Percent of Vehicles > 25 MPH:	64.5%
95th Percentile:	31.0 MPH	Percent in Pace:	90.1%		

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-A (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	6	5	1	0	0	0	0	0	0	0	12	34.0	30.3
1:00 AM	0	1	1	2	1	0	0	0	0	0	0	0	0	5	29.6	25.8
2:00 AM	0	0	2	3	2	0	0	0	0	0	0	0	0	7	31.3	27.9
3:00 AM	0	0	0	5	3	1	0	0	0	0	0	0	0	9	31.0	30.1
4:00 AM	0	0	2	4	5	1	0	0	0	0	0	0	0	12	32.0	29.0
5:00 AM	2	1	6	18	12	1	0	0	0	0	0	0	0	40	31.0	26.8
6:00 AM	0	1	37	76	36	4	1	0	0	0	0	0	0	155	31.0	27.5
7:00 AM	3	2	30	121	66	3	0	0	0	0	0	0	0	225	31.0	27.6
8:00 AM	0	8	26	103	82	8	1	1	0	0	0	0	0	229	32.0	28.4
9:00 AM	1	3	21	82	41	6	1	0	0	0	0	0	0	155	31.0	27.9
10:00 AM	0	0	36	80	40	4	4	0	0	0	0	0	0	164	31.0	27.9
11:00 AM	1	3	25	100	84	7	1	0	0	0	0	0	0	221	32.0	28.6
12:00 PM	0	5	38	119	102	11	3	0	0	0	0	0	0	278	33.0	28.6
1:00 PM	1	6	29	139	68	3	0	0	0	0	0	0	0	246	31.0	27.9
2:00 PM	3	6	37	139	74	4	0	0	0	0	0	0	0	263	31.0	27.5
3:00 PM	2	19	75	196	69	12	1	0	1	0	0	0	0	375	31.0	26.8
4:00 PM	3	15	69	211	132	14	1	0	0	0	0	0	0	445	32.0	27.6
5:00 PM	2	4	22	205	120	13	2	0	0	0	0	0	0	368	32.0	28.7
6:00 PM	0	4	27	139	69	13	1	0	0	0	0	0	0	253	32.0	28.2
7:00 PM	1	0	17	73	66	12	0	0	0	0	0	0	0	169	32.0	29.1
8:00 PM	0	0	7	77	49	2	3	0	0	0	0	0	0	138	32.0	29.1
9:00 PM	0	1	5	36	32	7	0	0	0	0	0	0	0	81	33.0	29.2
10:00 PM	0	1	6	23	17	3	2	0	0	0	0	0	0	52	33.0	29.3
11:00 PM	0	0	5	17	9	2	0	0	0	0	0	0	0	33	32.0	28.4
Total	19	80	523	1974	1184	132	21	1	1	0	0	0	0	3935	32.0	28.1
Percent	0.48%	2.03%	13.29%	50.17%	30.09%	3.35%	0.53%	0.03%	0.03%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	6:00 AM	7:00 AM	11:00 AM	8:00 AM	10:00 AM	8:00 AM						8:00 AM		
Volume	3	8	37	121	84	8	4	1	0	0	0	0	0	229		
PM Peak	2:00 PM	3:00 PM	3:00 PM	4:00 PM	4:00 PM	4:00 PM	12:00 PM		3:00 PM					4:00 PM		
Volume	3	19	75	211	132	14	3	0	1	0	0	0	0	445		

15th Percentile:	24.0 MPH	Average Speed:	28.1 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	28.0 MPH	10 MPH Pace:	24 to 33 MPH	Number of Vehicles > 25 MPH:	3069
85th Percentile:	32.0 MPH	Number in Pace:	3263	Percent of Vehicles > 25 MPH:	78.0%
95th Percentile:	34.0 MPH	Percent in Pace:	82.9%		

Ballardville Street
north of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-A (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	10	8	1	0	0	0	0	0	0	0	20	33.2	29.8
1:00 AM	0	1	1	4	1	0	0	0	0	0	0	0	0	7	28.4	25.9
2:00 AM	0	1	4	5	2	0	0	0	0	0	0	0	0	12	29.7	25.8
3:00 AM	0	0	1	8	5	1	0	0	0	0	0	0	0	15	30.9	29.0
4:00 AM	0	0	5	15	6	1	1	0	0	0	0	0	0	28	32.0	27.8
5:00 AM	3	2	17	57	19	2	0	0	0	0	0	0	0	100	30.0	26.6
6:00 AM	4	3	74	140	47	5	1	0	0	0	0	0	0	274	30.0	26.5
7:00 AM	6	6	75	260	97	4	0	0	0	0	0	0	0	448	30.0	27.0
8:00 AM	6	11	98	199	110	10	2	1	0	0	0	0	0	437	31.0	27.0
9:00 AM	4	6	61	160	62	6	1	0	0	0	0	0	0	300	31.0	26.9
10:00 AM	1	2	62	149	50	5	4	0	0	0	0	0	0	273	30.0	27.2
11:00 AM	3	4	50	174	99	7	1	0	0	0	0	0	0	338	31.0	27.7
12:00 PM	2	7	61	195	126	12	3	0	0	0	0	0	0	406	32.0	28.0
1:00 PM	3	7	61	215	105	5	0	0	0	0	0	0	0	396	31.0	27.6
2:00 PM	6	10	61	231	92	6	0	0	0	0	0	0	0	406	31.0	27.1
3:00 PM	8	23	139	292	80	12	1	0	1	0	0	0	0	556	30.0	26.1
4:00 PM	6	19	94	332	163	15	1	0	0	0	0	0	0	630	31.0	27.4
5:00 PM	4	5	43	334	163	15	2	0	0	0	0	0	0	566	31.0	28.3
6:00 PM	0	5	50	214	82	13	1	0	0	0	0	0	0	365	31.0	27.7
7:00 PM	1	1	30	140	78	12	0	0	0	0	0	0	0	262	31.9	28.3
8:00 PM	1	0	17	128	62	4	3	0	0	0	0	0	0	215	32.0	28.4
9:00 PM	0	3	10	50	37	8	0	0	0	0	0	0	0	108	32.0	28.5
10:00 PM	0	1	7	39	20	3	2	0	0	0	0	0	0	72	32.0	28.9
11:00 PM	0	0	6	25	10	2	0	0	0	0	0	0	0	43	30.7	28.1
Total	58	117	1028	3376	1524	149	23	1	1	0	0	0	0	6277	31.0	27.4
Percent	0.92%	1.86%	16.38%	53.78%	24.28%	2.37%	0.37%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	8:00 AM	7:00 AM	8:00 AM	8:00 AM	10:00 AM	8:00 AM						7:00 AM		
Volume	6	11	98	260	110	10	4	1	0	0	0	0	0	448		
PM Peak	3:00 PM	3:00 PM	3:00 PM	5:00 PM	4:00 PM	4:00 PM	12:00 PM		3:00 PM					4:00 PM		
Volume	8	23	139	334	163	15	3	0	1	0	0	0	0	630		

15th Percentile:	24.0 MPH	Average Speed:	27.4 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	28.0 MPH	10 MPH Pace:	23 to 32 MPH	Number of Vehicles > 25 MPH:	4580
85th Percentile:	31.0 MPH	Number in Pace:	5291	Percent of Vehicles > 25 MPH:	73.0%
95th Percentile:	33.0 MPH	Percent in Pace:	84.3%		

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION D A T A INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	11	13	2	0	0	0	0	0	0	27	39.0	35.3
1:00 AM	0	0	0	1	3	1	0	0	0	0	0	0	0	5	34.2	31.2
2:00 AM	0	0	0	1	4	6	1	0	0	0	0	0	0	12	38.4	35.5
3:00 AM	0	0	0	0	4	4	2	0	0	0	0	0	0	10	42.3	36.6
4:00 AM	0	0	0	3	3	3	2	0	0	0	0	0	0	11	40.5	34.6
5:00 AM	0	0	3	2	18	15	2	0	0	0	0	0	0	40	37.2	33.4
6:00 AM	0	0	0	18	63	35	5	0	0	0	0	0	0	121	36.0	33.1
7:00 AM	0	1	1	47	123	64	8	0	1	0	0	0	0	245	36.0	32.6
8:00 AM	1	1	8	75	175	73	7	1	0	0	0	0	0	341	36.0	31.9
9:00 AM	2	0	11	66	129	56	8	0	0	0	0	0	0	272	36.0	31.4
10:00 AM	1	0	1	52	129	62	8	0	0	0	0	0	0	253	36.0	32.4
11:00 AM	0	6	11	43	131	77	12	1	0	0	0	0	0	281	36.0	32.4
12:00 PM	0	0	3	46	193	106	17	2	0	0	0	0	0	367	37.0	33.2
1:00 PM	0	0	2	49	156	91	16	1	0	0	0	0	0	315	37.0	33.3
2:00 PM	0	1	11	123	217	98	17	0	0	0	0	0	0	467	36.0	31.8
3:00 PM	8	19	44	164	203	76	12	2	0	0	0	0	0	528	35.0	29.7
4:00 PM	9	30	49	170	181	69	6	1	0	0	0	0	0	515	34.0	29.0
5:00 PM	5	22	31	141	208	66	10	1	0	0	0	0	0	484	35.0	29.8
6:00 PM	1	2	9	112	178	68	7	0	0	0	0	0	0	377	35.0	31.3
7:00 PM	2	1	13	81	132	46	5	1	0	0	0	0	0	281	35.0	31.0
8:00 PM	1	0	3	41	106	72	11	0	0	0	0	0	0	234	37.0	32.9
9:00 PM	0	0	0	21	62	39	10	0	0	0	0	0	0	132	37.0	33.4
10:00 PM	1	0	0	8	37	27	6	1	0	0	0	0	0	80	38.0	33.6
11:00 PM	0	0	1	5	35	20	6	1	0	0	0	0	0	68	38.0	33.7
Total	31	83	201	1270	2501	1187	180	12	1	0	0	0	0	5466	36.0	31.6
Percent	0.57%	1.52%	3.68%	23.23%	45.76%	21.72%	3.29%	0.22%	0.02%	0.00%	0.00%	0.00%	0.00%			
AM Peak	9:00 AM	11:00 AM	9:00 AM	8:00 AM	8:00 AM	11:00 AM	11:00 AM	8:00 AM	7:00 AM					8:00 AM		
Volume	2	6	11	75	175	77	12	1	1	0	0	0	0	341		
PM Peak	4:00 PM	4:00 PM	4:00 PM	4:00 PM	2:00 PM	12:00 PM	12:00 PM	12:00 PM						3:00 PM		
Volume	9	30	49	170	217	106	17	2	0	0	0	0	0	528		

15th Percentile:	27.0 MPH	Average Speed:	31.6 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	27 to 36 MPH	Number of Vehicles > 30 MPH:	3453
85th Percentile:	36.0 MPH	Number in Pace:	4214	Percent of Vehicles > 30 MPH:	63.2%
95th Percentile:	39.0 MPH	Percent in Pace:	77.1%		

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION
D A T A
INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	9	6	0	0	0	0	0	0	0	16	36.8	33.3
1:00 AM	0	0	0	2	6	5	1	0	0	0	0	0	0	14	38.0	34.0
2:00 AM	0	0	0	0	4	5	1	0	0	0	0	0	0	10	39.0	35.0
3:00 AM	0	0	0	2	14	9	3	0	0	0	0	0	0	28	37.0	33.9
4:00 AM	0	0	0	8	45	24	8	0	0	0	0	0	0	85	38.0	34.0
5:00 AM	0	0	0	29	175	103	8	0	0	1	0	0	0	316	37.0	33.7
6:00 AM	5	3	11	125	315	93	4	0	0	0	0	0	0	556	35.0	31.3
7:00 AM	110	24	27	84	167	52	13	1	0	0	0	0	0	478	34.0	25.8
8:00 AM	58	30	15	72	186	77	4	1	0	0	0	1	0	444	35.0	28.0
9:00 AM	36	17	5	55	157	78	7	0	0	0	0	0	0	355	36.0	29.5
10:00 AM	0	0	3	61	216	87	11	0	0	0	0	0	0	378	36.0	32.6
11:00 AM	0	0	5	49	209	107	11	0	0	0	0	0	0	381	36.0	32.8
12:00 PM	1	0	0	53	201	114	12	2	1	0	0	0	0	384	36.0	33.2
1:00 PM	0	0	4	80	214	100	12	2	0	0	0	0	0	412	36.0	32.5
2:00 PM	0	1	7	69	203	101	12	1	1	0	0	0	0	395	36.0	32.6
3:00 PM	0	0	12	123	232	71	10	0	0	0	0	0	0	448	35.0	31.5
4:00 PM	0	0	4	107	302	94	11	2	0	0	0	0	0	520	35.0	32.0
5:00 PM	0	3	14	112	238	89	13	2	0	0	0	0	0	471	36.0	31.8
6:00 PM	0	0	3	86	227	69	11	1	0	0	0	0	0	397	36.0	32.1
7:00 PM	0	1	0	33	149	47	6	0	0	0	0	0	0	236	36.0	32.6
8:00 PM	0	1	0	23	93	49	8	2	2	0	0	0	0	178	37.0	33.5
9:00 PM	0	0	1	14	71	34	3	0	0	0	0	0	0	123	36.0	33.0
10:00 PM	0	0	0	8	36	16	1	0	0	0	0	0	0	61	36.0	32.9
11:00 PM	0	0	0	4	7	11	1	0	0	0	0	0	0	23	36.7	33.7
Total	210	80	111	1200	3476	1441	171	14	4	1	0	1	0	6709	36.0	31.5
Percent	3.13%	1.19%	1.65%	17.89%	51.81%	21.48%	2.55%	0.21%	0.06%	0.01%	0.00%	0.01%	0.00%			
AM Peak	7:00 AM	8:00 AM	7:00 AM	6:00 AM	6:00 AM	11:00 AM	7:00 AM	7:00 AM		5:00 AM		8:00 AM		6:00 AM		
Volume	110	30	27	125	315	107	13	1	0	1	0	1	0	556		
PM Peak	12:00 PM	5:00 PM	5:00 PM	3:00 PM	4:00 PM	12:00 PM	5:00 PM	12:00 PM	8:00 PM					4:00 PM		
Volume	1	3	14	123	302	114	13	2	2	0	0	0	0	520		

15th Percentile:	28.0 MPH	Average Speed:	31.5 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	4574
85th Percentile:	36.0 MPH	Number in Pace:	5462	Percent of Vehicles > 30 MPH:	68.2%
95th Percentile:	38.0 MPH	Percent in Pace:	81.4%		

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	20	19	2	0	0	0	0	0	0	43	38.0	34.6
1:00 AM	0	0	0	3	9	6	1	0	0	0	0	0	0	19	37.3	33.3
2:00 AM	0	0	0	1	8	11	2	0	0	0	0	0	0	22	39.0	35.3
3:00 AM	0	0	0	2	18	13	5	0	0	0	0	0	0	38	38.5	34.6
4:00 AM	0	0	0	11	48	27	10	0	0	0	0	0	0	96	38.0	34.1
5:00 AM	0	0	3	31	193	118	10	0	0	1	0	0	0	356	37.0	33.7
6:00 AM	5	3	11	143	378	128	9	0	0	0	0	0	0	677	35.0	31.6
7:00 AM	110	25	28	131	290	116	21	1	1	0	0	0	0	723	35.0	28.1
8:00 AM	59	31	23	147	361	150	11	2	0	0	0	1	0	785	35.0	29.7
9:00 AM	38	17	16	121	286	134	15	0	0	0	0	0	0	627	36.0	30.3
10:00 AM	1	0	4	113	345	149	19	0	0	0	0	0	0	631	36.0	32.5
11:00 AM	0	6	16	92	340	184	23	1	0	0	0	0	0	662	36.0	32.6
12:00 PM	1	0	3	99	394	220	29	4	1	0	0	0	0	751	36.0	33.2
1:00 PM	0	0	6	129	370	191	28	3	0	0	0	0	0	727	36.0	32.8
2:00 PM	0	2	18	192	420	199	29	1	1	0	0	0	0	862	36.0	32.2
3:00 PM	8	19	56	287	435	147	22	2	0	0	0	0	0	976	35.0	30.5
4:00 PM	9	30	53	277	483	163	17	3	0	0	0	0	0	1035	35.0	30.5
5:00 PM	5	25	45	253	446	155	23	3	0	0	0	0	0	955	35.0	30.8
6:00 PM	1	2	12	198	405	137	18	1	0	0	0	0	0	774	36.0	31.7
7:00 PM	2	2	13	114	281	93	11	1	0	0	0	0	0	517	35.0	31.7
8:00 PM	1	1	3	64	199	121	19	2	2	0	0	0	0	412	37.0	33.2
9:00 PM	0	0	1	35	133	73	13	0	0	0	0	0	0	255	36.0	33.2
10:00 PM	1	0	0	16	73	43	7	1	0	0	0	0	0	141	37.0	33.3
11:00 PM	0	0	1	9	42	31	7	1	0	0	0	0	0	91	38.0	33.7
Total	241	163	312	2470	5977	2628	351	26	5	1	0	1	0	12175	36.0	31.5
Percent	1.98%	1.34%	2.56%	20.29%	49.09%	21.59%	2.88%	0.21%	0.04%	0.01%	0.00%	0.01%	0.00%			
AM Peak	7:00 AM	8:00 AM	7:00 AM	8:00 AM	6:00 AM	11:00 AM	11:00 AM	8:00 AM	7:00 AM	5:00 AM		8:00 AM		8:00 AM		
Volume	110	31	28	147	378	184	23	2	1	1	0	1	0	785		
PM Peak	4:00 PM	4:00 PM	3:00 PM	3:00 PM	4:00 PM	12:00 PM	12:00 PM	12:00 PM	8:00 PM					4:00 PM		
Volume	9	30	56	287	483	220	29	4	2	0	0	0	0	1035		

15th Percentile:	28.0 MPH	Average Speed:	31.5 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	8027
85th Percentile:	36.0 MPH	Number in Pace:	9619	Percent of Vehicles > 30 MPH:	65.9%
95th Percentile:	38.0 MPH	Percent in Pace:	79.0%		

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION
D A T A
INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	2	4	13	7	3	0	0	0	0	0	0	29	38.0	32.8
1:00 AM	0	0	0	0	6	3	0	0	0	0	0	0	0	9	35.8	33.3
2:00 AM	0	0	0	2	2	2	1	0	1	0	0	0	0	8	41.8	36.1
3:00 AM	0	0	0	0	3	7	0	0	0	0	0	0	0	10	37.3	35.5
4:00 AM	0	0	0	0	5	6	1	0	0	0	0	0	0	12	36.4	34.4
5:00 AM	0	0	3	10	25	15	2	0	0	0	0	0	0	55	36.0	32.1
6:00 AM	1	0	5	27	45	30	4	0	0	0	0	0	0	112	36.0	31.7
7:00 AM	0	0	4	40	125	58	5	0	1	0	0	0	0	233	36.0	32.7
8:00 AM	0	0	3	54	167	88	16	0	0	0	0	0	0	328	36.0	32.8
9:00 AM	1	0	2	37	127	64	6	1	0	0	0	0	0	238	36.0	32.7
10:00 AM	0	0	3	38	105	70	8	0	0	0	0	0	0	224	37.0	32.8
11:00 AM	1	2	11	48	131	74	11	4	0	0	0	0	0	282	37.0	32.5
12:00 PM	1	0	2	41	144	114	16	1	1	0	0	0	0	320	37.0	33.6
1:00 PM	1	0	13	59	177	87	12	0	0	0	0	0	0	349	37.0	32.3
2:00 PM	0	3	19	100	242	107	15	0	0	0	0	0	0	486	35.0	31.8
3:00 PM	8	10	36	132	211	89	10	1	0	0	0	0	0	497	35.0	30.5
4:00 PM	6	9	29	136	224	91	9	0	0	0	0	0	0	504	35.0	30.6
5:00 PM	8	17	35	179	229	73	2	1	0	0	0	0	0	544	34.0	29.7
6:00 PM	0	1	16	111	201	66	8	1	1	0	0	0	0	405	35.0	31.1
7:00 PM	0	0	6	67	173	52	5	1	0	0	0	0	0	304	35.0	31.7
8:00 PM	0	0	4	36	109	69	4	0	0	0	0	0	0	222	37.0	32.7
9:00 PM	0	0	1	29	71	36	9	0	0	0	0	0	0	146	37.0	32.9
10:00 PM	0	0	1	13	53	38	2	1	0	0	0	0	0	108	38.0	33.7
11:00 PM	0	0	0	8	32	19	6	1	0	0	0	0	0	66	38.0	34.1
Total	27	42	195	1171	2620	1265	155	12	4	0	0	0	0	5491	36.0	31.8
Percent	0.49%	0.76%	3.55%	21.33%	47.71%	23.04%	2.82%	0.22%	0.07%	0.00%	0.00%	0.00%	0.00%			
AM Peak	6:00 AM	11:00 AM	11:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	11:00 AM	2:00 AM					8:00 AM		
Volume	1	2	11	54	167	88	16	4	1	0	0	0	0	328		
PM Peak	3:00 PM	5:00 PM	3:00 PM	5:00 PM	2:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM					5:00 PM		
Volume	8	17	36	179	242	114	16	1	1	0	0	0	0	544		

15th Percentile:	28.0 MPH	Average Speed:	31.8 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	27 to 36 MPH	Number of Vehicles > 30 MPH:	3592
85th Percentile:	36.0 MPH	Number in Pace:	4280	Percent of Vehicles > 30 MPH:	65.4%
95th Percentile:	39.0 MPH	Percent in Pace:	77.9%		

Middlesex Avenue
south of Salem Street
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Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	5	7	0	0	0	0	0	0	0	12	37.4	35.1
1:00 AM	0	1	0	2	2	1	0	0	0	0	0	0	0	6	34.0	29.2
2:00 AM	0	0	0	2	5	3	0	0	0	0	0	0	0	10	35.7	32.5
3:00 AM	0	0	0	2	12	6	3	0	0	0	0	0	0	23	38.1	34.4
4:00 AM	0	0	0	3	57	36	3	2	0	0	0	0	0	101	37.0	34.1
5:00 AM	0	0	0	33	162	101	9	0	0	0	0	0	0	305	37.0	33.4
6:00 AM	6	14	50	105	313	77	9	2	0	0	0	0	0	576	35.0	30.6
7:00 AM	44	48	57	159	167	59	8	3	0	0	0	0	0	545	34.0	27.3
8:00 AM	0	1	18	121	281	118	11	3	0	0	0	0	0	553	36.0	32.0
9:00 AM	0	2	7	66	203	104	12	0	0	0	0	0	0	394	36.0	32.6
10:00 AM	0	0	1	54	186	62	9	1	0	0	0	0	0	313	36.0	32.6
11:00 AM	0	1	0	52	222	106	12	1	0	0	0	0	0	394	36.0	32.9
12:00 PM	0	0	1	70	208	114	12	2	0	0	0	0	0	407	36.0	33.0
1:00 PM	0	0	2	68	195	98	11	3	1	0	0	0	0	378	36.5	33.0
2:00 PM	0	0	1	52	211	96	17	1	1	0	0	0	0	379	37.0	33.1
3:00 PM	6	8	32	126	203	78	7	1	0	0	0	0	0	461	35.0	30.5
4:00 PM	5	4	19	109	302	94	7	3	1	0	0	0	0	544	35.0	31.5
5:00 PM	41	15	31	108	146	44	6	0	0	0	0	0	0	391	34.0	27.8
6:00 PM	0	0	1	71	224	97	10	1	1	0	0	0	0	405	36.0	32.6
7:00 PM	0	0	3	51	148	52	6	1	0	0	0	0	0	261	36.0	32.2
8:00 PM	0	0	2	32	92	59	6	0	0	0	0	0	0	191	36.0	32.9
9:00 PM	0	0	6	17	99	29	5	0	0	0	0	0	0	156	36.0	32.5
10:00 PM	0	0	0	12	37	19	2	0	0	0	0	0	0	70	36.7	32.8
11:00 PM	0	0	0	6	23	11	5	0	0	0	0	0	0	45	37.4	33.6
Total	102	94	231	1321	3503	1471	170	24	4	0	0	0	0	6920	36.0	31.6
Percent	1.47%	1.36%	3.34%	19.09%	50.62%	21.26%	2.46%	0.35%	0.06%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	6:00 AM	8:00 AM	9:00 AM	7:00 AM						6:00 AM		
Volume	44	48	57	159	313	118	12	3	0	0	0	0	0	576		
PM Peak	5:00 PM	5:00 PM	3:00 PM	3:00 PM	4:00 PM	12:00 PM	2:00 PM	1:00 PM	1:00 PM					4:00 PM		
Volume	41	15	32	126	302	114	17	3	1	0	0	0	0	544		

15th Percentile:	28.0 MPH	Average Speed:	31.6 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	4652
85th Percentile:	36.0 MPH	Number in Pace:	5553	Percent of Vehicles > 30 MPH:	67.2%
95th Percentile:	38.0 MPH	Percent in Pace:	80.2%		

Middlesex Avenue
south of Salem Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-B (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	2	4	18	14	3	0	0	0	0	0	0	41	38.0	33.4
1:00 AM	0	1	0	2	8	4	0	0	0	0	0	0	0	15	35.9	31.7
2:00 AM	0	0	0	4	7	5	1	0	1	0	0	0	0	18	37.0	34.1
3:00 AM	0	0	0	2	15	13	3	0	0	0	0	0	0	33	38.2	34.7
4:00 AM	0	0	0	3	62	42	4	2	0	0	0	0	0	113	37.0	34.1
5:00 AM	0	0	3	43	187	116	11	0	0	0	0	0	0	360	37.0	33.2
6:00 AM	7	14	55	132	358	107	13	2	0	0	0	0	0	688	35.0	30.8
7:00 AM	44	48	61	199	292	117	13	3	1	0	0	0	0	778	35.0	28.9
8:00 AM	0	1	21	175	448	206	27	3	0	0	0	0	0	881	36.0	32.3
9:00 AM	1	2	9	103	330	168	18	1	0	0	0	0	0	632	36.0	32.6
10:00 AM	0	0	4	92	291	132	17	1	0	0	0	0	0	537	36.0	32.7
11:00 AM	1	3	11	100	353	180	23	5	0	0	0	0	0	676	36.0	32.7
12:00 PM	1	0	3	111	352	228	28	3	1	0	0	0	0	727	37.0	33.2
1:00 PM	1	0	15	127	372	185	23	3	1	0	0	0	0	727	37.0	32.6
2:00 PM	0	3	20	152	453	203	32	1	1	0	0	0	0	865	36.0	32.4
3:00 PM	14	18	68	258	414	167	17	2	0	0	0	0	0	958	35.0	30.5
4:00 PM	11	13	48	245	526	185	16	3	1	0	0	0	0	1048	35.0	31.1
5:00 PM	49	32	66	287	375	117	8	1	0	0	0	0	0	935	34.0	28.9
6:00 PM	0	1	17	182	425	163	18	2	2	0	0	0	0	810	35.0	31.9
7:00 PM	0	0	9	118	321	104	11	2	0	0	0	0	0	565	35.4	32.0
8:00 PM	0	0	6	68	201	128	10	0	0	0	0	0	0	413	36.2	32.8
9:00 PM	0	0	7	46	170	65	14	0	0	0	0	0	0	302	36.0	32.7
10:00 PM	0	0	1	25	90	57	4	1	0	0	0	0	0	178	37.0	33.3
11:00 PM	0	0	0	14	55	30	11	1	0	0	0	0	0	111	38.0	33.9
Total	129	136	426	2492	6123	2736	325	36	8	0	0	0	0	12411	36.0	31.7
Percent	1.04%	1.10%	3.43%	20.08%	49.34%	22.04%	2.62%	0.29%	0.06%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	8:00 AM	11:00 AM	2:00 AM					8:00 AM		
Volume	44	48	61	199	448	206	27	5	1	0	0	0	0	881		
PM Peak	5:00 PM	5:00 PM	3:00 PM	5:00 PM	4:00 PM	12:00 PM	2:00 PM	12:00 PM	6:00 PM					4:00 PM		
Volume	49	32	68	287	526	228	32	3	2	0	0	0	0	1048		

15th Percentile:	28.0 MPH	Average Speed:	31.7 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	8244
85th Percentile:	36.0 MPH	Number in Pace:	9819	Percent of Vehicles > 30 MPH:	66.4%
95th Percentile:	38.0 MPH	Percent in Pace:	79.1%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION
D A T A
INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	2	7	14	5	1	0	0	0	0	29	45.0	41.3
1:00 AM	0	0	0	2	1	2	4	3	1	0	0	0	0	13	46.0	40.2
2:00 AM	0	0	0	0	2	3	9	2	0	0	0	0	0	16	44.0	41.1
3:00 AM	0	0	0	0	2	9	11	2	1	0	0	0	0	25	44.0	40.3
4:00 AM	0	0	0	1	4	12	5	5	0	1	0	0	0	28	46.0	39.1
5:00 AM	0	0	0	0	14	35	41	14	0	0	1	0	0	105	44.0	40.0
6:00 AM	0	2	3	14	64	114	76	21	3	0	0	0	0	297	42.0	37.4
7:00 AM	1	4	6	26	117	198	148	25	1	0	0	0	0	526	42.0	36.9
8:00 AM	9	11	52	87	174	188	94	18	3	0	0	0	0	636	40.0	33.4
9:00 AM	3	2	26	52	102	151	97	16	3	1	0	0	0	453	41.0	35.2
10:00 AM	0	0	0	8	58	200	150	28	0	0	0	0	0	444	42.6	38.5
11:00 AM	0	0	0	10	48	193	131	23	9	0	0	0	0	414	43.0	38.6
12:00 PM	1	0	2	11	80	192	212	46	6	1	0	0	0	551	43.0	38.9
1:00 PM	0	0	1	6	64	192	157	45	5	0	0	0	0	470	43.7	39.0
2:00 PM	0	0	6	25	98	244	192	27	6	1	0	0	0	599	42.3	37.8
3:00 PM	1	1	6	25	103	301	175	32	0	0	0	0	0	644	42.0	37.5
4:00 PM	0	1	3	18	77	292	248	45	6	1	0	0	0	691	43.0	38.7
5:00 PM	1	1	2	7	83	251	214	48	2	0	0	0	0	609	43.0	38.6
6:00 PM	0	0	1	16	108	220	116	19	2	0	0	0	0	482	42.0	37.2
7:00 PM	0	0	1	9	54	152	98	26	3	0	0	0	0	343	43.0	38.2
8:00 PM	0	0	0	4	28	117	112	36	4	0	0	0	0	301	44.0	39.7
9:00 PM	0	0	1	1	13	53	72	19	2	0	0	0	0	161	44.0	40.1
10:00 PM	0	0	0	0	16	36	49	23	3	0	0	0	0	127	45.0	40.6
11:00 PM	0	0	0	1	14	36	35	15	3	0	0	0	0	104	45.0	39.9
Total	16	22	110	323	1326	3198	2460	543	64	5	1	0	0	8068	43.0	37.8
Percent	0.20%	0.27%	1.36%	4.00%	16.44%	39.64%	30.49%	6.73%	0.79%	0.06%	0.01%	0.00%	0.00%			
AM Peak	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	10:00 AM	10:00 AM	10:00 AM	11:00 AM	4:00 AM	5:00 AM			8:00 AM		
Volume	9	11	52	87	174	200	150	28	9	1	1	0	0	636		
PM Peak	12:00 PM	3:00 PM	2:00 PM	2:00 PM	6:00 PM	3:00 PM	4:00 PM	5:00 PM	12:00 PM	12:00 PM				4:00 PM		
Volume	1	1	6	25	108	301	248	48	6	1	0	0	0	691		

15th Percentile:	33.0 MPH	Average Speed:	37.8 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	38.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 35 MPH:	5761
85th Percentile:	43.0 MPH	Number in Pace:	5765	Percent of Vehicles > 35 MPH:	71.4%
95th Percentile:	46.0 MPH	Percent in Pace:	71.5%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	8	8	6	2	0	0	0	0	0	24	42.1	37.1
1:00 AM	0	0	0	1	2	4	12	0	0	0	0	0	0	19	43.0	39.3
2:00 AM	0	0	0	1	2	7	7	2	1	0	0	0	0	20	43.3	39.4
3:00 AM	0	0	0	0	6	15	5	3	1	0	0	0	0	30	43.3	38.7
4:00 AM	0	0	0	0	15	54	32	5	0	0	0	0	0	106	42.0	38.3
5:00 AM	1	0	0	2	75	202	77	5	1	0	0	0	0	363	41.0	37.1
6:00 AM	3	1	2	24	131	320	83	8	1	0	0	0	0	573	40.0	36.1
7:00 AM	1	3	2	8	159	336	126	5	2	0	0	0	0	642	40.0	36.5
8:00 AM	5	4	3	16	151	250	95	8	0	0	0	0	0	532	40.0	35.9
9:00 AM	5	1	2	20	170	234	87	9	2	0	0	0	0	530	40.0	35.6
10:00 AM	3	0	0	10	162	283	105	7	2	0	0	0	0	572	40.0	36.3
11:00 AM	2	1	3	31	158	262	83	5	1	0	0	0	0	546	40.0	35.8
12:00 PM	5	1	1	11	124	274	101	10	2	0	0	0	0	529	40.0	36.4
1:00 PM	3	2	4	12	175	285	92	11	0	0	0	1	0	585	40.0	36.1
2:00 PM	3	5	5	14	114	254	118	17	2	1	0	0	0	533	41.0	36.7
3:00 PM	1	4	9	17	169	289	99	11	1	0	0	0	0	600	40.0	35.9
4:00 PM	1	1	1	17	160	402	151	14	0	0	0	0	0	747	40.0	36.9
5:00 PM	4	2	3	16	196	372	116	17	2	0	0	0	0	728	40.0	36.2
6:00 PM	4	1	2	18	200	250	52	3	0	1	0	0	0	531	39.0	35.1
7:00 PM	3	2	2	12	100	196	35	5	0	0	0	0	0	355	39.0	35.3
8:00 PM	0	0	0	4	65	140	44	5	0	0	0	0	0	258	40.0	36.6
9:00 PM	0	0	0	8	45	90	29	0	1	0	0	0	0	173	40.0	36.1
10:00 PM	0	0	0	3	18	36	18	0	0	1	0	0	0	76	40.0	36.6
11:00 PM	0	0	0	0	14	15	17	3	2	0	0	0	0	51	43.5	38.5
Total	44	28	39	245	2419	4578	1590	155	21	3	0	1	0	9123	40.0	36.2
Percent	0.48%	0.31%	0.43%	2.69%	26.52%	50.18%	17.43%	1.70%	0.23%	0.03%	0.00%	0.01%	0.00%			
AM Peak	8:00 AM	8:00 AM	8:00 AM	11:00 AM	9:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM					7:00 AM		
Volume	5	4	3	31	170	336	126	9	2	0	0	0	0	642		
PM Peak	12:00 PM	2:00 PM	3:00 PM	6:00 PM	6:00 PM	4:00 PM	4:00 PM	2:00 PM	12:00 PM	2:00 PM		1:00 PM		4:00 PM		
Volume	5	5	9	18	200	402	151	17	2	1	0	1	0	747		

15th Percentile:	33.0 MPH	Average Speed:	36.2 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	32 to 41 MPH	Number of Vehicles > 35 MPH:	5447
85th Percentile:	40.0 MPH	Number in Pace:	7547	Percent of Vehicles > 35 MPH:	59.7%
95th Percentile:	43.0 MPH	Percent in Pace:	82.7%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Wednesday, October 23, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	10	15	20	7	1	0	0	0	0	53	44.2	39.4
1:00 AM	0	0	0	3	3	6	16	3	1	0	0	0	0	32	44.0	39.7
2:00 AM	0	0	0	1	4	10	16	4	1	0	0	0	0	36	44.0	40.1
3:00 AM	0	0	0	0	8	24	16	5	2	0	0	0	0	55	44.0	39.4
4:00 AM	0	0	0	1	19	66	37	10	0	1	0	0	0	134	42.0	38.4
5:00 AM	1	0	0	2	89	237	118	19	1	0	1	0	0	468	42.0	37.8
6:00 AM	3	3	5	38	195	434	159	29	4	0	0	0	0	870	41.0	36.5
7:00 AM	2	7	8	34	276	534	274	30	3	0	0	0	0	1168	41.0	36.7
8:00 AM	14	15	55	103	325	438	189	26	3	0	0	0	0	1168	40.0	34.5
9:00 AM	8	3	28	72	272	385	184	25	5	1	0	0	0	983	41.0	35.4
10:00 AM	3	0	0	18	220	483	255	35	2	0	0	0	0	1016	41.0	37.2
11:00 AM	2	1	3	41	206	455	214	28	10	0	0	0	0	960	41.0	37.0
12:00 PM	6	1	3	22	204	466	313	56	8	1	0	0	0	1080	42.0	37.6
1:00 PM	3	2	5	18	239	477	249	56	5	0	0	1	0	1055	42.0	37.4
2:00 PM	3	5	11	39	212	498	310	44	8	2	0	0	0	1132	42.0	37.3
3:00 PM	2	5	15	42	272	590	274	43	1	0	0	0	0	1244	41.0	36.8
4:00 PM	1	2	4	35	237	694	399	59	6	1	0	0	0	1438	42.0	37.7
5:00 PM	5	3	5	23	279	623	330	65	4	0	0	0	0	1337	41.6	37.3
6:00 PM	4	1	3	34	308	470	168	22	2	1	0	0	0	1013	40.0	36.1
7:00 PM	3	2	3	21	154	348	133	31	3	0	0	0	0	698	41.0	36.7
8:00 PM	0	0	0	8	93	257	156	41	4	0	0	0	0	559	42.3	38.3
9:00 PM	0	0	1	9	58	143	101	19	3	0	0	0	0	334	42.0	38.0
10:00 PM	0	0	0	3	34	72	67	23	3	1	0	0	0	203	44.0	39.1
11:00 PM	0	0	0	1	28	51	52	18	5	0	0	0	0	155	44.0	39.4
Total	60	50	149	568	3745	7776	4050	698	85	8	1	1	0	17191	41.0	37.0
Percent	0.35%	0.29%	0.87%	3.30%	21.78%	45.23%	23.56%	4.06%	0.49%	0.05%	0.01%	0.01%	0.00%			
AM Peak	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	10:00 AM	11:00 AM	4:00 AM	5:00 AM			7:00 AM		
Volume	14	15	55	103	325	534	274	35	10	1	1	0	0	1168		
PM Peak	12:00 PM	2:00 PM	3:00 PM	3:00 PM	6:00 PM	4:00 PM	4:00 PM	5:00 PM	12:00 PM	2:00 PM		1:00 PM		4:00 PM		
Volume	6	5	15	42	308	694	399	65	8	2	0	1	0	1438		

15th Percentile:	33.0 MPH	Average Speed:	37.0 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	37.0 MPH	10 MPH Pace:	32 to 41 MPH	Number of Vehicles > 35 MPH:	11208
85th Percentile:	41.0 MPH	Number in Pace:	13043	Percent of Vehicles > 35 MPH:	65.2%
95th Percentile:	44.0 MPH	Percent in Pace:	75.9%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	4	7	15	3	2	1	0	0	0	32	45.0	41.6
1:00 AM	0	0	0	0	1	4	6	5	1	0	0	0	0	17	46.2	42.0
2:00 AM	0	0	0	1	1	2	2	5	0	0	0	0	0	11	48.0	41.0
3:00 AM	0	0	0	1	0	5	9	8	1	1	0	0	0	25	46.0	42.8
4:00 AM	0	0	0	0	2	10	12	5	0	1	0	0	0	30	46.0	41.1
5:00 AM	0	0	0	1	10	48	44	15	2	0	0	0	0	120	44.0	39.8
6:00 AM	1	0	7	17	57	106	85	9	3	0	0	0	0	285	42.0	36.9
7:00 AM	1	1	8	20	101	217	103	26	4	3	0	0	0	484	42.0	36.9
8:00 AM	0	1	4	20	78	197	158	51	11	1	0	0	0	521	44.0	38.5
9:00 AM	5	1	6	28	84	146	113	34	5	0	1	0	0	423	43.0	37.2
10:00 AM	0	0	0	2	47	148	165	35	4	0	0	0	0	401	44.0	39.4
11:00 AM	0	0	0	5	53	183	151	43	8	1	0	0	0	444	44.0	39.2
12:00 PM	1	0	9	16	72	173	177	45	8	0	0	0	0	501	44.0	38.6
1:00 PM	2	0	0	9	76	206	203	63	5	2	0	0	0	566	44.0	39.1
2:00 PM	0	0	2	11	74	271	243	55	7	2	0	0	0	665	44.0	39.1
3:00 PM	1	2	8	21	91	246	243	55	8	1	0	0	0	676	43.0	38.6
4:00 PM	0	1	7	17	63	235	236	66	5	1	0	0	0	631	44.0	39.1
5:00 PM	0	1	10	19	86	303	226	39	4	0	0	0	0	688	43.0	38.2
6:00 PM	0	0	1	21	86	227	134	14	2	0	0	0	0	485	42.0	37.4
7:00 PM	0	0	0	13	64	177	103	23	5	0	0	0	0	385	43.0	38.1
8:00 PM	0	0	0	1	27	90	102	33	3	0	0	0	0	256	44.0	39.9
9:00 PM	0	0	0	0	12	54	84	26	4	0	0	0	0	180	45.0	40.8
10:00 PM	0	0	0	1	10	52	77	20	7	0	0	0	0	167	45.0	40.6
11:00 PM	0	0	0	2	7	32	32	12	5	0	0	0	0	90	46.0	40.4
Total	11	7	62	226	1106	3139	2723	690	104	14	1	0	0	8083	43.0	38.6
Percent	0.14%	0.09%	0.77%	2.80%	13.68%	38.83%	33.69%	8.54%	1.29%	0.17%	0.01%	0.00%	0.00%			
AM Peak	9:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM	7:00 AM	10:00 AM	8:00 AM	8:00 AM	7:00 AM	9:00 AM			8:00 AM		
Volume	5	1	8	28	101	217	165	51	11	3	1	0	0	521		
PM Peak	1:00 PM	3:00 PM	5:00 PM	3:00 PM	3:00 PM	5:00 PM	2:00 PM	4:00 PM	12:00 PM	1:00 PM				5:00 PM		
Volume	2	2	10	21	91	303	243	66	8	2	0	0	0	688		

15th Percentile:	34.0 MPH	Average Speed:	38.6 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	6179
85th Percentile:	43.0 MPH	Number in Pace:	5862	Percent of Vehicles > 35 MPH:	76.4%
95th Percentile:	46.0 MPH	Percent in Pace:	72.5%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	1	11	4	2	1	0	0	0	0	19	44.2	39.7
1:00 AM	0	0	0	1	2	5	3	0	0	0	0	0	0	11	40.0	36.5
2:00 AM	0	0	0	1	2	8	2	3	0	0	0	0	0	16	44.0	38.6
3:00 AM	0	0	0	1	5	15	8	3	0	0	0	0	0	32	43.0	38.1
4:00 AM	0	0	0	1	23	59	24	4	0	0	0	0	0	111	41.0	37.3
5:00 AM	0	0	1	2	67	206	68	4	0	0	0	0	0	348	40.0	37.0
6:00 AM	0	1	5	11	181	340	75	8	3	0	0	0	0	624	39.0	35.9
7:00 AM	2	2	3	16	210	324	114	9	0	0	0	0	0	680	40.0	36.0
8:00 AM	5	4	3	19	167	319	120	21	1	0	0	0	0	659	40.0	36.3
9:00 AM	1	2	0	12	155	288	96	9	0	1	0	0	0	564	40.0	36.4
10:00 AM	3	2	2	20	123	245	74	10	1	0	0	0	0	480	40.0	36.1
11:00 AM	1	1	6	23	157	298	83	13	1	0	0	0	0	583	40.0	36.0
12:00 PM	1	5	0	20	184	272	99	5	0	0	0	0	0	586	40.0	35.7
1:00 PM	6	1	5	27	144	282	103	8	1	0	0	0	0	577	40.0	35.9
2:00 PM	2	7	4	17	158	311	111	15	3	1	0	0	0	629	40.0	36.3
3:00 PM	2	3	0	7	140	355	139	12	0	0	0	0	0	658	40.0	36.8
4:00 PM	1	7	3	18	187	370	152	8	1	0	0	0	0	747	40.0	36.3
5:00 PM	4	3	4	11	177	372	111	11	0	0	0	0	0	693	40.0	36.2
6:00 PM	0	2	4	13	165	266	89	6	0	1	0	0	0	546	40.0	36.1
7:00 PM	3	4	1	13	112	183	43	6	2	0	0	0	0	367	39.0	35.5
8:00 PM	1	0	0	11	87	125	45	2	0	0	0	0	0	271	40.0	35.8
9:00 PM	0	0	2	7	46	90	33	2	0	0	0	0	0	180	40.0	36.1
10:00 PM	0	0	0	4	20	68	23	3	2	0	0	0	0	120	40.2	37.2
11:00 PM	0	1	0	0	19	33	18	3	0	1	0	0	0	75	41.9	37.3
Total	32	45	43	255	2532	4845	1637	167	16	4	0	0	0	9576	40.0	36.2
Percent	0.33%	0.47%	0.45%	2.66%	26.44%	50.60%	17.09%	1.74%	0.17%	0.04%	0.00%	0.00%	0.00%			
AM Peak	8:00 AM	8:00 AM	11:00 AM	11:00 AM	7:00 AM	6:00 AM	8:00 AM	8:00 AM	6:00 AM	9:00 AM				7:00 AM		
Volume	5	4	6	23	210	340	120	21	3	1	0	0	0	680		
PM Peak	1:00 PM	2:00 PM	1:00 PM	1:00 PM	4:00 PM	5:00 PM	4:00 PM	2:00 PM	2:00 PM	2:00 PM				4:00 PM		
Volume	6	7	5	27	187	372	152	15	3	1	0	0	0	747		

15th Percentile:	33.0 MPH	Average Speed:	36.2 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	32 to 41 MPH	Number of Vehicles > 35 MPH:	5707
85th Percentile:	40.0 MPH	Number in Pace:	8001	Percent of Vehicles > 35 MPH:	59.6%
95th Percentile:	42.0 MPH	Percent in Pace:	83.6%		

Route 62
north of High Street
City, State: Wilmington, MA
Client: Nitsch/ B. Zimolka
Site Code: 15428

PRECISION DATA INDUSTRIES, LLC

PDI File #: 240268 ATR-C (Speed)

Count Date
Thursday, October 24, 2024

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	5	18	19	5	3	1	0	0	0	51	45.0	40.9
1:00 AM	0	0	0	1	3	9	9	5	1	0	0	0	0	28	45.0	39.9
2:00 AM	0	0	0	2	3	10	4	8	0	0	0	0	0	27	46.1	39.6
3:00 AM	0	0	0	2	5	20	17	11	1	1	0	0	0	57	45.0	40.1
4:00 AM	0	0	0	1	25	69	36	9	0	1	0	0	0	141	43.0	38.1
5:00 AM	0	0	1	3	77	254	112	19	2	0	0	0	0	468	41.0	37.7
6:00 AM	1	1	12	28	238	446	160	17	6	0	0	0	0	909	40.0	36.2
7:00 AM	3	3	11	36	311	541	217	35	4	3	0	0	0	1164	41.0	36.4
8:00 AM	5	5	7	39	245	516	278	72	12	1	0	0	0	1180	42.0	37.3
9:00 AM	6	3	6	40	239	434	209	43	5	1	1	0	0	987	41.0	36.7
10:00 AM	3	2	2	22	170	393	239	45	5	0	0	0	0	881	42.0	37.6
11:00 AM	1	1	6	28	210	481	234	56	9	1	0	0	0	1027	42.0	37.4
12:00 PM	2	5	9	36	256	445	276	50	8	0	0	0	0	1087	42.0	37.1
1:00 PM	8	1	5	36	220	488	306	71	6	2	0	0	0	1143	42.0	37.5
2:00 PM	2	7	6	28	232	582	354	70	10	3	0	0	0	1294	42.0	37.7
3:00 PM	3	5	8	28	231	601	382	67	8	1	0	0	0	1334	42.0	37.7
4:00 PM	1	8	10	35	250	605	388	74	6	1	0	0	0	1378	42.0	37.6
5:00 PM	4	4	14	30	263	675	337	50	4	0	0	0	0	1381	41.0	37.2
6:00 PM	0	2	5	34	251	493	223	20	2	1	0	0	0	1031	41.0	36.7
7:00 PM	3	4	1	26	176	360	146	29	7	0	0	0	0	752	41.0	36.8
8:00 PM	1	0	0	12	114	215	147	35	3	0	0	0	0	527	43.0	37.8
9:00 PM	0	0	2	7	58	144	117	28	4	0	0	0	0	360	43.0	38.5
10:00 PM	0	0	0	5	30	120	100	23	9	0	0	0	0	287	43.0	39.2
11:00 PM	0	1	0	2	26	65	50	15	5	1	0	0	0	165	44.0	39.0
Total	43	52	105	481	3638	7984	4360	857	120	18	1	0	0	17659	42.0	37.3
Percent	0.24%	0.29%	0.59%	2.72%	20.60%	45.21%	24.69%	4.85%	0.68%	0.10%	0.01%	0.00%	0.00%			
AM Peak	9:00 AM	8:00 AM	6:00 AM	9:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	9:00 AM			8:00 AM		
Volume	6	5	12	40	311	541	278	72	12	3	1	0	0	1180		
PM Peak	1:00 PM	4:00 PM	5:00 PM	12:00 PM	5:00 PM	5:00 PM	4:00 PM	4:00 PM	2:00 PM	2:00 PM				5:00 PM		
Volume	8	8	14	36	263	675	388	74	10	3	0	0	0	1381		

15th Percentile:	33.0 MPH	Average Speed:	37.3 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	37.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 35 MPH:	11886
85th Percentile:	42.0 MPH	Number in Pace:	13384	Percent of Vehicles > 35 MPH:	67.3%
95th Percentile:	45.0 MPH	Percent in Pace:	75.8%		

Appendix B: MassDOT's 2023 Weekday Seasonal Adjustment Factors

Massachusetts Highway Department
Statewide Traffic Data Collection
2023 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.23	1.14	1.11	1.06	1.01	0.96	0.93	0.91	1.00	0.97	1.04	1.08	0.77
R3	1.11	1.07	1.02	0.95	0.90	0.89	0.87	0.87	0.92	0.89	0.95	0.99	0.98
R4-R7	1.19	1.16	1.10	1.00	0.92	0.91	0.87	0.88	0.93	0.93	1.01	1.06	0.98
U1-Boston	1.07	1.05	1.00	0.95	0.93	0.92	0.92	0.92	0.94	0.93	0.96	0.99	0.94
U1-Essex	1.14	1.11	1.06	1.00	0.95	0.91	0.87	0.87	0.94	0.95	1.00	1.03	0.96
U1-Southeast	1.12	1.09	1.04	0.96	0.91	0.87	0.84	0.86	0.92	0.94	0.98	1.03	0.96
U1-West	1.05	1.02	0.98	0.96	0.94	0.93	0.94	0.94	0.95	0.92	0.96	0.98	0.81
U1-Worcester	1.06	1.04	0.97	0.93	0.92	0.90	0.92	0.92	0.93	0.92	0.94	0.97	0.88
U3	1.05	1.02	0.96	0.92	0.89	0.89	0.91	0.92	0.91	0.90	0.94	0.96	0.98
U4-U7	1.02	1.00	0.94	0.89	0.86	0.88	0.91	0.92	0.89	0.88	0.91	0.91	0.99
UR2	1.05	1.01	0.97	0.92	0.90	0.90	0.91	0.91	0.91	0.90	0.94	0.97	0.98
Rec - East	1.17	1.16	1.09	1.04	0.92	0.84	0.76	0.80	0.93	1.00	1.03	1.06	0.98
Rec - West	1.46	1.38	1.32	1.06	0.94	0.79	0.59	0.69	0.97	0.99	1.18	1.28	0.98

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

UR2 Group - Combination of Urban Freeways and Expressways and Rural Freeways and Expressways.

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113, 1114,1116,2196,2197 and 2198.

Appendix C: Crash Rate Worksheets

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Oct-24

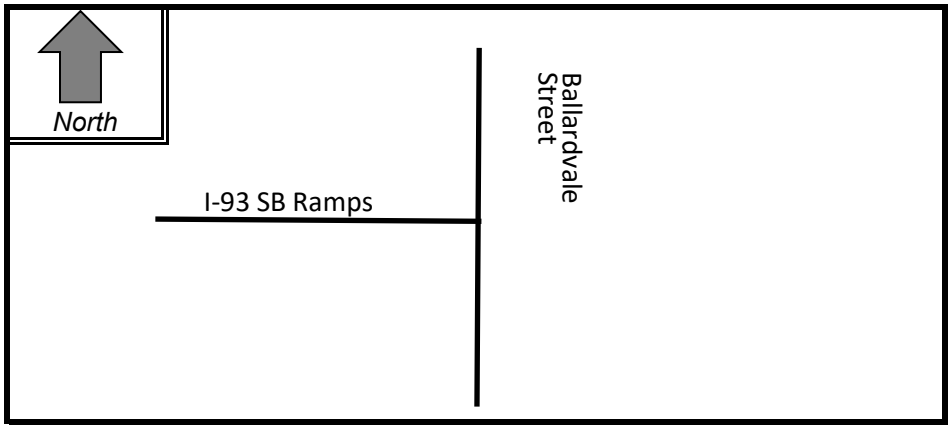
DISTRICT : 4 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Ballardvale Street

MINOR STREET(S) : I-93 Southbound Ramps

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB			
PEAK HOURLY VOLUMES (AM/(PM)) :	267	1,218	293			**1,778**

" K " FACTOR : **0.118** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **15,132**

TOTAL # OF CRASHES : 9 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.80**

CRASH RATE CALCULATION : **0.33** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : District 4 [Statewide] Average: 0.73 [0.78] Crashes per Million Entering Vehicles (MEV).

Project Title & Date: North Intermediate School - Nitsch Project #15428

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Oct-24

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

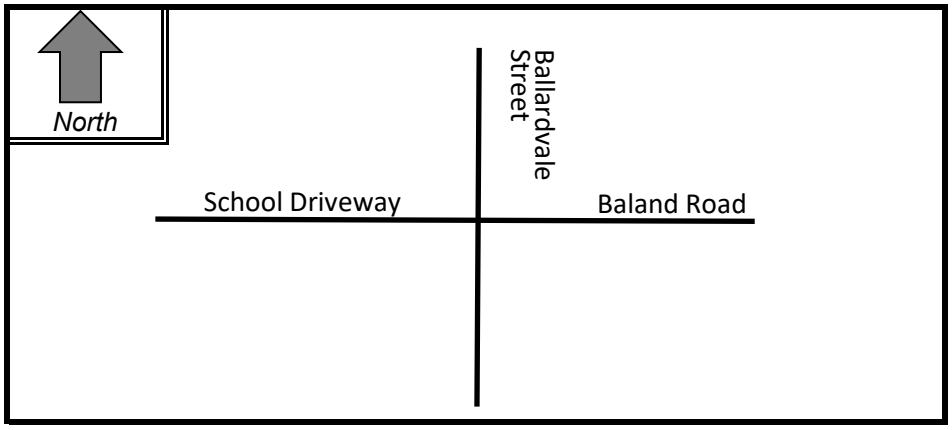
~ INTERSECTION DATA ~

MAJOR STREET : Ballardvale Street

MINOR STREET(S) : Baland Road

School Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	285	578	60	5		**928**

" K " FACTOR : **0.118** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,898**

TOTAL # OF CRASHES : 2 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.40**

CRASH RATE CALCULATION : **0.14** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : District 4 [Statewide] Average: 0.57 [0.57] Crashes per Million Entering Vehicles (MEV).

Project Title & Date: North Intermediate School - Nitsch Project #15428

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Oct-24

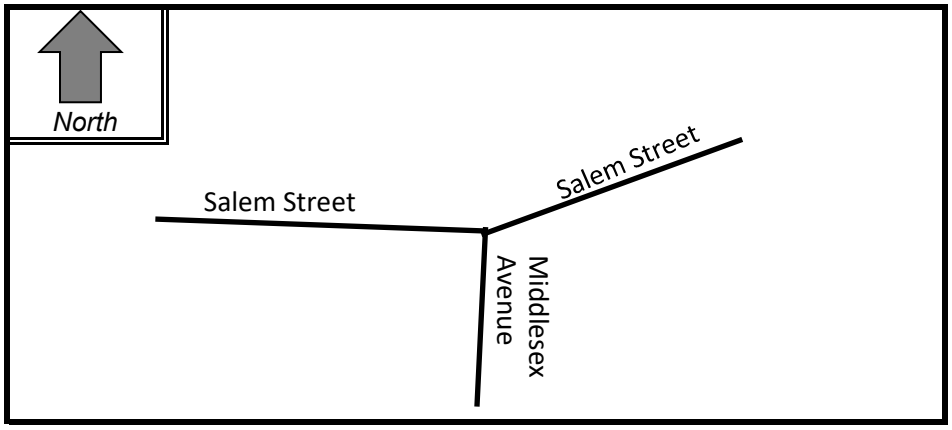
DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Salem Street

MINOR STREET(S) : Middlesex Avenue

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	EB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	565	509	594			**1,668**

" K " FACTOR : **0.094** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,840**

TOTAL # OF CRASHES : 8 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.60**

CRASH RATE CALCULATION : **0.25** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : District 4 [Statewide] Average: 0.57 [0.57] Crashes per Million Entering Vehicles (MEV).

Project Title & Date: North Intermediate School - Nitsch Project #15428

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Oct-24

DISTRICT : 4 UNSIGNALIZED : [ ] SIGNALIZED : [X]

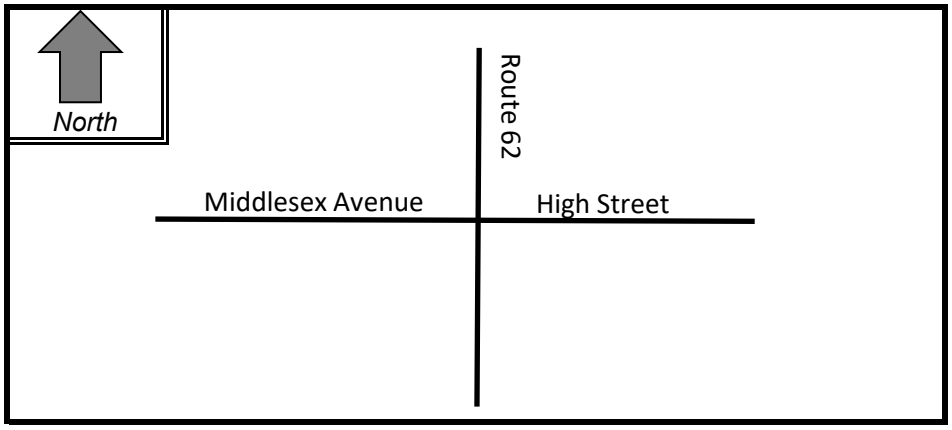
~ INTERSECTION DATA ~

MAJOR STREET : Ballardvale Street

MINOR STREET(S) : Middlesex Avenue

High Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/(PM)) :	605	645	507	185		**1,942**

" K " FACTOR :	**0.084**	INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME :	**23,119**

TOTAL # OF CRASHES :	26	# OF YEARS :	5	AVERAGE # OF CRASHES PER YEAR (**A**) :	**5.20**

CRASH RATE CALCULATION : **0.62** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : District 4 [Statewide] Average: 0.73 [0.78] Crashes per Million Entering Vehicles (MEV).

Project Title & Date: North Intermediate School - Nitsch Project #15428

Appendix D: Additional Developments' Traffic Studies

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

M E M O R A N D U M

DATE: November 8, 2023

TO: Christopher Neelon
Ciminelli Real Estate Corp.
Managing Director – Massachusetts Investments
800 Hingham Street, Ste. 31
Rockland, MA 02370

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Proposed Life Science/Biomanufacturing Facility**
181-187 Ballardvale Street, Wilmington, Massachusetts

MDM Transportation Consultants, Inc. (MDM) has conducted this traffic impact assessment (TIA) for a proposed facility to be located at 181-187 Ballardvale Street in Wilmington, Massachusetts. The location of the site relative to the adjacent roadway network is shown in **Figure 1.** This TIA provides a primary summary of the baseline traffic conditions at the Site and adjacent roadways/ intersections, evaluates existing and projected trip generation, quantifies incremental traffic impacts of the Site development on area roadways, and evaluates safety-related conditions at key study locations that provide access to the Site.

Key findings of the assessment are as follows:

- *Baseline Traffic Volumes.* Ballardvale Street carries approximately 19,956 vehicles per day (vpd) on weekdays. Peak hour traffic flow on Ballardvale Street ranges from approximately 935 to 1,060 vehicles per hour (vph) which represents 6 to 7 percent of daily traffic flow. The traffic flow on Ballardvale Street is skewed heavily in the northbound direction during the weekday morning peak hour and southbound during the weekday evening peak hour. The travel patterns are consistent with employee patterns for the commercial uses along that section of Ballardvale Street.

- *Safety Review.* Based on extensive review of MassDOT crash data, the study intersections all experienced crash rates well below the District 4 average and none of the intersection are listed as HSIP locations. No immediate safety countermeasures are warranted based on the crash history at the remaining study intersections.

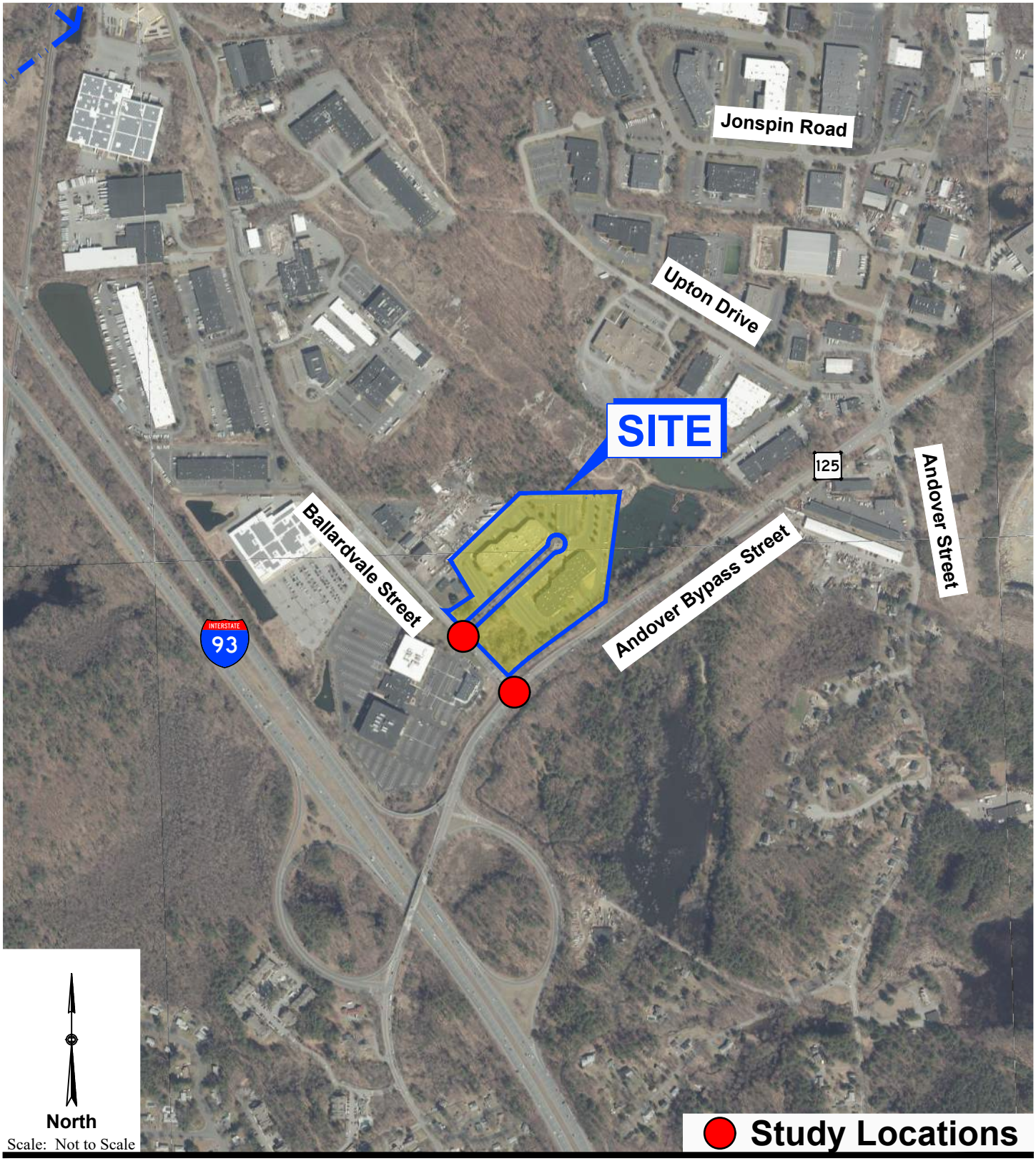


Figure 1

Site Location

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: October 2023
Dwg No. 1325 TIS.dwg
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- *Traffic Generation*. Projected trip generation for the Site based on industry-standard trip rates the proposed development is estimated to generate approximately 72 vehicle trips (60 entering and 12 exiting) during the weekday morning peak hour and 73 vehicle trips (17 entering and 56 exiting) during the weekday evening peak hour. On a daily basis, the proposed development is estimated to generate approximately 512 vehicle trips.

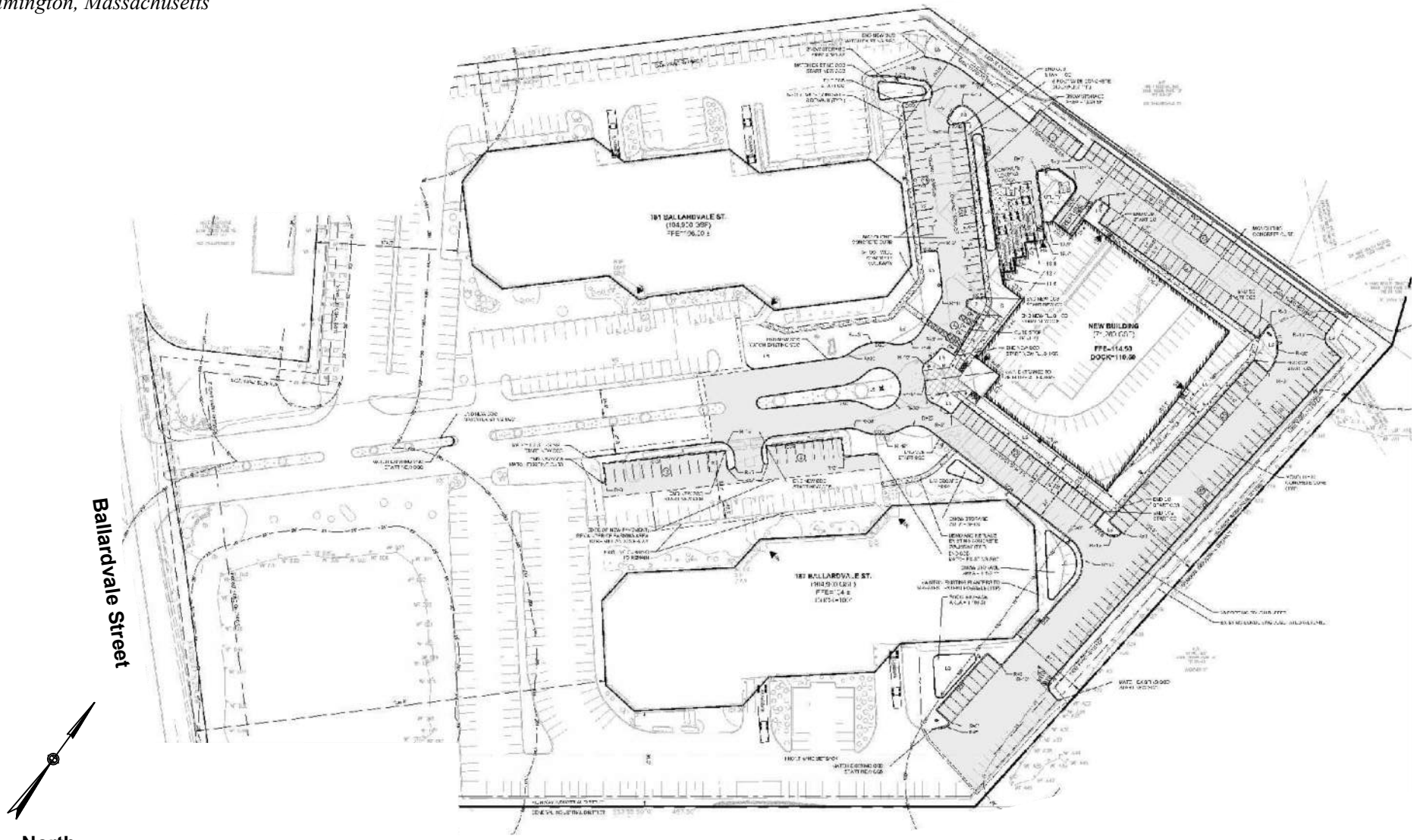
- *Nominal Impact.* The project at full buildout will result in less than 5% increase in traffic along Ballardvale Street and the gateway intersection at Route 125. The increase in trips due to the project are not expected to alter operating conditions compared to No-Build conditions with less than 2 new total vehicle trip or less every minute.

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions at the study intersections. Implementation of access/egress improvements, proposed pedestrian improvements, and a TDM program as outlined under *Recommendations and Conclusions* will establish a framework of minimizing Site traffic impacts.

PROJECT DESCRIPTION

The site consists of approximately 5.38± acres of land located at the northeastern corner of the Route 125 at Ballardvale intersection. The existing Site includes the Ballardvale Technology Center with includes two 104,900 sf office/manufacturing buildings. Access/egress is via a full access driveway along Ballardvale Street.

Under the proposed Site programming, the proposed facility will provide a total building area of approximately 71,300 square feet (sf) of life science/biomanufacturing space use within an expansion of the existing office park. Access/egress to the site will remain via a single driveway connection to Ballardvale Street. The preliminary site layout prepared by HighPoint Engineering, Inc. is presented in **Figure 2**.



Scale: Not to Scale

Source: High Point Engineering, Inc.

Figure 2

Preliminary Site Layout

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: October 2023
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BASELINE TRAFFIC & SAFETY CHARATERISTICS

An overview of roadway classification and geometric characteristics is provided below for the adjacent study roadway.

Ballardvale Street

Ballardvale Street is generally a north-south roadway under local jurisdiction and is classified by the Massachusetts Department of Transportation (MassDOT) as an Urban Minor Arterial roadway. The roadway becomes River Street to the north before connecting to Andover Street in Andover. To the south of the site, Ballardvale Street connects to Route 125 before becoming Middlesex Avenue and providing a connection to Route 62. Adjacent to the site, Ballardvale Street provides a single travel lane in the northbound direction and two travel lanes in the southbound direction, separated by a double yellow centerline. Additional turn lanes are provided at its major intersections. No pedestrian or bicycle facilities are provided withing the study area. Land use along Ballardvale Street in the immediate study area are primarily commercial uses including industrial and office uses in addition to a Target and retail plaza.

Baseline Traffic Data

Daily Traffic Counts

Daily traffic volumes along Ballardvale Street in the site vicinity are summarized in **Table 1** and included in the **Attachments**.

TABLE 1
ROADWAY TRAFFIC-VOLUME SUMMARY – BALLARDVALE STREET

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	19,956	6%	1,251	75% NB	935
Weekday Evening Peak Hour	19,956	7%	1,434	74% SB	1,060

[1]Two-way daily traffic expressed in vehicles per day.
[2]The percent of daily traffic that occurs during the peak hour.
[3]Two-way peak-hour volume expressed in vehicles per hour.
[4]NB = Northbound, SB = Southbound

As summarized in **Table 1**, Ballardvale Street carries approximately 19,956 vehicles per day (vpd) on weekdays. Peak hour traffic flow on Ballardvale Street ranges from approximately 935 to 1,060 vehicles per hour (vph) which represents 6 to 7 percent of daily traffic flow. The traffic flow on Ballardvale Street is skewed heavily in the northbound direction during the weekday morning peak hour and southbound during the weekday evening peak hour. The travel patterns are consistent with employee patterns for the commercial uses along that section of Ballardvale Street.

Existing Trip Generation Characteristics

Observed trip generation for the Ballardvale Technology Center (181-187 Ballardvale Street) has been determined based on turning movement counts conducted at the site driveway along Ballardvale Street in November 2023. **Table 2** presents the existing trip generation characteristics of the Center during the study periods.

TABLE 2
EXISTING TRIP GENERATION – BALLARDVALE TECHNOLOGY CENTER

Period/Direction	OBSERVED TRIPS[1]
Weekday Morning Peak Hour:	
Entering	77
Exiting	4
Total	81
Weekday Evening Peak Hour:	
Entering	11
Exiting	63
Total	74
Weekday Daily (24 hours)	610

[1]Based on turning movement counts conducted at the Ballardvale Technology Center in November 2023.

As summarized in **Table 2**, the existing Ballardvale Technology Center at 181-187 Ballardvale Street is currently fully occupied and observed to generate approximately 81 vehicle trips (77 entering and 4 exiting) during the weekday morning peak hour and 74 vehicle trips (11 entering and 63 exiting) during the weekday evening peak hour. On a daily basis, the existing center was observed to generate 610 vehicle trips on a weekday

Peak Hour Traffic

Traffic volume data were collected at the study intersections in November 2023 during the weekday morning (7:00 AM - 9:00 AM) and weekday evening (4:00 PM – 6:00 PM) periods to coincide with peak traffic activity of the proposed use and the adjacent streets. Review of MassDOT permanent count station data indicates that November an average traffic month. Therefore, then traffic volumes represent an average season analysis and no seasonal adjustment factor is needed. The weekday morning and weekday evening peak hour traffic volumes for the study intersections are shown in **Figure 3**. Traffic count data, MassDOT permanent count station data, and pandemic adjustment calculations are provided in the **Attachments.**

SIGHT LINE EVALUATION

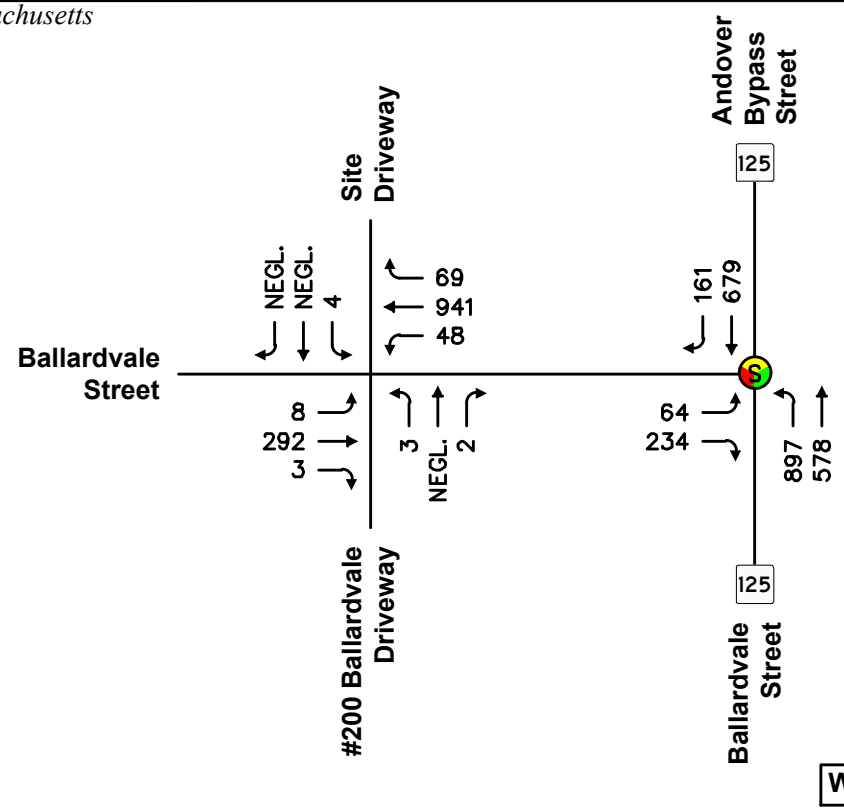
An evaluation of sight lines was conducted at the existing site driveway to ensure that minimum recommended sight lines are available to safely exit onto Ballardvale Street. The evaluation documents existing sight lines for vehicles as they relate to Ballardvale Street with comparison to recommended guidelines for the regulatory speed limit.

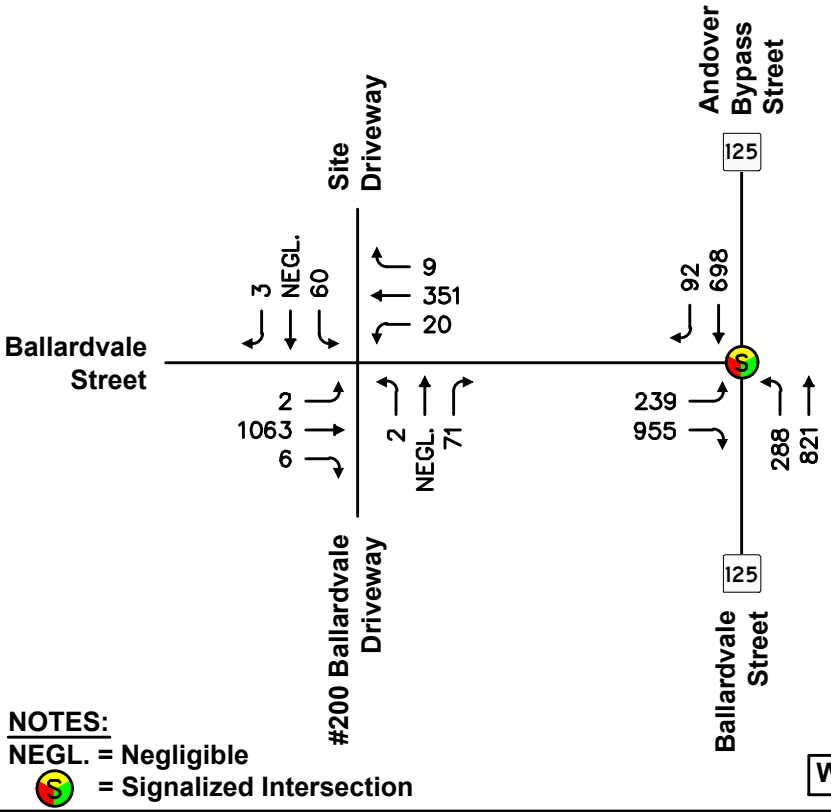
The American Association of State Highway and Transportation Officials' (AASHTO) standards[1] reference two types of sight distance which are relevant at the proposed site driveway intersection on Ballardvale Street: stopping sight distance (SSD) and intersection sight distance (ISD). Sight lines for critical vehicle movements at the site driveway intersection with Ballardvale Street were compared to minimum SSD and ISD for the regulatory speed limit in the Site vicinity.

Stopping Sight Distance

Sight distance is the length of roadway visible to the motorist to a fixed object. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near a regulatory speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle exiting onto Ballardvale Street. The SSD criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD includes the length of roadway traveled during the perception and reaction time of a driver to an object, and the distance traveled during brake application on wet level pavement. Adjustment factors are applied to account for roadway grades when applicable.

[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2018.





North
Scale: Not to Scale

NOTES:
NEGL. = Negligible
S = Signalized Intersection

Figure 3

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

2023 Baseline Conditions
Weekday Peak Hour Volumes

Date: October 2023
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SSD was estimated in the field using AASHTO standards for driver's eye (3.5 feet) and object height equivalent to the taillight height of a passenger car (2.0 feet) for the northbound and southbound Ballardvale Street approaches to the Site driveway. **Table 3** presents a summary of the available SSD as they relate to Ballardvale Street and AASHTO's recommended SSD.

TABLE 3
STOPPING SIGHT DISTANCE SUMMARY
BALLARDVALE STREET APPROACHES TO SITE DRIVEWAY

Approach/ Travel Direction	Available SSD	AASHTO Recommended[1] Regulatory Speed Limit[2]
Northbound	450± Feet	305 Feet
Southbound	>500 Feet	305 Feet

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet.
[2] Regulatory speed limit: Ballardvale Street = 40 mph

As summarized in **Table 3,** analysis results indicate that the available sight lines exceed AASHTO's recommended SSD criteria for the northbound and southbound travel directions along Ballardvale Street based on the regulatory (posted) speed limit.

Intersection Sight Distance

Clear sight lines provide sufficient sight distance for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road. As stated under AASHTO's Intersection Sight Distance (ISD) considerations, "…*If the available sight distance for an entering …vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to avoid collisions…To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road*." AASHTO's ISD criteria are defined into several "cases". For the unsignalized Site driveway location, which is under STOP sign control, the ISD in question relates to the ability to turn left or turn right from the proposed driveway.

Available ISD was estimated in the field using AASHTO standards for driver's eye (3.5 feet), object height (3.5 feet) and decision point (8 feet from the edge of the travel way) for the northbound and southbound directions along Ballardvale Street. **Table 4** presents a summary of the available ISD for the departure from the Site driveway and AASHTO's minimum recommended ISD.

TABLE 4
INTERSECTION SIGHT DISTANCE SUMMARY
SITE DRIVEWAY DEPARTURES TO BALLARDVALE STREET

Approach/ Travel Direction	Available ISD	AASHTO Minimum[1] Regulatory Speed Limit[2]	AASHTO Ideal[1] Regulatory Speed Limit[2]
Looking North	>500 Feet	305 Feet	445 Feet
Looking South	450± Feet	305 Feet	385 Feet

[1] Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet. Minimum value as noted represents SSD per AASHTO guidance.
[2] Regulatory speed limit: Ballardvale Street = 40 mph

The results of the ISD analysis presented in **Table 4** indicate that the available sight lines looking from the Site driveways onto Ballardvale Street will exceed the recommended sight line requirements from AASHTO. MDM recommends that any new plantings (shrubs, bushes) or physical landscape features to be located within the driveway sight lines should also be maintained at a height of 2 feet or less above the adjacent existing roadway grade to ensure unobstructed lines of sight.

Intersection Crash History

In order to identify crash trends and safety characteristics for study area intersections, crash data were obtained from MassDOT for the Town of Wilmington for the five-year period covering 2018-2022 (the most recent full year of data currently available from MassDOT). A summary of the crash data with crash rates for the study intersections with reported crashes is provided in **Table 5** with detailed data provided in the **Attachments.**

Crash rates were calculated for the study intersections as reported in **Table 5**. These rates quantify the number of crashes per million entering vehicles. MassDOT has determined the official District 4 (which includes the Town of Wilmington) crash rate to be 0.73 for signalized intersections and 0.57 for unsignalized intersections. This rate represents MassDOT's "average" crash experience for District 4 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted. A review of Highway Safety Improvement Project (HSIP) locations was also conducted.

TABLE 5
INTERSECTION CRASH SUMMARY
2018 THROUGH 2022[1]

Data Category	Route 125 at Ballardvale Street	Ballardvale Street at 181-187 and 200 Driveway
Traffic Control	Signalized	Unsignalized
Crash Rate[2]	**0.40**	**0.28**
MHD District 4 Avg[3]	0.73	0.57
Year:		
2018	9	1
2019	4	1
2020	2	0
2021	4	3
2022	6	4
Total	**25**	**9**
Type:		
Angle	7	4
Rear-End	11	5
Head-On	0	0
Sideswipe	7	0
Single-Vehicle	0	0
Unknown	0	0
Severity:		
P. Damage Only	21	7
Personal Injury	4	2
Fatality	0	0
Not Reported	0	0
Conditions:		
Dry	23	8
Wet	1	1
Snow	0	0
Unknown	1	0
Time:		
7:00 to 9:00 AM	3	1
4:00 to 6:00 PM	3	3
Rest of Day	19	5

[1] Source: MassDOT Crash Database
[2] Crashes per million entering vehicles
[3] District 4 Average Crash Rate

As summarized in **Table 5**:

- *Route 125 at Ballardvale Street*: A total of twenty-five (25) crashes were reported for the Route 125 signalized intersection with Ballardvale Street. The resulting crash rate of 0.40 is lower than the District 4 average. The reported crashes included fourteen (14) angle/sideswipe type collisions and eleven (11) rear-end type collisions. Eighty-four percent (84%) of the crashes resulted in property-damage only, generally indicative of low-speed crashes. Ninety-two percent (92%) of the crashes occurred under dry roadway conditions, and seventy-six percent (76%) occurred outside of peak travel times. No fatalities or pedestrian-related incidents were reported during the study period.

- *Ballardvale Street at 181-187 and 200 Ballardvale Street Driveways*: A total of nine (9) crashes were reported for the unsignalized Site Driveway intersection with Ballardvale Street. The resulting crash rate of 0.28 is lower than the District 4 average. The reported crashes included four (4) angle/sideswipe type collisions and five (5) rear-end type collisions. Seventy-eight percent (78%) of the crashes resulted in property-damage only, eighty-nine percent (89%) occurred under dry roadway conditions, and fifty-six percent (56%) occurred outside of peak travel times. No fatalities or pedestrian-related incidents were reported during the study period.

In summary, based on extensive review of MassDOT crash data, the study intersections, experienced crash rates below the District 4 averages and none of the intersection are listed as HSIP locations; therefore, no immediate safety countermeasures are warranted based on the crash history at the study intersections.

PROJECTED FUTURE TRAFFIC CONDITIONS

Evaluation of the proposed development impacts requires the establishment of a future baseline analysis condition. This section estimates future roadway and traffic conditions with and without the proposed development. For planning purposes, a seven-year planning horizon (year 2030) was selected consistent with standard industry practice.

To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to a future year condition. Traffic volumes on the roadway network at that time, in the absence of the development (that is, the No-Build condition), includes existing traffic, new traffic due to general background traffic growth, and traffic related to specific developments by others that are currently under review at the local and/or state level. Consideration of these factors resulted in the development of No-Build traffic volumes. Anticipated site-generated traffic volumes were then superimposed upon these No-Build traffic-flow networks to develop future Build conditions.

The following sections provide an overview of future No-Build traffic volumes and Build traffic volumes.

Historical Area Growth

Nearby permanent count station data published by MassDOT indicates a 0.5 percent per year growth rate. For purposes of this evaluation, a 1.0 percent compounded annual growth rate was used (7.2 percent increase over a 7-year horizon). This growth rate is higher than historic rates and is also expected to account for any small fluctuation in hourly traffic as may occur from time to time in the study area and traffic associated with other potential small developments or vacancies in the area. MassDOT permanent count station data and background growth calculations are provided in the **Attachments**.

Background Development-Related Growth

Development of future No-Build traffic volumes also considers traffic generated through the study area from other specific area developments. Review of Massachusetts Environmental Policy Act (MEPA) files and correspondence with the Town of Wilmington Planning Staff indicates that there are several Site-specific development projects in the area that may increase baseline traffic at the study intersections:

- *36 & 38 Upton Drive*. The commercial development is currently proposed to include 19,800± sf of R&D space, 39,000± sf of light industrial space, 78,500± sf of manufacturing space and 125,300± sf of warehouse space to be located at 36 and 38 Upton Drive in Wilmington. The site-specific trip tracings were obtained from the TIA prepared by Greenman-Pedersen, Inc. in September 2022. Trip tracings for the proposed development are provided in the **Attachments**.

- *30 Upton Drive*. The commercial redevelopment is proposed to include 91,305± sf of warehouse space and 38,935± sf of office space to be located at 30 Upton Drive in Wilmington. The site-specific trip tracings were obtained from the TIA prepared by Greenman-Pedersen, Inc. in December 2021. Trip tracings for the proposed development are provided in the **Attachments**.

- *225 Andover Street*. The 27,395± sf self-storage facility is proposed to be located at 225 Andover Street in Wilmington. The site-specific trips associated with the development are proposed to minimal and accounted for in the conservative background growth.

- *100 Research Drive*. The proposed development includes the construction of approximately 20,000± sf of commercial space. A Traffic Impact Assessment prepared by Vanasse Hangen Brustlin Inc. (VHB) dated July 2019 compares the impact of three land use scenarios. Background trip tracings for the proposed development are based on the highest generating land use, LUC 180 Specialty Contractor, and are provided in the **Attachments**.

2030 No-Build Traffic Volume Networks

In summary, to account for future traffic growth in the study area future No-Build traffic volumes are developed by increasing the Baseline (2023) volumes by approximately 7.2 percent (1.0 percent compounded annually over 7 years). The resulting 2030 No-Build traffic volumes are displayed in **Figure 4**.

Trip Generation

The trip generation estimates for the proposed development are provided for the weekday morning and weekday evening, which correspond to the critical analysis periods for the proposed uses and adjacent street traffic flow. In this case, ITE's land use code (LUC) for General Office (LUC 710) and Manufacturing (140) were selected for analysis purposes; the use category generally aligns with the proposed characterization of the Site. New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation*[2] for the Land Use Code (LUC) 710 – General Office and LUC 140 – Manufacturing. **Table 6** presents the trip-generation comparison for the proposed development based on ITE methodology and trip rates based on the exiting site uses.

[2]*Trip Generation,* Eleventh Edition; Institute of Transportation Engineers; Washington, DC; 2021.

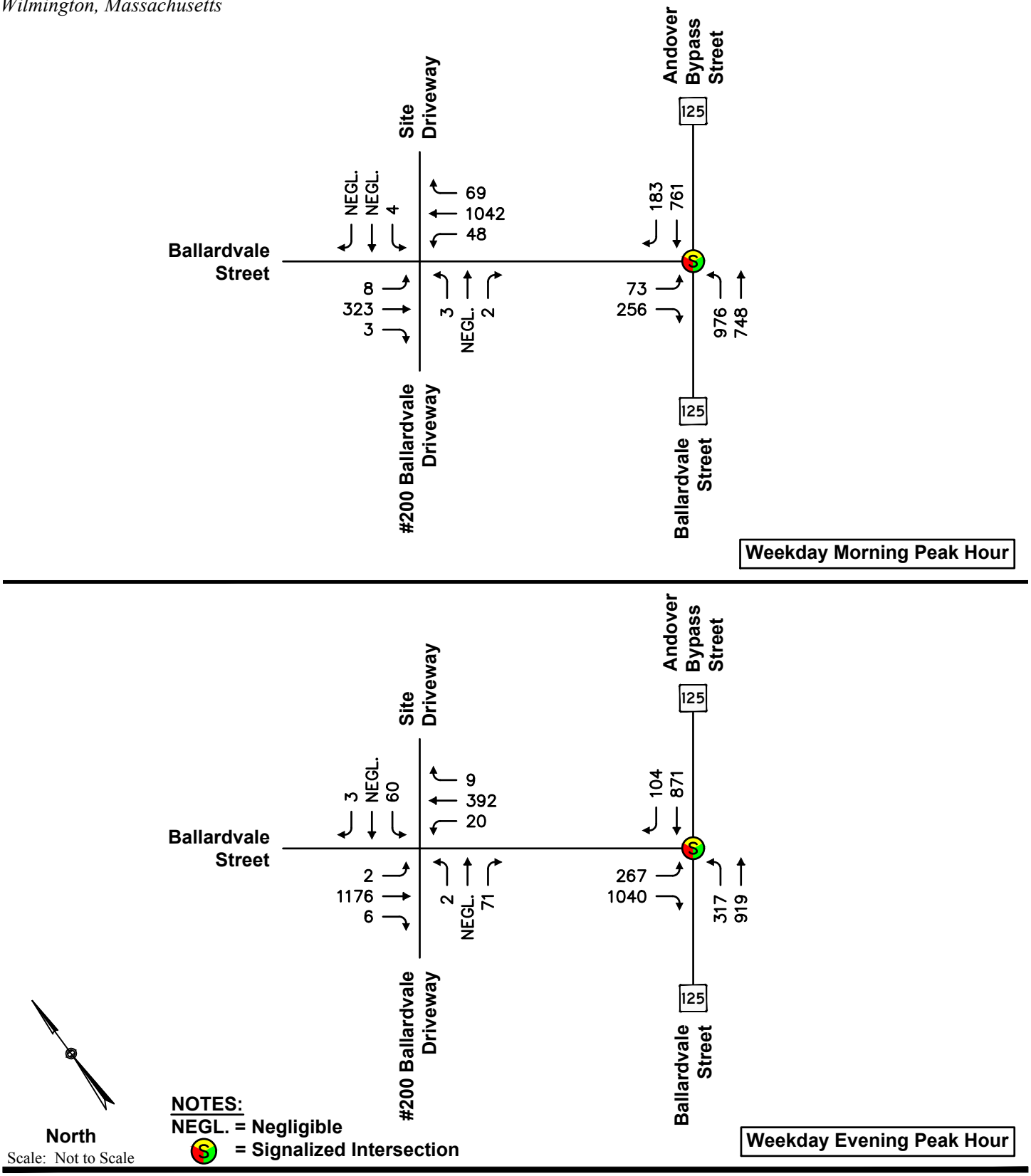

Figure 4

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2030 No-Build Conditions
Weekday Peak Hour Volumes

Date: October 2023
Dwg No. 1325 TIS.dwg
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TABLE 6
TRIP-GENERATION SUMMARY

Peak Hour/Direction	Empirical Basis[1]	ITE Basis: Office (28,500 sf)[2]	ITE Basis: Manufacturing (42,800 sf)[3]	ITE Basis: Total	Used for Report
Weekday Morning Peak Hour:					
Entering	27	38	22	60	**60**
Exiting	2	5	7	12	**12**
Total	29	43	29	72	**72**
Weekday Evening Peak Hour:					
Entering	4	7	10	17	**17**
Exiting	22	34	22	56	**56**
Total	26	41	32	73	**73**
Weekday Daily:	208	308	204	512	**512**

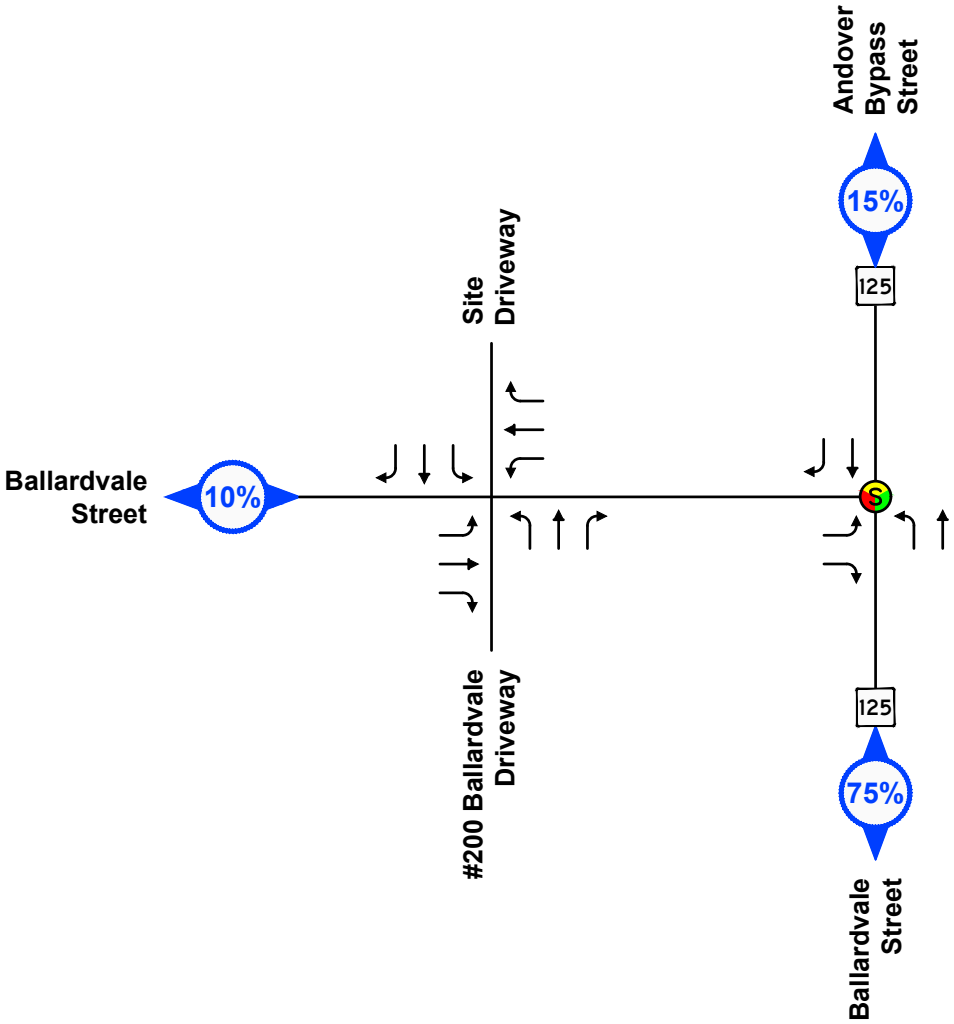
Source: ITE *Trip Generation*, 11th Edition; 2021.
[1]Based on Table 2 applied to 71.3ksf.
[2]ITE LUC 710 – General Office trip rates applied to 28,500 sf.
[3]ITE LUC 140 – Manufacturing Park trip rates applied to 42,800 sf.

As summarized in **Table 6**, based on industry-standard trip rates the proposed development is estimated to generate approximately 72 vehicle trips (60 entering and 12 exiting) during the weekday morning peak hour and 73 vehicle trips (17 entering and 56 exiting) during the weekday evening peak hour. On a daily basis, the proposed development is estimated to generate approximately 512 vehicle trips.

Trip Distribution

The directional distribution of development-generated trips on the roadway network is a function of a number of variables including local area populations and the efficiency of the roadways leading to the Site. Existing roadway travel patterns served as the primary basis for determining the trip distribution pattern for the proposed development. The distribution of the site generated trips is displayed in **Figure 5**. Trip distribution calculations are provided in the **Attachments**.

Development-related trips for the proposed development are assigned to the roadway network using the trip-generation estimates shown in **Table 6** and the distribution patterns presented in **Figure 5**. Development-related trips at each intersection approach for the weekday morning and weekday evening peak hours are quantified in **Figure 6**.



North
Scale: Not to Scale

NOTES:
S = Signalized Intersection

Figure 5

Trip Distribution

MDM TRANSPORTATION CONSULTANTS, INC.
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Date: October 2023
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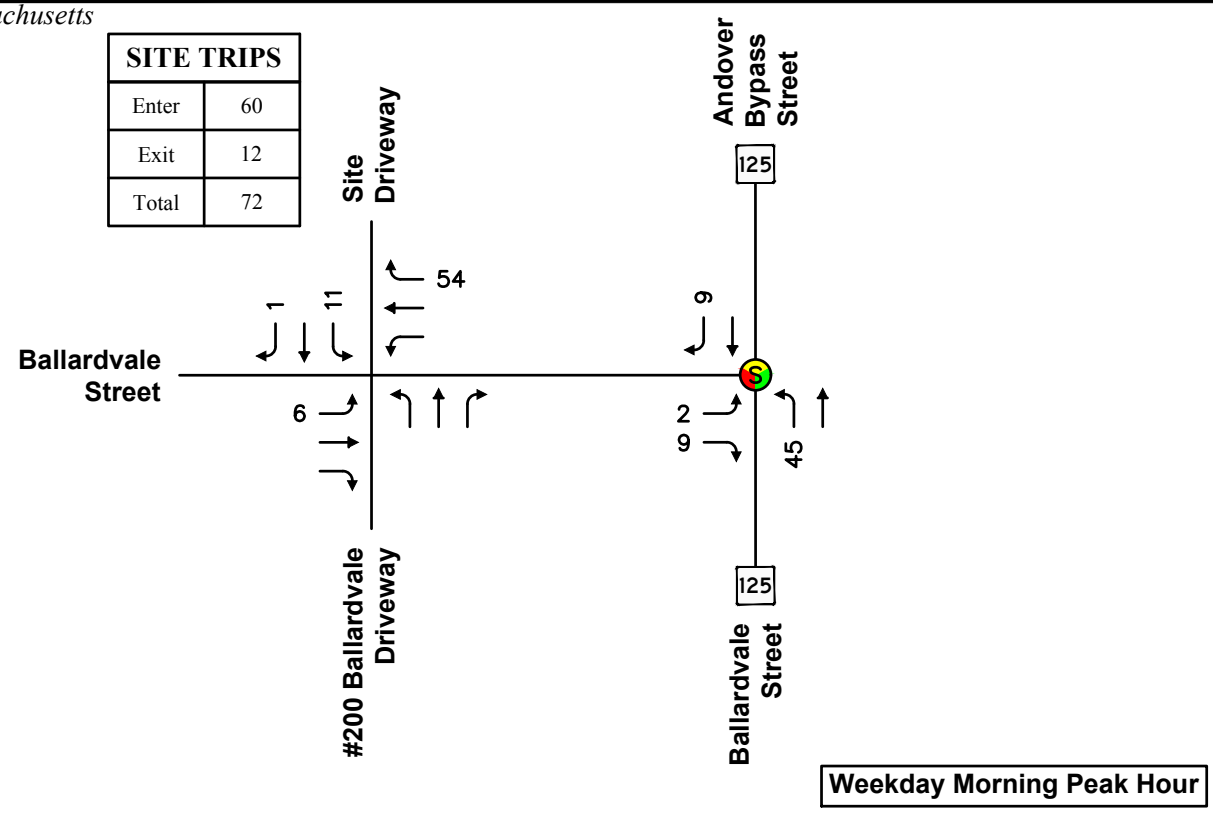

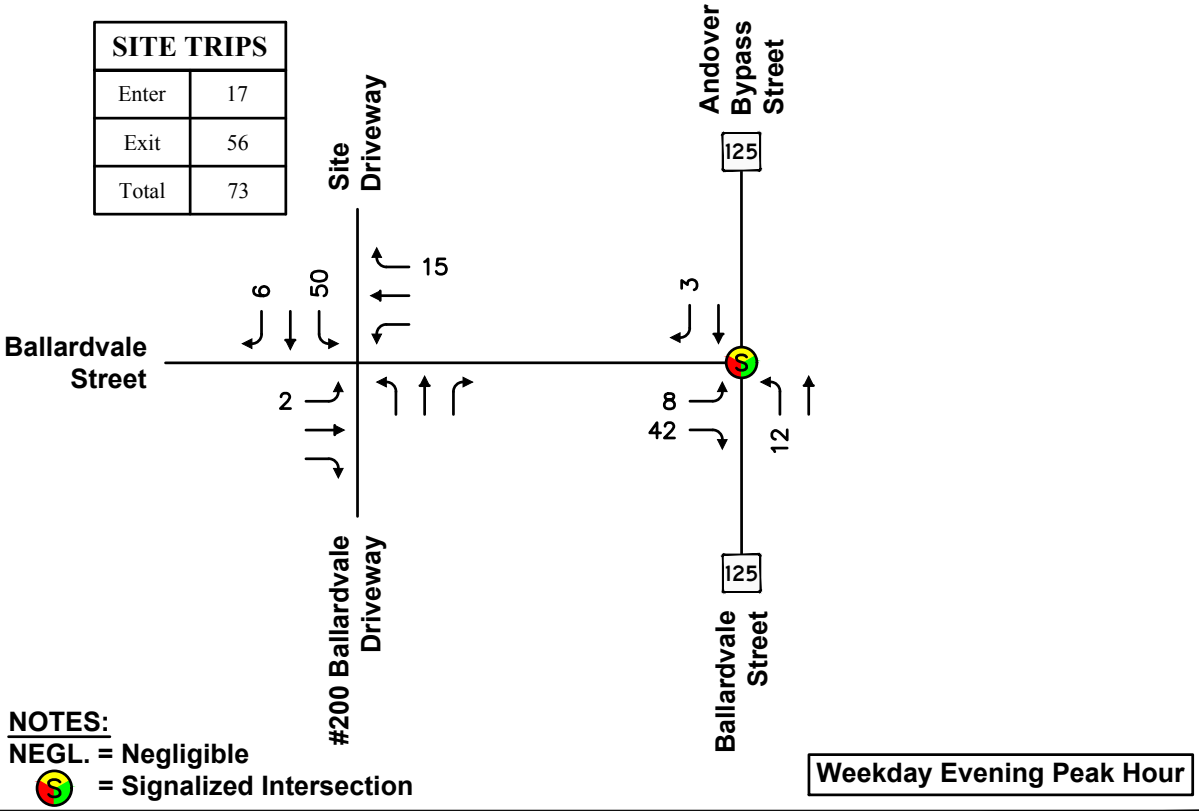

North
Scale: Not to Scale

NOTES:
NEGL. = Negligible
S = Signalized Intersection

Figure 6

Site Generated Trips

MDM TRANSPORTATION CONSULTANTS, INC.
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Date: October 2023
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2030 Build Traffic Conditions

2030 Build condition traffic volumes are derived by adding incremental traffic increases for the proposed development of the Site to the 2030 No-Build conditions. **Figure 7** presents the 2030 Build condition traffic-volume networks for the weekday morning and weekday evening peak hours.

QUALTATIVE STATEMENT OF IMPACT

This section provides a quantitative statement of impact and described trip increases associated with the development relative to future 2030 No-Build conditions along Ballardvale Street. A comparison of the total intersection entering volume for the two gateway study intersections during the weekday morning peak hour and weekday evening peak hour, are summarized in **Table 7**.

TABLE 7
ROADWAY TOTAL ENTERING VOLUME

	Peak Hour	2030 No-Build Entering Volume[1]	Project Impact # of New Trips	Project Impact %Δ
Route 125 at Ballardvale Street	Weekday AM	2,997	65	2.2%
	Weekday PM	3,518	65	1.8%
Ballardvale Street at Site Driveway	Weekday AM	1,502	72	4.8%
	Weekday PM	1,741	73	4.2%

[1] Volumes based on traffic peak hour turning movement counts conducted in November 2023.

As shown in **Table 7**, the project at full buildout will result in less than 5% increase in traffic along Ballardvale Street and the gateway intersection at Route 125. The increase in trips due to the project are not expected to alter operating conditions compared to No-Build conditions with less than 2 new total vehicle trip or less every minute.

RECOMMENDATIONS AND CONCLUSIONS

Based on this preliminary report, MDM has identified several mitigation actions that are likely to be required through the local permitting process to support the project. These include (a) access-related improvements, (b) pedestrian and bicycle accommodations, and (c) a transportation demand management (TDM) program to enhance traffic operations and travel safety:

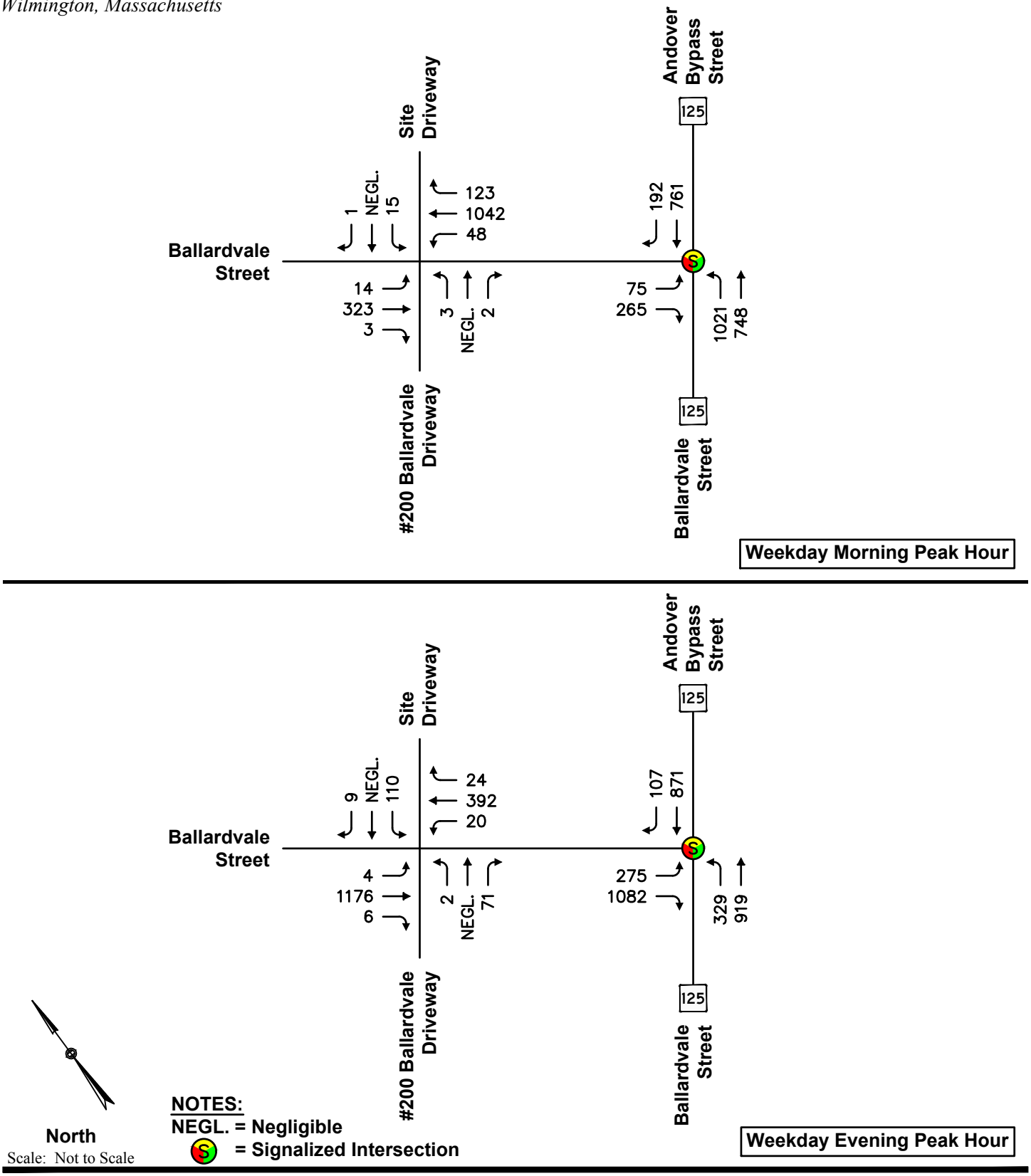

Figure 7

2030 Build Conditions
Weekday Peak Hour Volumes

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: October 2023
Dwg No. 1325 TIS.dwg
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Access/Egress Improvements

- *Signs and Pavement Markings.* A STOP sign (R1-1) and STOP line pavement marking should be installed on the Site Driveway approach to Ballardvale Street. The sign and pavement markings shall conform to Manual on Uniform Traffic Control Devices (MUTCD) standards.

- *Sight Line Maintenance.* The sight lines for the Sight Driveway approach to Ballardvale Street should be maintained with the construction of the Site. Any new plantings (shrubs, bushes) or physical landscape features to be located within the sight lines should also be maintained at a height of 2 feet or less above the adjacent roadway grade to ensure unobstructed lines of sight.

Pedestrian and Bicycle Accommodations

- *Pedestrian Accommodation.* The design shall incorporate sidewalks that connect the proposed building entrances with the proposed parking areas.

- *Bicycle Amenities*. The Proponent shall incorporate secure and weather-protected bicycle racks to encourage and facilitate this mode of transportation to/from the Site by employees.

Transportation Demand Management (TDM)

A preliminary list of potential TDM program elements may include the following, subject to refinement of the development program and further evaluation by the Proponent:

- *On-Site Transportation Coordinator*
- *TMA Membership*
- *Public Transportation Information & Promotion*
- *Preferential Parking for Carpools, Vanpools*
- *Electric Vehicle Charging Station*
- *Preferential Parking for Low-Emission Vehicles*
- *Workforce Transportation Program*
- *Off-Peak Shift Changes*
- *Automatic Employee Payroll Reduction*
- *Commuter Assistance Programs*
- *Guaranteed Ride Home*
- *Pedestrian Infrastructure*
- *Bicycle Racks*
- *Secure Covered Bike Parking*
- *On-Site Support Services/Amenities*

CONCLUSIONS

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions at the study intersections. Implementation of access/egress improvements, proposed pedestrian improvements, and a TDM program as outlined under *Recommendations and Conclusions* will establish a framework of minimizing Site traffic impacts.

ATTACHMENTS

- Traffic Volume Data
- Seasonal/Yearly Growth Data
- Sight Distance Calculations
- Crash Data
- Background Projects
- Trip Generation
- Trip Distribution Calculations

- Traffic Volume Data

Ballardvale Street
Wilmigton, MA

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Road, Suite 280
Marlborough, MA 01752

Site Code:

Start Time	02-Nov-23 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		9	140			11	174				
12:15		10	138			11	163				
12:30		6	140			19	163				
12:45		8	150	33	568	9	166	50	666	83	1234
01:00		6	94			8	158				
01:15		4	140			9	133				
01:30		7	126			13	132				
01:45		11	130	28	490	7	139	37	562	65	1052
02:00		11	114			16	231				
02:15		17	114			10	163				
02:30		22	115			8	219				
02:45		38	98	88	441	6	160	40	773	128	1214
03:00		26	101			23	228				
03:15		19	114			10	215				
03:30		19	107			14	238				
03:45		33	119	97	441	12	208	59	889	156	1330
04:00		35	107			16	291				
04:15		42	103			25	235				
04:30		62	83			20	278				
04:45		113	81	252	374	19	256	80	1060	332	1434
05:00		98	85			33	290				
05:15		101	64			55	248				
05:30		119	79			63	185				
05:45		204	75	522	303	66	182	217	905	739	1208
06:00		145	62			66	131				
06:15		133	47			69	108				
06:30		124	65			58	98				
06:45		159	54	561	228	74	81	267	418	828	646
07:00		179	60			90	80				
07:15		158	38			79	73				
07:30		182	38			83	62				
07:45		235	26	754	162	84	61	336	276	1090	438
08:00		213	34			88	52				
08:15		244	30			68	48				
08:30		243	19			76	29				
08:45		235	32	935	115	68	53	300	182	1235	297
09:00		223	32			80	48				
09:15		200	18			126	41				
09:30		162	28			109	36				
09:45		122	23	707	101	100	29	415	154	1122	255
10:00		104	10			92	35				
10:15		116	12			85	13				
10:30		100	9			87	28				
10:45		127	16	447	47	107	26	371	102	818	149
11:00		103	16			110	36				
11:15		93	12			104	30				
11:30		117	10			125	27				
11:45		145	6	458	44	154	15	493	108	951	152
Total		4882	3314			2665	6095			7547	9409
Percent		59.6%	40.4%			30.4%	69.6%			44.5%	55.5%
Total		4882	3314			2665	6095			7547	9409
Percent		59.6%	40.4%			30.4%	69.6%			44.5%	55.5%
Combined Total		8196				8760				16956	

Site Driveway
Wilmington, MA

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Road, Suite 280
Marlborough, MA 01752

Site Code:

Start Time	02-Nov-23 Thu	Entering Morning	Entering Afternoon	Hour Totals Morning	Hour Totals Afternoon	Exiting Morning	Exiting Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	2			0	12				
12:15		0	9			0	8				
12:30		0	10			0	7				
12:45		0	5	0	26	0	2	0	29	0	55
01:00		0	2			0	4				
01:15		0	4			0	5				
01:30		0	8			0	2				
01:45		0	2	0	16	0	2	0	13	0	29
02:00		0	3			0	6				
02:15		1	5			1	1				
02:30		0	4			0	6				
02:45		0	1	1	13	0	4	1	17	2	30
03:00		0	3			0	11				
03:15		0	2			0	5				
03:30		0	3			0	10				
03:45		0	2	0	10	0	5	0	31	0	41
04:00		0	0			0	12				
04:15		0	4			0	10				
04:30		0	1			0	18				
04:45		0	1	0	6	0	11	0	51	0	57
05:00		0	4			0	25				
05:15		0	4			0	14				
05:30		2	0			0	17				
05:45		1	1	3	9	1	18	1	74	4	83
06:00		2	1			0	10				
06:15		2	0			1	7				
06:30		3	0			0	5				
06:45		6	0	13	1	0	3	1	25	14	26
07:00		7	0			1	1				
07:15		9	0			2	2				
07:30		9	0			2	6				
07:45		9	0	34	0	2	2	7	11	41	11
08:00		14	0			2	3				
08:15		17	0			1	0				
08:30		22	0			1	0				
08:45		25	0	78	0	0	1	4	4	82	4
09:00		22	0			3	0				
09:15		13	0			2	0				
09:30		15	0			1	0				
09:45		16	0	66	0	3	0	9	0	75	0
10:00		6	0			1	0				
10:15		6	0			1	0				
10:30		3	0			1	0				
10:45		3	0	18	0	2	0	5	0	23	0
11:00		2	0			1	0				
11:15		1	0			4	0				
11:30		3	0			6	0				
11:45		4	0	10	0	11	0	22	0	32	0
Total		223	81			50	255			273	336
Percent		73.4%	26.6%			16.4%	83.6%			44.8%	55.2%
Total		223	81			50	255			273	336
Percent		73.4%	26.6%			16.4%	83.6%			44.8%	55.2%
Combined Total		304				305				609	

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28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Ballardvale Street
WB: 181-187 Ballardvale Dwy
Wilmington, MA

File Name : 1325_Ballardvale_at_Site_11-02-2023
Site Code : 1325
Start Date : 11/2/2023
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Road

	Ballardvale Street From North					181 Ballardvale - Site From East					Ballardvale Street From South					Business Plaza Dwy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	88	3	0	92	1	0	0	0	1	6	178	4	0	188	0	0	0	0	0	281
07:15 AM	0	78	2	0	80	1	0	1	0	2	8	156	9	0	173	1	0	0	0	1	256
07:30 AM	1	80	2	0	83	1	0	1	0	2	6	180	8	0	194	1	0	1	0	2	281
07:45 AM	1	81	0	0	82	1	0	1	0	2	9	232	5	0	246	3	0	1	0	4	334
Total	3	327	7	0	337	4	0	3	0	7	29	746	26	0	801	5	0	2	0	7	1152
08:00 AM	1	86	3	0	90	0	0	2	0	2	11	211	11	0	233	1	0	1	0	2	327
08:15 AM	1	65	2	0	68	0	0	1	0	1	15	246	11	0	272	0	0	1	0	1	342
08:30 AM	1	73	3	0	77	0	0	1	0	1	19	247	6	0	272	0	0	1	0	1	351
08:45 AM	0	68	0	0	68	0	0	0	0	0	24	237	20	0	281	1	0	0	0	1	350
Total	3	292	8	0	303	0	0	4	0	4	69	941	48	0	1058	2	0	3	0	5	1370
03:00 PM	4	220	0	0	224	1	0	9	0	10	3	101	4	0	108	8	0	1	0	9	351
03:15 PM	3	213	0	0	216	0	0	7	0	7	2	113	1	0	116	14	1	4	0	19	358
03:30 PM	3	232	1	0	236	1	0	8	0	9	2	108	6	0	116	11	0	0	0	11	372
03:45 PM	2	207	0	0	209	1	0	5	0	6	2	117	2	0	121	10	0	2	0	12	348
Total	12	872	1	0	885	3	0	29	0	32	9	439	13	0	461	43	1	7	0	51	1429
04:00 PM	7	282	0	0	289	0	0	12	0	12	0	103	6	0	109	18	0	5	0	23	433
04:15 PM	2	234	0	0	236	1	0	9	0	10	4	103	4	0	111	26	0	2	0	28	385
04:30 PM	0	281	1	0	282	1	0	16	0	17	0	82	7	0	89	8	0	0	0	8	396
04:45 PM	1	254	0	0	255	0	0	12	0	12	1	80	5	0	86	17	0	0	0	17	370
Total	10	1051	1	0	1062	2	0	49	0	51	5	368	22	0	395	69	0	7	0	76	1584
05:00 PM	3	294	1	0	298	1	0	23	0	24	4	86	4	0	94	20	0	0	0	20	436
05:15 PM	2	254	0	0	256	2	0	13	0	15	3	65	9	0	77	17	0	0	0	17	365
05:30 PM	4	180	0	0	184	2	0	16	0	18	0	77	5	0	82	11	0	1	0	12	296
05:45 PM	5	176	1	0	182	3	0	15	0	18	0	71	4	0	75	10	1	0	0	11	286
Total	14	904	2	0	920	8	0	67	0	75	7	299	22	0	328	58	1	1	0	60	1383
Grand Total		3446	19	0	3507	17	0	152	0	169	119	2793	131	0	3043	177	2	20	0	199	6918
Apprch %	1.2	98.3	0.5	0		10.1	0	89.9	0		3.9	91.8	4.3	0		88.9	1	10.1	0		
Total %	0.6	49.8	0.3	0	50.7	0.2	0	2.2	0	2.4	1.7	40.4	1.9	0	44	2.6	0	0.3	0	2.9	
Lights	37	3182	18	0	3237	16	0	149	0	165	119	2436	130	0	2685	174	0	20	0	194	6281
% Lights	88.1	92.3	94.7	0	92.3	94.1	0	98	0	97.6	100	87.2	99.2	0	88.2	98.3	0	100	0	97.5	90.8
Mediums	4	146	1	0	151	1	0	3	0	4	0	224	1	0	225	2	2	0	0	4	384
% Mediums	9.5	4.2	5.3	0	4.3	5.9	0	2	0	2.4	0	8	0.8	0	7.4	1.1	100	0	0	2	5.6
Articulated Trucks																					
% Articulated Trucks	2.4	3.4	0	0	3.4	0	0	0	0	0	0	4.7	0	0	4.3	0.6	0	0	0	0.5	3.6
Bicycles on Road	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Ballardvale Street
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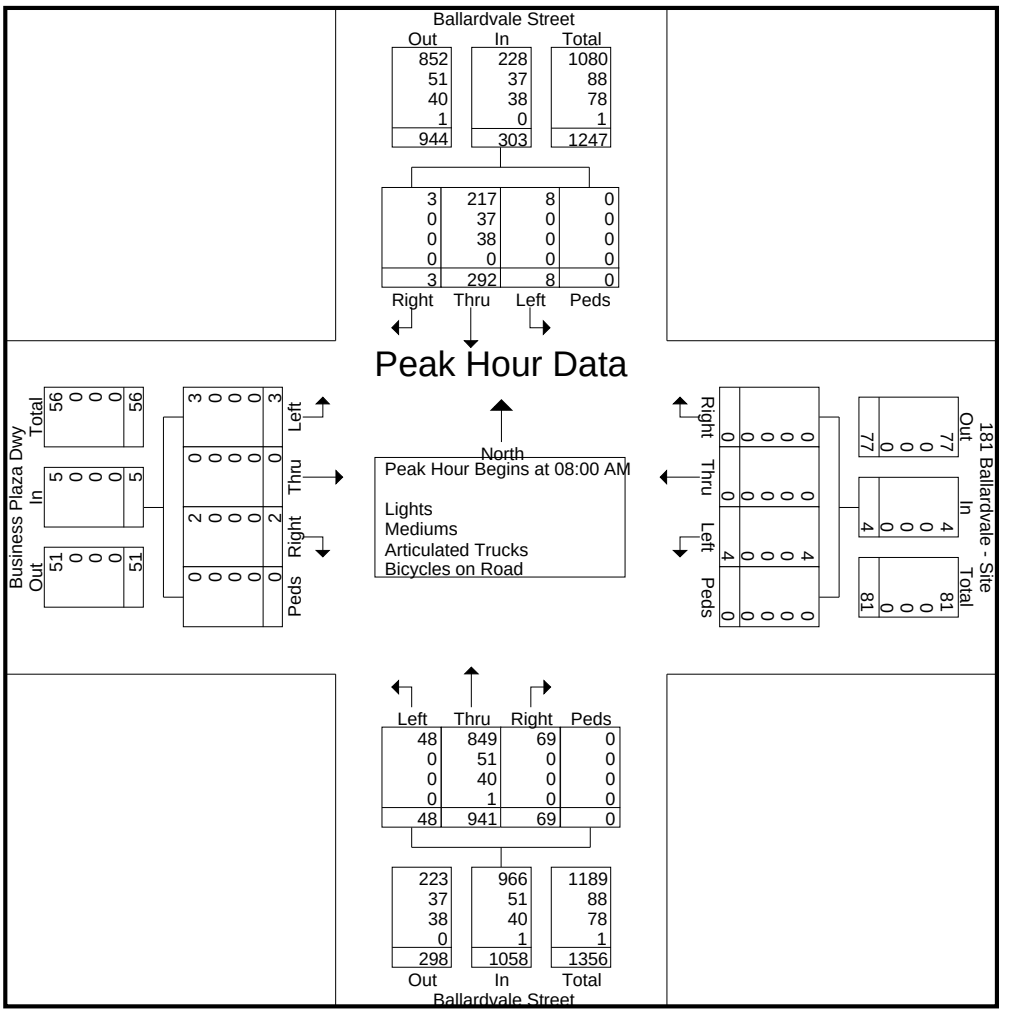
File Name : 1325_Ballardvale_at_Site_11-02-2023
Site Code : 1325
Start Date : 11/2/2023
Page No : 2

	Ballardvale Street From North					181 Ballardvale - Site From East					Ballardvale Street From South					Business Plaza Dwy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**1**	**86**	**3**	0	**90**	0	0	**2**	0	**2**	11	211	11	0	233	**1**	0	**1**	0	**2**	327
08:15 AM	1	65	2	0	68	0	0	1	0	1	15	246	11	0	272	0	0	1	0	1	342
08:30 AM	1	73	3	0	77	0	0	1	0	1	19	**247**	6	0	272	0	0	1	0	1	**351**
08:45 AM	0	68	0	0	68	0	0	0	0	0	**24**	237	**20**	0	**281**	1	0	0	0	1	350
Total Volume	3	292	8	0	303	0	0	4	0	4	69	941	48	0	1058	2	0	3	0	5	1370
% App. Total	1	96.4	2.6	0		0	0	100	0		6.5	88.9	4.5	0		40	0	60	0		
PHF	.750	.849	.667	.000	.842	.000	.000	.500	.000	.500	.719	.952	.600	.000	.941	.500	.000	.750	.000	.625	.976
Lights	3	217	8	0	228	0	0	4	0	4	69	849	48	0	966	2	0	3	0	5	1203
% Lights	100	74.3	100	0	75.2	0	0	100	0	100	100	90.2	100	0	91.3	100	0	100	0	100	87.8
Mediums	0	37	0	0	37	0	0	0	0	0	0	51	0	0	51	0	0	0	0	0	88
% Mediums	0	12.7	0	0	12.2	0	0	0	0	0	0	5.4	0	0	4.8	0	0	0	0	0	6.4
Articulated Trucks	0	38	0	0	38	0	0	0	0	0	0	40	0	0	40	0	0	0	0	0	78
% Articulated Trucks	0	13.0	0	0	12.5	0	0	0	0	0	0	4.3	0	0	3.8	0	0	0	0	0	5.7
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.1



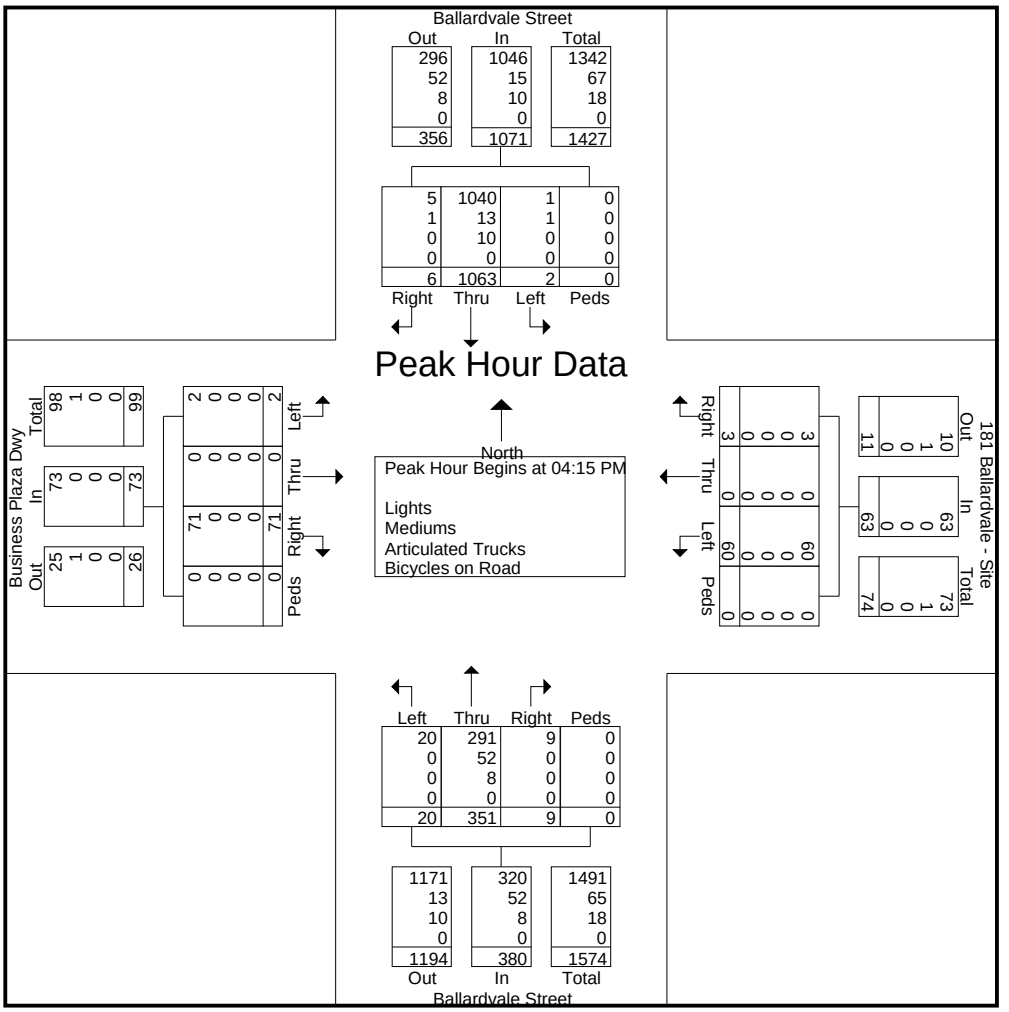
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Ballardvale Street
WB: 181-187 Ballardvale Dwy
Wilmington, MA

File Name : 1325_Ballardvale_at_Site_11-02-2023
Site Code : 1325
Start Date : 11/2/2023
Page No : 3

	Ballardvale Street From North					181 Ballardvale - Site From East					Ballardvale Street From South					Business Plaza Dwy From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	234	0	0	236	**1**	0	9	0	10	**4**	**103**	4	0	**111**	**26**	0	**2**	0	**28**	385
04:30 PM	0	281	**1**	0	282	1	0	16	0	17	0	82	**7**	0	89	8	0	0	0	8	396
04:45 PM	1	254	0	0	255	0	0	12	0	12	1	80	5	0	86	17	0	0	0	17	370
05:00 PM	**3**	**294**	1	0	**298**	1	0	**23**	0	**24**	4	86	4	0	94	20	0	0	0	20	**436**
Total Volume	6	1063	2	0	1071	3	0	60	0	63	9	351	20	0	380	71	0	2	0	73	1587
% App. Total		99.3						95.2				92.4				97.3					
PHF	.500	.904	.500	.000	.898	.750	.000	.652	.000	.656	.563	.852	.714	.000	.856	.683	.000	.250	.000	.652	.910
Lights	5	1040	1	0	1046	3	0	60	0	63	9	291	20	0	320	71	0	2	0	73	1502
% Lights	83.3	97.8	50.0									82.9									
Mediums	1	13	1	0	15	0	0	0	0	0	0	52	0	0	52	0	0	0	0	0	67
% Mediums	16.7	1.2	50.0	0	1.4	0	0	0	0	0	0	14.8	0	0	13.7	0	0	0	0	0	4.2
Articulated Trucks	0	10	0	0	10	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	18
% Articulated Trucks	0	0.9	0	0	0.9	0	0	0	0	0	0	2.3	0	0	2.1	0	0	0	0	0	1.1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

E/W: Route 125
SB: Ballardvale Street
Wilmington, MA

File Name : 1325_Route_125_at_Ballardvale_TMC_11-02-2023
Site Code : 1325
Start Date : 11/2/2023

Groups Printed- Lights - Mediums - Articulated Trucks - Bicycles on Road

	Ballardvale Street From North				Route 125 From East				Route 125 From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	69	12	0	81	24	169	0	193	110	164	0	274	548
07:15 AM	69	13	0	82	40	193	0	233	137	138	0	275	590
07:30 AM	68	15	0	83	35	207	0	242	157	159	0	316	641
07:45 AM	70	16	0	86	53	172	0	225	174	202	0	376	687
Total	276	56	0	332	152	741	0	893	578	663	0	1241	2466
08:00 AM	70	13	0	83	40	177	0	217	167	195	0	362	662
08:15 AM	45	20	0	65	43	171	0	214	134	220	0	354	633
08:30 AM	63	18	0	81	44	160	0	204	137	226	0	363	648
08:45 AM	54	13	0	67	33	171	0	204	140	255	0	395	666
Total	232	64	0	296	160	679	0	839	578	896	0	1474	2609
03:00 PM	205	43	0	248	22	131	0	153	148	87	0	235	636
03:15 PM	196	39	0	235	13	146	0	159	131	106	0	237	631
03:30 PM	217	56	0	273	30	163	0	193	160	82	0	242	708
03:45 PM	200	37	0	237	21	149	0	170	167	97	0	264	671
Total	818	175	0	993	86	589	0	675	606	372	0	978	2646
04:00 PM	241	67	0	308	20	182	0	202	166	95	0	261	771
04:15 PM	207	57	0	264	23	133	0	156	196	91	0	287	707
04:30 PM	235	62	0	297	27	188	0	215	208	61	0	269	781
04:45 PM	231	56	0	287	14	164	0	178	215	70	0	285	750
Total	914	242	0	1156	84	667	0	751	785	317	0	1102	3009
05:00 PM	261	59	0	320	26	213	0	239	202	61	0	263	822
05:15 PM	228	68	0	296	18	182	0	200	145	57	0	202	698
05:30 PM	160	34	0	194	24	190	0	214	152	57	0	209	617
05:45 PM	163	40	0	203	11	155	0	166	146	65	0	211	580
Total	812	201	0	1013	79	740	0	819	645	240	0	885	2717
Grand Total	3052	738	0	3790	561	3416	0	3977	3192	2488	0	5680	13447
Apprch %	80.5	19.5	0		14.1	85.9	0		56.2	43.8	0		
Total %	22.7	5.5	0	28.2	4.2	25.4	0	29.6	23.7	18.5	0	42.2	
Lights	2811	712	0	3523	519	3275	0	3794	3073	2178	0	5251	12568
% Lights	92.1	96.5	0	93	92.5	95.9	0	95.4	96.3	87.5	0	92.4	93.5
Mediums	121	19	0	140	38	108	0	146	89	177	0	266	552
% Mediums	4	2.6	0	3.7	6.8	3.2	0	3.7	2.8	7.1	0	4.7	4.1
Articulated Trucks	120	7	0	127	4	33	0	37	30	132	0	162	326
% Articulated Trucks	3.9	0.9	0	3.4	0.7	1	0	0.9	0.9	5.3	0	2.9	2.4
Bicycles on Road	0	0	0	0	0	0	0	0	0	1	0	1	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0

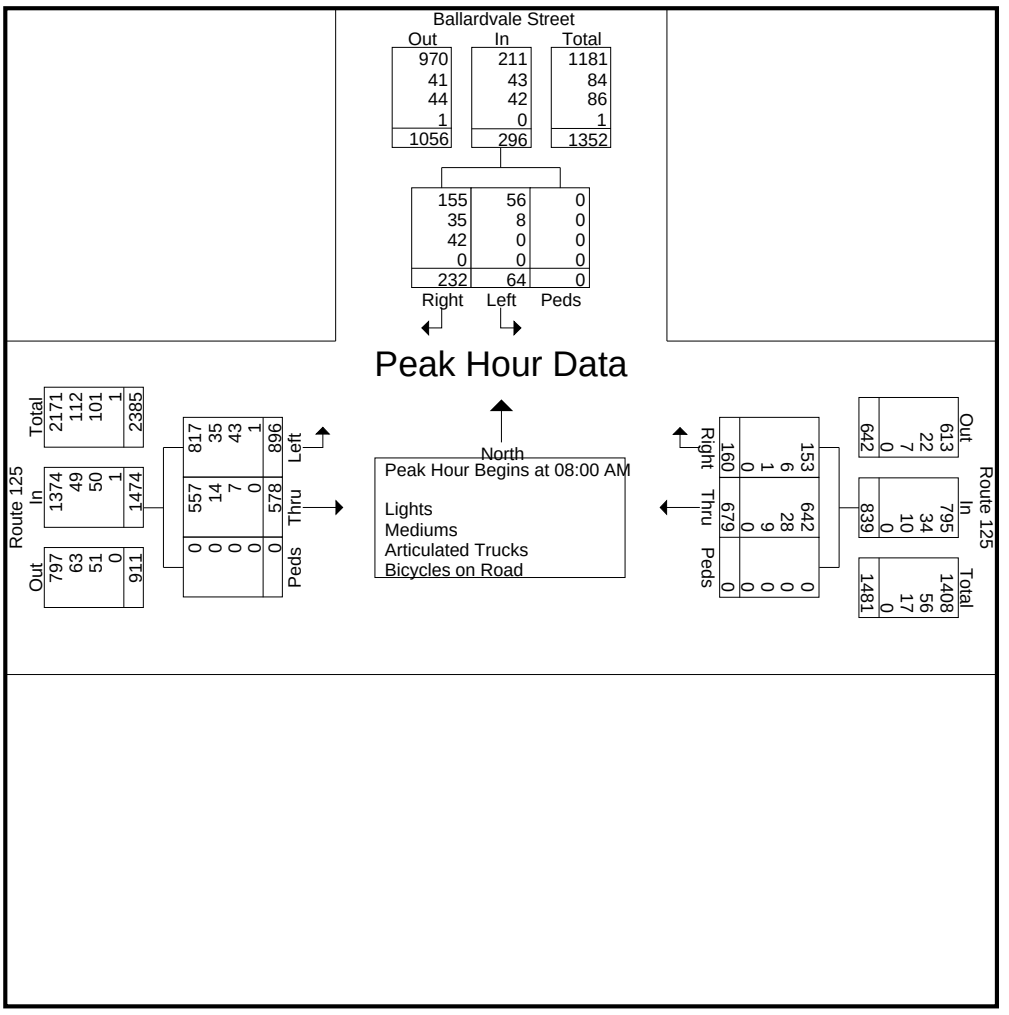
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

E/W: Route 125
SB: Ballardvale Street
Wilmington, MA

File Name : 1325_Route_125_at_Ballardvale_TMC_11-02-2023
Site Code : 1325
Start Date : 11/2/2023
Page No : 2

	Ballardvale Street From North				Route 125 From East				Route 125 From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	**70**	13	0	**83**	40	**177**	0	**217**	**167**	195	0	362	662
08:15 AM	45	**20**	0	65	43	171	0	214	134	220	0	354	633
08:30 AM	63	18	0	81	**44**	160	0	204	137	226	0	363	648
08:45 AM	54	13	0	67	33	171	0	204	140	**255**	0	**395**	**666**
Total Volume	232	64	0	296	160	679	0	839	578	896	0	1474	2609
% App. Total	78.4	21.6	0		19.1	80.9	0		39.2	60.8	0		
PHF	.829	.800	.000	.892	.909	.959	.000	.967	.865	.878	.000	.933	.979
Lights	155	56	0	211	153	642	0	795	557	817	0	1374	2380
% Lights	66.8	87.5	0	71.3	95.6	94.6	0	94.8	96.4	91.2	0	93.2	91.2
Mediums	35	8	0	43	6	28	0	34	14	35	0	49	126
% Mediums	15.1	12.5	0	14.5	3.8	4.1	0	4.1	2.4	3.9	0	3.3	4.8
Articulated Trucks	42	0	0	42	1	9	0	10	7	43	0	50	102
% Articulated Trucks	18.1	0	0	14.2	0.6	1.3	0	1.2	1.2	4.8	0	3.4	3.9
Bicycles on Road	0	0	0	0	0	0	0	0	0	1	0	1	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.0



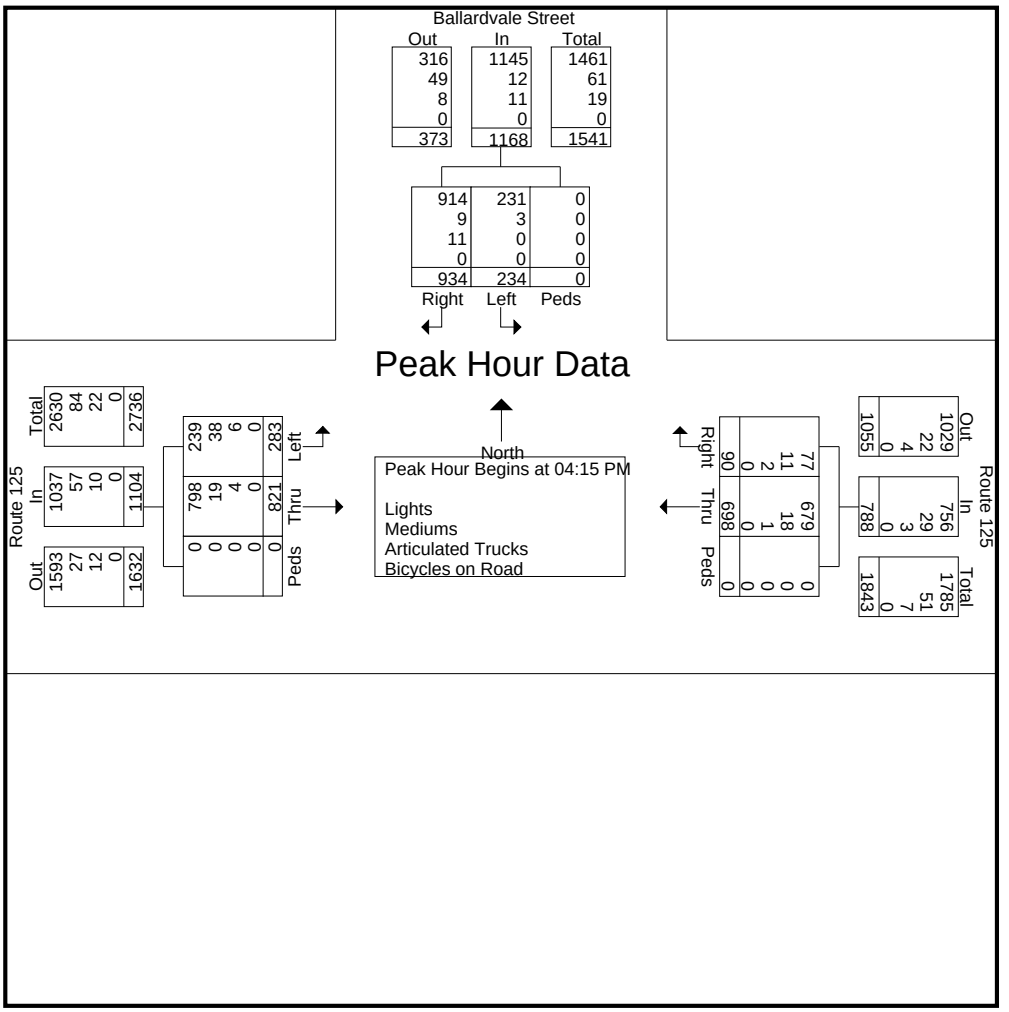
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

E/W: Route 125
SB: Ballardvale Street
Wilmington, MA

File Name : 1325_Route_125_at_Ballardvale_TMC_11-02-2023
Site Code : 1325
Start Date : 11/2/2023
Page No : 3

	Ballardvale Street From North				Route 125 From East				Route 125 From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	207	57	0	264	23	133	0	156	196	**91**	0	**287**	707
04:30 PM	235	**62**	0	297	**27**	188	0	215	208	61	0	269	781
04:45 PM	231	56	0	287	14	164	0	178	**215**	70	0	285	750
05:00 PM	**261**	59	0	**320**	26	**213**	0	**239**	202	61	0	263	**822**
Total Volume	934	234	0	1168	90	698	0	788	821	283	0	1104	3060
% App. Total	80	20	0		11.4	88.6	0		74.4	25.6	0		
PHF	.895	.944	.000	.913	.833	.819	.000	.824	.955	.777	.000	.962	.931
Lights	914	231	0	1145	77	679	0	756	798	239	0	1037	2938
% Lights	97.9	98.7	0	98.0	85.6	97.3	0	95.9	97.2	84.5	0	93.9	96.0
Mediums	9	3	0	12	11	18	0	29	19	38	0	57	98
% Mediums	1.0	1.3	0	1.0	12.2	2.6	0	3.7	2.3	13.4	0	5.2	3.2
Articulated Trucks	11	0	0	11	2	1	0	3	4	6	0	10	24
% Articulated Trucks	1.2	0	0	0.9	2.2	0.1	0	0.4	0.5	2.1	0	0.9	0.8
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0



□ Seasonal/Yearly Growth Data

STATION 5127 - ANDOVER - ANDOVER BYPASS SOUTH OF ROUTE 28

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
06	14,564	14,358	15,099	14,994	16,032	15,800	14,113	14,688	15,104	15,000	14,836	12,599	14,766
	-22%	-13%	-5%	-3%	-14%	-7%	5%	-5%	-2%	-2%	-2%	24%	-1%
09	11,428	12,502	14,278	14,509	13,736	14,681	14,800	13,939	14,846	14,700	14,486	15,580	14,124
	27%	3%	1%	5%	12%	-5%	-1%	9%	9%	12%	14%	-17%	1%
13	14,509	12,825	14,383	15,177	15,418	13,989	14,587	15,137	16,205	16,471	16,534	12,907	14,845
	-6%	8%	4%	2%	2%	15%	1%	2%	1%	3%	-13%	5%	2%
14	13,612	13,830	14,898	15,465	15,677	16,134	14,732	15,426	16,368	16,917	14,392	13,615	15,089
	17%	16%	6%	13%	12%	11%	10%	9%	9%	9%	19%	12%	3%
18	15,928	16,034	15,719	17,431	*17,499*	*17,924*	*16,198*	16,774	17,839	18,505	17,126	15,313	16,858
	0%	3%	5%	0%	1%	1%	2%	2%	2%	0%	-10%	-36%	-2%
19	15,970	16,473	16,543	17,355	*17,613*	*18,119*	*16,507*	17,114	18,128	18,454	15,464	9,843	16,465
	-33%	-36%	-28%	-25%	-22%	-19%	-16%	-17%	-16%	-16%	-6%	18%	-10%
21	10,625	10,593	11,924	12,951	*13,780*	*14,607*	*13,825*	14,178	15,150	15,570	14,518	11,602	13,277
	9%	33%	12%	13%	9%	4%	6%	2%	1%	1%	2%	18%	8%
22	11,621	14,081	13,414	14,623	15,041	*15,162*	*14,699*	14,476	15,339	15,775	14,741	13,662	14,386
Seasonal Adjustment Factor (to average month)	1.12	1.07	1.03	0.99	0.97	0.95	1.00	0.99	0.94	0.93	1.00	1.15	
												Growth	**0.1%**

Average Yearly Growth Calculated 0.1%

ITALICS = ESTIMATED DATA

MADT

□ Sight Distance Calculations

Stopping Sight Distance - Posted Speed

Ballardvale Street

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	NB	40	147	153.3	300.3
Direction 2	SB	40	147	153.3	300.3

INPUTS	Direction 1	Direction 2
Travel Direction	NB	SB
Speed	40	40
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Intersection Sight Distance Calculations

Source: *A Policy on Geometric Design of Highways and Street, 6th Edition;* AASHTO; 2011.

Passenger Car
ISD = 1.47 * V * t

V = speed
t = time gap

t = 7.5 s for a passenger car for Left Turn from a Stop
t = 6.5 s for a passenger car for Right Turn from a Stop

Ballardvale Street

		Average Speed		Ideal ISD	SAY
Looking North (left-turn from a stop)	ISD = 1.47*	40	* 7.5 =	441	**445 feet**
Looking South (right-turn from a stop)	ISD = 1.47*	40	* 6.5 =	382.2	**385 feet**

- Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Nov-23

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

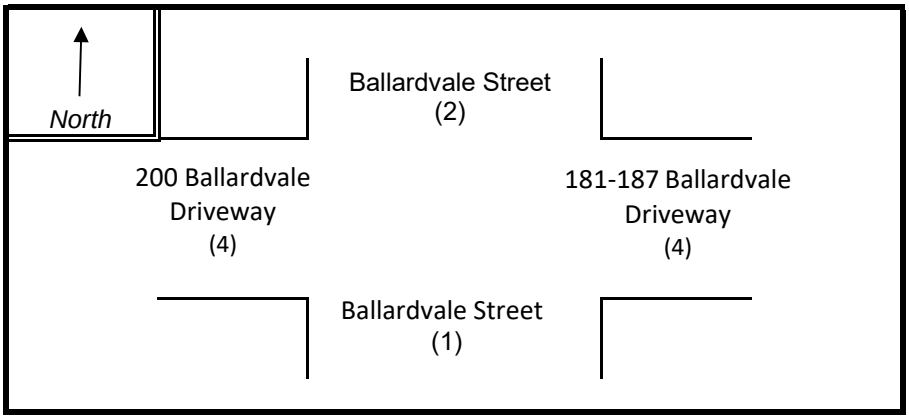
~ INTERSECTION DATA ~

MAJOR STREET : Ballardvale Street

MINOR STREET(S) : 181-187 Ballardvale Street Driveway

200 Ballardvale Street Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	390	1,071	73	63		**1,597**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,744**

TOTAL # OF CRASHES : 9

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **1.80**

CRASH RATE CALCULATION : **0.28**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 4 Avg: Signalized = 0.73; Unsignalized = 0.57

Project Title & Date: 1325 - Wilmington

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington, MA COUNT DATE : Nov-23

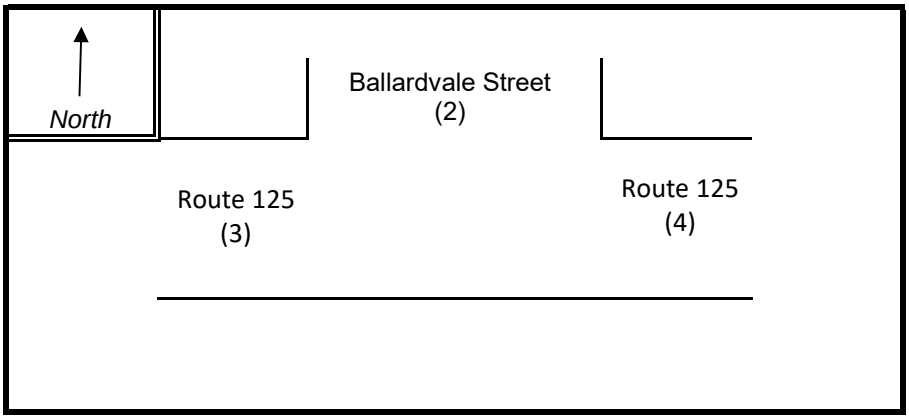
DISTRICT : 4 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 125

MINOR STREET(S) : Ballardvale Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :		1,194	1,109	790		**3,093**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **34,367**

TOTAL # OF CRASHES : 25

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **5.00**

CRASH RATE CALCULATION : 0.40

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 4 Avg: Signalized = 0.73; Unsignalized = 0.57

Project Title & Date: 1325 - Wilmington

Crash Number	Crash Date	Crash Severity	Crash Time	Number of Vehicles	Light Conditions	Manner of Collision	Road Surface Condition	Total Fatalities	Total Non-Fatal Injuries	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Most Harmful Event (All Vehicles)	X	Y	Roadway
4482490	01/05/2018	Property damage only (none injured)	1:56 PM	2	Daylight	Rear-end	Dry		0	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.2655	926374.0197	ROUTE 125 Rte 125 N
4507826	01/11/2018	Non-fatal injury	3:00 AM	2	Dark - lighted roadway	Rear-end	Dry		2	V2: Travelling straight ahead / V1: Slowing or stopped in traffic	V2:(Passenger car) / V1:(Unknown heavy truck, cannot classify)	V2: E / V1: E	Clear	V2:(Collision with motor vehicle in traffic) / V1:(Collision with motor vehicle in traffic)	228283.2468	926373.8573	BALLARDVALE STREET / ROUTE 125
4518223	02/06/2018	Property damage only (none injured)	12:28 PM	2	Daylight	Angle	Dry		0	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: W	Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.4225	926373.8617	BALLARDVALE STREET Rte W / ROUTE 125
4519491	03/09/2018	Property damage only (none injured)	9:47 AM	3	Daylight	Angle	Dry		0	V1: Turning left / V3: Slowing or stopped in traffic / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V3:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Single-unit truck (2-axle, 6-tires))	V1: N / V3: S / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.7872	926374.4057	BALLARDVALE STREET / ROUTE 125 Rte SR125 N
4556628	05/15/2018	Property damage only (none injured)	7:46 AM	2	Daylight	Sideswipe, same direction	Dry		0	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228278.2157	926378.0975	BALLARDVALE ST
4605057	08/15/2018	Non-fatal injury	6:33 AM	3	Daylight	Sideswipe, opposite direction	Dry		1	V1: Turning right / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: W / V2: E / V3: E	Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	228282.7872	926374.4057	BALLARDVALE STREET Rte 125 N / ROUTE 125 Rte SR125 N
4614528	09/20/2018	Property damage only (none injured)	6:45 AM	2	Dawn	Sideswipe, same direction	Dry		0	V1: Turning right / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	Rte SR125 S / BALLARDVALE STREET
4624998	10/25/2018	Property damage only (none injured)	1:05 PM	2	Daylight	Sideswipe, same direction	Dry		0	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Other)	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	BALLARDVALE ST / Rte 125 E
4640488	11/30/2018	Property damage only (none injured)	11:01 PM	2	Dark - roadway not lighted	Sideswipe, same direction	Dry		0	V1: Slowing or stopped in traffic / V2: Overtaking/passing	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	/ Rte SR125 N / BALLARDVALE STREET
4732837	06/18/2019	Property damage only (none injured)	6:21 PM	2	Daylight	Angle			0	V1: Turning right / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Cloudy/Rain	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.7872	926374.4057	BALLARDVALE STREET / ROUTE 125 Rte SR125 W
4755462	08/19/2019	Property damage only (none injured)	9:42 AM	2	Daylight	Rear-end	Dry		0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.7872	926374.4057	BALLARDVALE STREET / ROUTE 125 Rte SR125 N
4779766	10/12/2019	Property damage only (none injured)	2:14 PM	2	Daylight	Angle	Dry		0	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: N	Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	BALLARDVALE ST Rte 125 / ROUTE 125 HWY
4795011	12/05/2019	Property damage only (none injured)	9:50 AM	2	Daylight	Sideswipe, same direction	Dry		0	V1: Turning right / V2: Turning right	V1:(Passenger car) / V2:(Tractor/semi-trailer)	V1: W / V2: W	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.7872	926374.4057	BALLARDVALE STREET / ROUTE 125 Rte SR125 W
4876417	08/20/2020	Property damage only (none injured)	10:49 AM	2	Daylight	Angle	Dry		0	V1: Making U-turn / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	ROUTE 125 Rte SR125 N
4895002	10/30/2020	Non-fatal injury	12:45 PM	2	Daylight	Rear-end	Wet		0	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Cloudy/Snow	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	ROUTE 125 Rte SR125 N / BALLARDVALE STREET
4930472	01/12/2021	Property damage only (none injured)	1:37 PM	1	Daylight	Rear-end	Dry		0	V1: Slowing or stopped in traffic	V1:(Passenger car)	V1: N	Clear	V1:(Collision with motor vehicle in traffic)	228282.8433	926373.438	BALLARDVALE STREET Rte SR125 N / ROUTE 125 Rte SR125
5033980	11/14/2021	Property damage only (none injured)	4:18 PM	2	Daylight	Sideswipe, opposite direction	Dry		0	V1: Turning right / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	BALLARDVALE STREET / ROUTE 125 Rte SR125 S
5079418	12/14/2021	Property damage only (none injured)	10:19 AM	2	Daylight	Rear-end	Dry		0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228272.367	926383.9865	BALLARDVALE ST
5079423	12/14/2021	Property damage only (none injured)	12:21 PM	2	Daylight	Rear to Side	Dry		0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228272.367	926383.9865	BALLARDVALE ST
5091177	04/04/2022	Property damage only (none injured)	4:13 PM	2	Daylight	Rear-end	Dry		0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: S	Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8433	926373.438	Rte SR125 S
5099287	04/22/2022	Property damage only (none injured)	12:23 PM	2	Daylight	Rear-end	Dry		0	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Truck/trailer) / V2:(Tractor/semi-trailer)	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228274.7557	926366.0612	BALLARDVALE STREET Rte SR125 S
5160353	10/07/2022	Property damage only (none injured)	4:02 PM	2	Daylight	Angle	Dry		0	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8434	926373.4379	Rte SR125 N
5171518	10/29/2022	Property damage only (none injured)	11:15 PM	2	Dark - roadway not lighted	Rear-end	Dry		0	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8434	926373.4379	ROUTE 125 Rte 125 N
5184910	11/23/2022	Non-fatal injury	7:04 AM	2	Daylight	Rear-end	Dry		1	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8434	926373.4379	ROUTE 125 Rte SR125 N / BALLARDVALE STREET
5194730	12/19/2022	Property damage only (none injured)	8:05 AM	2	Daylight	Rear-end	Dry		0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Truck/trailer) / V2:(Truck/trailer)	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228282.8434	926373.4379	ROUTE 125 Rte SR125 S / BALLARDVALE STREET

Crash Number	Crash Date	Crash Severity	Crash Time	Number of Vehicles	Light Conditions	Manner of Collision	Road Surface Condition	Total Fatalities	Total Non-Fatal Injuries	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Most Harmful Event (All Vehicles)	X	Y	Roadway
4507624	01/10/2018	Property damage only (none injured)	12:12 PM	2	Daylight	Angle	Dry	0	0	V1: Changing lanes / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Tractor/semi-trailer)	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228150.9252	926508.1291	BALLARDVALE ST
4812872	12/31/2019	Property damage only (none injured)	9:53 AM	2	Daylight	Front to Rear	Wet	0	0	V1: Travelling straight ahead / V2: Backing	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: S	Rain	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228142.5987	926516.7653	BALLARDVALE ST
4956735	03/19/2021	Property damage only (none injured)	7:36 AM	2	Daylight	Angle	Dry	0	0	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228142.5987	926516.7653	BALLARDVALE ST
5047518	07/31/2021	Property damage only (none injured)	6:41 PM	2	Daylight	Rear-end	Dry	0	0	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228160.2683	926498.4386	BALLARDVALE ST
5054859	09/23/2021	Non-fatal injury	5:39 PM	5	Daylight	Rear-end	Dry	0	2	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic / V4: Slowing or stopped in traffic / V5: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car) / V4:(Passenger car) / V5:(Tractor/semi-trailer)	V1: S / V2: S / V3: S / V4: S / V5: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic) / V4:(Collision with motor vehicle in traffic) / V5:(Collision with motor vehicle in traffic)	228156.4205	926502.4294	BALLARDVALE ST
5117342	06/06/2022	Property damage only (none injured)	3:38 PM	2	Daylight	Angle	Dry	0	0	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: E	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228156.4205	926502.4294	BALLARDVALE STREET
5117343	06/06/2022	Non-fatal injury	5:09 PM	2	Daylight	Angle	Dry	0	2	V1: Turning right / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: S	Clear/Other	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228160.2683	926498.4386	BALLARDVALE STREET
5117346	06/07/2022	Property damage only (none injured)	5:38 PM	2	Daylight	Rear-end	Dry	0	0	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	228160.2683	926498.4386	BALLARDVALE STREET
5166844	10/06/2022	Property damage only (none injured)	2:47 PM	3	Daylight	Rear-end	Dry	0	0	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car) / V3:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: S / V3: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	228156.4205	926502.4294	BALLARDVALE STREET

- Background Projects

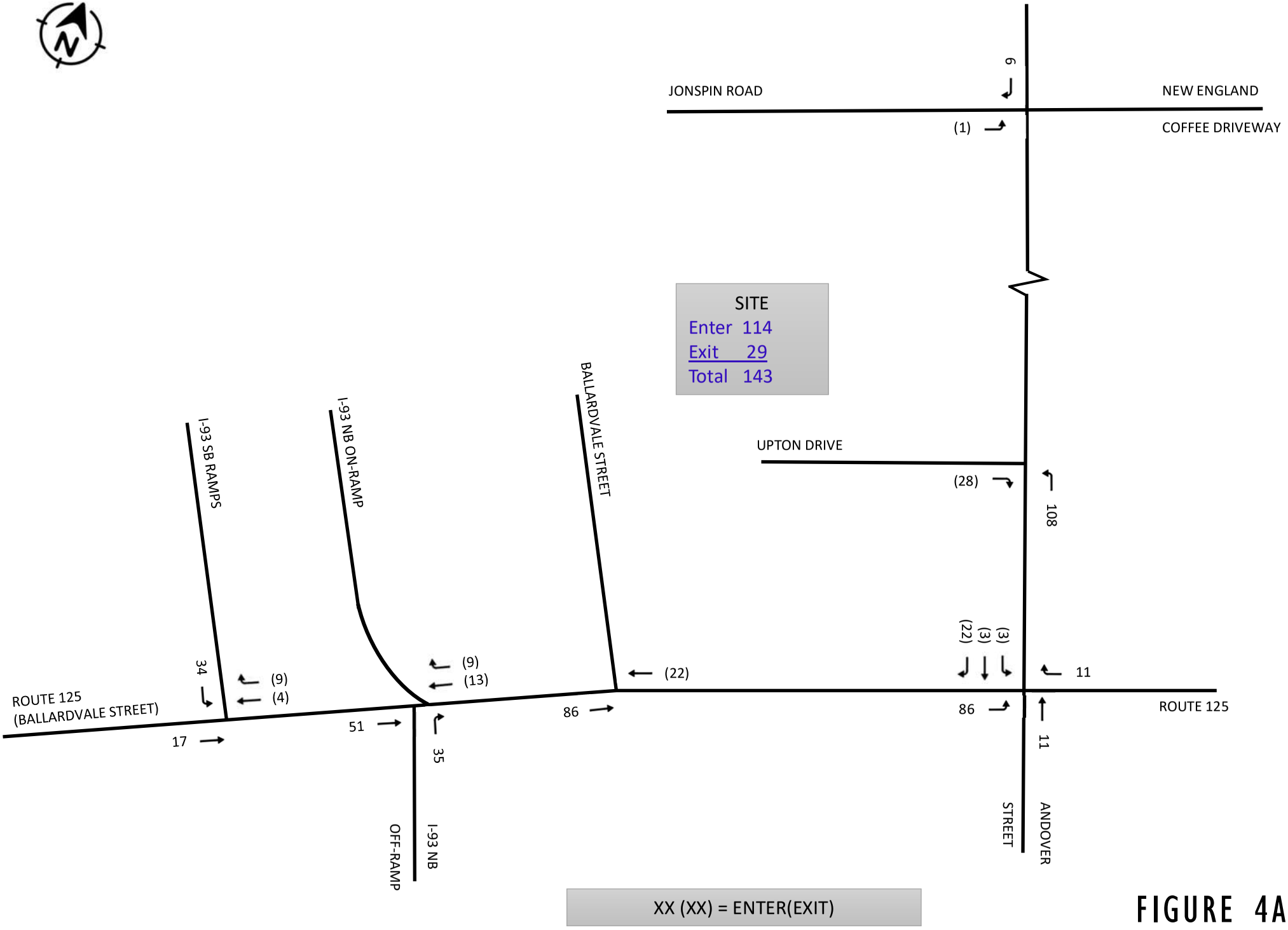


FIGURE 4A

AM SITE-GENERATED WEEKDAY PEAK HOUR TRAFFIC VOLUMES

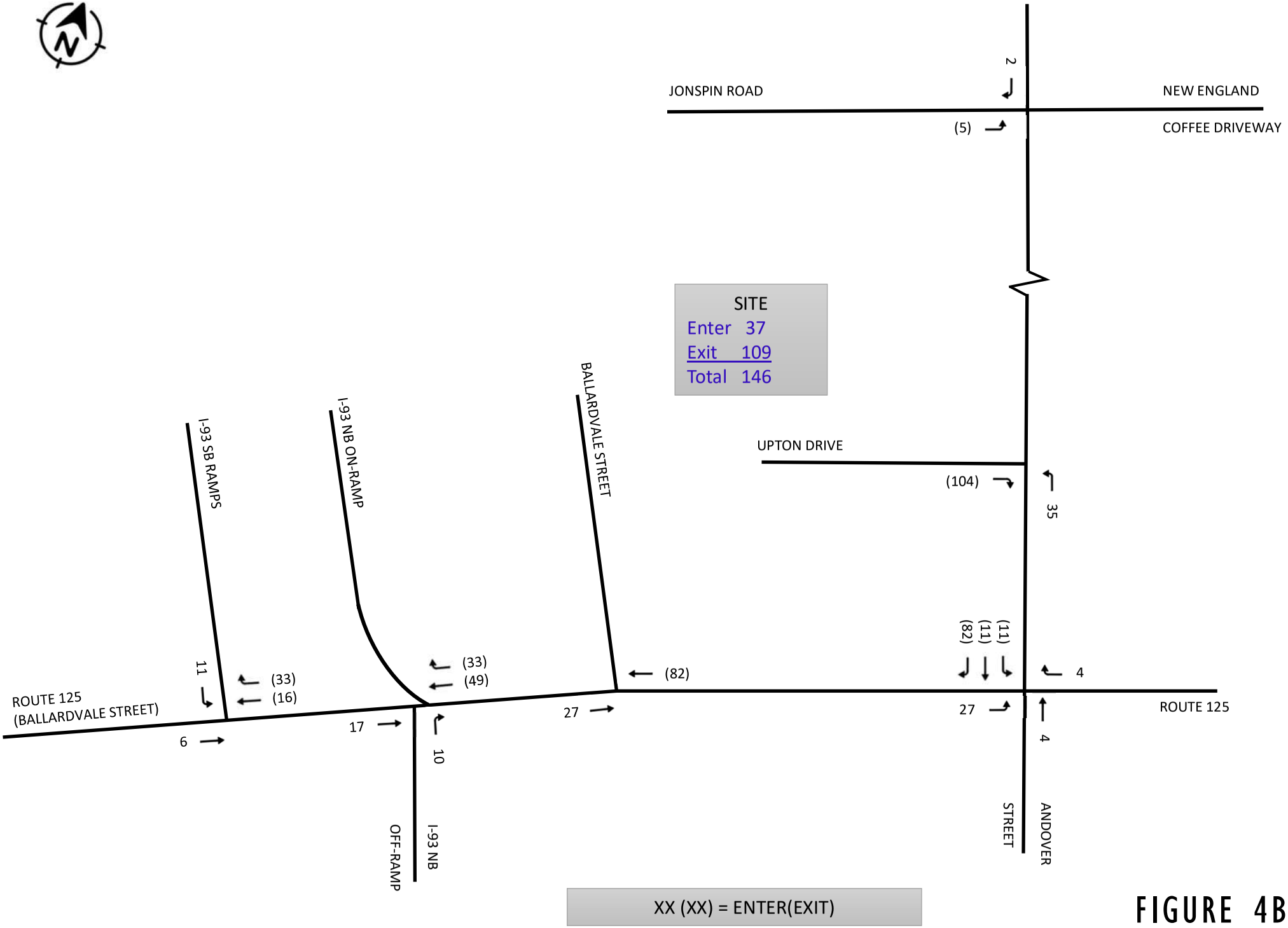


FIGURE 4B

PM SITE-GENERATED WEEKDAY PEAK HOUR TRAFFIC VOLUMES

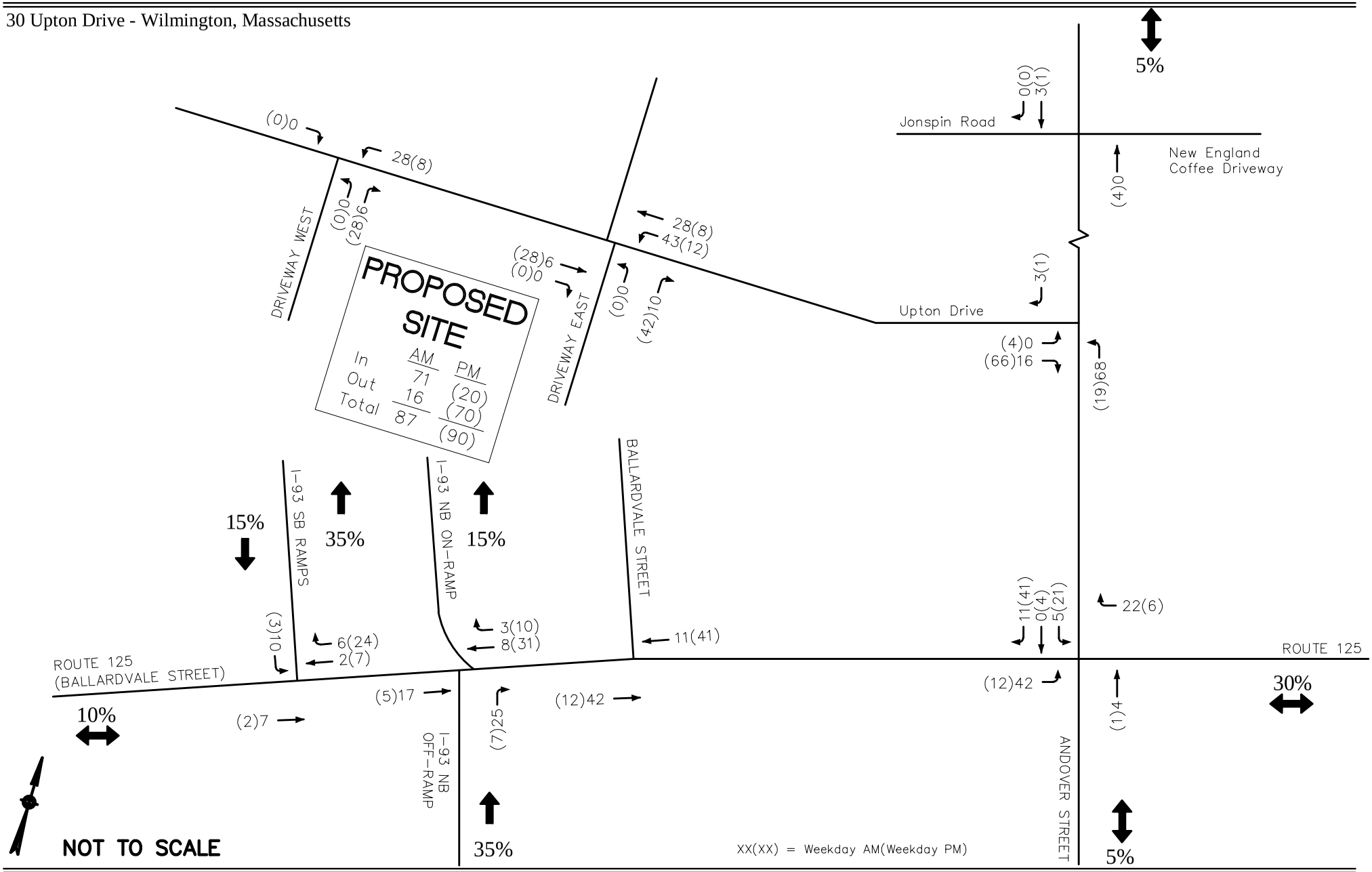


Figure 5

Site Generated Trips
Peak Hour Traffic Volumes

GPI Greenman-Pedersen, Inc.

Engineering and Construction Services

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

LANDUSE: Specialty Trade Contractor
LANDUSE CODE: 180 Independent Variable --- 1,000 Sq. Feet Gross Floor Area
LOCATION: General Urban / Suburban
JOB NAME: **FLOOR AREA (KSF):** 20.0
JOB NUMBER:

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	19	--	10.22	3.00	43.33	6	2	13	50%	50%
AM PEAK OF GENERATOR	19	--	2.01	0.47	11.25	6	2	13	76%	24%
PM PEAK OF GENERATOR	19	--	2.23	0.85	10.83	6	2	13	38%	62%
AM PEAK (ADJACENT ST)	19	--	1.66	0.12	9.17	6	2	13	73%	27%
PM PEAK (ADJACENT ST)	18	--	1.97	0.38	10.83	6	2	13	32%	68%

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	204	102	102	--	--	--
AM PEAK OF GENERATOR	41	31	10	--	--	--
PM PEAK OF GENERATOR	45	17	28	--	--	--
AM PEAK (ADJACENT ST)	33	24	9	--	--	--
PM PEAK (ADJACENT ST)	40	13	27	--	--	--

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
PEAK OF GENERATOR	--	--	--	--	--	--

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
PEAK OF GENERATOR	--	--	--	--	--	--

- Trip Generation

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 140 - Manufacturing

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 42.8

AVERAGE WEEKDAY DAILY

T = 4.75 * (X)
T = 4.75 * 42.8
T = 203.30
T = 204 vehicle trips
with 50% (102 vpd) entering and 50% (102 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.68 * (X)
T = 0.68 * 42.8
T = 29.10
T = 29 vehicle trips
with 76% (22 vph) entering and 24% (7 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.74 * (X)
T = 0.74 * 42.8
T = 31.67
T = 32 vehicle trips
with 31% (10 vph) entering and 69% (22 vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 28.5

AVERAGE WEEKDAY DAILY

T = 10.84 * (X)
T = 10.84 * 28.5
T = 308.94
T = 308 vehicle trips
with 50% (**154** vpd) entering and 50% (**154** vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 1.52 * (X)
T = 1.52 * 28.5
T = 43.32
T = 43 vehicle trips
with 88% (**38** vph) entering and 12% (**5** vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 1.44 * (X)
T = 1.44 * 28.5
T = 41.04
T = 41 vehicle trips
with 17% (**7** vph) entering and 83% (**34** vph) exiting.

SATURDAY DAILY

T = 2.21 * (x)
T = 2.21 * 28.5
T = 62.99
T = 62 vehicle trips
with 50% (**31** vpd) entering and 50% (**31** vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.53 * (X)
T = 0.53 * 28.5
T = 15.11
T = 15 vehicle trips
with 54% (**8** vph) entering and 46% (**7** vph) exiting.

□ Trip Distribution Calculations

1325 Wilmington
Trip Distribution Calculations
Existing Travel Patterns

	Weekday Morning			Weekday Evening				
Ballardvale Street	Entering	Exiting		Entering	Exiting			**Say**
To/From the West	8	0	10%	2	3	7%	8%	**10%**
To/From the East	69	4	90%	9	60	93%	92%	90%
Total	77	4	100%	11	63	100%	100%	

Route 125	IN	OUT		IN	OUT			**Say**
To/From the North	161	64	16%	92	239	19%	17%	**15%**
To/From the South	897	161	74%	288	955	71%	73%	**75%**
Total	1058	225	90%	380	1194	90%	90%	

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

M E M O R A N D U M

DATE: April 23, 2024

TO: Valerie Gingrich
Director of Planning and Conservation
121 Glen Road
Wilmington, MA 01887

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Response to Comments – Wilmington Engineering/ Planning & Conservation**
Proposed Life Science/Biomanufacturing Facility
181-187 Ballardvale Street – Wilmington, MA

MDM Transportation Consultants, Inc. (MDM) has prepared the following responses to transportation-related comments as issued in a letter by the Town of Wilmington Engineering Division dated February 6, 2024, a letter by the Town of Wilmington Department of Planning and Conservation dated January 29, 2024, and a letter by The Engineering Corporation (TEC) dated March 7, 2024. The. To facilitate review, specific transportation related comments are paraphrased with corresponding responses.

Town of Wilmington Engineering Division Letter

Traffic and Site Layout Comments

Comment 3: *"The Engineering Division recommends that the Traffic Memorandum provided be peer reviewed by a third-party traffic engineer. The study area should also be expanded to include the junction of Route 93 and Route 125. Further, at Community Development Technical Review (CDTR), Town staff discussed with the Applicant the Town's desire to improve pedestrian mobility and connectivity along this section of Ballardvale Street. The Town engaged VHB, Inc. in c.2021 to study pedestrian mobility in this location and develop concept level plans to improve pedestrian safety and connectivity in the area. This study is furnishable to the Applicant and Planning Board upon request. The project may present an opportunity to advance (in part) the goal of pedestrian improvements along the corridor with such improvements being mutually beneficial to both the Town and Applicant."*

Response: The Traffic Memorandum (TM) by MDM dated November 8, 2023, has been sent out for peer review by TEC with comments received on March 7, 2024. MDM's responses are provided in a subsequent section of this memo.

As shown in the TM, the project will result in a nominal increase in traffic activity at the Ballardvale Street (Route 125) signalized intersection with I-93. Specifically, the increase in trips due to the project is not expected to alter operating conditions compared to No-Build conditions with less than 1 vehicle trip or less per minute. A review of crash history indicates that neither of the Ballardvale Street intersections with I-93 are listed as high crash locations (HSIP) by MassDOT. MDM finds the relative traffic increases for the proposed project represent an inconsequential change in area roadway volumes - a level of change that falls well within normal day-to-day fluctuations in traffic entering and exiting the study area. Therefore, there is no material benefit to studying the Route 125 and 93 interchange ramps as part of this project.

The Proponent will work with the Town to provide an easement along the site frontage to accommodate the planned multi-modal improvements along this section of Ballardvale Street. For reference, the concept level plans to improve pedestrian safety and connectivity in the area prepared by the Town by VHB, Inc. in c.2021 are provided in the **Attachments**.

Comment 4: "*A truck turning maneuverability plan shall be provided for review. Turning exhibits shall be provided for the largest truck size expected to use the site, as well as trash pickup, and the Wilmington Ladder Truck.*"

Response: Truck turning maneuverability plans which include a WB-50, refuse vehicle, and Wilmington Ladder truck as prepared by Highpoint Engineering, Inc. are provided in the **Attachments** for reference. As shown the site has been designed to accommodate the largest design vehicle, refuse vehicle, and Wilmington Ladder truck.

Comment 5: "*The proposed layout does not appear to comply with the Town's Zoning Bylaw Section 6.4 Parking and Site Design Standards. Specifically, offset/setback of paved surfaces to property lines. The Applicant's cover letter indicates that the Applicant is seeking a waiver request from this zoning bylaw section, however, there appears to be an opportunity to increase the offset of the proposed parking bay to the northerly adjoining property boundary without sacrificing parking or impeding circulation. The Board may wish to discuss this with the Applicant.*"

Response: The site plan set has been updated by Highpoint Engineering, Inc. to remove the need for the requested waiver for offset/setback (see **Attachments** for reference).

Comment 6: "*The parking chart shown on the plans provides a split of 40% office and 60% Industrial/Manufacturing for the two existing buildings and the proposed building. The Applicant should provide additional information on existing uses, including floor plans, to demonstrate that the 40/60 split is appropriate."*

Response: The existing tenant list indicates a split of 38% office space and 62% R&D space. A breakdown of existing tenants is provided in the **Attachments**. The Proponent will continue to convert office to R&D space as opportunity presents. Furthermore, as shown in **Table 6** of the TA the existing uses of the site are generating trips at approximately half the industry standard ITE rate. Therefore, based on the existing tenant mix a 40/60 split is appropriate and results in a conservative parking estimate.

Comment 7: "*The Applicant's Engineer shall evaluate reducing the entrance radii proposed at the existing site driveway intersection at Ballardvale Street. Further, the Department of Public Works requests vertical granite curbing for each radii (proposed within the Public Right of Way) with details and plan callouts for appropriate transition curbing accordingly.*"

Response: Highpoint considered reducing the entrance radius from 35 ft to 30 ft as suggested by the Town. However, it was found that the 30 ft radii would not allow a WB-50 trailer to make a right turn into the property from Ballardvale Street without the rear tired riding up on the curb. Therefore, the entrance radii were kept at 35 feet. The site layout has been revised to include vertical granite curb within the right-of-way as requested by the Department of Public Works.

Town of Wilmington Department of Planning and Conservation Letter

Comment 8: "*As discussed at the January 22, 2024, Community Development Technical Review (CDTR) team meeting, a peer review of the traffic memorandum will be recommended to the Planning Board. As requested by the applicant, the review can be initiated prior to the Planning Board meeting.*"

Response: The Traffic Memorandum (TM) by MDM dated November 8, 2023, has been sent out for peer review by TEC with comments received on March 7, 2024. MDM's responses are provided in a subsequent section of this memo.

Comment 9: "*A truck turning exhibit shall be included with the revisions. This should show the turn radius of the Wilmington Fire Truck apparatus as well as any other large trucks that will access loading docks and dumpsters.*"

Response: Truck turning maneuverability plans which include a WB-50, refuse vehicle, and Wilmington Ladder truck as prepared by Highpoint Engineering, Inc. are provided in the **Attachments** for reference. As shown the site has been designed to accommodate the largest design vehicle, refuse vehicle, and Wilmington Ladder truck.

The Engineering Corp (TEC) Letter

Traffic Impact Assessment Comments

TEC Comment 5: *"To assess sight distance, the Applicant utilized the posted speed limit of 40 MPH along Ballardvale Street northwest bound rather than using 85th percentile travel speeds in each direction. Since the access drive to the Ballardvale Technology Center is located roughly 450 feet northwest of Route 125, TEC believes the posted speed limit is a conservative estimate of travel speed. Vehicles turning from Route 125 onto Ballardvale Street will likely not attain a speed of 40 MPH prior to the access drive. In addition, the posted speed along Ballardvale Street southeast bound prior to the access drive is 25 MPH, so TEC believes using a 40 MPH speed in this direction is also a conservative approach. The sight distances reported in Tables 3 and 4 of the TIA are in accordance with the American Association of State Highway and Transportation Officials (AASHTO) requirements. In a field review conducted on February 15, 2024, TEC confirmed the measured Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) provided in the TIA. The Applicant has recommended that any new plantings or physical landscape features within the proposed Project driveway should be maintained at a height of 2 feet or less to ensure unobstructed lines of sight. The site plans should show the sight line triangles based on the AASHTO criteria provided in MDM's report. The Applicant should also commit to maintain vegetation along the site frontage consistently to ensure that sight lines remain unobstructed at the site driveway intersection with Ballardvale Street."*

Response: MDM concurs, the sight line triangles will be provided on the final site plan set by Highpoint Engineering. The Site Layout Plan will also include a note citing that "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2-feet in height. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."

TEC Comment 6: "*The TIA presents motor vehicle crash data for the study intersections between 2018 and 2022, the most recent five-year period available from MassDOT. During this period, there were 25 crashes at the Route 125/Ballardvale Street intersection, 4 of which resulted in personal injury, and 9 crashes at the Ballardvale Street/181-187 and 200 Ballardvale Street driveways, 2 of which resulted in personal injury. Neither of the intersections had fatalities or crashes involving bicycles or pedestrians. The crash rates at each of the intersections were determined to be 0.40 for the former and 0.28 for the latter. Both are below MassDOT District 4 averages for signalized and unsignalized intersections, 0.73 and 0.57, respectively. Neither of the intersections contains a Highway Safety Improvement Plan (HSIP) cluster, so MDM has not recommended any immediate term safety countermeasures. TEC generally agrees with this assessment. However, on Ballardvale Street northwest bound, there is a transition from two lanes to one at the 181-187 and 200 Ballardvale Street driveways, which may have contributed to some of the crashes. TEC also observed queues that extend back from the Route 125 traffic signal that can frequently block the site driveway during the late afternoon and evening peak period. TEC recommends that the Applicant explore options to revise the pavement markings and signs along Ballardvale Street northwest bound to improve safety, including a striped 'Do Not Block' box."*

Response: The Proponent will work with the Town and if approved by the DPW the pavement markings will be updated to revise the northwest bound lane drop markings an signage as appropriate and to install a striped "Do Not Block box" markings and signage at the 181/187 driveway.

TEC Comment 10: "*There was no capacity or queue analysis conducted as part of the TIA. Rather, MDM provided a qualitative assessment of operations, essentially comparing 2030 No-Build volumes with 2030 Build volumes. On page 14, they have shown in Table 7 and have stated that the increase in traffic at each of the study locations will be less than 5%, and therefore, will have minimal impact on operations. While TEC generally concurs with the qualitative results, MDM should also provide 2023 Existing, 2030 No-Build and 2030 Build capacity and queue analyses as part of the TIA utilizing Highway Capacity Manual (HCM) methodologies if the Board desires additional quantitative analysis to assess the incremental increase in vehicle delays.*"

Response: As previously indicated, the project will result in a nominal increase in traffic activity at the study intersections. Specifically, the increase in trips due to the project is not expected to alter operating conditions compared to No-Build conditions with approximately 1 directional vehicle trip or less per minute. MDM finds the relative traffic increases for the proposed project represent an inconsequential change in area roadway volumes - a level of change that falls well within normal day-to-day fluctuations in traffic entering and exiting the study area. Therefore, there is no material benefit to providing capacity and queue analysis.

TEC Comment 11: "*MDM has recommended several mitigation measures for the Project: a) Access/ Egress Improvements, b) Pedestrian and Bicycle Accommodations, and c) Transportation Demand Management (TDM). These are described on page 15 of the TIA. TEC generally concurs with the identified measures. However, TEC understands that the Town is considering multi-mode improvements to Ballardvale Street between the Target Plaza and the 181-187 and 200 Ballardvale Street driveways. These improvements include a Shared Use Path (SUP) and/or sidewalk along both sides of Ballardvale Street and a crosswalk with a Pedestrian Hybrid Beacon (PHB) between 193 and 206 Ballardvale Street. In lieu of other data collection, analysis, or physical mitigation to address their increase in vehicular traffic, TEC recommends that the Applicant provide sidewalks along the site access to Ballardvale Street and provide fair-share mitigation funding to be utilized by the Town for the planning and design phase of the Ballardvale Street multi-modal improvements.*"

Response: The Proponent is not providing a walkway from the development to Ballardvale Street but will work with the Town to provide an easement along the site frontage to accommodate the planned multi-modal improvements along this section of Ballardvale Street and will work with the Town to provide appropriate fair share mitigation funding for the planning and design of the multi-modal improvements by the Town.

Site Plan Comments

TEC Comment 14: "*The Applicant should provide an Autoturn truck sweep analysis to demonstrate the ability of the expected delivery vehicles, service vehicles, or emergency vehicles to circulate around the site without leaving the paved surface and access the loading docks for each building. The Applicant should review any potential need for cross-access easements for employee and/or truck access.*"

Response: Truck turning maneuverability plans which include a WB-50, refuse vehicle, and Wilmington Ladder truck as prepared by Highpoint Engineering, Inc. are provided in the **Attachments** for reference. As shown the site has been designed to accommodate the largest design vehicle, refuse vehicle, and Wilmington Ladder truck. No cross-access easements for employee and/or truck access is required.

TEC Comment 15: "*The Applicant should coordinate with the Town of Wilmington Fire Department for preferred locations of fire lanes (if needed), confirmation of on-site hydrant locations (if needed), and sign requirements for fire lanes within the site.*"

Response: Based on discussions with the Town of Wilmington Fire Department no fire lanes or further requirements are needed. Highpoint Engineering, Inc. will continue to coordinate with WFD as needed.

TEC Comment 16: "*The plans should depict a 12" stop line and stop sign at the access drive as described in the*
TIA."

Response: A 12" STOP line and STOP sign (R1-1) will be included on the final site plan set prepared by Highpoint Engineering.

TEC Comment 17: "*The bottom of all traffic signs on-site should be a minimum of 7 feet above the ground surface per the Manual on Uniform Traffic Control Devices (MUTCD) when directly impeding sidewalks or travel paths. Detail C1 on Sheet C600 and Detail C4 on Sheet C601 show the height to be 6 feet above the ground surface.*"

Response: The updated bottom of all traffic signs on-site will be updated to a minimum of 7 feet above the ground surface per MUTCD guidance. This will be included on the final site plan set prepared by Highpoint Engineering.

TEC Comment 18: "*Details should be provided showing the layout and dimensions of compact vehicle parking spaces. Alternatively, a note could be added to Detail C1 on Sheet C601 denoting the size as 8' x 16'.*"

Response: The site proposes two different sized compact spaces; (7.5' x 16') and (8′ x 16′). The site layout has been revised to include where the compact spaces are proposed, and site details have been revised to include both on the site plan sets prepared by Highpoint Engineering.

TEC Comment 19: "*The Applicant has proposed to provide sidewalks connecting building entrances with the parking areas. As noted in Comment 11 above, TEC recommends that the Applicant also provide sidewalks along the reconstructed access drive to its intersection with Ballardvale Street. This will provide a continuous connection from the proposed building to the future Ballardvale Street improvements. There are several informal footpaths that lead from the northerly edge of the parking lot toward the north in the direction of the powerline easement and Upton Drive. A sidewalk along the driveway will potentially provide a connection for other walkers in the area.*"

Response: See Response to TEC Comment 11.

TEC Comment 20: "*The site plans should include a plan sheet depicting the sight triangles to and from the site driveway and identify areas to restrict vegetation, signage, and off-street parking to maintain AASHTO minimum recommendations. Notes should indicate: "Signs, landscaping and other features located within sight triangle areas shall be designed, installed, and maintained so as not to exceed 2.0 feet in height. Snow windrows located within sight triangle areas that exceed 3.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed." All permanent and temporary signs should be located outside the sight line triangles.*"

Response: See Response to TEC Comment 5.

TEC Comment 21: "*The Applicant should denote the designated locations of secure and weather protected bicycle racks as described in the TIA.*"

Response: The site plan has been updated by Highpoint Engineering to include the location of the bicycle racks. The design of the shelter will be coordinated with the architect to fit into the overall design.

TEC Comment 22: "*Since the property abuts Route 125, a MassDOT-owned roadway, it is likely that an Indirect Access Permit will be required. The Applicant should be prepared to submit the appropriate Permit Application and supporting documents to the District 4 Office in Arlington.*"

Response: After the site plan review process, if required a Highway Access Permit will be submitted to MassDOT for the driveway.

TEC Comment 23: "*Although snow storage areas are shown on the plan, the Applicant should provide a snow removal and parking management plan for Town staff review.*"

Response: Given the adequate snow storage areas on the Site, the Proponent doesn't anticipate a snow storage problem. If snow was overly restricting parking the excess snow from any parking areas blocked will be removed from the Site at the expense of the Proponent.

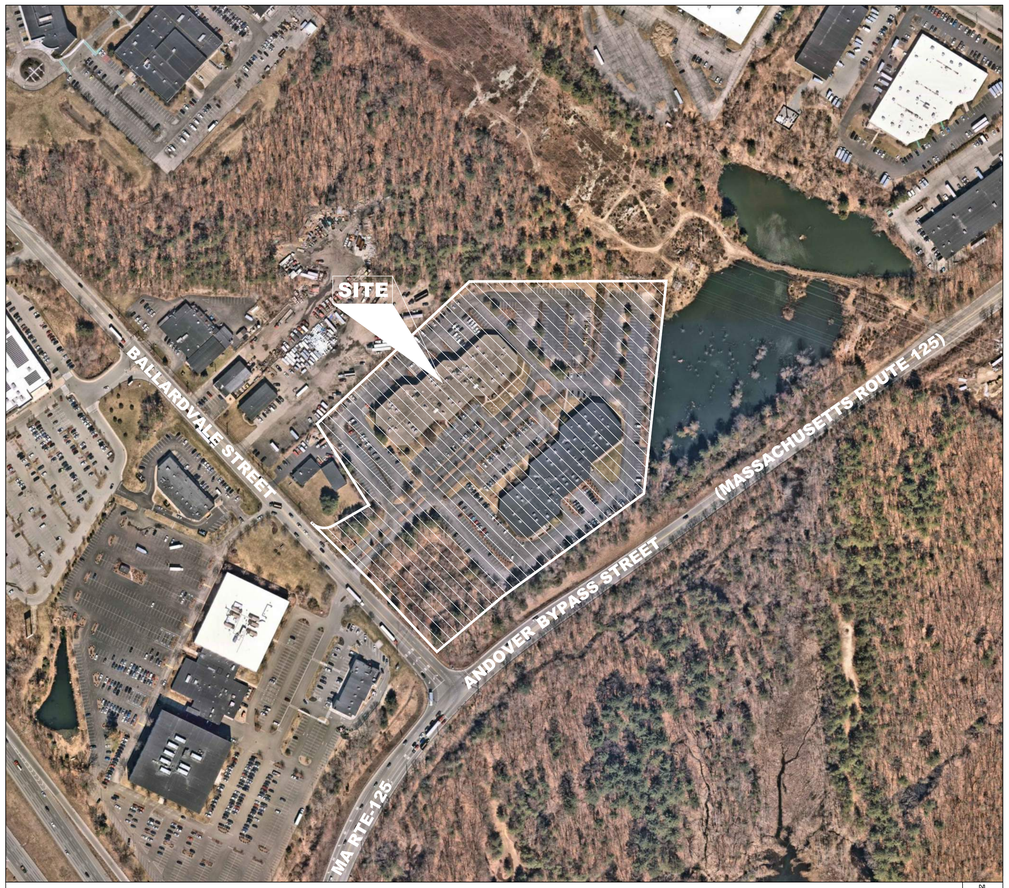
ATTACHMENTS

- □ Updated Site Plan
- □ Improvement Plan
- □ Existing Tenant Split

□ Updated Site Plan

PROPOSED OFFICE CAMPUS RE-USE
LIFE SCIENCE / BIOMANUFACTURING CONVERSION
181-187 BALLARDVALE STREET
WILMINGTON, MASSACHUSETTS 01887

PERMIT SUBMISSION: JANUARY 10, 2024
REVISED: APRIL 22, 2024



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SCALE: N.T.S.

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INDEX OF DRAWINGS

ISSUE HISTORY:		PERMIT SUBMISSION JANUARY 10, 2024	RESPONSE TO COMMENTS #1 APRIL 22, 2024				
CIVIL							
T100	TITLE SHEET	●	●				
G001	GENERAL NOTES SHEET	●	●				
G002	GENERAL LEGEND SHEET	●	●				
C100	SITE PREPARATION & EROSION CONTROL PLAN	●	●				
C200	LAYOUT AND MATERIALS PLAN	●	●				
C300	OVERALL GRADING & DRAINAGE PLAN	●	●				
C301	GRADING AND DRAINAGE PLAN	●	●				
C302	GRADING AND DRAINAGE PLAN	●	●				
C303	GRADING AND DRAINAGE PLAN	●	●				
C400	UTILITY PLAN	●	●				
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T000	TITLE SHEET	●	●				
A101	FLOOR PLAN - LEVEL 1	●	●				
A102	FLOOR PLAN - LEVEL 2	●	●				
A500	EXTERIOR ELEVATIONS	●	●				
A501	EXTERIOR ELEVATIONS	●	●				
LAND SURVEY (BY OTHERS)							
EX-1	EXISTING CONDITIONS PLAN DATED MARCH 27, 2023 (1 OF 4)	●	●				
EX-2	EXISTING CONDITIONS PLAN DATED MARCH 27, 2023 (2 OF 4)	●	●				
EX-3	EXISTING CONDITIONS PLAN DATED MARCH 27, 2023 (3 OF 4)	●	●				
EX-4	EXISTING CONDITIONS PLAN DATED MARCH 27, 2023 (4 OF 4)	●	●				

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SEAL
COMMONWEALTH OF MASSACHUSETTS
DOUGLAS J. HARTNETT
CIVIL
No. 37796
REGISTERED PROFESSIONAL ENGINEER
04-22-2024

DATE APPROVED:

WILMINGTON PLANNING BOARD

OFFICE CAMPUS REUSE
LIFE SCIENCE/BIOMANUFACTURING CONVERSION
181-187 BALLARDVALE STREET
WILMINGTON, MA
OWNER/APPLICANT: BALLARDVALE OWNER, LLC

REV	DATE	DESCRIPTION
1	04.22.2024	RESPONSE TO COMMENTS #1

ISSUE TYPE:
DESIGN DEVELOPMENT
ISSUE DATE:
01/10/2024
PROJECT NUMBER:
22047

DRAWN BY: JMP
CHECKED BY: HK/NCL

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SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T100

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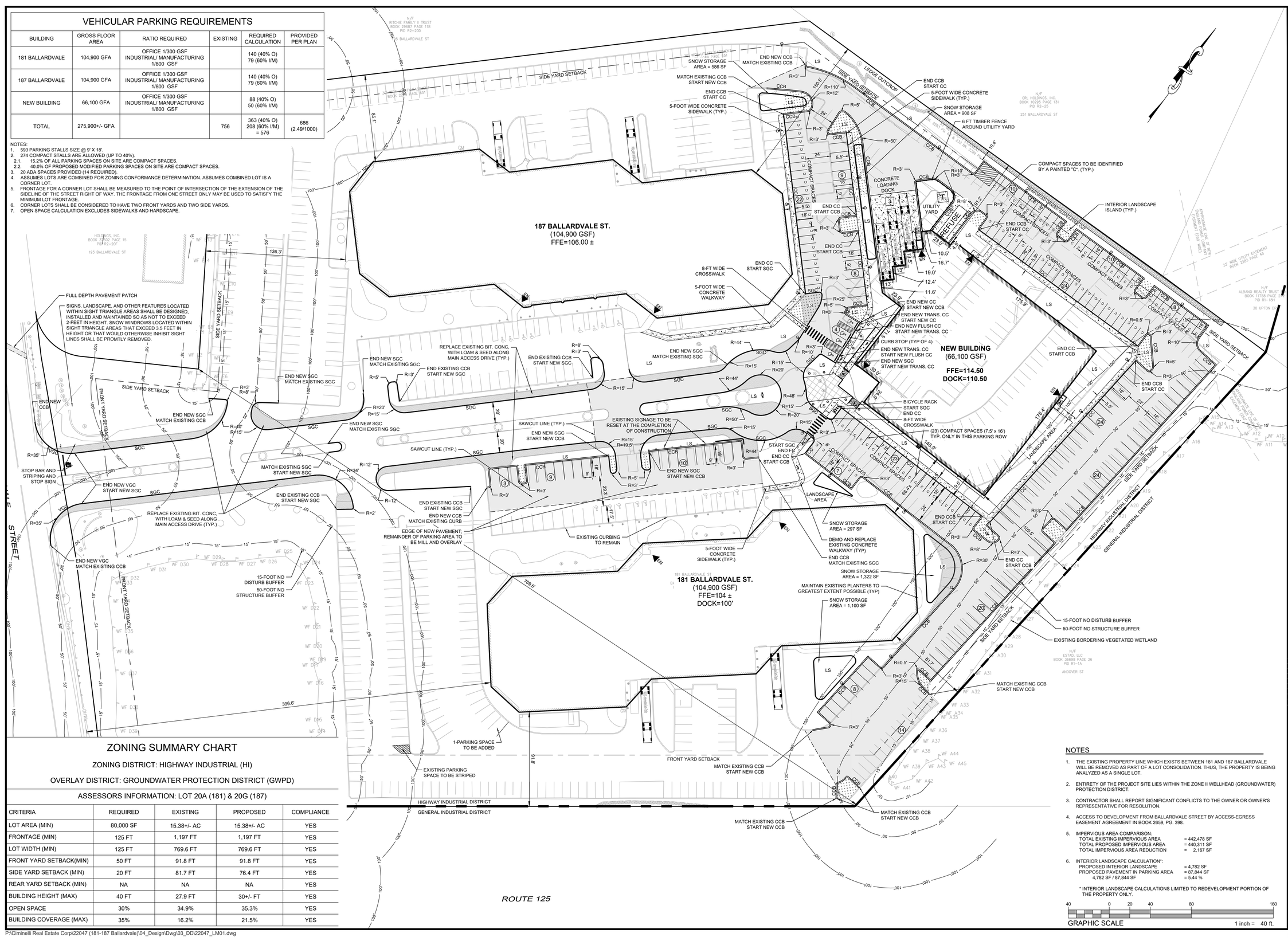
ISSUED FOR : **PERMIT SET**

VEHICULAR PARKING REQUIREMENTS

BUILDING	GROSS FLOOR AREA	RATIO REQUIRED	EXISTING	REQUIRED CALCULATION	PROVIDED PER PLAN
181 BALLARDVALE	104,900 GFA	OFFICE 1/300 GSF INDUSTRIAL/ MANUFACTURING 1/800 GSF		140 (40% O) 79 (60% I/M)	
187 BALLARDVALE	104,900 GFA	OFFICE 1/300 GSF INDUSTRIAL/ MANUFACTURING 1/800 GSF		140 (40% O) 79 (60% I/M)	
NEW BUILDING	66,100 GFA	OFFICE 1/300 GSF INDUSTRIAL/ MANUFACTURING 1/800 GSF		88 (40% O) 50 (60% I/M)	
TOTAL	275,900+/- GFA		756	363 (40% O) 208 (60% I/M) = 576	686 (2.49/1000)

NOTES:
1. 593 PARKING STALLS SIZE @ 9' X 18'.
2. 274 COMPACT STALLS ARE ALLOWED (UP TO 40%).
   2.1. 15.2% OF ALL PARKING SPACES ON SITE ARE COMPACT SPACES.
   2.2. 40.0% OF PROPOSED MODIFIED PARKING SPACES ON SITE ARE COMPACT SPACES.
3. 20 ADA SPACES PROVIDED (14 REQUIRED).
4. ASSUMES LOTS ARE COMBINED FOR ZONING CONFORMANCE DETERMINATION. ASSUMES COMBINED LOT IS A CORNER LOT.
5. FRONTAGE FOR A CORNER LOT SHALL BE MEASURED TO THE POINT OF INTERSECTION OF THE EXTENSION OF THE SIDELINE OF THE STREET RIGHT OF WAY. THE FRONTAGE FROM ONE STREET ONLY MAY BE USED TO SATISFY THE MINIMUM LOT FRONTAGE.
6. CORNER LOTS SHALL BE CONSIDERED TO HAVE TWO FRONT YARDS AND TWO SIDE YARDS.
7. OPEN SPACE CALCULATION EXCLUDES SIDEWALKS AND HARDSCAPE.



ZONING SUMMARY CHART

ZONING DISTRICT: HIGHWAY INDUSTRIAL (HI)

OVERLAY DISTRICT: GROUNDWATER PROTECTION DISTRICT (GWPD)

ASSESSORS INFORMATION: LOT 20A (181) & 20G (187)

CRITERIA	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
LOT AREA (MIN)	80,000 SF	15.38+/- AC	15.38+/- AC	YES
FRONTAGE (MIN)	125 FT	1,197 FT	1,197 FT	YES
LOT WIDTH (MIN)	125 FT	769.6 FT	769.6 FT	YES
FRONT YARD SETBACK(MIN)	50 FT	91.8 FT	91.8 FT	YES
SIDE YARD SETBACK (MIN)	20 FT	81.7 FT	76.4 FT	YES
REAR YARD SETBACK (MIN)	NA	NA	NA	YES
BUILDING HEIGHT (MAX)	40 FT	27.9 FT	30+/- FT	YES
OPEN SPACE	30%	34.9%	35.3%	YES
BUILDING COVERAGE (MAX)	35%	16.2%	21.5%	YES

NOTES

1. THE EXISTING PROPERTY LINE WHICH EXISTS BETWEEN 181 AND 187 BALLARDVALE WILL BE REMOVED AS PART OF A LOT CONSOLIDATION. THUS, THE PROPERTY IS BEING ANALYZED AS A SINGLE LOT.
2. ENTIRETY OF THE PROJECT SITE LIES WITHIN THE ZONE II WELLHEAD (GROUNDWATER) PROTECTION DISTRICT.
3. CONTRACTOR SHALL REPORT SIGNIFICANT CONFLICTS TO THE OWNER OR OWNER'S REPRESENTATIVE FOR RESOLUTION.
4. ACCESS TO DEVELOPMENT FROM BALLARDVALE STREET BY ACCESS-EGRESS EASEMENT AGREEMENT IN BOOK 2659, PG. 398.
5. IMPERVIOUS AREA COMPARISON:
   TOTAL EXISTING IMPERVIOUS AREA = 442,478 SF
   TOTAL PROPOSED IMPERVIOUS AREA = 440,311 SF
   TOTAL IMPERVIOUS AREA REDUCTION = 2,167 SF
6. INTERIOR LANDSCAPE CALCULATION*:
   PROPOSED INTERIOR LANDSCAPE = 4,782 SF
   PROPOSED PAVEMENT IN PARKING AREA = 87,844 SF
   4,782 SF / 87,844 SF = 5.44 %

   * INTERIOR LANDSCAPE CALCULATIONS LIMITED TO REDEVELOPMENT PORTION OF THE PROPERTY ONLY.

GRAPHIC SCALE 40 0 20 40 80 160 — 1 inch = 40 ft.

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04-22-2024

DATE APPROVED:

WILMINGTON PLANNING BOARD

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DRAWN BY: JMP
CHECKED BY: HK/NCL

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SHEET TITLE:
LAYOUT & MATERIALS PLAN

SHEET NUMBER:
C200

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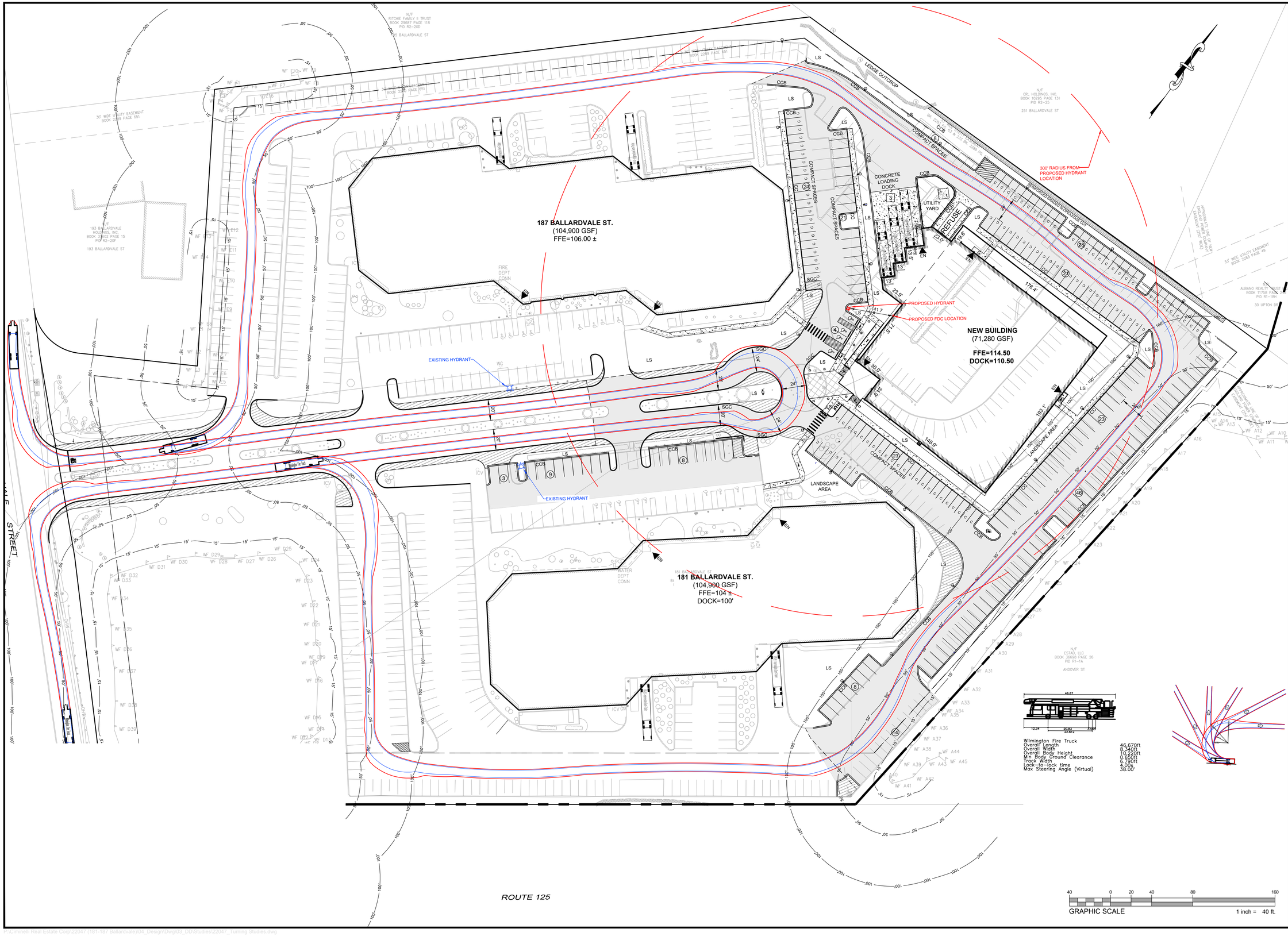
ISSUED FOR : PERMIT SET



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SHEET TITLE:

FIRE TRUCK TURN PLAN #1

SHEET NUMBER:

C700

ISSUED FOR : **PERMIT SET**

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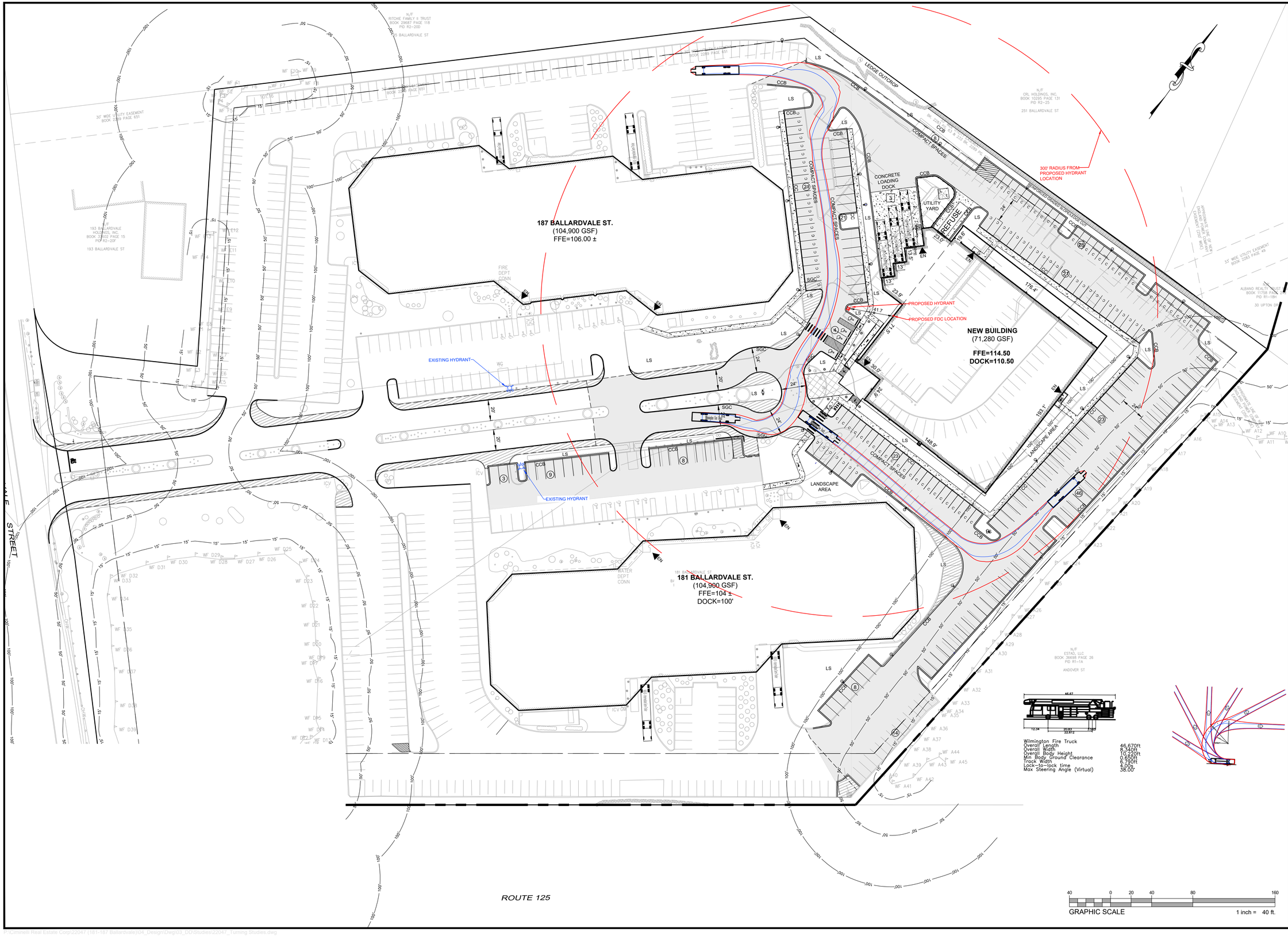

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LAND PLANNING
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CIVIL ENGINEERING
CONSULTING

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CONSULTANT:

SEAL

COMMONWEALTH OF MASSACHUSETTS
DOUGLAS J. HARTNETT
CIVIL
No. 37796
REGISTERED PROFESSIONAL ENGINEER

04-22-2024

DATE APPROVED:

WILMINGTON PLANNING BOARD

OFFICE CAMPUS REUSE
LIFE SCIENCE/BIOMANUFACTURING CONVERSION

181-187 BALLARDVALE STREET
WILMINGTON, MA

OWNER/APPLICANT: BALLARDVALE OWNER, LLC

REV	DATE	DESCRIPTION
1	04.22.2024	RESPONSE TO COMMENTS #1

ISSUE TYPE:
DESIGN DEVELOPMENT

ISSUE DATE:
02/28/2024

PROJECT NUMBER:
22047

DRAWN BY: JMP

CHECKED BY: HK/NCL

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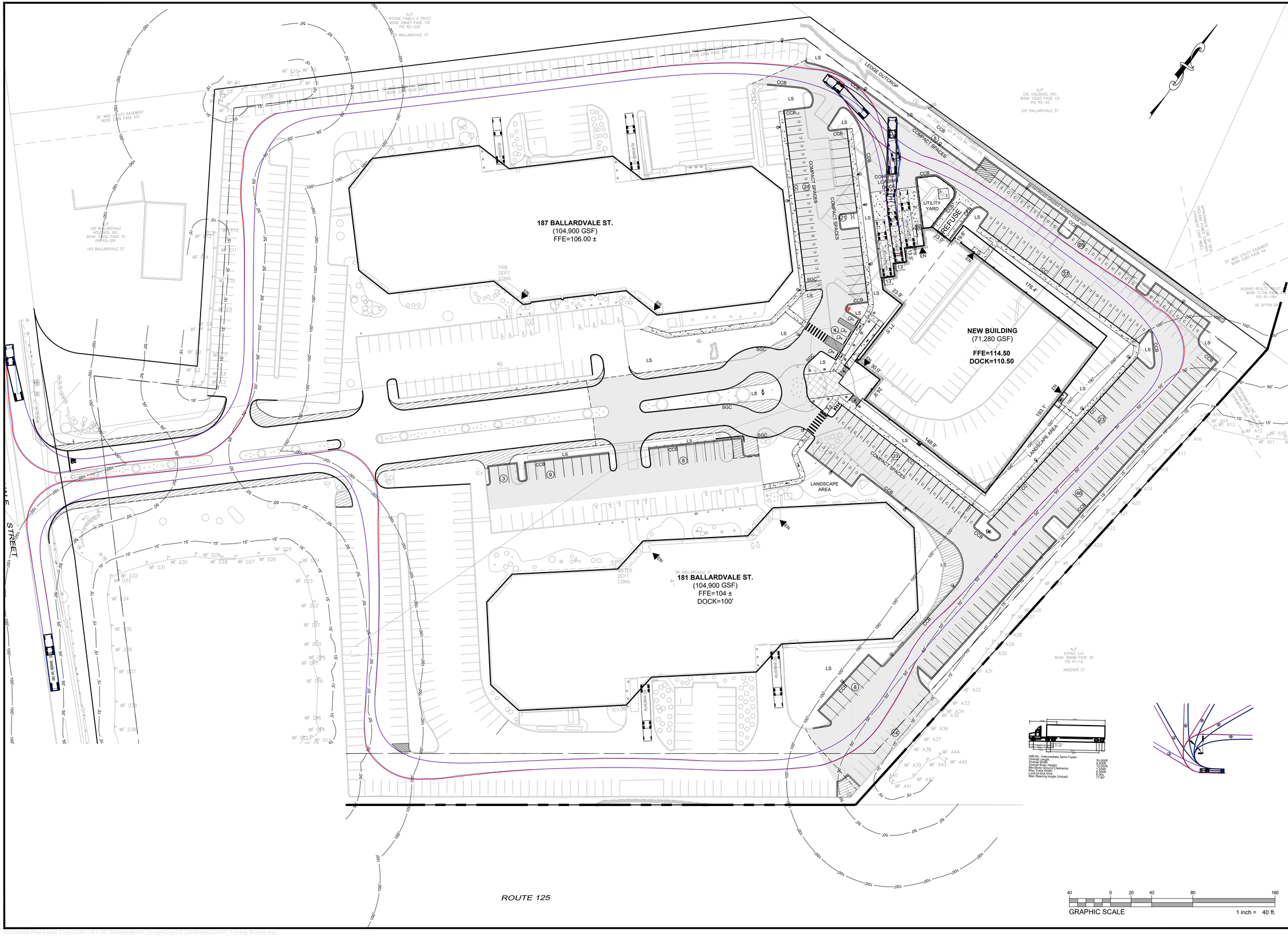
SHEET TITLE:

FIRE TRUCK
TURN PLAN #2

SHEET NUMBER:
C701

ISSUED FOR : PERMIT SET



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COMMONWEALTH OF MASSACHUSETTS
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04-22-2024

DATE APPROVED:

WILMINGTON PLANNING BOARD

OFFICE CAMPUS REUSE
LIFE SCIENCE/BIOMANUFACTURING CONVERSION

181-187 BALLARDVALE STREET
WILMINGTON, MA

OWNER/APPLICANT: BALLARDVALE OWNER, LLC

REV	DATE	DESCRIPTION
1	04.22.2024	RESPONSE TO COMMENTS #1

ISSUE TYPE:
DESIGN DEVELOPMENT

ISSUE DATE:
03/01/2024

PROJECT NUMBER:
22047

DRAWN BY: JMP

CHECKED BY: HK/NCL

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SHEET TITLE:

WB-50 TRUCK TURN PLAN

SHEET NUMBER:

C702

ISSUED FOR : **PERMIT SET**

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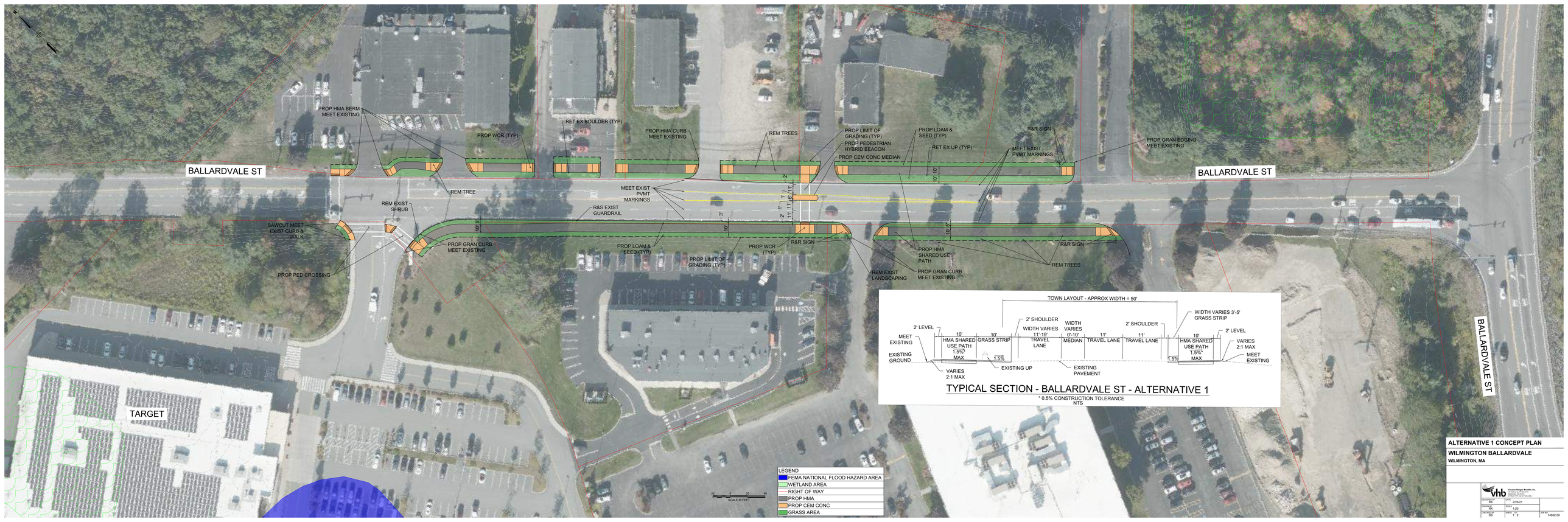
□ Improvement Plan



ALTERNATIVE 1 CONCEPT PLAN

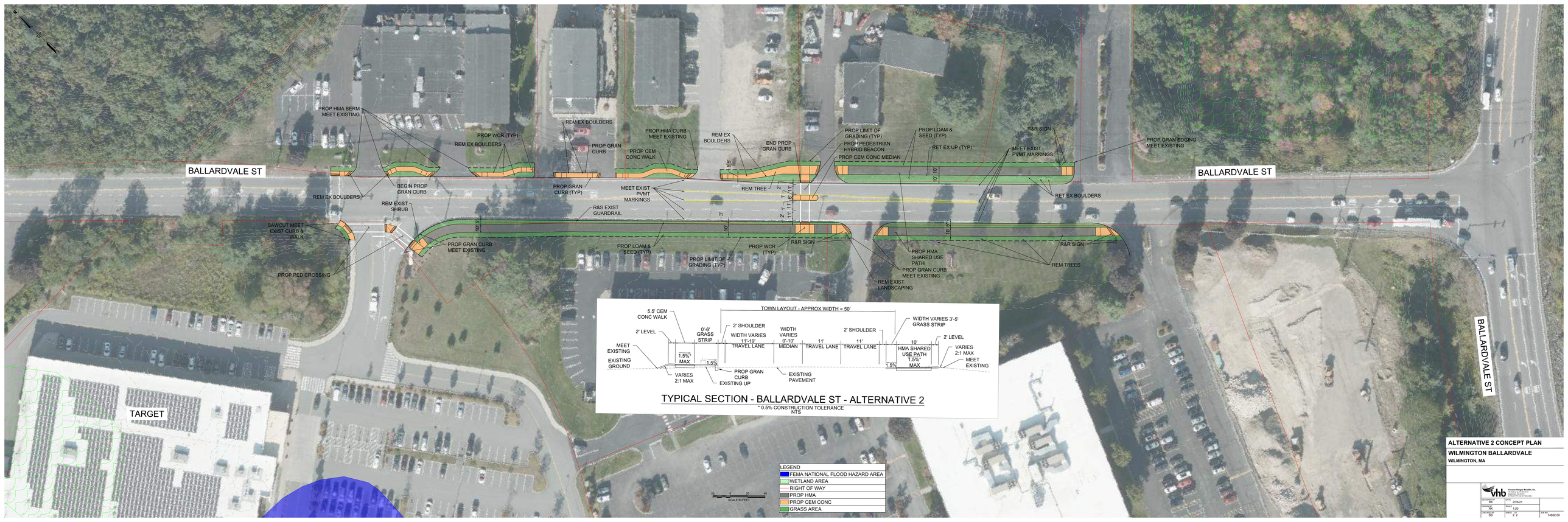
WILMINGTON BALLARDVALE

WILMINGTON, MA

vhb

Vanasse Hangen Brustlin, Inc.
101 Walnut St, PO Box 9151
Watertown, MA 02471-9151
617.924.1770 FAX 617.924.2286

DESIGNED: RK	DATE: 2/25/21		
DRAWN BY: RK	SCALE: 1:20		
CHECKED BY: SB	SHEET: 1 OF 2	JOB NO.: 14852.00	


BALLARDVALE ST
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BALLARDVALE ST
TARGET
PROP HMA BERM MEET EXISTING
REM EX BOULDERS
PROP WCR (TYP)
REM EX BOULDERS
REM EX BOULDERS
PROP GRAN CURB
PROP HMA CURB MEET EXISTING
PROP CEM CONC WALK
REM EX BOULDERS
END PROP GRAN CURB
PROP LIMIT OF GRADING (TYP)
PROP PEDESTRIAN HYBRID BEACON
PROP CEM CONC MEDIAN
PROP LOAM & SEED (TYP)
RET EX UP (TYP)
R&R SIGN
MEET EXIST PVMT MARKINGS
PROP GRAN EDGING MEET EXISTING
BEGIN PROP GRAN CURB
REM EX BOULDERS
PROP GRAN CURB (TYP)
MEET EXIST PVMT MARKINGS
REM TREE
RET EX BOULDERS
REM EXIST SHRUB
R&S EXIST GUARDRAIL
SAWCUT MEET EXIST CURB & WALK
PROP GRAN CURB MEET EXISTING
PROP LOAM & SEED (TYP)
PROP WCR (TYP)
R&R SIGN
PROP LIMIT OF GRADING (TYP)
PROP HMA SHARED USE PATH
PROP GRAN CURB MEET EXISTING
REM EXIST LANDSCAPING
R&R SIGN
REM TREES
PROP PED CROSSING
TOWN LAYOUT - APPROX WIDTH = 50'
5.5' CEM CONC WALK
2' LEVEL
MEET EXISTING
EXISTING GROUND
0'-6' GRASS STRIP
2' SHOULDER
WIDTH VARIES 11'-10'
TRAVEL LANE
WIDTH VARIES 0'-10'
MEDIAN
11' TRAVEL LANE
2' SHOULDER
11' TRAVEL LANE
WIDTH VARIES 3'-5' GRASS STRIP
10' HMA SHARED USE PATH
2' LEVEL
VARIES 2:1 MAX
MEET EXISTING
1.5%* MAX
1.5%
1.5%
1.5%* MAX
VARIES 2:1 MAX
PROP GRAN CURB EXISTING UP
EXISTING PAVEMENT
TYPICAL SECTION - BALLARDVALE ST - ALTERNATIVE 2
* 0.5% CONSTRUCTION TOLERANCE
NTS
LEGEND
FEMA NATIONAL FLOOD HAZARD AREA
WETLAND AREA
RIGHT OF WAY
PROP HMA
PROP CEM CONC
GRASS AREA
20 0 20 40
SCALE IN FEET
ALTERNATIVE 2 CONCEPT PLAN
WILMINGTON BALLARDVALE
WILMINGTON, MA
vhb
Vanasse Hangen Brustlin, Inc.
DESIGNED BY: RK
DRAWN BY: RK
CHECKED BY: SB
DATE: 2/25/21
SCALE: 1:20
SHEET: 2 OF 2
PROJECT NO.: 14852.00

□ Existing Tenant Split

181/187 Ballardvale

Tenant Name	R&D Square Feet	Office Square Feet
Viant	19,253	
Gener8	20,401	
Ledvance	20,134	
Re:Build Fikst	35,789	
Liberty Defense	9,920	
Universal Services of America	14,406	
IDEX	8,216	
XOS Technologies		6,810
Greenman Pedersen		12,110
Caretenders		5,113
Trane		22,189
Unifirst		8,275
Righter Group		3,580
Security Innovation		6,042
WB Engineering		5,465
Parker Ibrahim & Berg		2,364
Transperfect		5,058
Kuberre Systems		2,294
Total	128,119	79,300
	62%	38%

Transportation Impact Assessment

Proposed Warehouse Building
800 Salem Street
Wilmington, Massachusetts

Prepared for:

Camber Development
Boston, Massachusetts

September 2022

Prepared by:

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Dear Reviewer:

This letter shall certify that this *Transportation Impact Assessment* has been prepared under my direct supervision and responsible charge. I am a Registered Professional Engineer (P.E.) in the Commonwealth of Massachusetts (Massachusetts P.E. No. 38871, Civil) and hold Certification as a Professional Traffic Operations Engineer (PTOE) from the Transportation Professional Certification Board, Inc. (TPCB), an independent affiliate of the Institute of Transportation Engineers (ITE) (PTOE Certificate No. 993). I am also a Fellow of the Institute of Transportation Engineers (FITE).

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Managing Partner

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EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a warehouse building to be located at 800 Salem Street (Route 62) in Wilmington, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the Town of Wilmington and the Massachusetts Department of Transportation (MassDOT), and was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

An end user for the proposed warehouse building has not been determined and, as such, the trip estimates for the Project have been evaluated using a warehouse type that results in the highest overall trip estimates for the Project in order to provide conservative (high) traffic volumes from which to assess the potential impact of the Project on the transportation infrastructure.

Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] for a trip intensive warehouse use (general warehousing in this case), the Project is expected to generate approximately 414 vehicle trips on an average weekday (two-way, volume over the operational day of the Project), consisting of 270 passenger car trips and 144 truck trips. During the weekday morning peak-hour, the Project is expected to generate 52 vehicle trips, consisting of 47 passenger car trips and 5 truck trips. During the weekday evening peak-hour, the Project is expected to generate 55 vehicle trips, consisting of 48 passenger car trips and 7 truck trips;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over anticipated future conditions without the Project (No-Build condition), acknowledging that one or more movements at the study area intersections are currently operating or are predicted to operate at or over capacity (i.e., level-of-service (LOS) "E" or "F", respectively) independent of the Project;

[1] *Trip Generation*, 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

3. Independent of the Project, left-turn movements from the I-93 north and southbound off-ramps to Route 62 were identified to be operating over capacity (i.e., LOS "F") during both peak hours under 2022 Existing conditions, with Project-related impacts on these movements generally defined as an increase in average motorist delay that resulted in an increase in vehicle queuing of up to one (1) vehicle;

4. All movements exiting the Project site driveways are predicted to operate at LOS D or better during the peak hours with negligible vehicle queuing;

5. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study intersections; and

6. Lines of sight at the Project site driveway intersections with Route 62 were found to meet or exceed, or could be made to meet or exceed the recommended minimum sight distance to function in a safe manner based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the Project site will be provided by way of two driveways configured as follows: a full-access driveway that will intersect the north side of Route 62 approximately 90 feet east of the existing westerly driveway that serves the Project site and a full-access driveway that will intersect the north side of Route 62 approximately 80 feet west of the easterly property line. The existing driveways (three (3)) that serve the Project site will be closed in conjunction with the Project and will result in a net reduction of one (1) driveway along the Route 62 corridor and the elimination of the associated conflicts with vehicles, pedestrians and bicyclists. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveways and internal circulating aisles should be 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle and a large tractor semi-trailer combination (WB-67 design vehicle).

- Where perpendicular parking is proposed within the employee parking areas, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.

- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided. STOP-signs and marked STOP-lines should also be provided at intersections located within the Project site.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[2]

- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided at pedestrian crossings that are to be constructed or modified in conjunction with the Project.

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveways should be designed and maintained so as not to restrict lines of sight.

- Trees and vegetation located along the north side of Route 62 within the sight triangle areas of the Project site driveways should be trimmed or removed and maintained in order to provide the necessary sight lines for safe operation. In addition, the large stone located within the sight triangle area of the east Project site driveway should also be removed.

- Snow accumulation (windrows) within sight triangle areas of the Project site driveways should be promptly removed where such accumulations would impede sight lines.

Off-Site

Route 62 at Woburn Street

Independent of the Project, the Woburn Street approaches to Route 62 are predicted to operate over capacity (i.e., LOS "F") during the weekday morning peak-hour under 2029 No-Build conditions. In an effort to off-set the predicted impact of the Project and to reduce motorist delays and vehicle queueing, the Project proponent will design and implement an optimal traffic signal timing and phasing plan for the intersection. With the implementation of an optimal traffic signal and phasing plan, intersection overall intersection operations will improve from LOS F to LOS D during the weekday morning peak-hour and no movement or approach will operate below LOS E, an improvement over No-Build conditions. All movements at the intersection will continue to operate at LOS D or better during the weekday evening peak-hour. These improvements will be completed prior to the issuance of a Certification of Occupancy for the Project, subject to the receipt of all necessary rights, permit and approvals.

Route 62 at the I-93 Ramps

Independent of the Project, left-turn movements from the I-93 off-ramps (north and southbound) to Route 62 are currently operating over capacity with extended vehicle queueing (up to 28 vehicles), with conditions expected to worsen in the future. The addition of Project-related traffic to the intersections was shown to result in a predicted increase in average motorist delay during the peak hours that resulted in a corresponding increase in vehicle queueing of up to two (2) vehicles. In order to assist the Town and MassDOT to advance improvements along Route 62 within the I-93 interchange area that are desirable independent of the Project, the Project proponent will prepare a Functional Design Report (FDR) and accompanying concept plans to identify potential improvement strategies for the ramp intersections. The FDR and concept plans will be provided to the Town prior to the issuance of a Certificate of Occupancy for the Project.

[2] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided within the study area or to the Project site. In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures are under consideration as a part of the Project:

- A transportation coordinator will be assigned for the Project to coordinate the TDM program;
- The transportation coordinator will facilitate a rideshare matching program for employees to encourage carpooling;
- A "welcome packet" will be provided to employees detailing the contact information for the transportation coordinator and information to enroll in the employee rideshare program;
- Specific amenities will be provided to discourage off-site trips, including providing a break-room equipped with a microwave and refrigerator; offering direct deposit of paychecks; allowing telecommuting or flexible work schedules; and other such measures to reduce overall traffic volumes and travel during peak-traffic-volume periods;
- Prioritization will be given to local hirings and an effort to reduce traffic volume increases outside of the local area;
- Pedestrian accommodations will be incorporated within the Project site to link the employee parking areas to the warehouse building; and
- Secure bicycle parking will be provided at an appropriate location within the Project site.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a warehouse building to be located at 800 Salem Street (Route 62) in Wilmington, Massachusetts (hereafter referred to as the Project). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Route 62 and at major intersections located along this roadway through which Project-related traffic will travel.

PROJECT DESCRIPTION

The Project will entail the construction of a 237,880± square foot (sf) warehouse building to be located at 800 Salem Street in Wilmington, Massachusetts. The Project site encompasses approximately 28± acres of land that is generally bounded by a materials processing yard, wetlands, and areas of open and wooded space to the north; Route 62 to the south; Route 62 and a materials processing yard to the east; and wetlands and areas of open and wooded space to the west. The Project site currently contains a materials processing yard and associated appurtenances that will be removed to accommodate the Project. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of two driveways configured as follows: a full-access driveway that will intersect the north side of Route 62 approximately 90 feet east of the existing westerly driveway that serves the Project site and a full-access driveway that will intersect the north side of Route 62 approximately 80 feet west of the easterly property line. The existing driveways (three (3)) that serve the Project site will be closed in conjunction with the Project and will result in a net reduction of one (1) driveway along the Route 62 corridor and the elimination of the associated conflicts with vehicles, pedestrians and bicyclists.

The Project will include the construction of 322 parking spaces for employees and visitors, 45 loading bays that can accommodate a similar number of tractor semi-trailer combinations or trailers without tractors, and 29 trailer storage spaces (396 spaces total). The employee/visitor

Figure 1

Site Location Map

Vanasse & Associates inc

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parking (322 parking spaces) meets the requirements of Section 6.4.1.1, *Schedule of Uses*, of the Wilmington Zoning Bylaw[3].

STUDY METHODOLOGY

This study was prepared in consultation with the Massachusetts Department of Transportation (MassDOT) and the Town of Wilmington; was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; public transportation services; observations of traffic flow; and collection of daily and peak-period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for analyses consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

[3]The Zoning Bylaw requires a minimum of 1.0 parking spaces for each 300 sf of floor area devoted to office use (11,894 sf is proposed) and a minimum of 1.0 parking spaces for each 800 sf of floor area devoted to industrial use (225,986 sf is proposed), which would require a total of 322 parking spaces.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in March, April and May 2022. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Salem Street (Route 62), and the following specific intersections through which Project-related traffic will travel: Route 62 at the Interstate 93 (I-93) southbound ramps; Route 62 at the I-93 northbound ramps; and Route 62 at Woburn Street.

The following describes the study area roadways and intersections.

ROADWAY

Salem Street/Lowell Road (Route 62)

- Two-lane urban minor arterial roadway under Town jurisdiction with the exception of the segment of Salem Street between Middlesex Avenue and Woburn Street where the roadway is under MassDOT jurisdiction;
- Traverses the study area in a general east-west direction, becoming Lowell Road at the North Reading town line;
- Provides two 11 to 13-foot wide travel lanes that are separated by a double-yellow centerline with 1 to 2-foot wide marked shoulders in the vicinity of the Project site and additional travel lanes are provided at major intersections;
- The posted speed limit is 35 miles per hour (mph) eastbound and 40 mph westbound in the vicinity of the Project site;
- A sidewalk is provided along the north side of Salem Street easterly to a point approximately 600 feet east of Woburn Street and along south side between the driveway to 471 Salem Street westerly to Woburn Street;
- Illumination is provided by way of streetlights mounted on wood poles; and
- Land use within the study area consists of the Project site, residential and commercial properties, and areas of open and wooded space.

INTERSECTIONS

Table 1 and Figure 2 summarize lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in April and May 2022.

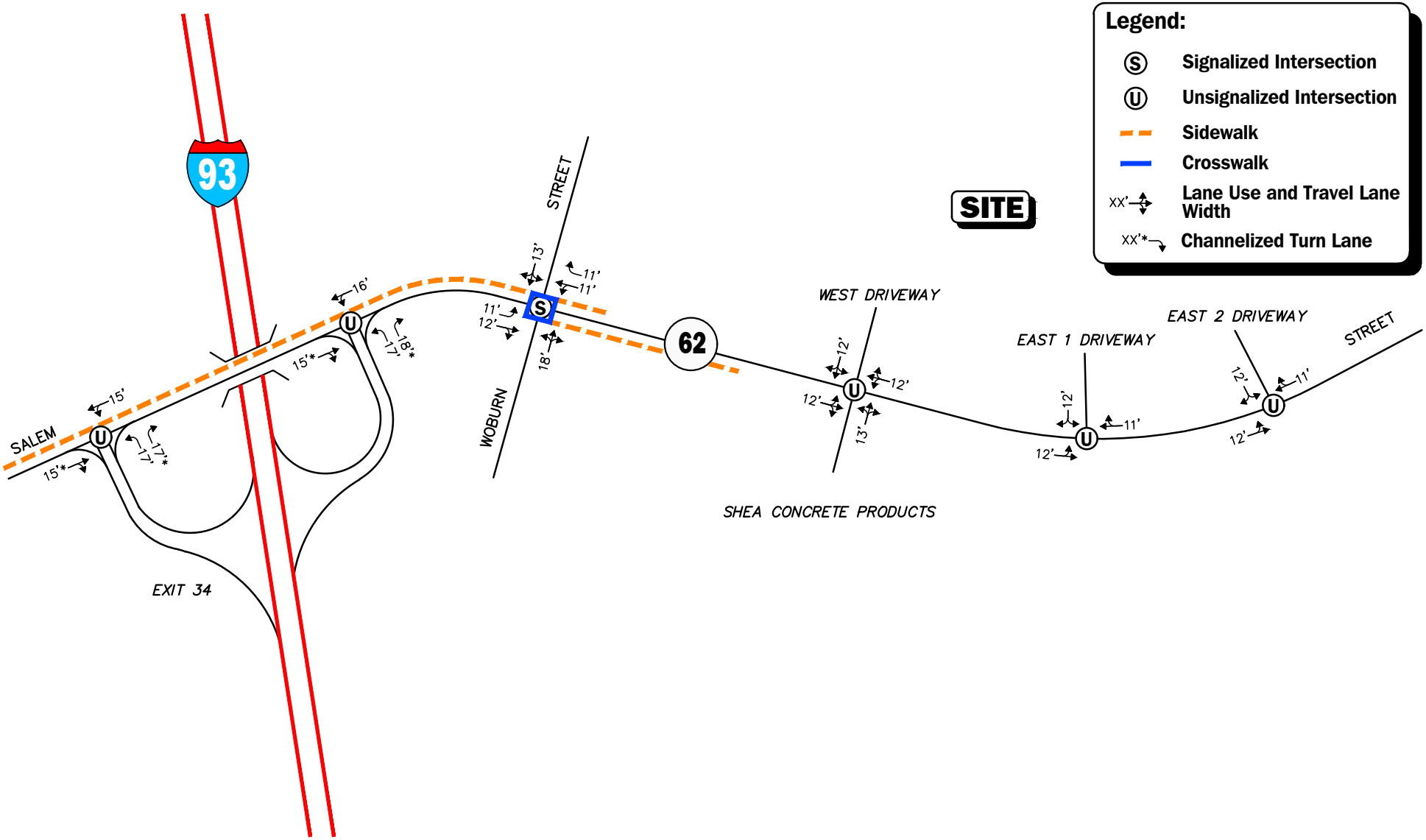
Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Route 62/ I-93 SB Ramps	S	1 general-purpose travel lane on all approaches with northbound and eastbound right-turns exiting prior to the intersection by way of channelized right-turn lanes	Yes; 3 to 10 feet on Route 62 and 2 to 3 feet on the I-93 ramps	Yes; sidewalk along the north side of Route 62	Yes; Shared-traveled-way on Route 62[b]
Route 62/ I-93 NB Ramps	S	1 general-purpose travel lane on all approaches with northbound and eastbound right-turns exiting prior to the intersection by way of channelized right-turn lanes	Yes; 3 to 8 feet on Route 62 and 2 feet on the I-93 ramps	Yes; sidewalk along the north side of Route 62	Yes; Shared-traveled-way on Route 62
Route 62/ Woburn St.	TS	1 general-purpose travel lane on Woburn St. approaches; 1 left-turn lane and 1 through/ right-turn lane on Route 62 eastbound approach; 1 left-turn/ through lane and 1 right-turn lane on Route 62 westbound approach	Yes; 2 to 6 feet on all approaches	Yes; sidewalks provided along the north side of Route 62 east and west of the intersection and along the south side to the east; crosswalks are provided for crossing all legs; pedestrian traffic signal equipment and phasing (exclusive) provided	Yes; Shared-traveled-way on all approaches

[a]S = STOP-sign control; TS = Traffic Signal control.
[b]Combined shoulder and travel lane width equal to or exceed 14 feet.

TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs), and vehicle classification counts were completed in March 2022. The ATR counts were conducted on March 23rd through 24th, 2022 (Wednesday through Thursday, inclusive) on Route 62 in the vicinity of the Project site in order to record weekday traffic conditions over an extended period, with weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak-period TMCs performed at the study area intersections on March 23, 2022 (Wednesday), and on March 29, 2022 (Tuesday). These time periods were selected for analysis purposes as they are representative of the peak-traffic-volume hours for both the Project and the adjacent roadway network.



Not To Scale

Figure 2

Existing Intersection Lane Use, Travel Lane Width, and Pedestrian Facilities

Vanasse & Associates inc

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Traffic-Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic-volume data from MassDOT Continuous Count Station No. 5127 located on the Andover Bypass in Andover was reviewed.[4] Based on a review of this data, it was determined that traffic volumes during the month of March are approximately 5.4 percent *below* average-month conditions. As such, the March traffic volumes were adjusted upward by 5.4 percent in order to be representative of average-month conditions.

In order to account for the impact on traffic volumes and trip patterns resulting from the COVID-19 pandemic, traffic-volume data collected at MassDOT Continuous Count Station No. 4096, located on I-93 north of Route 129 in Wilmington, in March 2022 was compared to data collected at the same count station in March 2017. The 2017 traffic volumes were expanded to 2019 by applying the traffic growth procedure detailed in the April 2020 "Guidance on Traffic Counting Data" published by MassDOT[5] in order to allow for a comparison of the data. Based on this pre- and post-COVID-19 traffic-volume comparison, the March traffic-volume data that was collected as part of this assessment was found to be approximately 1.9 percent *below* the conditions that existed prior to the COVID-19 pandemic. As such, the seasonally adjusted March traffic volumes were adjusted upward by an additional 1.9 percent.

The 2022 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figures 3 and 4, respectively. Note that the peak-hour traffic volumes presented in Table 2 were obtained from aforementioned figures.

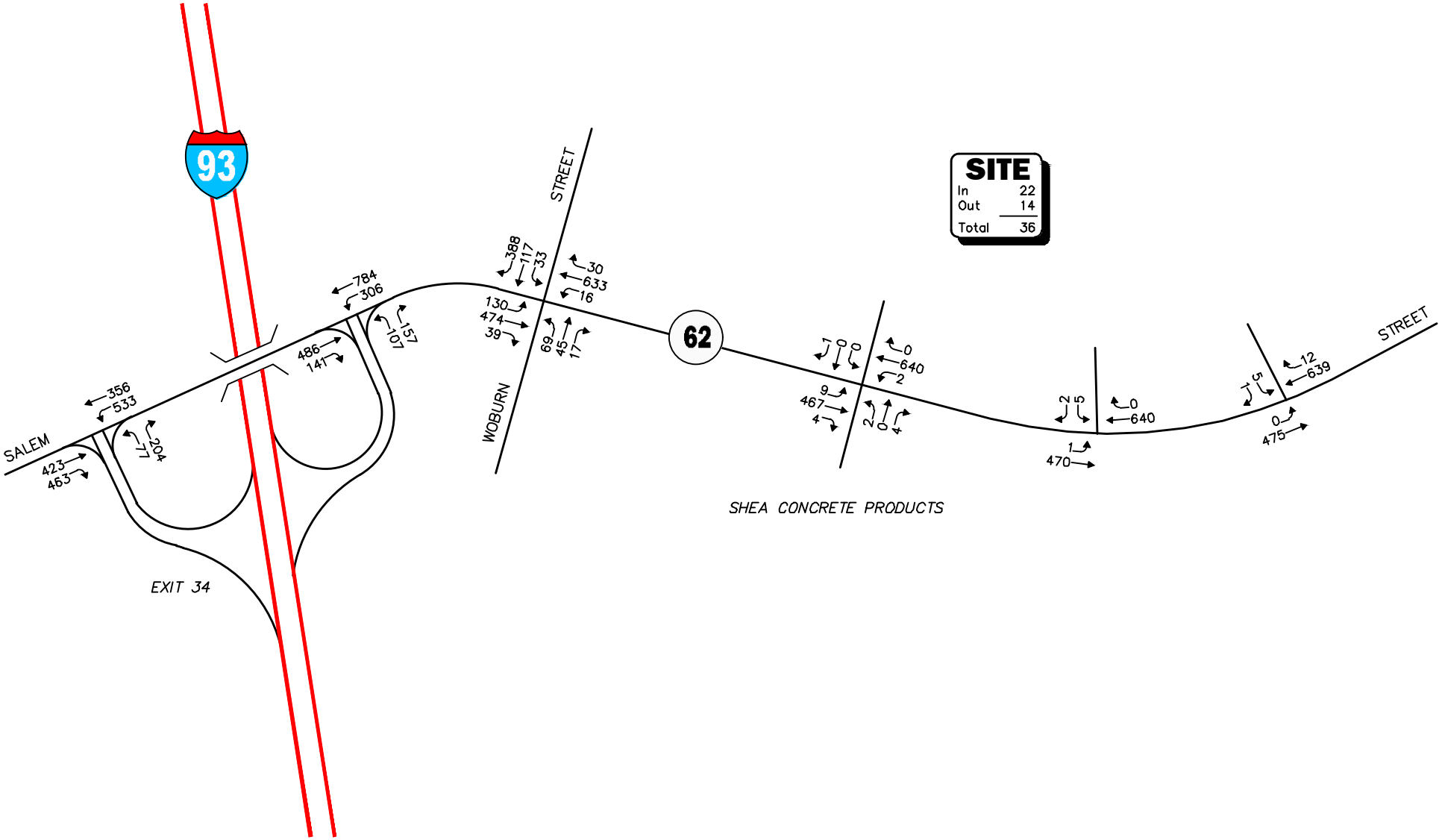
Table 2
2022 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Route 62, west of the Shea Concrete Driveway:	14,130	--	--	--
Weekday Morning (7:00 – 8:00 AM)	--	1,123	7.9	57.3% WB
Weekday Evening (4:30 – 5:30 PM)	--	1,260	8.9	57.6% EB

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak hour.
[d]Percent traveling in peak direction.
EB = eastbound, WB = westbound.

As can be seen in Table 2, Route 62 in the vicinity of the Project site was found to accommodate approximately 14,130 vehicles on an average weekday (two-way, 24-hour volume), with approximately 1,123 vehicles per hour (vph) during the weekday morning peak-hour and 1,260 vph during the weekday evening peak-hour.

[4]MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2022.
[5]*Guidance on Traffic Counting Data*; MassDOT; revised April 2020.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 3

2022 Existing
Weekday Morning
Peak-Hour Traffic Volumes

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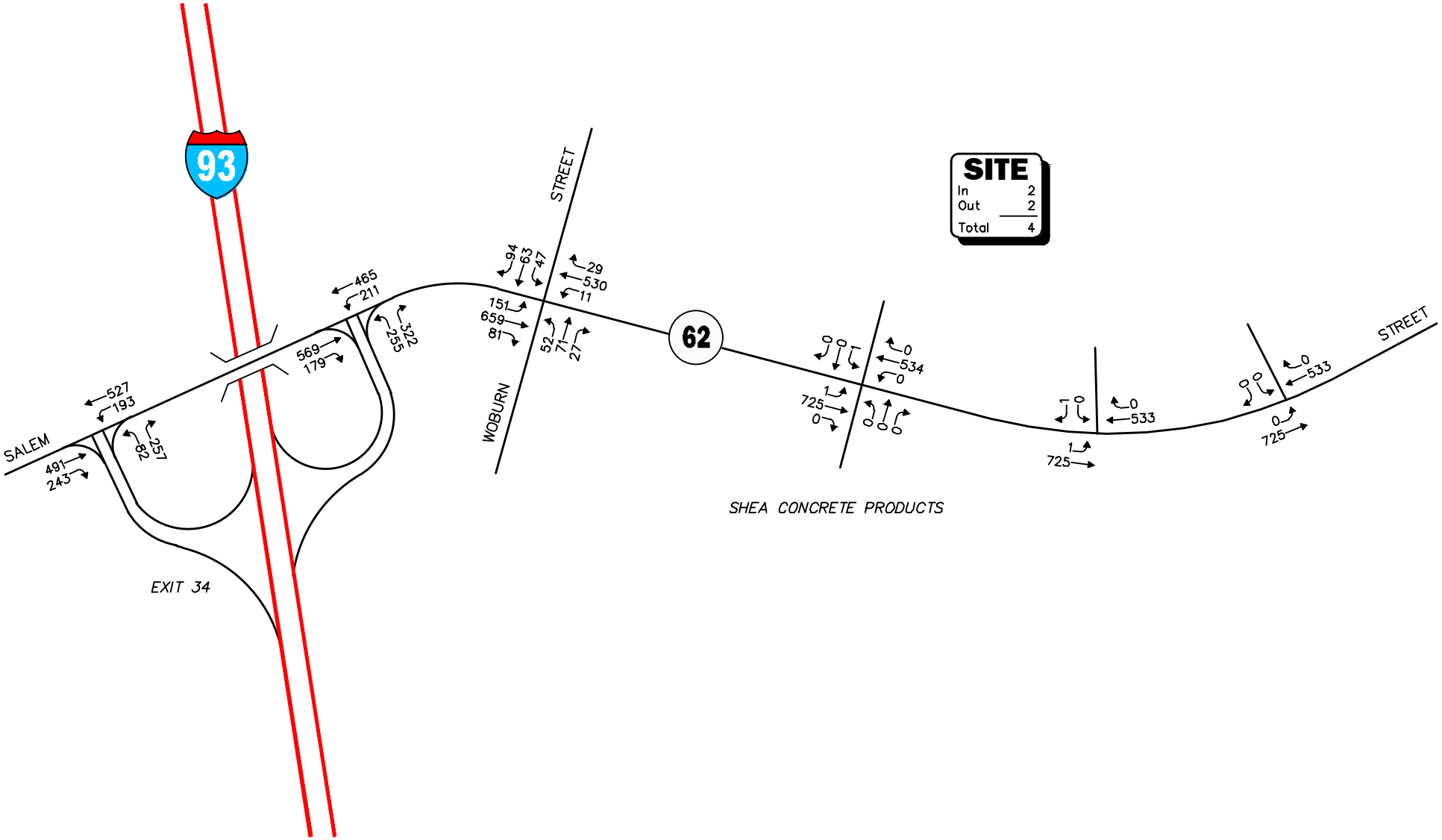

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 4

2022 Existing
Weekday Evening
Peak-Hour Traffic Volumes

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PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in April and May 2022. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadway and at the study intersections, as well as the location of existing and planned future bicycle facilities. As detailed on Figure 2, a sidewalk is provided along the north side of Salem Street easterly to a point approximately 600 feet east of Woburn Street and along south side between the driveway to 471 Salem Street westerly to Woburn Street. Marked crosswalks are provided for crossing all legs of the Route 62/ Woburn Street intersection, with pedestrian traffic signal equipment and phasing (exclusive) provided.

Formal bicycle facilities are not currently provided along the study area roadways; however, Route 62 and Woburn Street provide sufficient width (combined travel lane and shoulder) on a continuous basis to support bicycle travel in a shared traveled-way configuration.[6]

PUBLIC TRANSPORTATION

Regularly scheduled public transportation services are provided to the Town of Wilmington, but are not currently available at the Project site. The closest public transportation services to the Project site are provided by the Massachusetts Bay Transportation Authority (MBTA), which provides Commuter Rail service to North Station in Boston on the Haverhill Line from North Wilmington Station, which is located at 370 Middlesex Avenue (Route 62), approximately 1.6 miles southwest of the Project site. In addition, paratransit services are provided for eligible persons who cannot use fixed-route bus services all or some of the time due to a physical, cognitive, or mental disability in compliance with the Americans with Disabilities Act (ADA) by the MBTA (the RIDE) and the Lowell Regional Transit Authority (LRTA) (Road Runner).

SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Route 62 in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Route 62	
	Eastbound	Westbound
Mean Travel Speed (mph)	39	40
85th Percentile Speed (mph)	43	45
Posted Speed Limit (mph)	35	40

mph = miles per hour.

[6] A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

As can be seen in Table 3, the mean vehicle travel speed along Route 62 in the vicinity of the Project site was found to be 39 mph in eastbound direction and 40 mph westbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 43 mph in the eastbound direction and 45 mph westbound, which is 5 to 8 mph above the posted speed limit (35/40 mph) at the Project site. The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances and is often used in establishing posted speed limits.

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2015 through 2019, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 4.

Based on a review of this data, no (0) motor vehicle crashes were reported to have occurred along Route 62 at the two (2) east driveways that serve the Project site over the five-year review period. The remaining study area intersections were found to have experienced an average of 4.0 or fewer reported motor vehicle crashes per year over the five-year review period and were found to have motor vehicle crash rates *below* the MassDOT statewide and District average crash rates for similar intersections for the MassDOT Highway Division District in which the intersections are located (District 4). The majority of the reported crashes occurred on a weekday; under clear weather conditions; during daylight; and involved angle-type collisions that resulted in property damage only.

A review of the MassDOT statewide High Crash Location List indicated that there are no locations within the study area or along Route 62 in the Town of Wilmington that are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as high crash locations. In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

The detailed MassDOT Crash Rate Worksheets are provided in the Appendix.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Route 62/ I-93 Southbound Ramps	Route 62/ I-93 Northbound Ramps	Route 62/ Woburn Street	Route 62/ West Project Site Driveway/ Shea Concrete Driveway
Traffic Control Type[b]	U	U	S	U
Year:				
2015	1	4	3	1
2016	4	4	5	2
2017	3	5	5	0
2018	2	4	2	2
2019	4	3	3	0
Total	14	20	18	5
Average	2.80	4.00	3.60	1.00
Rate[c]	0.35	0.49	0.49	0.20
MassDOT Crash Rate:[d]	0.57/0.57	0.57/0.57	0.73/0.78	0.57/0.57
Significant?[e]	No	No	No	No
Type:				
Angle	8	12	7	0
Rear-End	4	5	7	2
Head-On	1	1	0	0
Sideswipe	1	0	2	1
Fixed Object	0	2	2	0
Pedestrian/Bicycle	0	0	0	0
Unknown/Other	0	0	0	2
Total	14	20	18	5
Conditions:				
Clear	11	15	7	4
Cloudy	3	4	3	0
Rain	0	1	7	0
Fog/Smog/Smoke	0	0	0	0
Snow/Ice	0	0	1	1
Total	14	20	18	5
Lighting:				
Daylight	12	18	12	3
Dawn/Dusk	0	0	1	0
Dark (Road Lit)	2	0	5	2
Dark (Road Unlit)	0	2	0	0
Total	14	20	18	5
Day of Week:				
Monday through Friday	10	18	12	4
Saturday	2	1	3	1
Sunday	2	1	3	0
Total	14	20	18	5
Severity:				
Property Damage Only	8	13	13	4
Personal Injury	6	7	4	1
Fatality	0	0	0	0
Unknown	0	0	1	0
Total	14	20	18	5

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2015 through 2019.
[b]Traffic Control Type: S = Signalized; U = unsignalized.
[c]Crash rate per million vehicles entering the intersection.
[d]Districtwide/Statewide crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 4).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2029, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2029 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2029 No-Build traffic volumes to reflect 2029 Build traffic-volume conditions with the Project.

FUTURE TRAFFIC GROWTH

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic; however, potential population growth and development external to the study area would not be accounted for in the resulting traffic projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

Specific Development by Others

The Planning Departments of the Towns of Wilmington and North Reading were contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on this consultation, the following projects were identified for review in conjunction with this assessment:

- ***Proposed Multifamily Residential Development, Middlesex Avenue/Jefferson Road, Wilmington, Massachusetts.*** This project entails the construction of approximately 108± multifamily residential units to be generally situated in the northeast corner of the Middlesex Avenue/Jefferson Road intersection to the southwest of the Project site. Traffic

volumes associated with this project within the study area were obtained from the traffic study prepared for the project and were incorporated into the future conditions traffic volumes.[7]

- ***Proposed Age-Restricted (55+) Condominiums, 104 Lowell Road (Route 62), North Reading, Massachusetts.*** This project entails the construction of approximately 450± age-restricted (55+) condominiums to be located at 104 Lowell Road to the east of the Project site. Traffic volumes associated with this project within the study area were obtained from the traffic study prepared for the project and were incorporated into the future conditions traffic volumes.[8]

No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate (discussion follows).

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations located in Wilmington, Andover, Tewksbury, and Woburn were reviewed in order to determine general traffic growth trends in the area. This data indicates that traffic volumes have fluctuated over the past several years (2015 to 2019), with the average growth rate found to be approximately 0.70 percent. In order to provide a prudent planning condition for the Project, a slightly higher 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

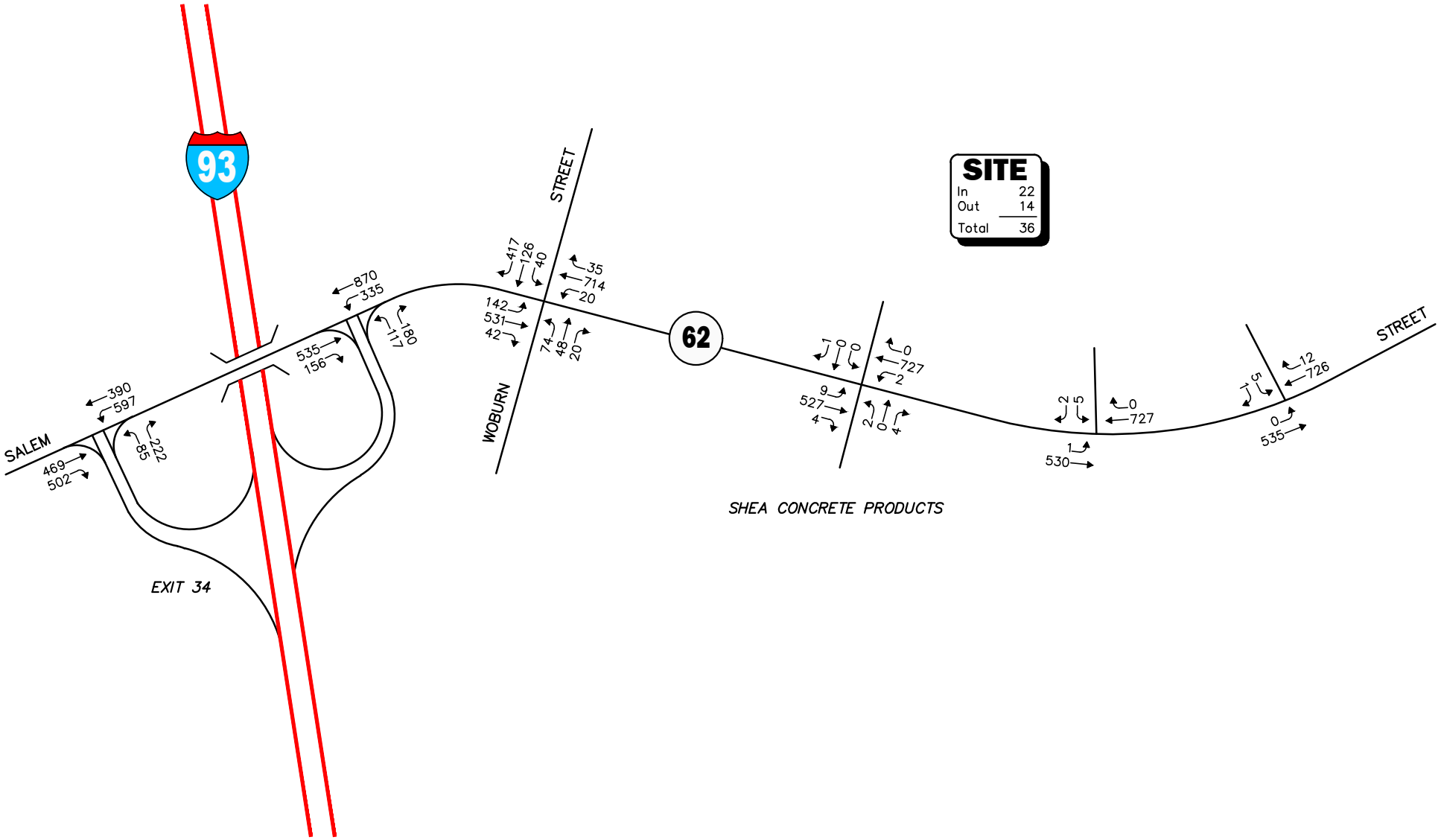
MassDOT and the Town of Wilmington were consulted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2029 within the study area. Based on these discussions, no future roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

No-Build Traffic Volumes

The 2029 No-Build condition peak-hour traffic volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2022 Existing peak-hour traffic volumes and then adding the peak-hour traffic volumes associated with the identified specific development projects by others (Jefferson Road Residential development and 104 Lowell Road Condominiums). The resulting 2029 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 5 and 6, respectively.

[7] *Transportation Impact Assessment*, Proposed Multifamily Residential Development, Wilmington, Massachusetts; VAI; May 4, 2020.

[8] *Traffic Impact Assessment*, Proposed Age-Restricted (55+) Condominiums, North Reading, Massachusetts; MDM; December 21, 2020.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 5

2029 No-Build
Weekday Morning
Peak-Hour Traffic Volumes

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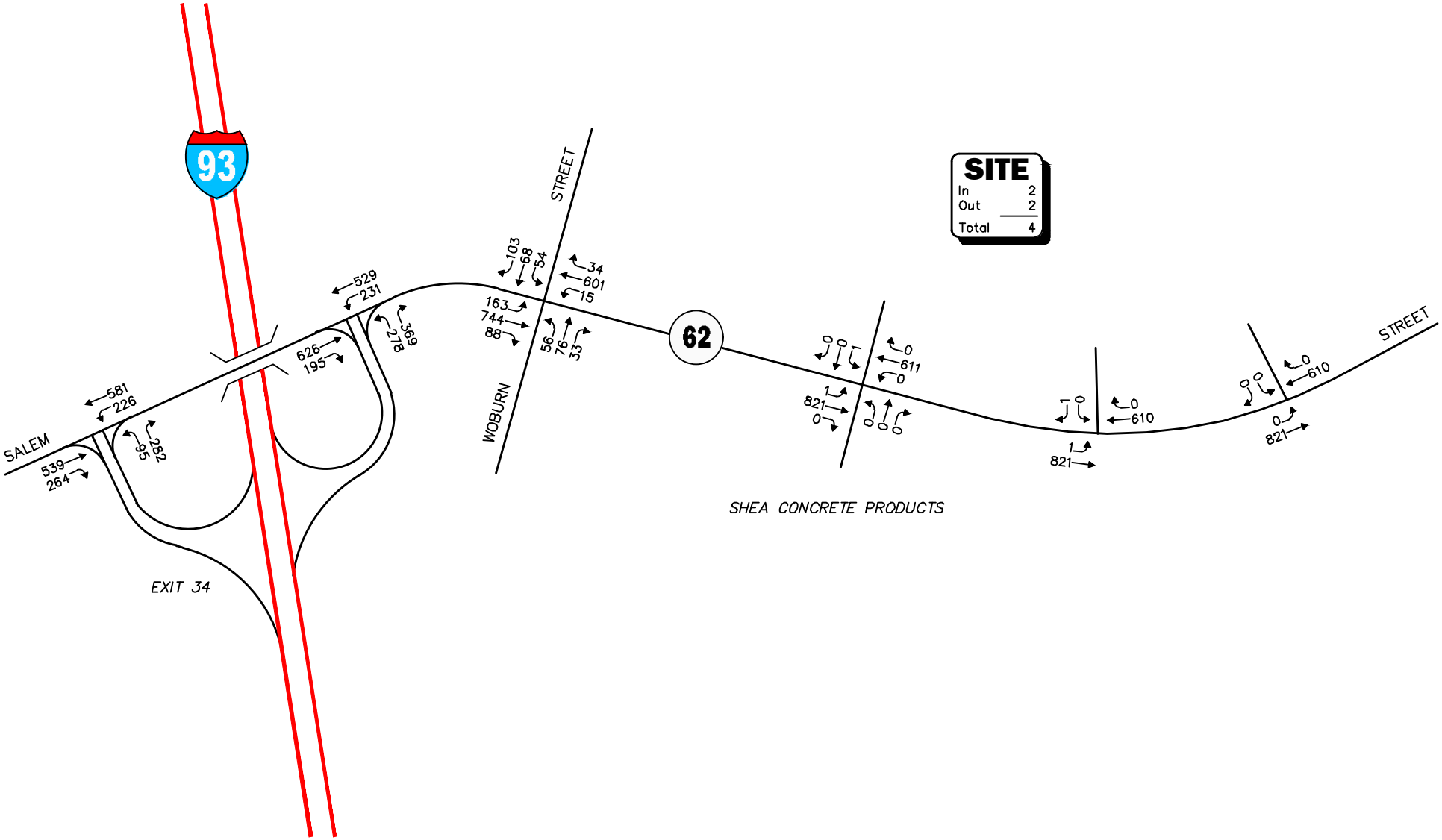

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 6

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2029 No-Build
Weekday Evening
Peak-Hour Traffic Volumes

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PROJECT-GENERATED TRAFFIC

Design year (2029 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 237,880± sf warehouse building. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE[9] for various warehouse uses were reviewed, including those for a general warehouse and both sortation and non-sortation type warehouses. Based on this review and the relative size of the warehouse building, ITE Land Use Code (LUC) 150, *Warehousing*, was used to develop the traffic characteristics of the Project as this use produced higher overall traffic volumes for the Project vs. the use of trip-generation data for a non-sortation warehouse given that an end user of the warehouse buildings has not been identified; the sortation-type warehouse produced a disproportionate volume of traffic in relation to the overall size of the buildings that are proposed. The resulting traffic volumes are summarized in Table 5 and have been disseminated into passenger car trips and truck trips.

Table 5
TRIP-GENERATION SUMMARY[a]

Time Period/Direction	(A) Passenger Car Trips	(B) Truck Trips	(C = A+B) Vehicle Trips
Average Weekday Daily:			
Entering	135	72	207
Exiting	135	72	207
Total	270	144	414
Weekday Morning Peak Hour:			
Entering	38	2	40
Exiting	9	3	12
Total	47	5	52
Weekday Evening Peak Hour:			
Entering	11	4	15
Exiting	37	3	40
Total	48	7	55

[a]Based on ITE LUC 150, *Warehousing; 237,880 sf.*

Project-Generated Traffic Volume Summary

As can be seen in Table 5, using the higher trip rates associated with a general warehouse, the Project is expected to generate 414 vehicle trips on an average weekday (two-way volume over the operational day of the Project, or 207 vehicles entering and 207 exiting), consisting of 270 passenger car (employee) trips and 144 truck trips. During the weekday morning peak hour,

[9]Ibid 1.

the Project is expected to generate 52 vehicle trips (40 vehicles entering and 12 exiting), consisting of 47 passenger car trips and 5 truck trips. During the weekday evening peak hour, the Project is expected to generate 55 vehicle trips (15 vehicles entering and 40 exiting), consisting of 48 passenger car trips and 7 truck trips.

TRIP DISTRIBUTION AND ASSIGNMENT

Given the differing nature of the trips associated with the Project, separate trip-distribution patterns were created for employee trips and truck trips. The employee trip-distribution pattern was developed based on a review of Journey-to-Work data for persons employed in the Town of Wilmington obtained from the U.S. Census and then refined based on the location of major population centers in the area and existing traffic patterns. The truck trip-distribution pattern was determined based on the location of connections of the Interstate Highway System (IHS). Figures 7 and 8 depict the resulting trip-distribution pattern for employees and trucks, respectively. The additional passenger vehicle traffic expected to be generated by the Project was assigned on to the study area roadway network as shown on Figures 9 and 10 for the weekday morning and evening peak hours, respectively, and the additional truck traffic expected to be generated by the Project was assigned onto the study area roadway network as shown on Figures 11 and 12 for the weekday morning and evening peak hours, respectively.

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2029 Build condition traffic volumes were developed by: i) removing the traffic volumes associated with the existing use that occupies the Project site and that will be removed to accommodate the Project from the 2029 No-Build peak-hour traffic volumes; and ii) adding the peak-hour traffic volumes that are expected to be generated by the Project. The 2029 Build weekday morning and evening peak-hour traffic volumes are graphically depicted on Figures 13 and 14, respectively.

A summary of peak-hour projected traffic-volume changes outside of the study area that is the subject of this assessment is shown in Table 6. These changes are a result of the construction of the Project.

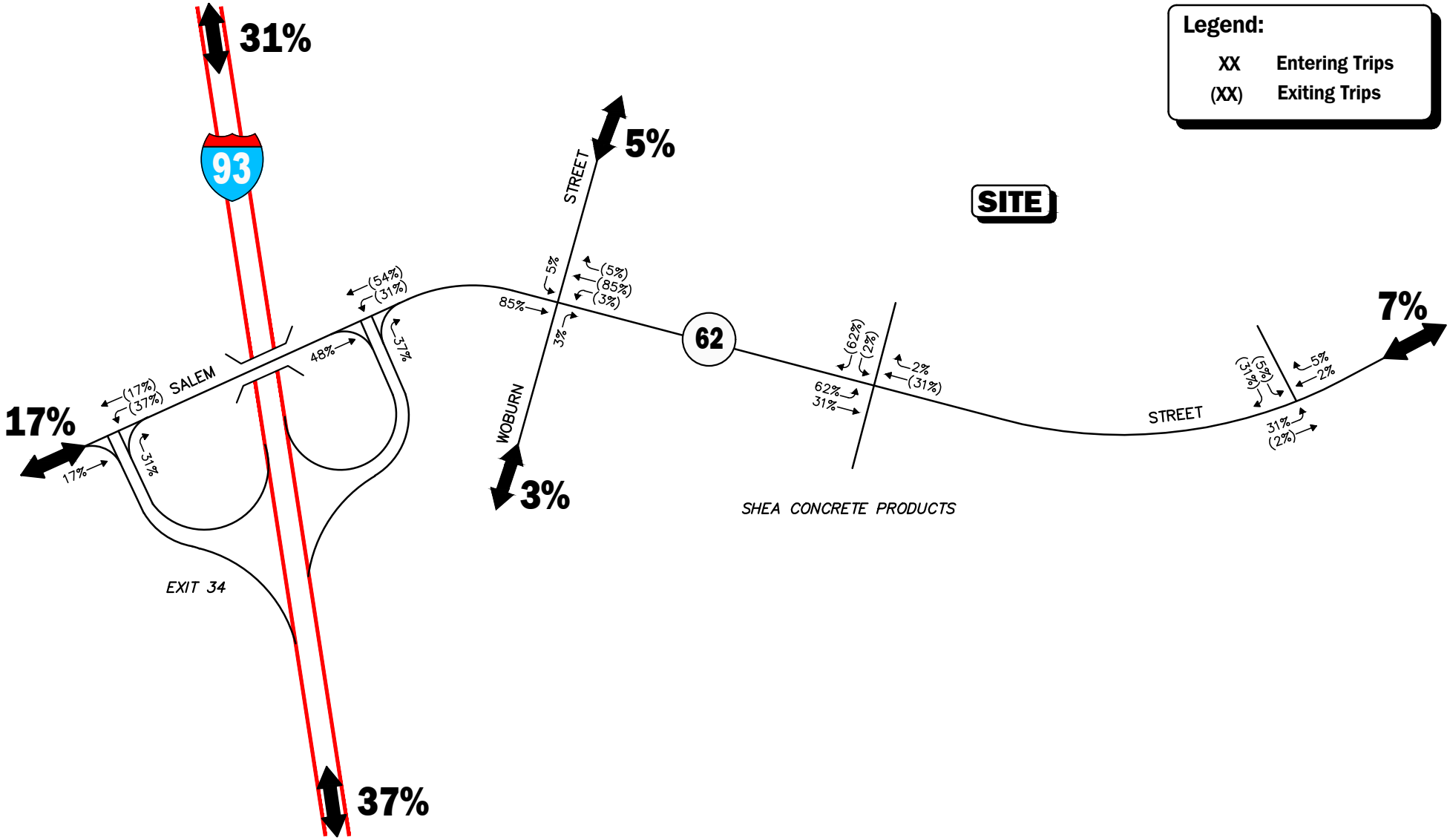

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Figure 7

Passenger Car
Trip Distribution Map

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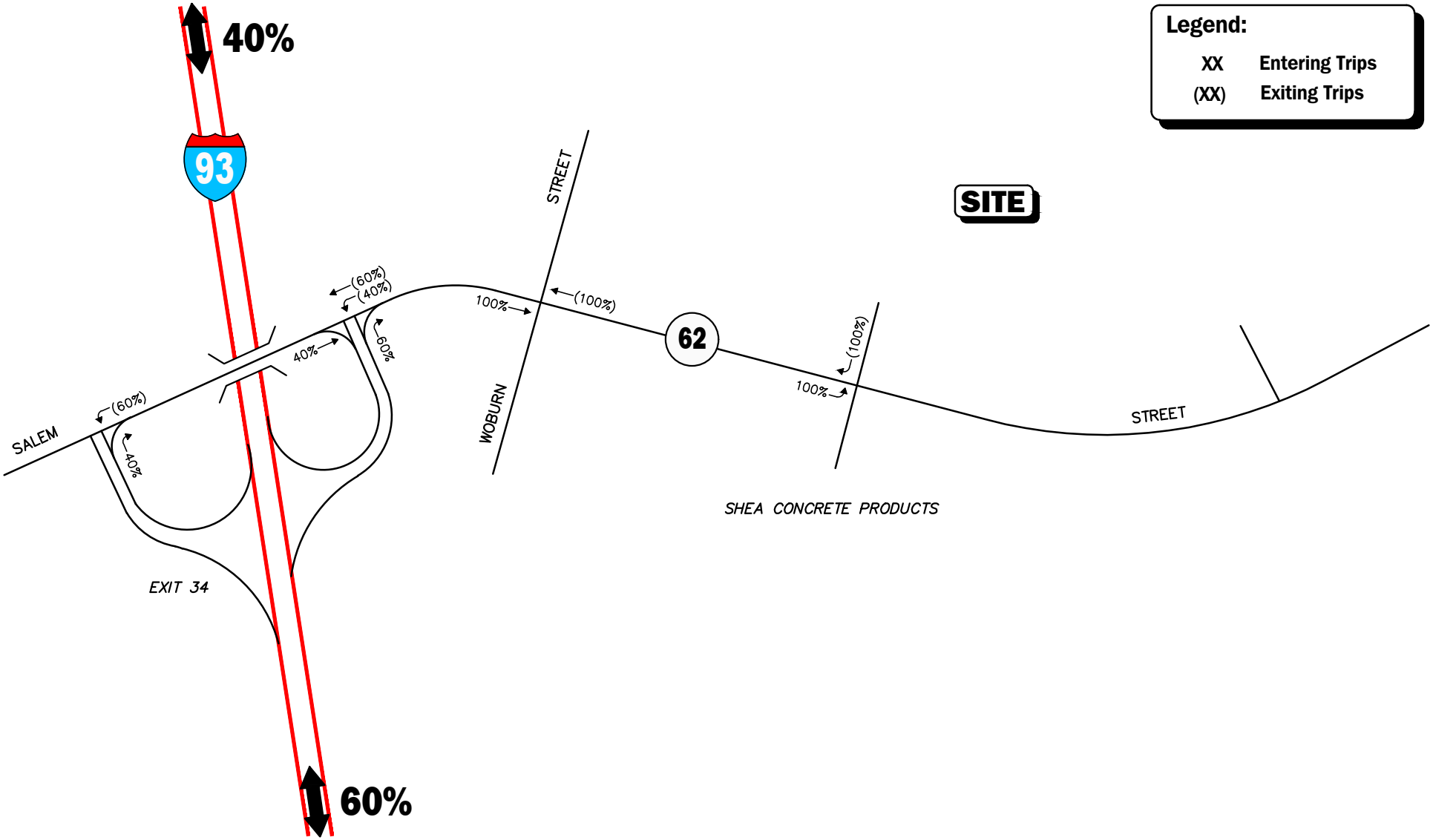

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Figure 8

Truck
Trip Distribution Map

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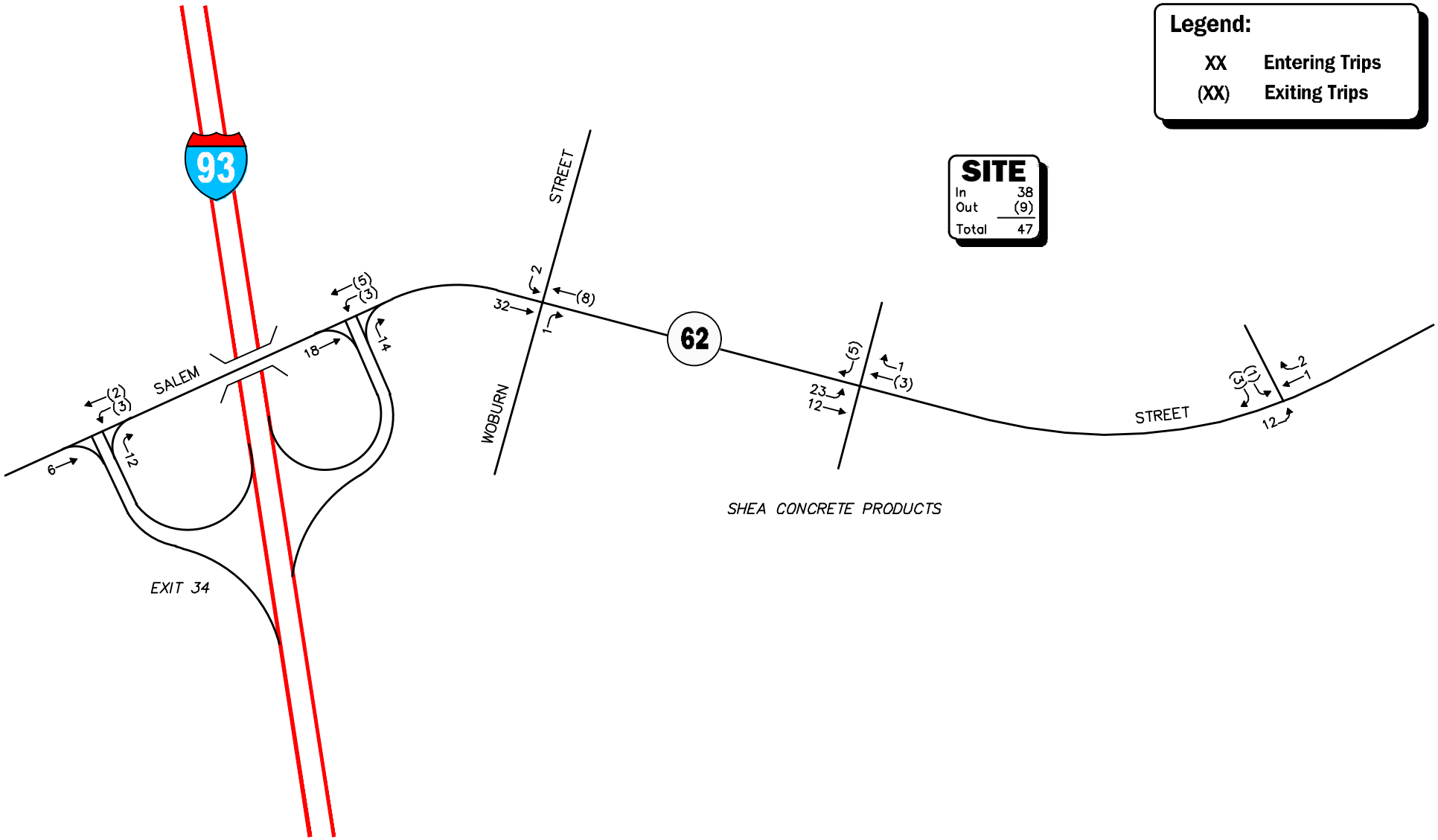

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Figure 9

Project-Generated Passenger Car Trips Weekday Morning Peak Hour Traffic Volumes

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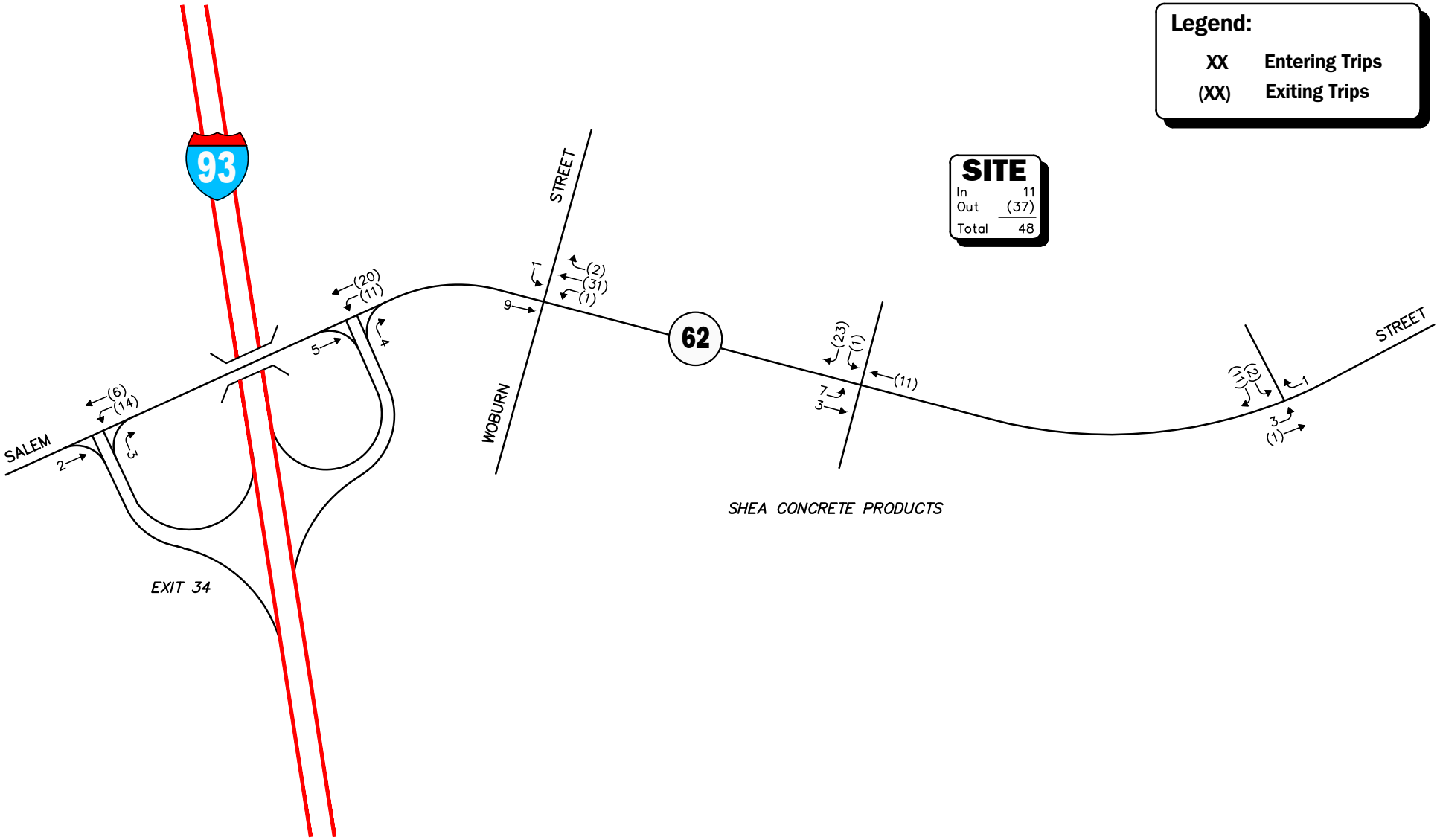

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Figure 10

Project-Generated Passenger Car Trips Weekday Evening Peak Hour Traffic Volumes

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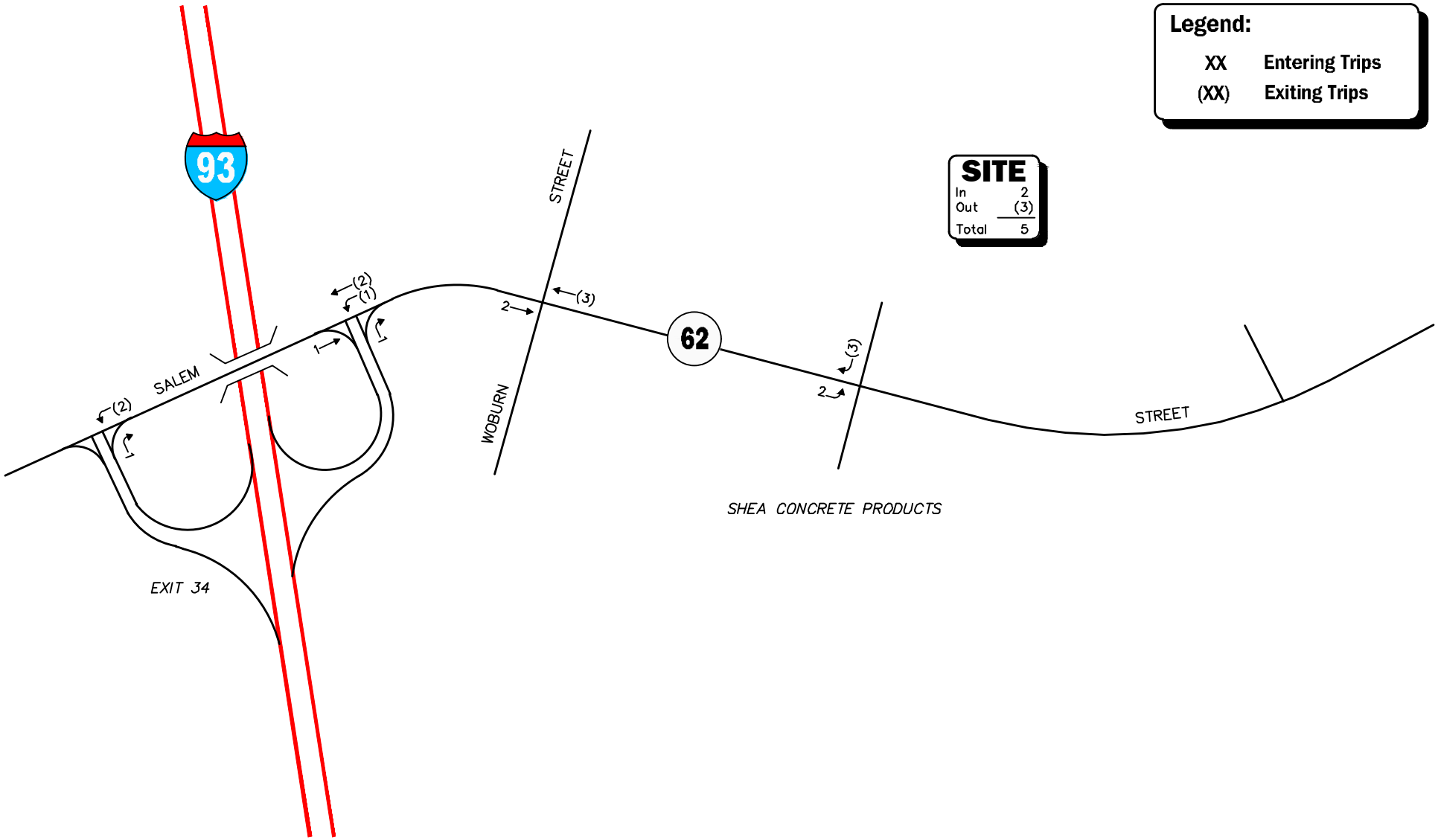

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Figure 11

Project-Generated Truck Trips Weekday Morning Peak Hour Traffic Volumes

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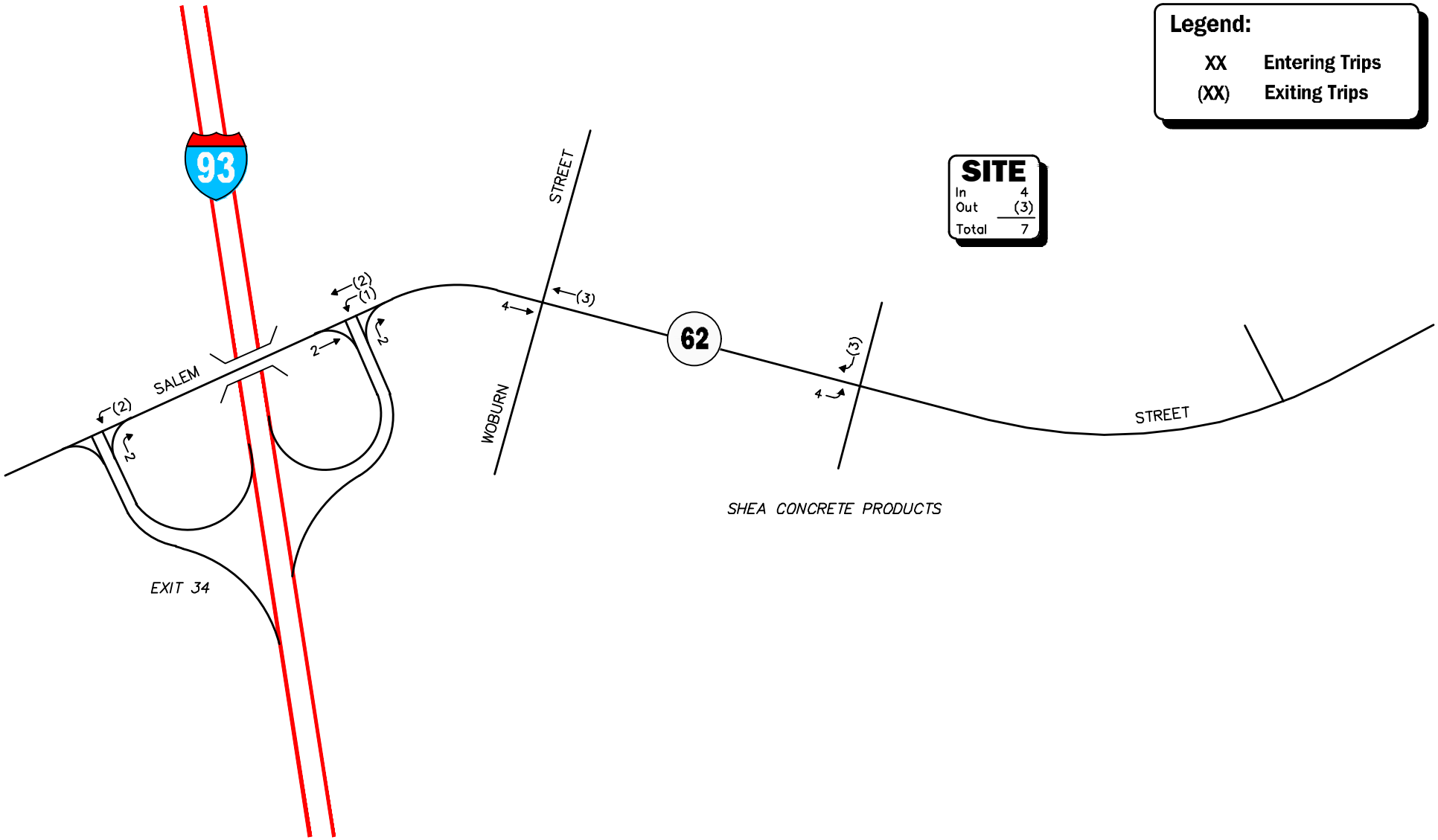

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Figure 12

Project-Generated Truck Trips Weekday Evening Peak Hour Traffic Volumes

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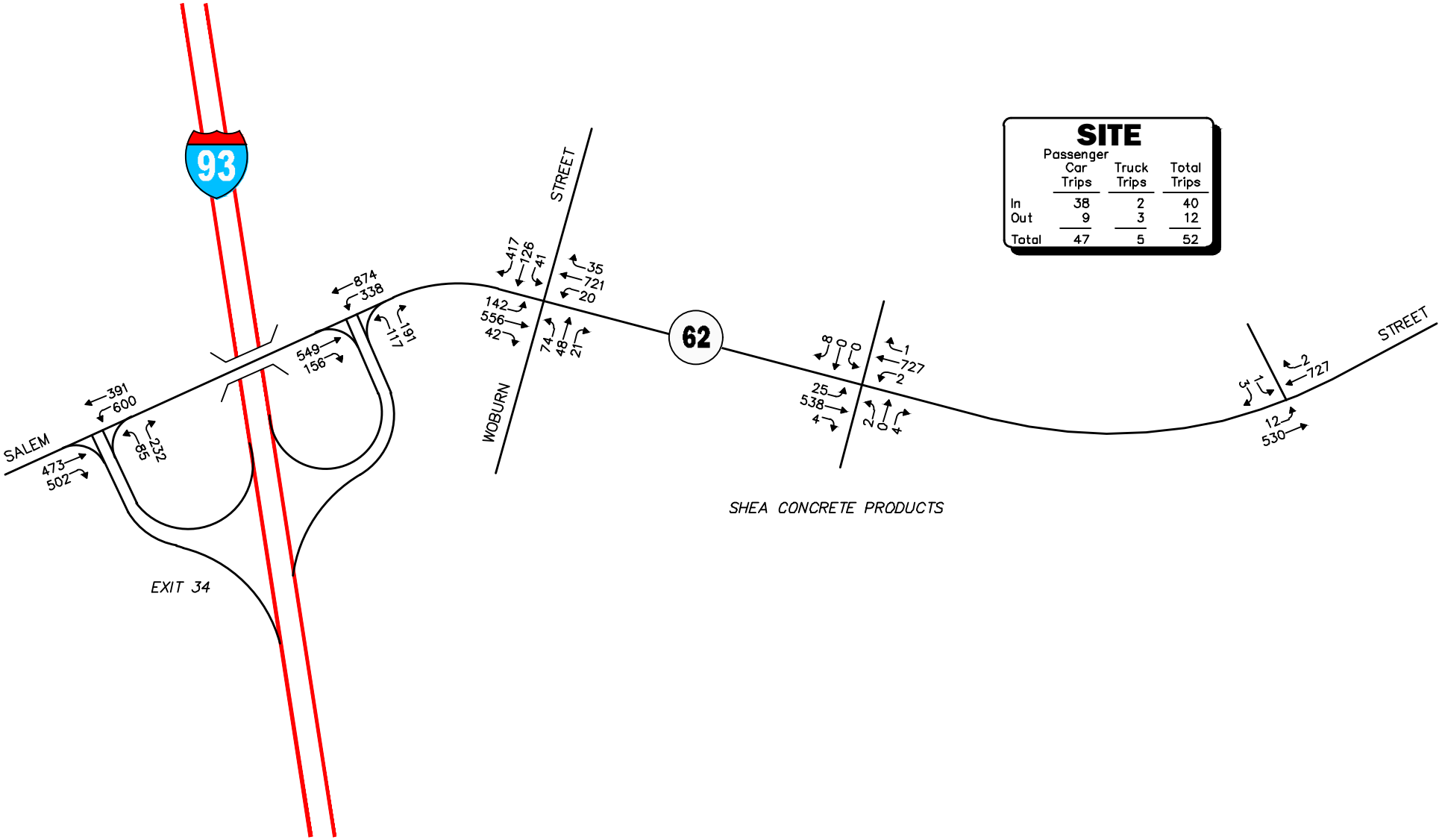

SITE

	Passenger Car Trips	Truck Trips	Total Trips
In	38	2	40
Out	9	3	12
Total	47	5	52

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 13

2029 Build
Weekday Morning
Peak-Hour Traffic Volumes

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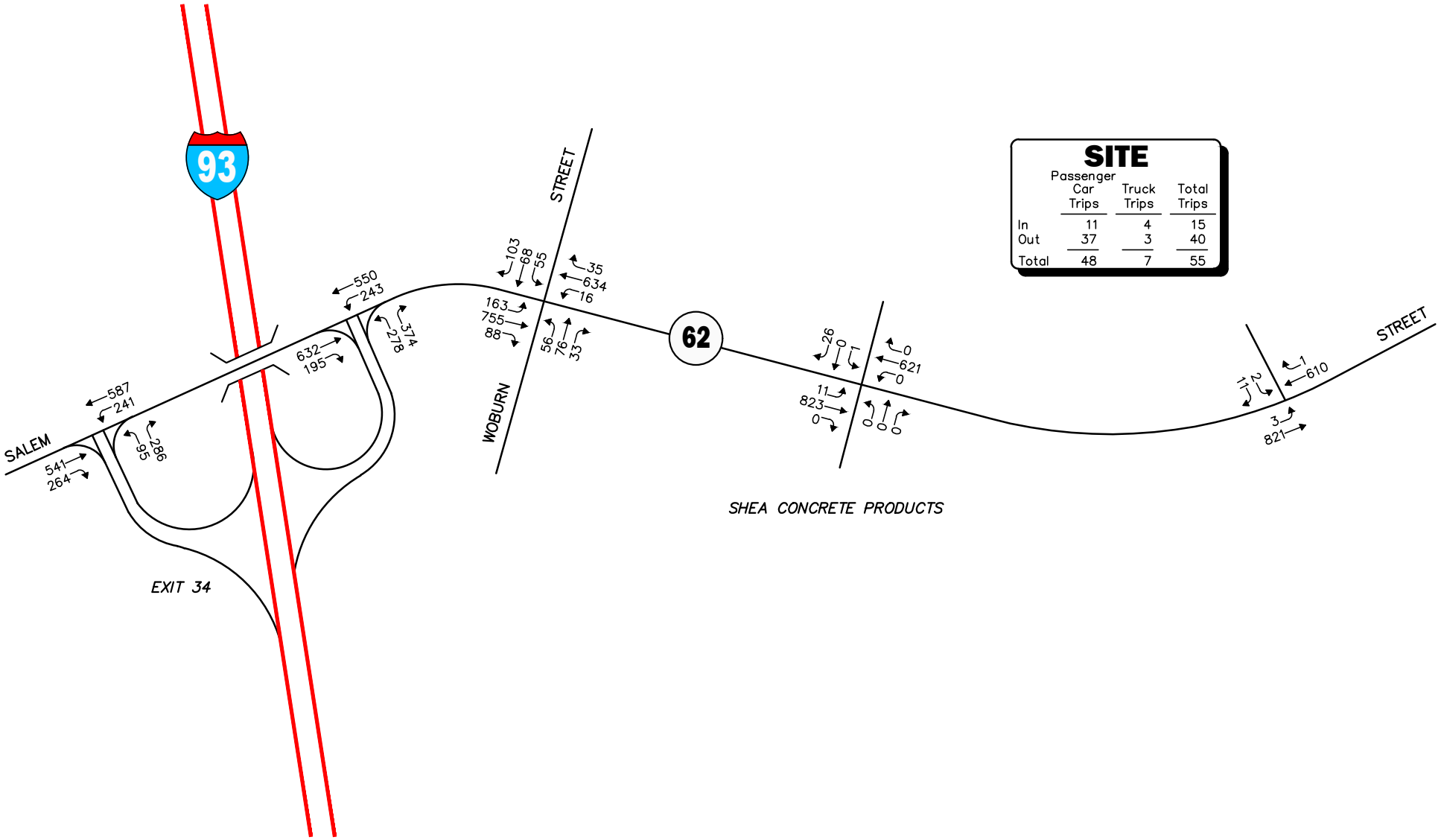

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 14

2029 Build
Weekday Evening
Peak-Hour Traffic Volumes

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Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak Hour	2022 Existing	2029 No-Build	2029 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
Route 62, west of I-93:					
Weekday Morning	1,319	1,446	1,451	5	0.3
Weekday Evening	1,343	1,479	1,487	8	0.5
Woburn Street, north of Route 62:					
Weekday Morning	745	808	809	1	0.1
Weekday Evening	455	498	501	3	0.6
Woburn Street, south of Route 62:					
Weekday Morning	303	330	331	1	0.3
Weekday Evening	305	336	337	1	0.3
Route 62, east of the Project Site:					
Weekday Morning	1,131	1,278	1,260	-18	-1.4
Weekday Evening	1,258	1,431	1,434	3	0.2

As shown in Table 6, Project-related traffic-volume changes outside of the study area relative to 2029 No-Build conditions are anticipated to range from a reduction of 1.4 percent to an increase of 0.6 percent during the peak periods, with corresponding vehicle volume changes shown to range from a reduction of 18 vehicle to an increase of eight (8) vehicles. The identified traffic volume reductions are a result of the removal of trips associated with the existing use that occupies the Project site (materials processing yard). ***When distributed over the peak hour, the predicted traffic-volume increases would not result in a significant impact (increase) on motorist delays or vehicle queuing outside of the immediate study area that is the subject of this assessment.***

TRAFFIC OPERATIONS ANALYSIS

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[10] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

[10]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, DC; 2010.

Signalized Intersections

The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than LOS A.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with oversaturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual.*[11] and implemented as a part of the Synchro® 11 software as recommended by MassDOT. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 7 summarizes the relationship between level of service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 7
LEVEL-OF-SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS[a]

Level of Service	Control (Signal) Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

[a]Source: *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2000; page 16-2.

[11]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual.*[12] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 8 summarizes the relationship between level of service and average control delay for two-way STOP-controlled and all-way STOP-controlled intersections.

Table 8
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
v/c ≤ 1.0	v/c > 1.0	
A	F	≥10.0
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	>50.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

[12]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro® intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual*. The Synchro® vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of 6 seconds or more at an intersection. For signalized intersections, Synchro® reports both the average (50th percentile) the 95th percentile vehicle queue. For unsignalized intersections, Synchro® reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately 3 minutes out of 60 minutes during the peak one hour of the day (during the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length).

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2022 Existing, 2029 No-Build, and 2029 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized on Tables 9 and 10, with the detailed analysis results presented in the Appendix.

The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area. For context, we note that an LOS of "D" or better is generally defined as "acceptable" operating conditions. Project-related impacts at the study area intersections are shown in Tables 9 and 10 and are defined as follows:

Signalized Intersection

Route 62 at Woburn Street

No change in overall level-of-service is predicted to occur over No-Build conditions, with Project-related impacts generally defined as a predicted increase in overall average motorist delay that resulted in an increase in vehicle queuing of up to two (2) vehicles. Independent of the Project, the overall intersection and the Woburn Street approaches are predicted to operate over capacity (i.e., LOS "F") under 2029 No-Build conditions during the weekday morning peak-hour.

Unsignalized Intersections

Route 62 at the I-93 Southbound Ramps

No change in level-of-service is predicted to occur for any movement over No-Build conditions, with Project-related impacts generally defined as a predicted increase in average motorist delay that resulted in an increase in vehicle queuing of up to one (1) vehicle. Independent of the Project, the left-turn movements from the I-93 southbound off-ramp are currently operating over capacity under 2022 Existing conditions during the peak hours and right-turn movements from the off-ramp are predicted to operate at capacity (i.e., LOS "E") under 2029 No-Build (without the Project) conditions during the weekday evening peak-hour.

Route 62 at the I-93 Northbound Ramps

No change in level-of-service is predicted to occur for any movement over No-Build conditions, with Project-related impacts generally defined as a predicted increase in average motorist delay that resulted in an increase in vehicle queuing of up to one (1) vehicle. Independent of the Project, left-turn movements from the I-93 northbound off-ramp are currently operating over capacity under 2022 Existing conditions during the peak hours and right-turn movements from the off-ramp are predicted to operate over capacity under 2029 No-Build (without the Project) conditions during the weekday evening peak-hour.

Route 62 at Shea Concrete Driveway and the West Project Site Driveway

All movements at the west Project site driveway intersection with Route 62 are predicted to operate at LOS D or better with negligible vehicle queuing. All movements along Route 62 approaching the Project site driveway were shown to operate at LOS A during both peak hours also with negligible vehicle queuing.

Route 62 at the East 1 Project Site Driveway

This driveway will be closed under 2029 Build conditions with the construction of the Project.

Route 62 at the East 2 Project Site Driveway

All movements at the east Project site driveway intersection with Route 62 are predicted to operate at LOS C or better with negligible vehicle queuing. All movements along Route 62 approaching the Project site driveway were shown to operate at LOS A during both peak hours also with negligible vehicle queuing.

Table 9
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak-hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Route 62 at Woburn Street												
Weekday Morning:												
Route 62 EB LT	0.60	42.0	D	4/6	0.66	46.9	D	4/7	0.66	46.9	D	4/7
Route 62 EB TH/RT	0.48	7.0	A	6/8	0.52	7.1	A	7/9	0.54	7.4	A	7/10
Route 62 WB LT/TH	0.80	24.8	C	14/20	0.88	30.6	C	17/27	0.89	31.6	C	17/28
Route 62 WB RT	0.02	11.7	B	0/0	0.02	11.3	B	0/0	0.02	11.3	B	0/0
Woburn Street NB LT/TH/RT	1.56	>80.0	F	6/10	1.77	>80.0	F	7/11	1.74	>80.0	F	7/11
Woburn Street SB LT/TH/RT	0.76	43.3	D	6/14	1.61	>80.0	F	22/31	1.63	>80.0	F	22/31
Overall	--	**49.0**	**D**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--
Weekday Evening:												
Route 62 EB LT	0.54	33.1	C	3/9	0.64	42.6	D	4/10	0.70	51.4	D	4/10
Route 62 EB TH/RT	0.69	12.5	B	9/24	0.74	14.2	B	11/30	0.72	13.1	B	11/31
Route 62 WB LT/TH	0.79	28.2	C	10/21	0.81	29.4	C	12/27	0.78	26.4	C	13/29
Route 62 WB RT	0.02	15.3	B	0/0	0.02	14.9	B	0/0	0.02	13.8	B	0/0
Woburn Street NB LT/TH/RT	0.48	28.2	C	3/8	0.59	35.5	D	4/9	0.68	44.4	D	5/10
Woburn Street SB LT/TH/RT	0.53	29.1	C	3/11	0.66	37.9	D	5/13	0.74	47.8	D	6/13
Overall	--	**22.2**	**C**	--	--	**25.6**	**C**	--	--	**26.8**	**C**	--

[a]Volume-to-capacity ratio.
[b]Percentile delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 10
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Route 62 at the I-93 SB Ramps												
Weekday Morning:												
Route 62 EB TH/RT	886	0.0	A	0	971	0.0	A	0	975	0.0	A	0
Route 62 WB LT/TH	891	7.4	A	4	987	8.8	A	5	991	8.9	A	5
I-93 SB Ramps NB LT	77	>50.0	F	12	85	>50.0	F	14	85	>50.0	F	14
I-93 SB Ramps NB RT	201	21.7	C	3	222	27.3	D	4	232	29.1	D	4
Weekday Evening:												
Route 62 EB TH/RT	734	0.0	A	0	803	0.0	A	0	805	0.0	A	0
Route 62 WB LT/TH	720	2.5	A	1	807	2.8	A	1	828	2.9	A	1
I-93 SB Ramps NB LT	82	>50.0	F	7	95	>50.0	F	11	95	>50.0	F	12
I-93 SB Ramps NB RT	257	25.9	D	5	282	36.4	E	7	286	37.7	E	7
Route 62 at the I-93 NB Ramps												
Weekday Morning:												
Route 62 EB TH/RT	627	0.0	A	0	691	0.0	A	0	705	0.0	A	0
Route 62 WB LT/TH	1,090	2.9	A	2	1,205	3.1	A	2	1,212	3.2	A	2
I-93 NB Ramps NB LT	107	>50.0	F	16	117	>50.0	F	18	117	>50.0	F	18
I-93 NB Ramps NB RT	157	17.0	C	2	180	20.2	C	3	191	21.5	C	3
Weekday Evening:												
Route 62 EB TH/RT	748	0.0	A	0	821	0.0	A	0	827	0.0	A	0
Route 62 WB LT/TH	676	3.1	A	1	760	3.2	A	1	793	3.2	A	1
I-93 NB Ramps NB LT	255	>50.0	F	28	278	>50.0	F	34	278	>50.0	F	35
I-93 NB Ramps NB RT	322	34.8	D	7	369	>50.0	F	11	374	>50.0	F	12
Route 62 at Shea Concrete Driveway and West Project Site Driveway												
Weekday Morning:												
Route 62 EB LT/TH/RT	480	0.2	A	0	540	0.2	A	0	567	0.4	A	0
Route 62 WB LT/TH/RT	642	0.0	A	0	729	0.0	A	0	730	0.0	A	0
Shea Concrete Driveway NB LT/TH/RT	6	20.1	C	0	6	24.0	C	0	6	25.9	D	0
West Project Site Driveway SB LT/TH/RT	1	16.5	C	0	1	18.2	C	0	8	14.2	B	0
Weekday Evening:												
Route 62 EB LT/TH/RT	726	0.0	A	0	822	0.0	A	0	834	0.1	A	0
Route 62 WB LT/TH/RT	534	0.0	A	0	611	0.0	A	0	621	0.0	A	0
Shea Concrete Driveway NB LT/TH/RT	0	0.0	A	0	0	0.0	A	0	0	0.0	A	0
West Project Site Driveway SB LT/TH/RT	1	34.3	D	0	1	45.0	E	0	27	15.1	C	0

See notes at end of table.

Table 10 (Continued)
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Route 62 at the East 1 Project Site Driveway												
Weekday Morning:												
Route 62 EB LT/TH	471	0.0	A	0	531	0.0	A	0				
Route 62 WB TH/RT	640	0.0	A	0	727	0.0	A	0	Driveway to be Closed in Conjunction			
East 1 Project Site Driveway SB LT/RT	7	20.2	C	0	7	23.8	C	0	with the Project			
Weekday Evening:												
Route 62 EB LT/TH	726	0.0	A	0	822	0.0	A	0				
Route 62 WB TH/RT	533	0.0	A	0	610	0.0	A	0				
East 1 Project Site Driveway SB LT/RT	1	11.8	B	0	1	12.6	B	0				
Route 62 at the East 2 Project Site Driveway												
Weekday Morning:												
Route 62 EB LT/TH	475	0.0	A	0	535	0.0	A	0	542	0.2	A	0
Route 62 WB TH/RT	651	0.0	A	0	738	0.0	A	0	729	0.0	A	0
East 2 Project Site Driveway SB LT/RT	6	26.9	D	1	6	33.1	D	1	4	17.4	C	0
Weekday Evening:												
Route 62 EB LT/TH	725	0.0	A	0	821	0.0	A	0	824	0.0	A	0
Route 62 WB TH/RT	533	0.0	A	0	610	0.0	A	0	611	0.0	A	0
East 2 Project Site Driveway SB LT/RT	0	0.0	A	0	0	0.0	A	0	13	16.5	C	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the Project site driveway intersections with Route 62 (two (2) locations) in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[13] requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with oncoming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 11 presents the measured SSD and ISD at the subject intersections.

[13] *A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

Table 11
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Route 62 at the West Project Site Driveway			
Stopping Sight Distance:			
Route 62 approaching from the east	360	--	426
Route 62 approaching from the west	360	--	489
Intersection Sight Distance:			
Looking to the east from the West Project Driveway	360	695	455[c]
Looking to the west from the West Project Driveway	360	765	413
Route 62 at the East Project Site Driveway			
Stopping Sight Distance:			
Route 62 approaching from the east	360	--	500+
Route 62 approaching from the west	360	--	491
Intersection Sight Distance:			
Looking to the east from the East Project Driveway	360	695	500+
Looking to the west from the East Project Driveway	360	765	277/479[d]

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 45 mph approach speed on Route 62.

[b]Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed. The critical gap for the intersection sight distance values were increased to 11.5 seconds for left-turn movements and to 10.5 seconds for right-turn movements to reflect the longer gaps that are required for combination trucks (i.e., tractor semi-trailer combinations).

[c]Available sight distance with the trimming/removal of trees and vegetation located within the sight triangle area to the east of the west Project site driveway along the north side of Route 62.

[d]Available sight distance with the removal of a large stone located within the sight triangle area to the west of the east Project site driveway along the north side of Route 62.

As can be seen in Table 11, with the trimming or removal of trees and vegetation located within the sight triangle area of the west Project site driveway and the removal of a large stone located within the sight triangle area of the east Project site driveway, the available lines of sight to and from the Project site driveway intersections were found to exceed the recommended minimum sight distance to function in a safe (SSD) manner based on a 45 mph appropriate approach speed, which is above both the measured 85th percentile vehicle travel speed (43/45 mph) and the posted speed limits (35/40) at the Project site driveways.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a warehouse building to be located at 800 Salem Street (Route 62) in Wilmington, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment and using conservative (high) trip estimates for the Project, we have concluded the following:

1. Using trip-generation statistics published by the ITE[14] for a trip intensive warehouse use (general warehousing in this case), the Project is expected to generate approximately 414 vehicle trips on an average weekday (two-way, volume over the operational day of the Project), consisting of 270 passenger car trips and 144 truck trips. During the weekday morning peak-hour, the Project is expected to generate 52 vehicle trips, consisting of 47 passenger car trips and 5 truck trips. During the weekday evening peak-hour, the Project is expected to generate 55 vehicle trips, consisting of 48 passenger car trips and 7 truck trips;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over anticipated future conditions without the Project (No-Build condition), acknowledging that one or more movements at the study area intersections are currently operating or are predicted to operate at or over capacity (i.e., LOS "E" or "F", respectively) independent of the Project;

3. Independent of the Project, left-turn movements from the I-93 north and southbound off-ramps to Route 62 were identified to be operating over capacity (i.e., LOS "F") during both peak hours under 2022 Existing conditions, with Project-related impacts on these movements generally defined as an increase in average motorist delay that resulted in an increase in vehicle queuing of up to one (1) vehicle;

4. All movements exiting the Project site driveways are predicted to operate at LOS D or better during the peak hours with negligible vehicle queuing;

[14] Ibid 1.

5. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study intersections; and

6. Lines of sight at the Project site driveway intersections with Route 62 were found to meet or exceed, or could be made to meet or exceed the recommended minimum sight distance to function in a safe manner based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the Project site will be provided by way of two driveways configured as follows: a full-access driveway that will intersect the north side of Route 62 approximately 90 feet east of the existing westerly driveway that serves the Project site and a full-access driveway that will intersect the north side of Route 62 approximately 80 feet west of the easterly property line. The existing driveways (three (3)) that serve the Project site will be closed in conjunction with the Project and will result in a net reduction of one (1) driveway along the Route 62 corridor and the elimination of the associated conflicts with vehicles, pedestrians and bicyclists. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveways and internal circulating aisles should be 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle and a large tractor semi-trailer combination (WB-67 design vehicle).

- Where perpendicular parking is proposed within the employee parking areas, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.

- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided. STOP-signs and marked STOP-lines should also be provided at intersections located within the Project site.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[15]

[15] Ibid 2.

- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided at pedestrian crossings that are to be constructed or modified in conjunction with the Project.

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveways should be designed and maintained so as not to restrict lines of sight.

- Trees and vegetation located along the north side of Route 62 within the sight triangle areas of the Project site driveways should be trimmed or removed and maintained in order to provide the necessary sight lines for safe operation. In addition, the large stone located within the sight triangle area of the east Project site driveway should also be removed.

- Snow accumulation (windrows) within sight triangle areas of the Project site driveways should be promptly removed where such accumulations would impede sight lines.

Off-Site

Route 62 at Woburn Street

Independent of the Project, the Woburn Street approaches to Route 62 are predicted to operate over capacity (i.e., LOS "F") during the weekday morning peak-hour under 2029 No-Build conditions. In an effort to off-set the predicted impact of the Project and to reduce motorist delays and vehicle queueing, the Project proponent will design and implement an optimal traffic signal timing and phasing plan for the intersection. With the implementation of an optimal traffic signal and phasing plan, intersection overall intersection operations will improve from LOS F to LOS D during the weekday morning peak-hour and no movement or approach will operate below LOS E, an improvement over No-Build conditions. As can be seen in Table 12, all movements at the intersection will continue to operate at LOS D or better during the weekday evening peak-hour. These improvements will be completed prior to the issuance of a Certification of Occupancy for the Project, subject to the receipt of all necessary rights, permit and approvals.

Route 62 at the I-93 Ramps

Independent of the Project, left-turn movements from the I-93 off-ramps (north and southbound) to Route 62 are currently operating over capacity with extended vehicle queueing (up to 28 vehicles), with conditions expected to worsen in the future. The addition of Project-related traffic to the intersections was shown to result in a predicted increase in average motorist delay during the peak hours that resulted in a corresponding increase in vehicle queueing of up to two (2) vehicles. In order to assist the Town and MassDOT to advance improvements along Route 62 within the I-93 interchange area that are desirable independent of the Project, the Project proponent will prepare a Functional Design Report (FDR) and accompanying concept plans to identify potential improvement strategies for the ramp intersections. The FDR and concept plans will be provided to the Town prior to the issuance of a Certificate of Occupancy for the Project.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided within the study area or to the Project site. In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures are under consideration as a part of the Project:

- A transportation coordinator will be assigned for the Project to coordinate the TDM program;
- The transportation coordinator will facilitate a rideshare matching program for employees to encourage carpooling;
- A "welcome packet" will be provided to employees detailing the contact information for the transportation coordinator and information to enroll in the employee rideshare program;
- Specific amenities will be provided to discourage off-site trips, including providing a break-room equipped with a microwave and refrigerator; offering direct deposit of paychecks; allowing telecommuting or flexible work schedules; and other such measures to reduce overall traffic volumes and travel during peak-traffic-volume periods;
- Prioritization will be given to local hirings in an effort to reduce traffic volume increases outside of the local area;
- Pedestrian accommodations will be incorporated within the Project site to link the employee parking areas to the warehouse building; and
- Secure bicycle parking will be provided at an appropriate location within the Project site.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

Table 12
MITIGATED SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2029 No-Build				2029 Build				2029 Build with Mitigation			
Signalized Intersection/Peak-hour/Movement	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Route 62 at Woburn Street												
Weekday Morning:												
Route 62 EB LT	0.66	46.9	D	4/7	0.66	46.9	D	4/7	0.86	49.5	D	2/6
Route 62 EB TH/RT	0.52	7.1	A	7/9	0.54	7.4	A	7/10	0.66	15.2	B	11/15
Route 62 WB LT/TH	0.88	30.6	C	17/27	0.89	31.6	C	17/28	0.97	49.1	D	18/29
Route 62 WB RT	0.02	11.3	B	0/0	0.02	11.3	B	0/0	0.02	13.2	B	0/0
Woburn Street NB LT/TH/RT	1.77	>80.0	F	7/11	1.74	>80.0	F	7/11	0.69	35.8	D	4/6
Woburn Street SB LT/TH/RT	1.61	>80.0	F	22/31	1.63	>80.0	F	22/31	1.03	77.8	E	15/24
Overall	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**45.9**	**D**	--
Weekday Evening:												
Route 62 EB LT	0.64	42.6	D	4/10	0.70	51.4	D	4/10	0.68	46.1	D	4/10
Route 62 EB TH/RT	0.74	14.2	B	11/30	0.72	13.1	B	11/31	0.72	12.9	B	10/31
Route 62 WB LT/TH	0.81	29.4	C	12/27	0.78	26.4	C	13/29	0.80	27.1	C	12/29
Route 62 WB RT	0.02	14.9	B	0/0	0.02	13.8	B	0/0	0.02	13.6	B	0/0
Woburn Street NB LT/TH/RT	0.59	35.5	D	4/9	0.68	44.4	D	5/10	0.69	43.1	D	4/10
Woburn Street SB LT/TH/RT	0.66	37.9	D	5/13	0.74	47.8	D	6/13	0.75	46.0	D	5/13
Overall	--	**25.6**	**C**	--	--	**26.8**	**C**	--	--	**26.2**	**C**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements

APPENDIX

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
COVID ADJUSTMENT DATA
PUBLIC TRANSPORTATION SCHEDULES
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT TRAFFIC VOLUME NETWORKS
TRIP-GENERATION CALCULATIONS
JOURNEY-TO-WORK TRIP DISTRIBUTIONS
PRELIMINARY TRAFFIC SIGNAL WARRANTS ANALYSIS
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

Plotted by Matthew Costa on August 11, 2022

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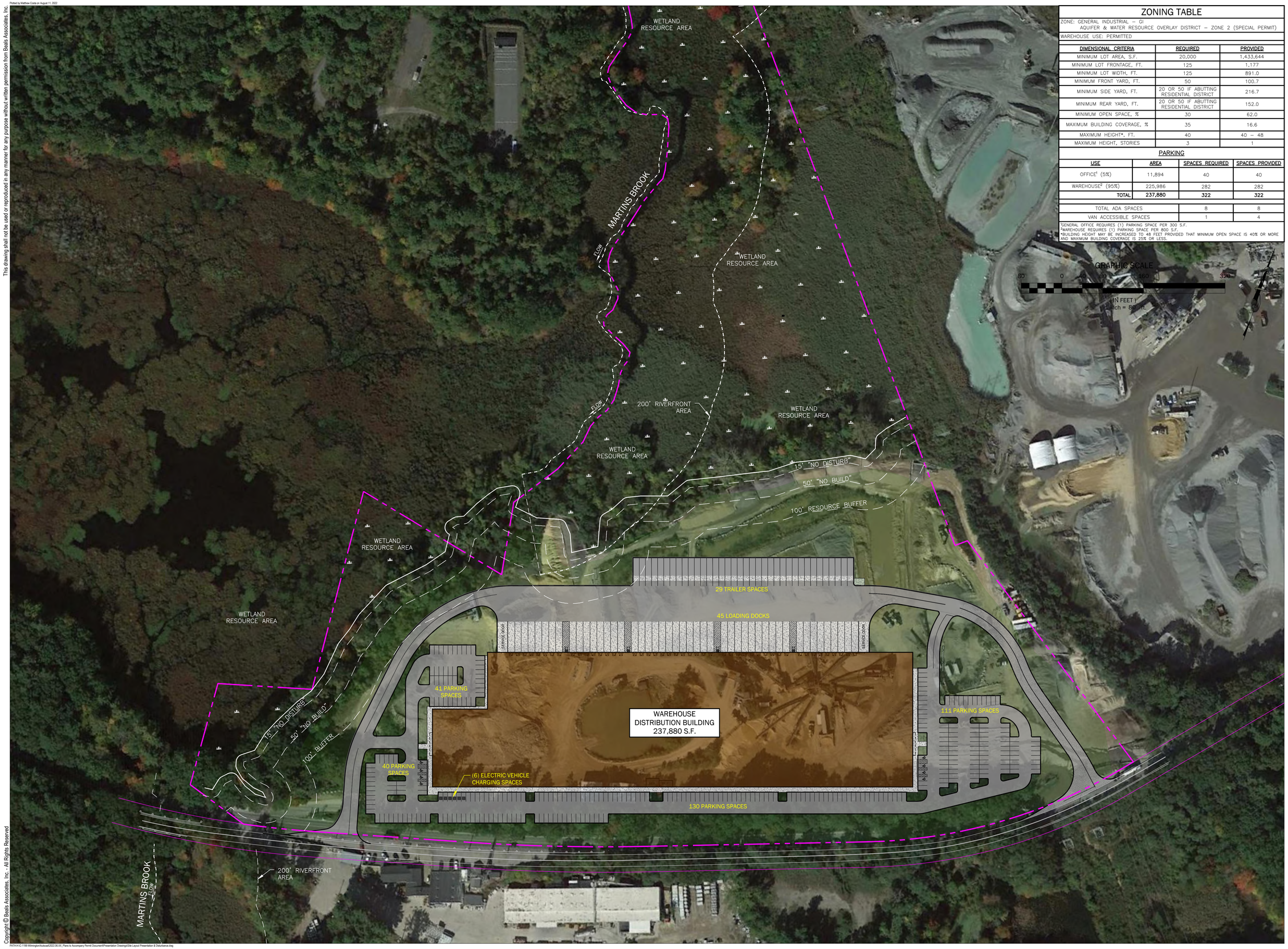

ZONING TABLE

ZONE: GENERAL INDUSTRIAL – GI
AQUIFER & WATER RESOURCE OVERLAY DISTRICT – ZONE 2 (SPECIAL PERMIT)

WAREHOUSE USE: PERMITTED

DIMENSIONAL CRITERIA	REQUIRED	PROVIDED
MINIMUM LOT AREA, S.F.	20,000	1,433,644
MINIMUM LOT FRONTAGE, FT.	125	1,177
MINIMUM LOT WIDTH, FT.	125	891.0
MINIMUM FRONT YARD, FT.	50	100.7
MINIMUM SIDE YARD, FT.	20 OR 50 IF ABUTTING RESIDENTIAL DISTRICT	216.7
MINIMUM REAR YARD, FT.	20 OR 50 IF ABUTTING RESIDENTIAL DISTRICT	152.0
MINIMUM OPEN SPACE, %	30	62.0
MAXIMUM BUILDING COVERAGE, %	35	16.6
MAXIMUM HEIGHT*, FT.	40	40 – 48
MAXIMUM HEIGHT, STORIES	3	1

PARKING

USE	AREA	SPACES REQUIRED	SPACES PROVIDED
OFFICE[1] (5%)	11,894	40	40
WAREHOUSE[2] (95%)	225,986	282	282
TOTAL	**237,880**	**322**	**322**
TOTAL ADA SPACES		8	8
VAN ACCESSIBLE SPACES		1	4

[1]GENERAL OFFICE REQUIRES (1) PARKING SPACE PER 300 S.F.
[2]WAREHOUSE REQUIRES (1) PARKING SPACE PER 800 S.F.
*BUILDING HEIGHT MAY BE INCREASED TO 48 FEET PROVIDED THAT MINIMUM OPEN SPACE IS 40% OR MORE AND MAXIMUM BUILDING COVERAGE IS 25% OR LESS.

BEALS · ASSOCIATES INC.
2 PARK PLAZA SUITE 200 BOSTON, MA 02116
PHONE: 617-242-1120
•PLANNING •ENGINEERING •PERMITTING •MANAGEMENT

Camber DACON
DESIGN | ARCHITECTURE | CONSTRUCTION
Camber Development
125 High Street Suite 200, Boston, MA 02110
Dacon Corporation
16 Huron Drive, Natick MA, 02420

WILMINGTON PLANNING BOARD

DATE:

CHAIR:

THIS SITE PLAN APPROVAL DOES NOT NECESSARILY INDICATE COMPLIANCE WITH THE WILMINGTON ZONING BYLAWS.

Applicant
Camber Development
125 High Street, Suite 200
Boston, MA 02110

Owner
WQV - 800 Salem, LLC.
c/o Camber Development, LLC.
125 High Street, Suite 200
Boston, MA 02110

Distribution Center

800 Salem Street
Wilmington, MA

No.	Revision	Date

Not for Construction
Permit Documents

Designed by: MEC	Checked by: TPM
Proj. No.: C-1199	Issue Date: 08.11.22
Drawing Scale: 1"=80'	

Sheet Title
MARKETING SITE PLAN OVERALL

Sheet Number
P120

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AUTOMATIC TRAFFIC RECORDER COUNT DATA

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA

3/23/2022	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	112			4	116				
12:15	4	109			5	124				
12:30	5	106			5	102				
12:45	2	118	16	445	7	98	21	440	37	885
1:00	4	114			2	110				
1:15	3	109			2	121				
1:30	1	97			1	101				
1:45	4	122	12	442	7	104	12	436	24	878
2:00	1	108			3	102				
2:15	2	111			2	114				
2:30	4	117			6	125				
2:45	4	128	11	464	9	108	20	449	31	913
3:00	2	147			3	111				
3:15	3	154			2	123				
3:30	3	115			6	147				
3:45	3	152	11	568	8	139	19	520	30	1088
4:00	5	165			2	141				
4:15	3	146			7	143				
4:30	9	155			14	127				
4:45	14	151	31	617	19	134	42	545	73	1162
5:00	11	154			28	113				
5:15	18	181			28	117				
5:30	24	167			31	128				
5:45	43	160	96	662	51	105	138	463	234	1125
6:00	44	137			55	100				
6:15	35	108			69	99				
6:30	53	112			87	90				
6:45	75	107	207	464	103	66	314	355	521	819
7:00	70	89			110	61				
7:15	89	80			143	71				
7:30	107	81			172	73				
7:45	105	69	371	319	161	57	586	262	957	581
8:00	107	58			139	39				
8:15	93	45			156	39				
8:30	130	38			137	46				
8:45	98	42	428	183	141	38	573	162	1001	345
9:00	105	49			122	33				
9:15	90	37			119	25				
9:30	93	40			105	29				
9:45	96	34	384	160	93	21	439	108	823	268
10:00	79	35			95	12				
10:15	79	16			103	30				
10:30	96	28			94	25				
10:45	91	13	345	92	100	33	392	100	737	192
11:00	118	18			101	11				
11:15	103	16			111	10				
11:30	115	19			97	10				
11:45	116	14	452	67	80	10	389	41	841	108
Total	2364	4483			2945	3881			5309	8364
Percent	34.5%	65.5%			43.1%	56.9%			38.8%	61.2%

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA

3/24/2022	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	106			4	101				
12:15	5	86			9	111				
12:30	8	105			2	93				
12:45	1	111	19	408	5	92	20	397	39	805
1:00	2	94			3	96				
1:15	9	87			2	83				
1:30	2	102			4	110				
1:45	1	105	14	388	2	96	11	385	25	773
2:00	2	94			2	96				
2:15	2	99			3	98				
2:30	3	113			7	100				
2:45	3	128	10	434	6	109	18	403	28	837
3:00	2	121			3	101				
3:15	3	119			6	97				
3:30	2	135			5	127				
3:45	4	129	11	504	10	110	24	435	35	939
4:00	4	147			6	125				
4:15	3	131			4	127				
4:30	12	147			11	97				
4:45	8	155	27	580	15	91	36	440	63	1020
5:00	13	137			26	103				
5:15	13	168			29	113				
5:30	24	161			27	98				
5:45	29	134	79	600	46	102	128	416	207	1016
6:00	46	153			60	95				
6:15	35	110			61	93				
6:30	62	107			80	76				
6:45	74	87	217	457	98	62	299	326	516	783
7:00	77	96			88	70				
7:15	84	59			111	61				
7:30	94	63			162	53				
7:45	107	64	362	282	128	44	489	228	851	510
8:00	103	67			139	47				
8:15	107	67			149	54				
8:30	121	57			147	65				
8:45	81	38	412	229	148	38	583	204	995	433
9:00	75	36			112	29				
9:15	74	35			101	22				
9:30	92	39			98	36				
9:45	85	38	326	148	80	21	391	108	717	256
10:00	79	32			91	23				
10:15	77	27			72	33				
10:30	71	23			90	23				
10:45	95	23	322	105	86	35	339	114	661	219
11:00	92	14			99	16				
11:15	112	11			87	18				
11:30	87	17			107	11				
11:45	112	11	403	53	105	5	398	50	801	103
Total	2202	4188			2736	3506			4938	7694
Percent	34.5%	65.5%			43.8%	56.2%			39.1%	60.9%
Grand Total	4566	8671			5681	7387			10247	16058
Percent	34.5%	65.5%			43.5%	56.5%			39.0%	61.0%
ADT		ADT: 13,152		AADT: 13,152						

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA

3/21/2022	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,
12:00 AM	*	*	*	*	16	21	19	20	*	*	*	*	*	*	18	20
1:00	*	*	*	*	12	12	14	11	*	*	*	*	*	*	13	12
2:00	*	*	*	*	11	20	10	18	*	*	*	*	*	*	10	19
3:00	*	*	*	*	11	19	11	24	*	*	*	*	*	*	11	22
4:00	*	*	*	*	31	42	27	36	*	*	*	*	*	*	29	39
5:00	*	*	*	*	96	138	79	128	*	*	*	*	*	*	88	133
6:00	*	*	*	*	207	314	217	299	*	*	*	*	*	*	212	306
7:00	*	*	*	*	371	586	362	489	*	*	*	*	*	*	366	538
8:00	*	*	*	*	428	573	412	583	*	*	*	*	*	*	420	578
9:00	*	*	*	*	384	439	326	391	*	*	*	*	*	*	355	415
10:00	*	*	*	*	345	392	322	339	*	*	*	*	*	*	334	366
11:00	*	*	*	*	452	389	403	398	*	*	*	*	*	*	428	394
12:00 PM	*	*	*	*	445	440	408	397	*	*	*	*	*	*	426	418
1:00	*	*	*	*	442	436	388	385	*	*	*	*	*	*	415	410
2:00	*	*	*	*	464	449	434	403	*	*	*	*	*	*	449	426
3:00	*	*	*	*	568	520	504	435	*	*	*	*	*	*	536	478
4:00	*	*	*	*	617	545	580	440	*	*	*	*	*	*	598	492
5:00	*	*	*	*	662	463	600	416	*	*	*	*	*	*	631	440
6:00	*	*	*	*	464	355	457	326	*	*	*	*	*	*	460	340
7:00	*	*	*	*	319	262	282	228	*	*	*	*	*	*	300	245
8:00	*	*	*	*	183	162	229	204	*	*	*	*	*	*	206	183
9:00	*	*	*	*	160	108	148	108	*	*	*	*	*	*	154	108
10:00	*	*	*	*	92	100	105	114	*	*	*	*	*	*	98	107
11:00	*	*	*	*	67	41	53	50	*	*	*	*	*	*	60	46
Total	0	0	0	0	6847	6826	6390	6242	0	0	0	0	0	0	6617	6535
Day	0		0		13673		12632		0		0		0		13152	
AM Peak					11:00	7:00	8:00	8:00							11:00	8:00
Volume					452	586	412	583							428	578
PM Peak					5:00	4:00	5:00	4:00							5:00	4:00
Volume					662	545	600	440							631	492
Comb Total	0		0		13673		12632		0		0		0		13152	
ADT	ADT: 13,152		AADT: 13,152													

TURNING MOVEMENT COUNT DATA

Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 1

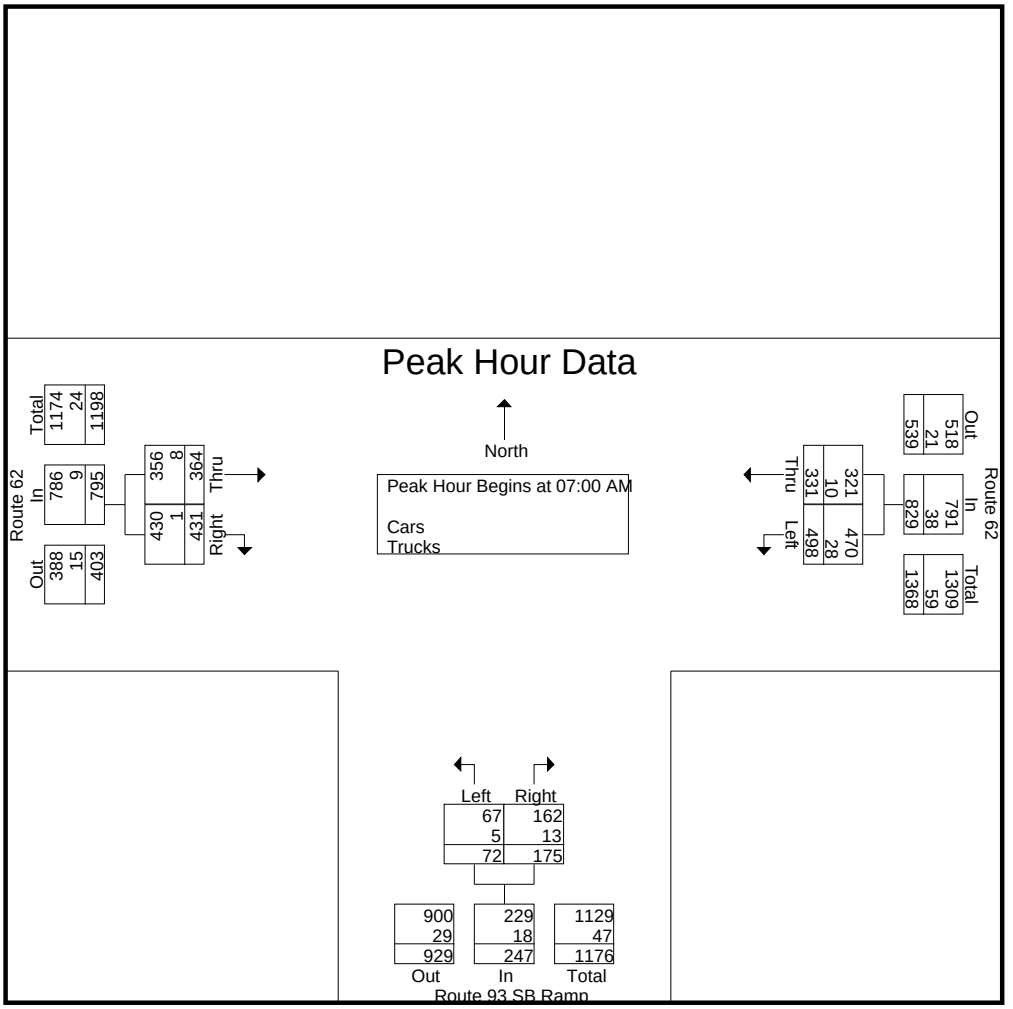
Groups Printed- Cars - Trucks

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	95	76	12	42	71	142	438
07:15 AM	145	87	24	38	94	92	480
07:30 AM	139	81	22	43	96	114	495
07:45 AM	119	87	14	52	103	83	458
Total	498	331	72	175	364	431	1871
08:00 AM	109	85	25	38	91	68	416
08:15 AM	98	83	31	65	117	63	457
08:30 AM	70	93	24	46	99	72	404
08:45 AM	57	93	38	45	87	55	375
Total	334	354	118	194	394	258	1652
Grand Total	832	685	190	369	758	689	3523
Apprch %	54.8	45.2	34	66	52.4	47.6	
Total %	23.6	19.4	5.4	10.5	21.5	19.6	
Cars	793	663	175	335	741	686	3393
% Cars	95.3	96.8	92.1	90.8	97.8	99.6	96.3
Trucks	39	22	15	34	17	3	130
% Trucks	4.7	3.2	7.9	9.2	2.2	0.4	3.7

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	95	76	171	12	42	54	71	**142**	**213**	438
07:15 AM	**145**	**87**	**232**	**24**	38	62	94	92	186	480
07:30 AM	139	81	220	22	43	65	96	114	210	**495**
07:45 AM	119	87	206	14	**52**	**66**	**103**	83	186	458
Total Volume	498	331	829	72	175	247	364	431	795	1871
% App. Total	60.1	39.9		29.1	70.9		45.8	54.2		
PHF	.859	.951	.893	.750	.841	.936	.883	.759	.933	.945
Cars	470	321	791	67	162	229	356	430	786	1806
% Cars	94.4	97.0	95.4	93.1	92.6	92.7	97.8	99.8	98.9	96.5
Trucks	28	10	38	5	13	18	8	1	9	65
% Trucks	5.6	3.0	4.6	6.9	7.4	7.3	2.2	0.2	1.1	3.5

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 2



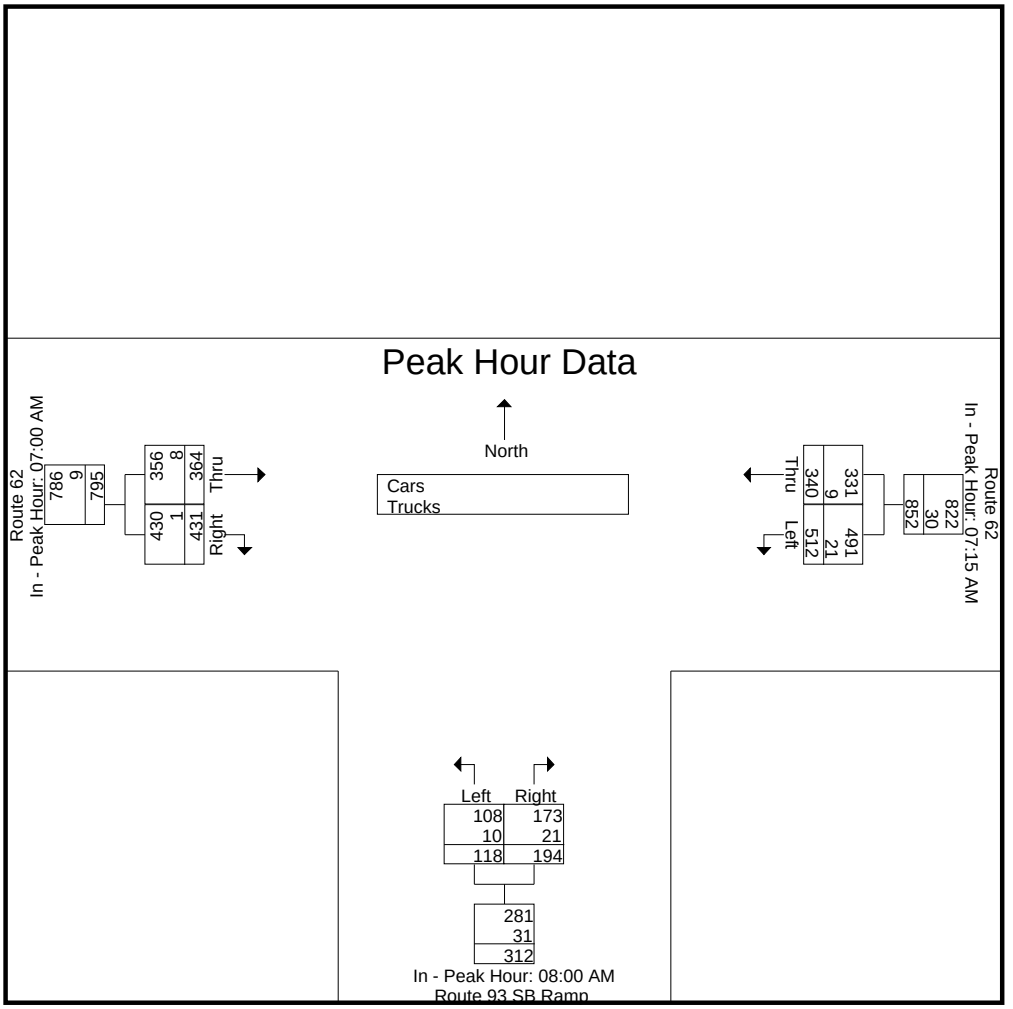
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			08:00 AM			07:00 AM		
+0 mins.	**145**	**87**	**232**	25	38	63	71	**142**	**213**
+15 mins.	139	81	220	31	**65**	**96**	94	92	186
+30 mins.	119	87	206	24	46	70	96	114	210
+45 mins.	109	85	194	**38**	45	83	**103**	83	186
Total Volume	512	340	852	118	194	312	364	431	795
% App. Total	60.1	39.9		37.8	62.2		45.8	54.2	
PHF	.883	.977	.918	.776	.746	.813	.883	.759	.933
Cars	491	331	822	108	173	281	356	430	786
% Cars	95.9	97.4	96.5	91.5	89.2	90.1	97.8	99.8	98.9
Trucks	21	9	30	10	21	31	8	1	9
% Trucks	4.1	2.6	3.5	8.5	10.8	9.9	2.2	0.2	1.1

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	88	73	11	36	70	142	420
07:15 AM	140	86	23	33	92	92	466
07:30 AM	132	78	20	43	92	113	478
07:45 AM	110	84	13	50	102	83	442
Total	470	321	67	162	356	430	1806
08:00 AM	109	83	23	35	87	68	405
08:15 AM	93	77	26	56	117	63	432
08:30 AM	68	89	24	40	99	71	391
08:45 AM	53	93	35	42	82	54	359
Total	323	342	108	173	385	256	1587
Grand Total	793	663	175	335	741	686	3393
Apprch %	54.5	45.5	34.3	65.7	51.9	48.1	
Total %	23.4	19.5	5.2	9.9	21.8	20.2	

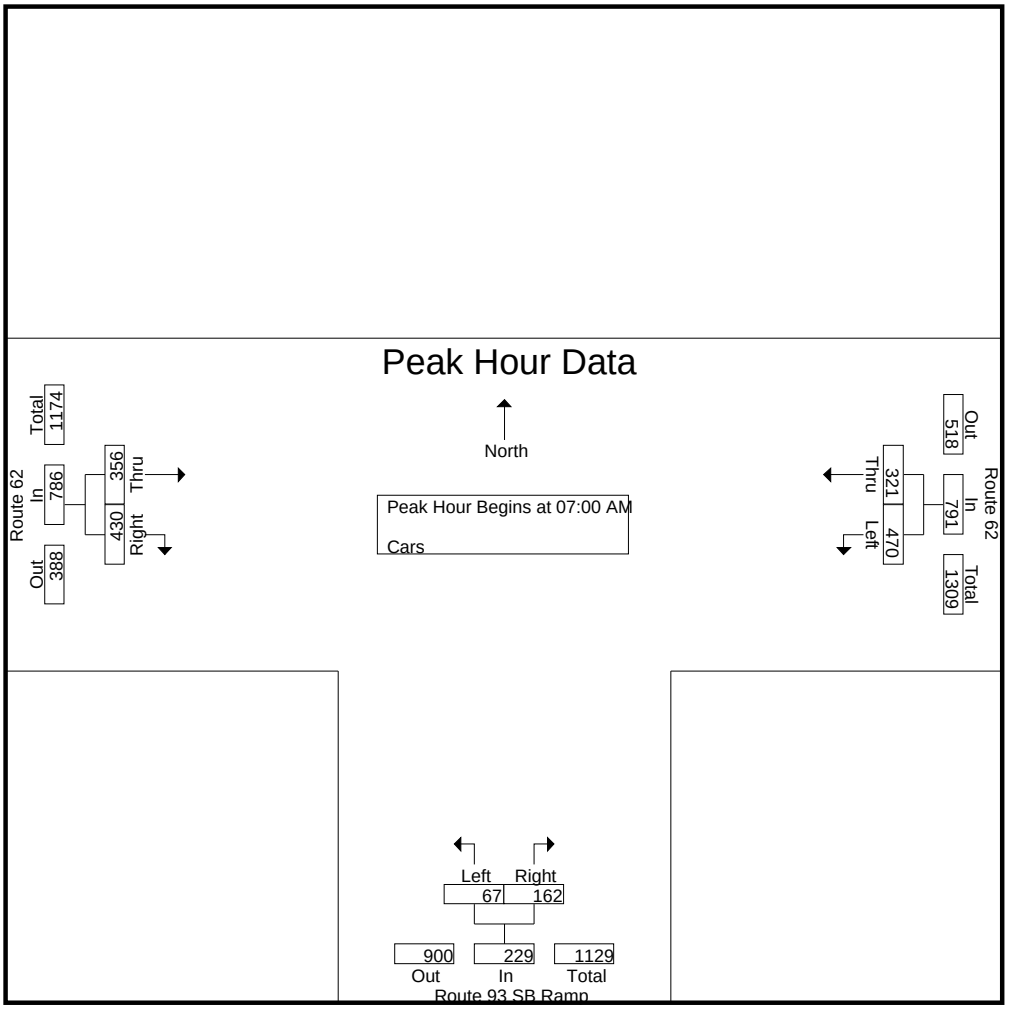
	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	88	73	161	11	36	47	70	**142**	**212**	420
07:15 AM	**140**	**86**	**226**	**23**	33	56	92	92	184	466
07:30 AM	132	78	210	20	43	**63**	92	113	205	**478**
07:45 AM	110	84	194	13	**50**	63	**102**	83	185	442
Total Volume	470	321	791	67	162	229	356	430	786	1806
% App. Total	59.4	40.6		29.3	70.7		45.3	54.7		
PHF	.839	.933	.875	.728	.810	.909	.873	.757	.927	.945

Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

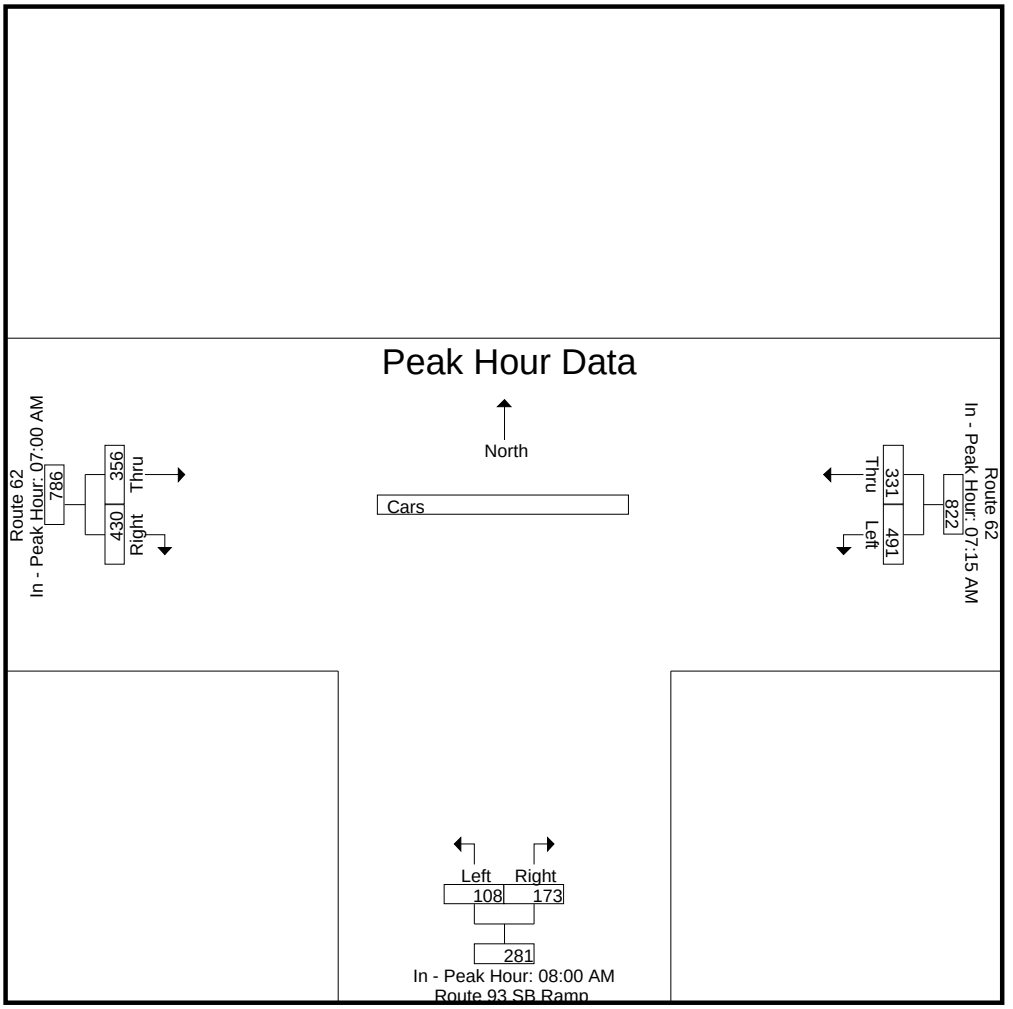
Peak Hour for Each Approach Begins at:

	07:15 AM			08:00 AM			07:00 AM		
+0 mins.	**140**	**86**	**226**	23	35	58	70	**142**	**212**
+15 mins.	132	78	210	26	**56**	**82**	92	92	184
+30 mins.	110	84	194	24	40	64	92	113	205
+45 mins.	109	83	192	**35**	42	77	**102**	83	185
Total Volume	491	331	822	108	173	281	356	430	786
% App. Total	59.7	40.3		38.4	61.6		45.3	54.7	
PHF	.877	.962	.909	.771	.772	.857	.873	.757	.927

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022

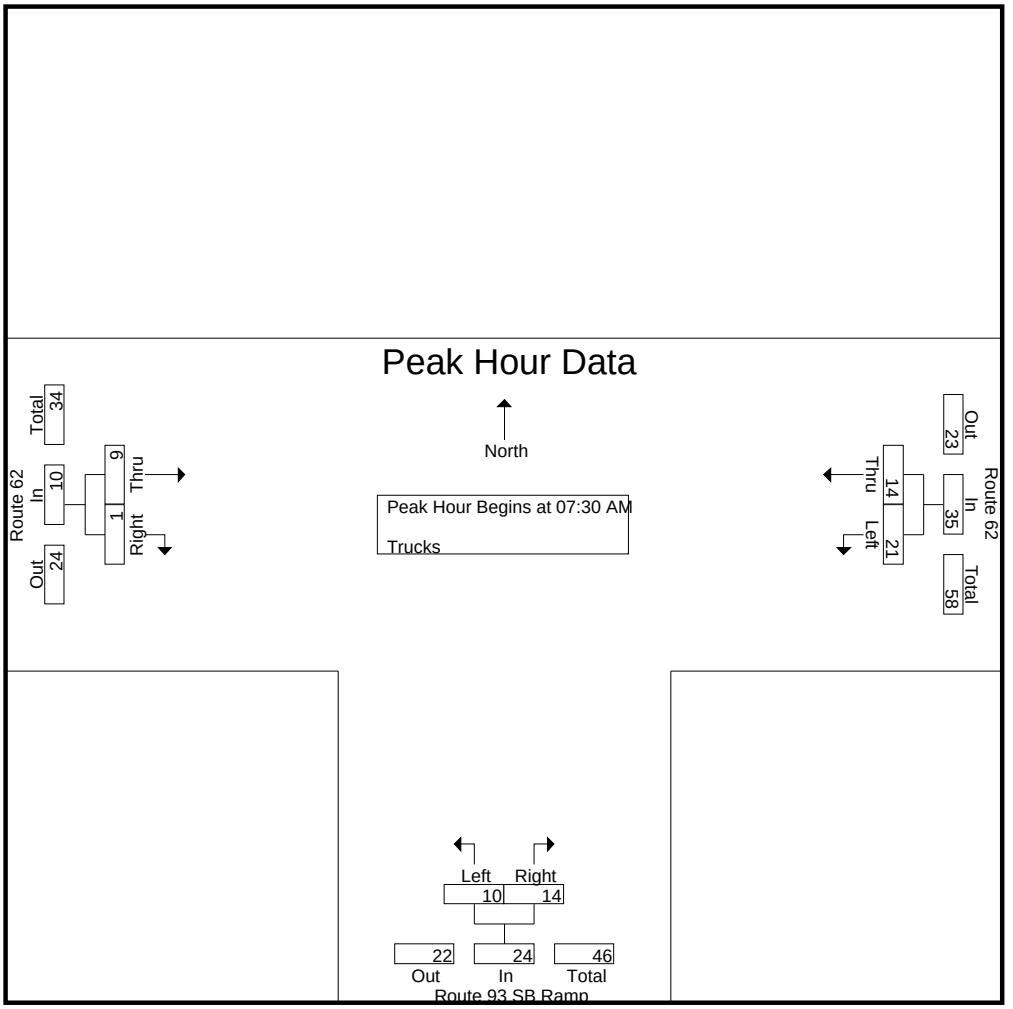
Groups Printed- Trucks

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	7	3	1	6	1	0	18
07:15 AM	5	1	1	5	2	0	14
07:30 AM	7	3	2	0	4	1	17
07:45 AM	9	3	1	2	1	0	16
Total	28	10	5	13	8	1	65
08:00 AM	0	2	2	3	4	0	11
08:15 AM	5	6	5	9	0	0	25
08:30 AM	2	4	0	6	0	1	13
08:45 AM	4	0	3	3	5	1	16
Total	11	12	10	21	9	2	65
Grand Total	39	22	15	34	17	3	130
Apprch %	63.9	36.1	30.6	69.4	85	15	
Total %	30	16.9	11.5	26.2	13.1	2.3	

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	7	3	10	2	0	2	**4**	**1**	**5**	17
07:45 AM	**9**	3	**12**	1	2	3	1	0	1	16
08:00 AM	0	2	2	2	3	5	4	0	4	11
08:15 AM	5	**6**	11	**5**	**9**	**14**	0	0	0	**25**
Total Volume	21	14	35	10	14	24	9	1	10	69
% App. Total	60	40		41.7	58.3		90	10		
PHF	.583	.583	.729	.500	.389	.429	.563	.250	.500	.690

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 8



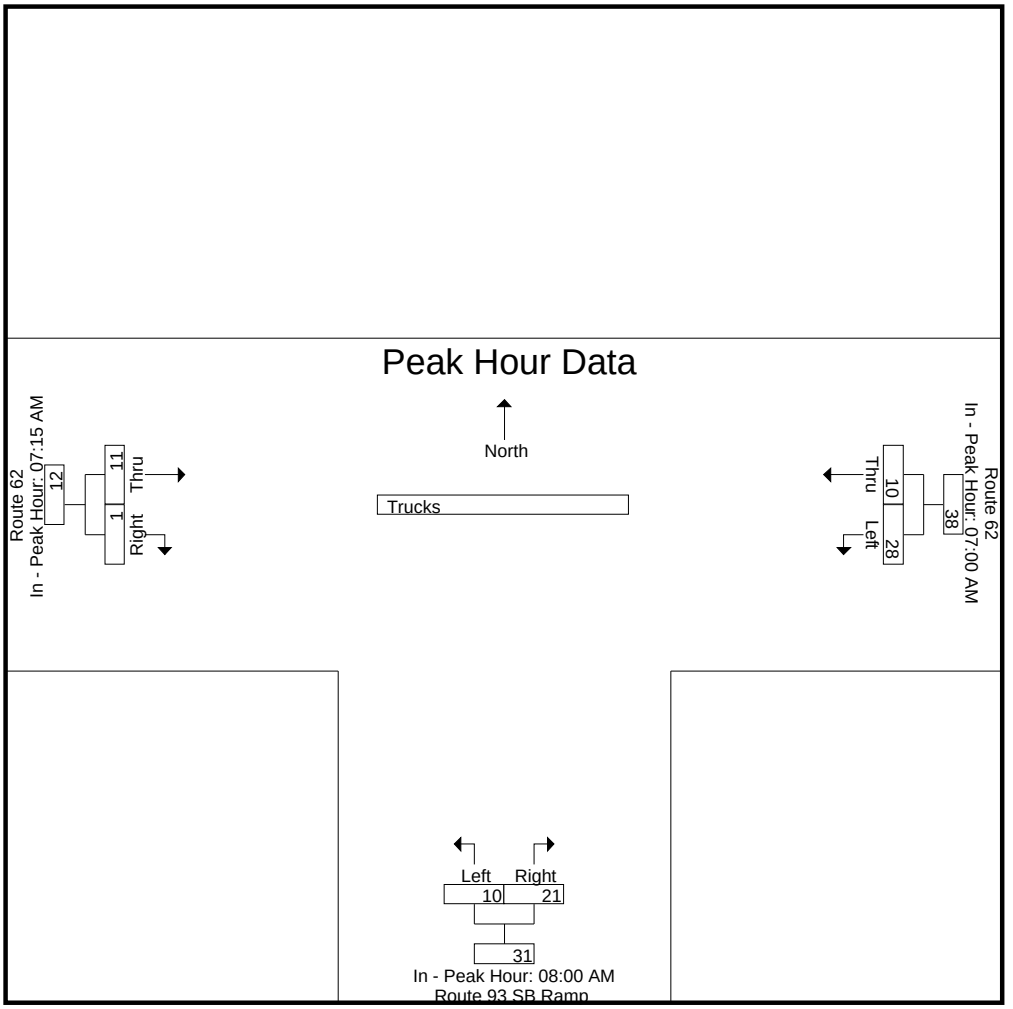
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:15 AM		
+0 mins.	7	**3**	10	2	3	5	2	0	2
+15 mins.	5	1	6	**5**	**9**	**14**	**4**	**1**	**5**
+30 mins.	7	3	10	0	6	6	1	0	1
+45 mins.	**9**	3	**12**	3	3	6	4	0	4
Total Volume	28	10	38	10	21	31	11	1	12
% App. Total	73.7	26.3		32.3	67.7		91.7	8.3	
PHF	.778	.833	.792	.500	.583	.554	.688	.250	.600

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022

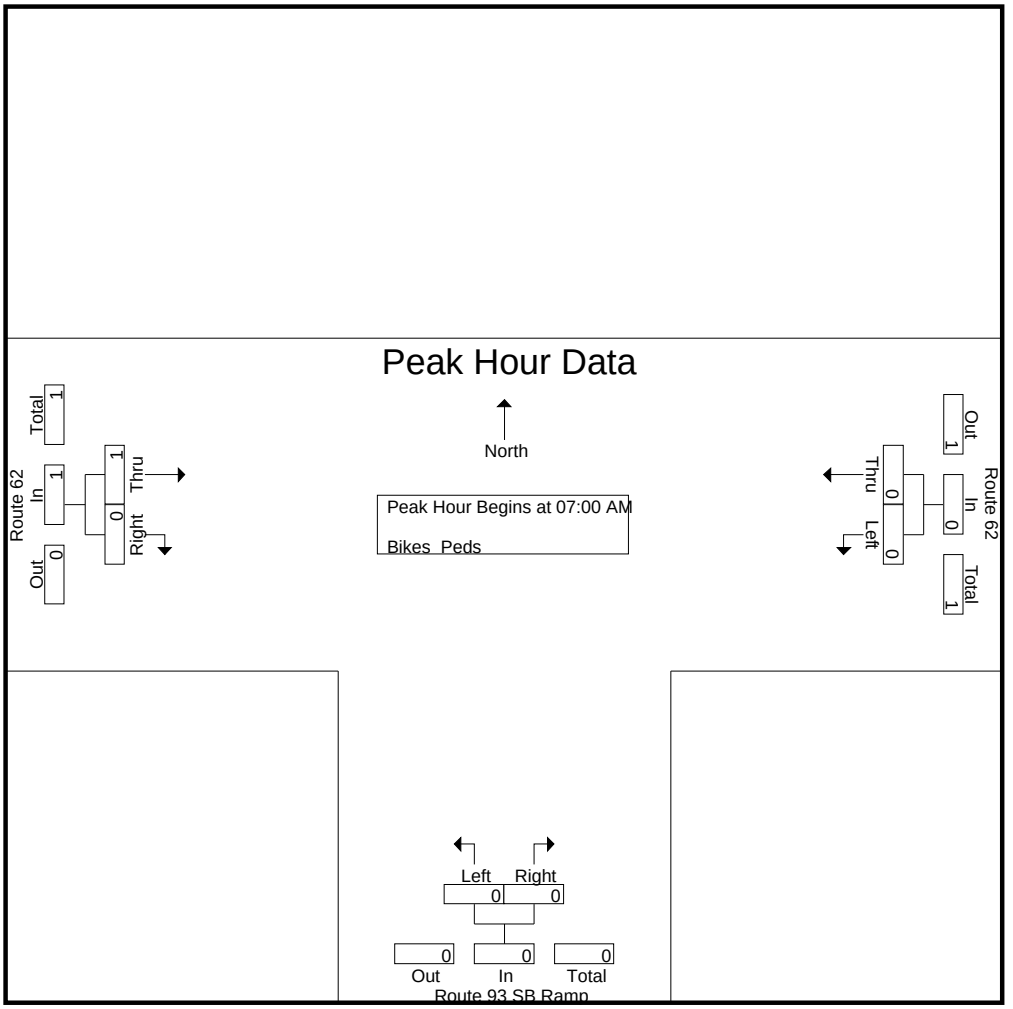
Groups Printed- Bikes Peds

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	0	1	1
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		0	100	

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	**1**	0	**1**	**1**
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 11



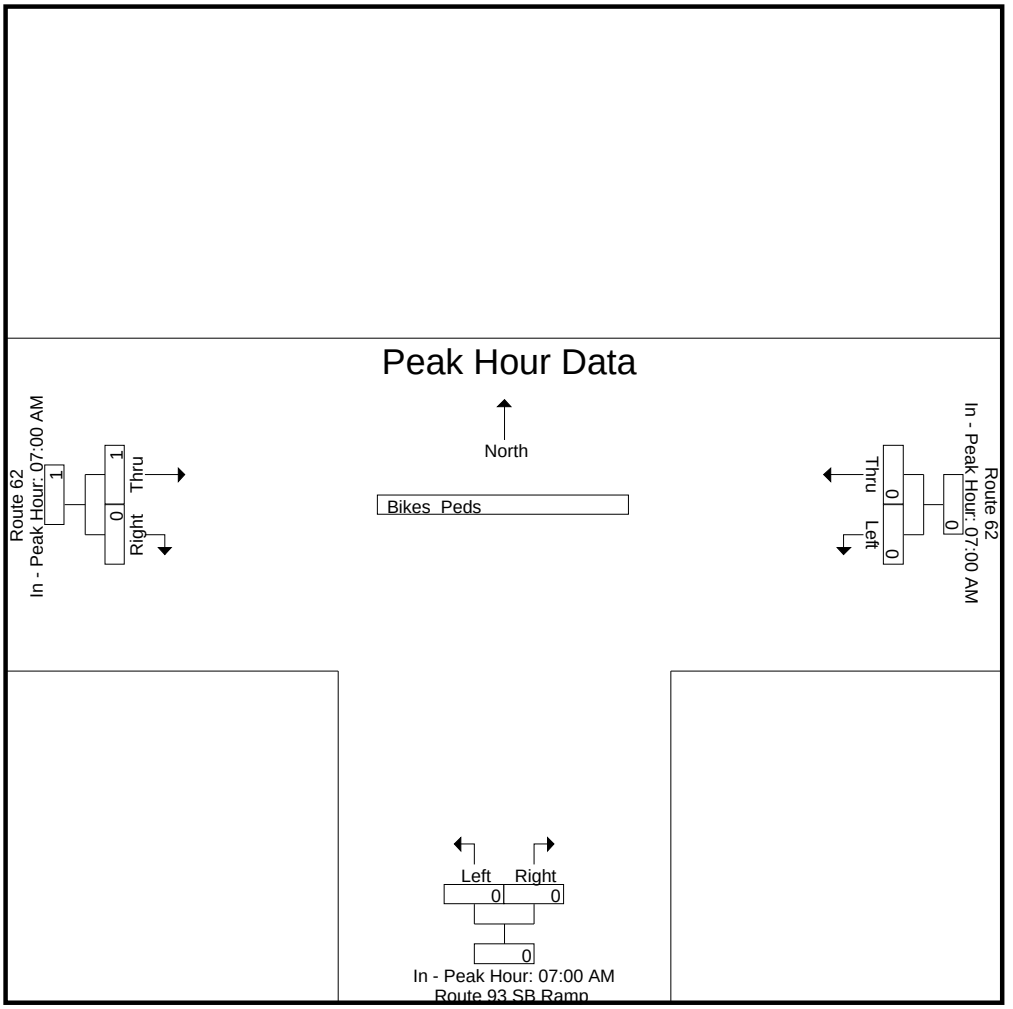
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	**1**	0	**1**
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 1

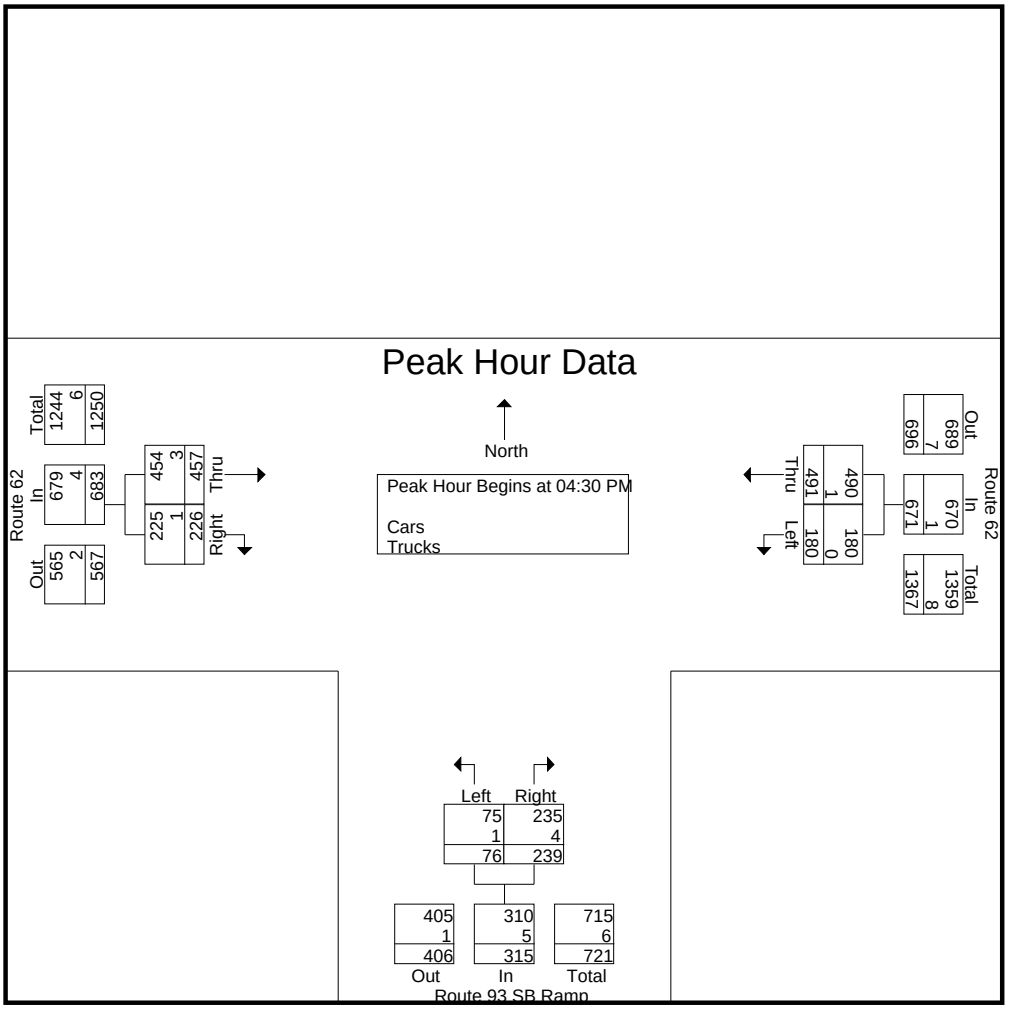
Groups Printed- Cars - Trucks

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	38	140	23	44	101	41	387
04:15 PM	41	132	27	58	99	53	410
04:30 PM	47	123	19	47	109	55	400
04:45 PM	40	126	20	61	105	51	403
Total	166	521	89	210	414	200	1600
05:00 PM	41	108	16	64	118	56	403
05:15 PM	52	134	21	67	125	64	463
05:30 PM	35	115	19	63	107	48	387
05:45 PM	38	106	13	68	92	51	368
Total	166	463	69	262	442	219	1621
Grand Total	332	984	158	472	856	419	3221
Apprch %	25.2	74.8	25.1	74.9	67.1	32.9	
Total %	10.3	30.5	4.9	14.7	26.6	13	
Cars	331	981	156	460	851	418	3197
% Cars	99.7	99.7	98.7	97.5	99.4	99.8	99.3
Trucks	1	3	2	12	5	1	24
% Trucks	0.3	0.3	1.3	2.5	0.6	0.2	0.7

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	47	123	170	19	47	66	109	55	164	400
04:45 PM	40	126	166	20	61	81	105	51	156	403
05:00 PM	41	108	149	16	64	80	118	56	174	403
05:15 PM	**52**	**134**	**186**	**21**	**67**	**88**	**125**	**64**	**189**	**463**
Total Volume	180	491	671	76	239	315	457	226	683	1669
% App. Total	26.8	73.2		24.1	75.9		66.9	33.1		
PHF	.865	.916	.902	.905	.892	.895	.914	.883	.903	.901
Cars	180	490	670	75	235	310	454	225	679	1659
% Cars	100	99.8	99.9	98.7	98.3	98.4	99.3	99.6	99.4	99.4
Trucks	0	1	1	1	4	5	3	1	4	10
% Trucks	0	0.2	0.1	1.3	1.7	1.6	0.7	0.4	0.6	0.6

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

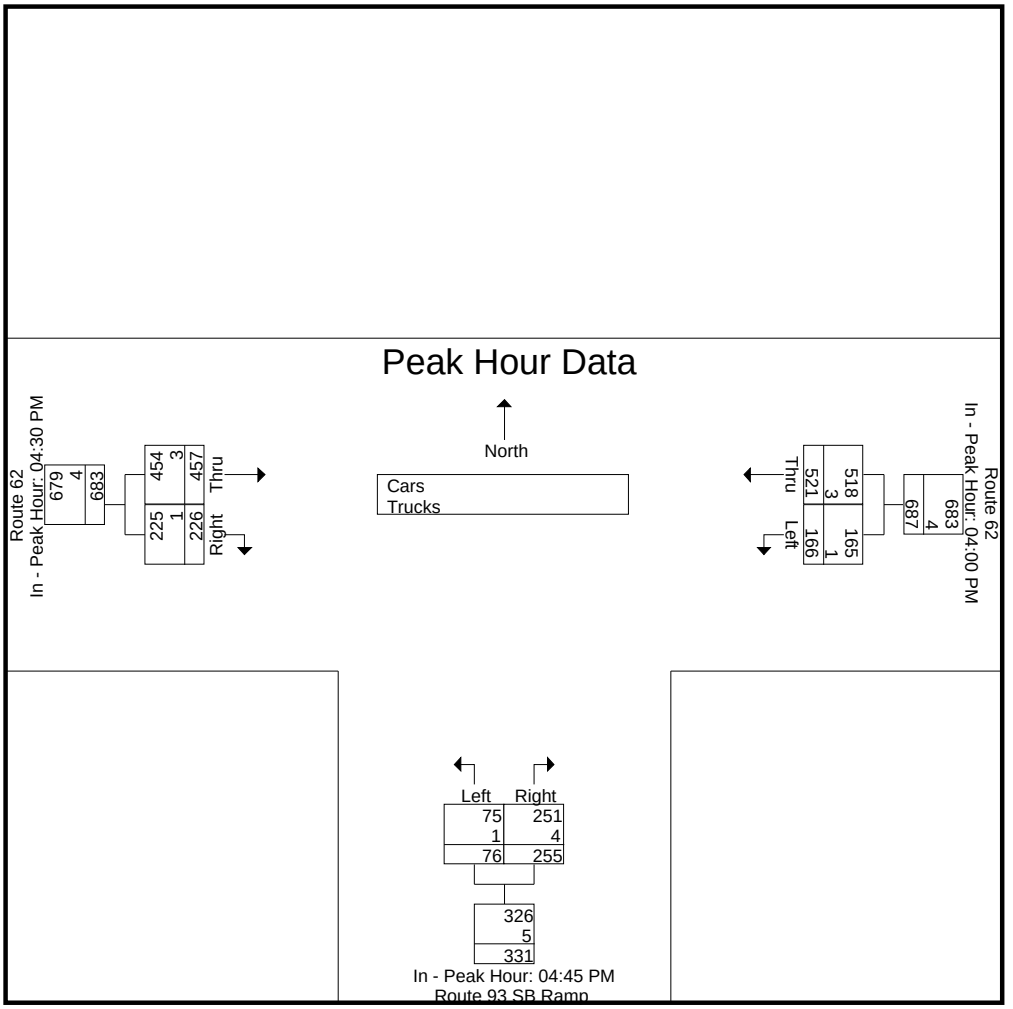
	04:00 PM			04:45 PM			04:30 PM		
+0 mins.	38	**140**	**178**	20	61	81	109	55	164
+15 mins.	41	132	173	16	64	80	105	51	156
+30 mins.	**47**	123	170	**21**	**67**	**88**	118	56	174
+45 mins.	40	126	166	19	63	82	**125**	**64**	**189**
Total Volume	166	521	687	76	255	331	457	226	683
% App. Total	24.2	75.8		23	77		66.9	33.1	
PHF	.883	.930	.965	.905	.951	.940	.914	.883	.903
Cars	165	518	683	75	251	326	454	225	679
% Cars	99.4	99.4	99.4	98.7	98.4	98.5	99.3	99.6	99.4
Trucks	1	3	4	1	4	5	3	1	4
% Trucks	0.6	0.6	0.6	1.3	1.6	1.5	0.7	0.4	0.6

Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	37	138	23	43	101	41	383
04:15 PM	41	132	26	55	98	53	405
04:30 PM	47	122	19	46	107	55	396
04:45 PM	40	126	20	59	105	50	400
Total	165	518	88	203	411	199	1584
05:00 PM	41	108	16	63	117	56	401
05:15 PM	52	134	20	67	125	64	462
05:30 PM	35	115	19	62	106	48	385
05:45 PM	38	106	13	65	92	51	365
Total	166	463	68	257	440	219	1613
Grand Total	331	981	156	460	851	418	3197
Apprch %	25.2	74.8	25.3	74.7	67.1	32.9	
Total %	10.4	30.7	4.9	14.4	26.6	13.1	

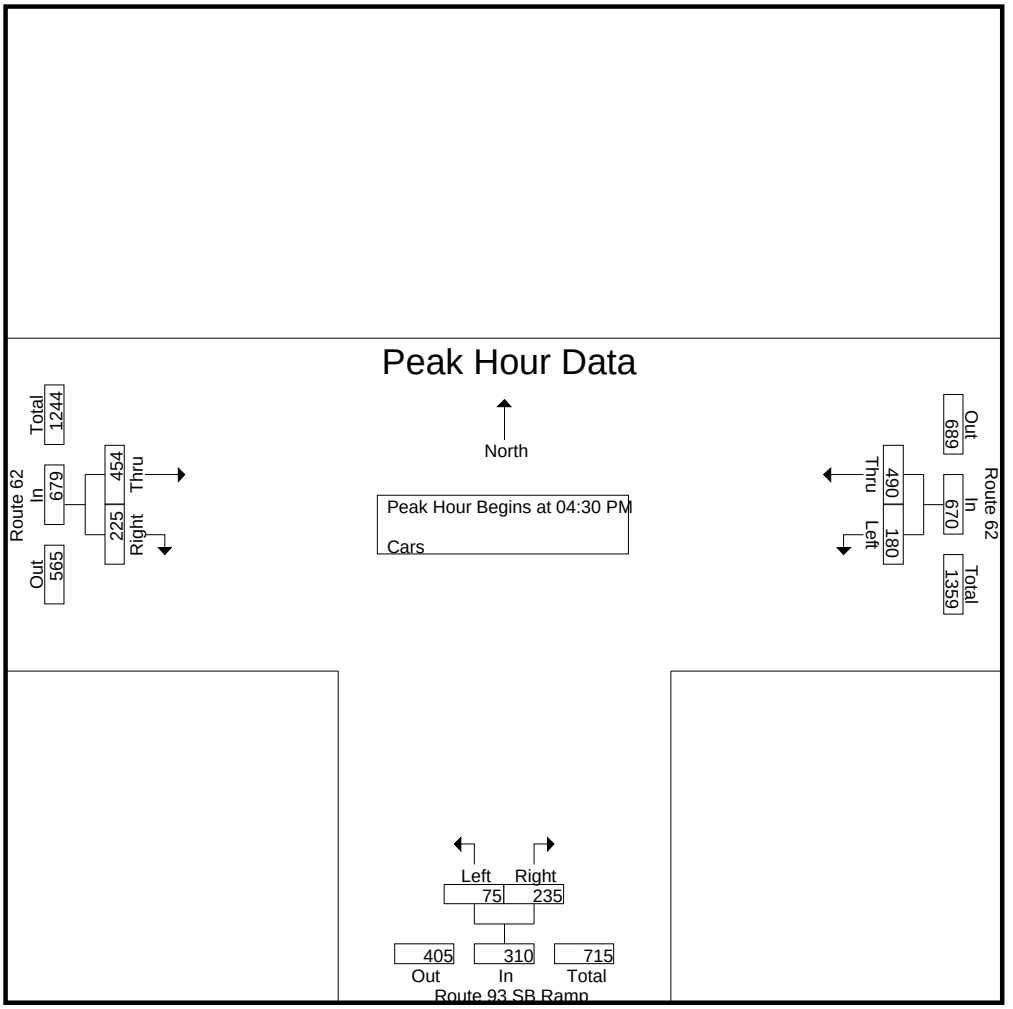
	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	47	122	169	19	46	65	107	55	162	396
04:45 PM	40	126	166	**20**	59	79	105	50	155	400
05:00 PM	41	108	149	16	63	79	117	56	173	401
05:15 PM	**52**	**134**	**186**	20	**67**	**87**	**125**	**64**	**189**	**462**
Total Volume	180	490	670	75	235	310	454	225	679	1659
% App. Total	26.9	73.1		24.2	75.8		66.9	33.1		
PHF	.865	.914	.901	.938	.877	.891	.908	.879	.898	.898

Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 5



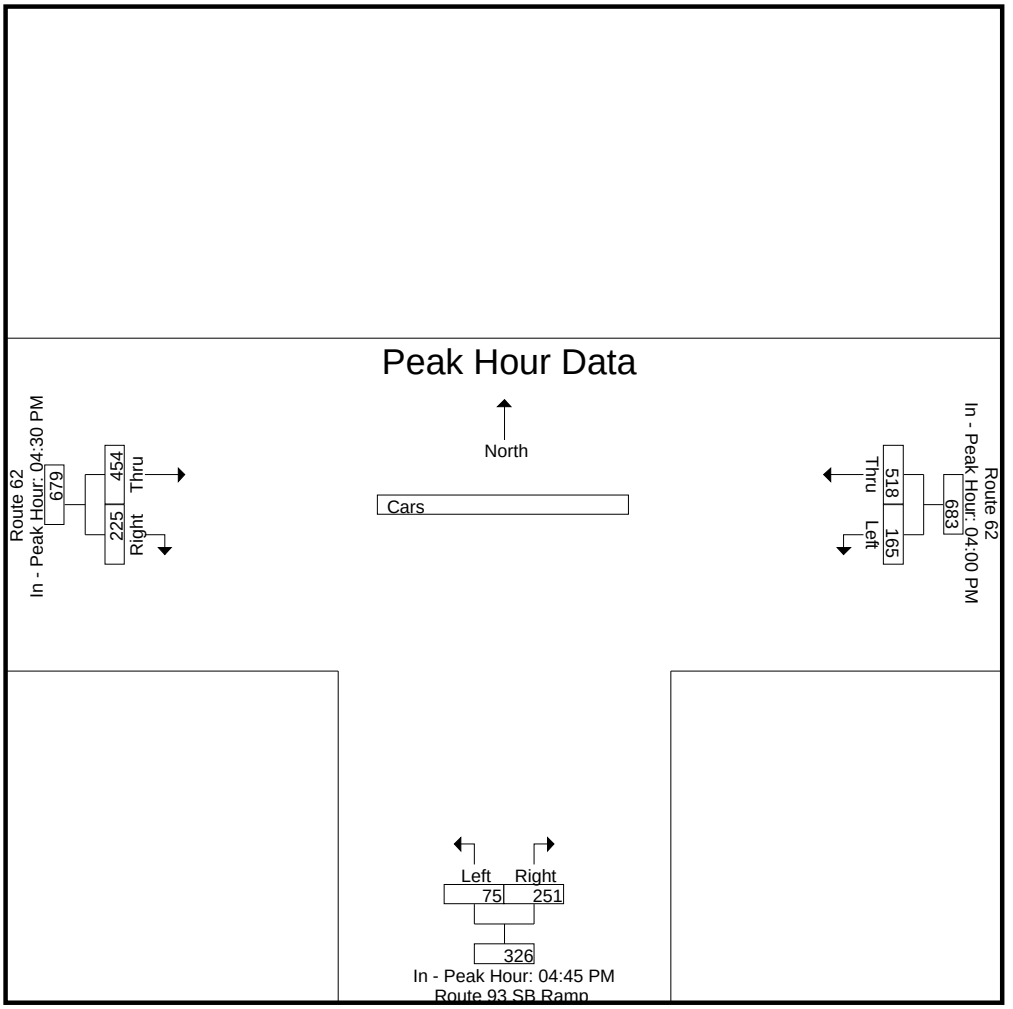
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:45 PM			04:30 PM		
+0 mins.	37	**138**	**175**	**20**	59	79	107	55	162
+15 mins.	41	132	173	16	63	79	105	50	155
+30 mins.	**47**	122	169	20	**67**	**87**	117	56	173
+45 mins.	40	126	166	19	62	81	**125**	**64**	**189**
Total Volume	165	518	683	75	251	326	454	225	679
% App. Total	24.2	75.8		23	77		66.9	33.1	
PHF	.878	.938	.976	.938	.937	.937	.908	.879	.898

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022

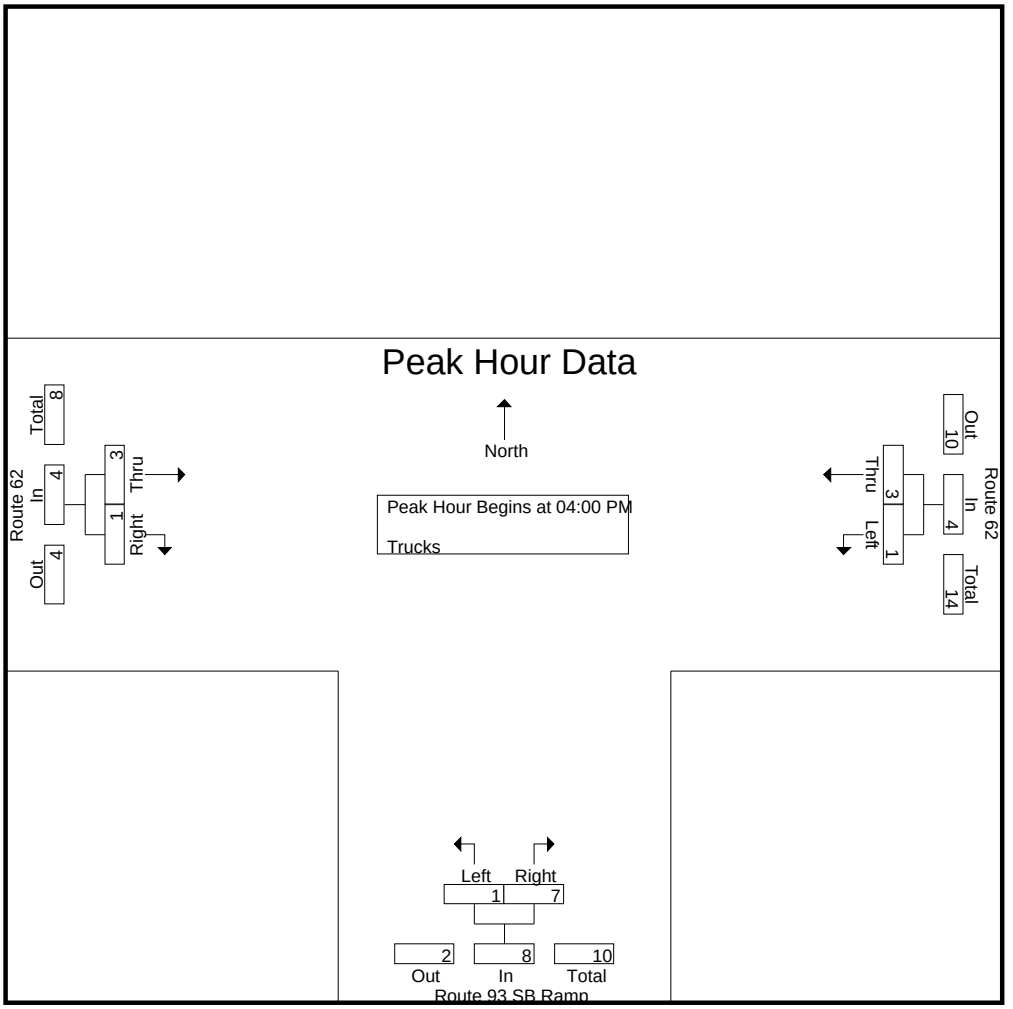
Groups Printed- Trucks

	Route 62 From East		Route 93 SB Ramp From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	1	2	0	1	0	0	4
04:15 PM	0	0	1	3	1	0	5
04:30 PM	0	1	0	1	2	0	4
04:45 PM	0	0	0	2	0	1	3
Total	1	3	1	7	3	1	16
05:00 PM	0	0	0	1	1	0	2
05:15 PM	0	0	1	0	0	0	1
05:30 PM	0	0	0	1	1	0	2
05:45 PM	0	0	0	3	0	0	3
Total	0	0	1	5	2	0	8
Grand Total	1	3	2	12	5	1	24
Apprch %	25	75	14.3	85.7	83.3	16.7	
Total %	4.2	12.5	8.3	50	20.8	4.2	

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**1**	**2**	**3**	0	1	1	0	0	0	4
04:15 PM	0	0	0	**1**	**3**	**4**	1	0	1	**5**
04:30 PM	0	1	1	0	1	1	**2**	0	**2**	4
04:45 PM	0	0	0	0	2	2	0	**1**	1	3
Total Volume	1	3	4	1	7	8	3	1	4	16
% App. Total	25	75		12.5	87.5		75	25		
PHF	.250	.375	.333	.250	.583	.500	.375	.250	.500	.800

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 8



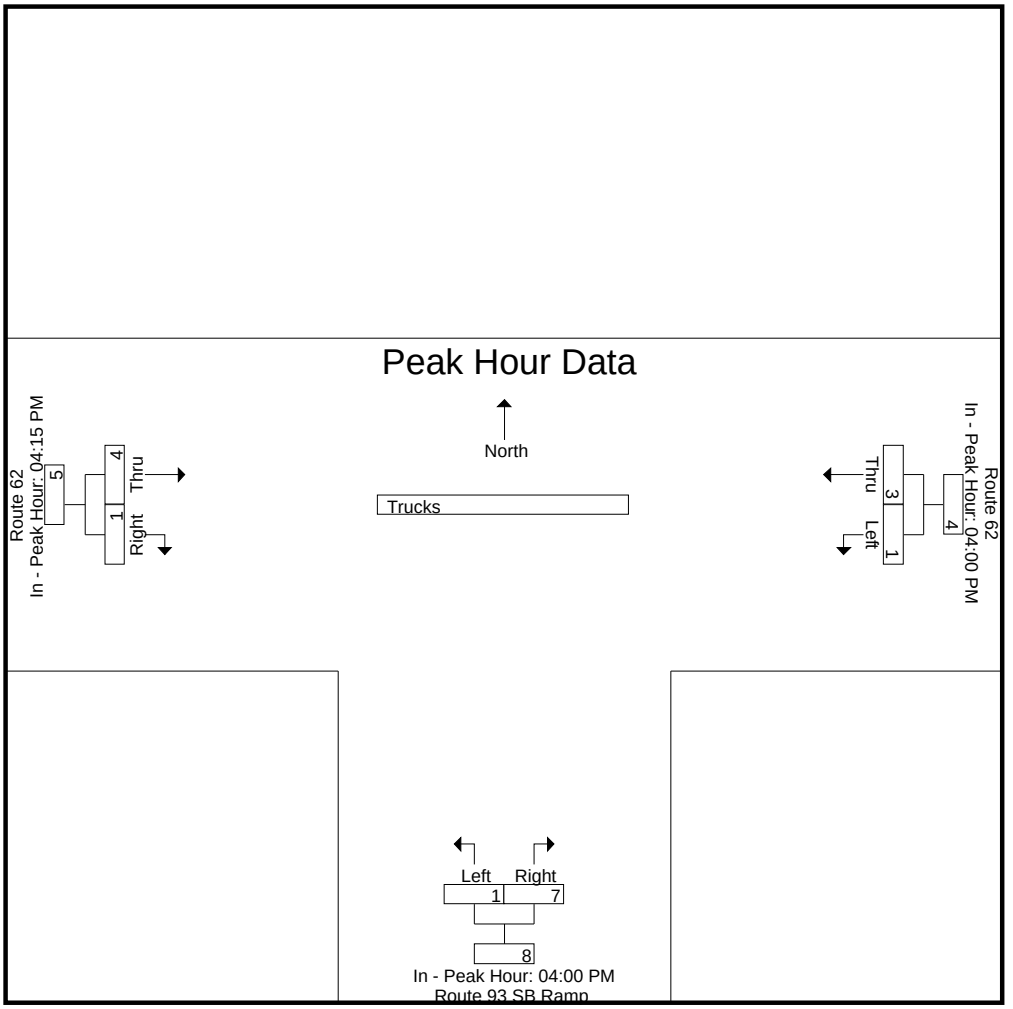
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:15 PM		
+0 mins.	**1**	**2**	**3**	0	1	1	1	0	1
+15 mins.	0	0	0	**1**	**3**	**4**	**2**	0	**2**
+30 mins.	0	1	1	0	1	1	0	**1**	1
+45 mins.	0	0	0	0	2	2	1	0	1
Total Volume	1	3	4	1	7	8	4	1	5
% App. Total	25	75		12.5	87.5		80	20	
PHF	.250	.375	.333	.250	.583	.500	.500	.250	.625

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022

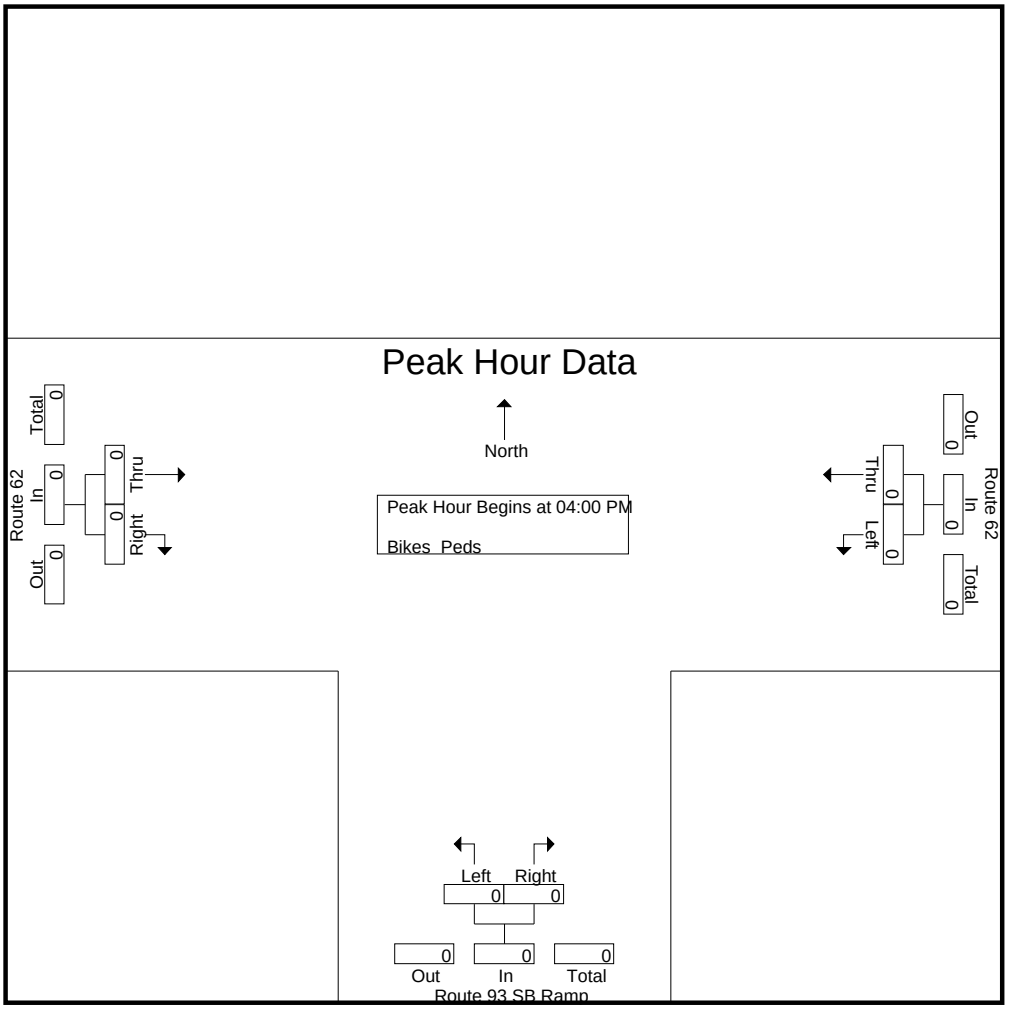
Groups Printed- Bikes Peds

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

	Route 62 From East			Route 93 SB Ramp From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 11



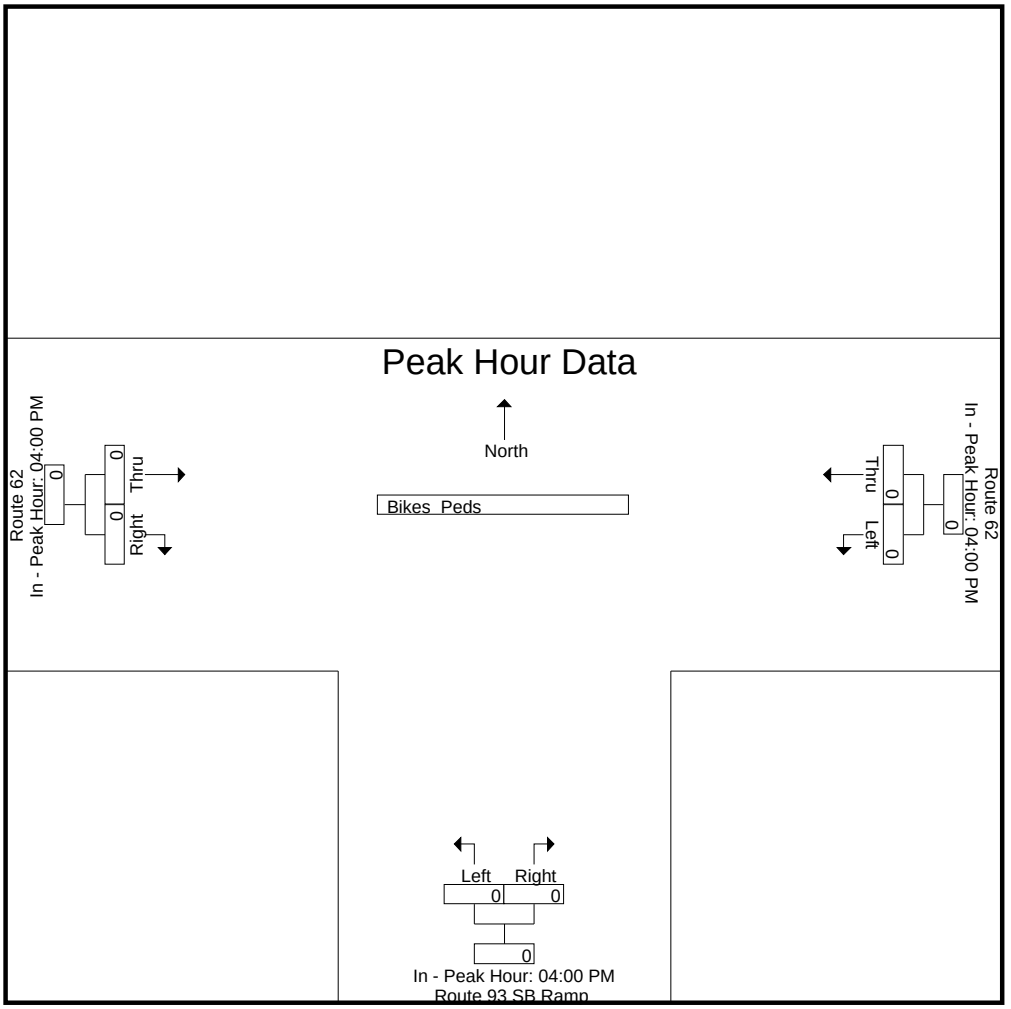
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Route 93 SB Ramp
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110001
Site Code : 93110001
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 1

Groups Printed- Cars - Trucks

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	45	153	18	36	115	35	402
07:15 AM	56	151	15	40	108	42	412
07:30 AM	75	152	31	31	98	27	414
07:45 AM	60	113	28	28	98	27	354
Total	236	569	92	135	419	131	1582
08:00 AM	53	92	26	32	85	27	315
08:15 AM	37	100	36	30	91	22	316
08:30 AM	36	101	27	28	87	24	303
08:45 AM	32	101	33	34	74	23	297
Total	158	394	122	124	337	96	1231
Grand Total	394	963	214	259	756	227	2813
Apprch %	29	71	45.2	54.8	76.9	23.1	
Total %	14	34.2	7.6	9.2	26.9	8.1	
Cars	357	887	208	206	711	212	2581
% Cars	90.6	92.1	97.2	79.5	94	93.4	91.8
Trucks	37	76	6	53	45	15	232
% Trucks	9.4	7.9	2.8	20.5	6	6.6	8.2

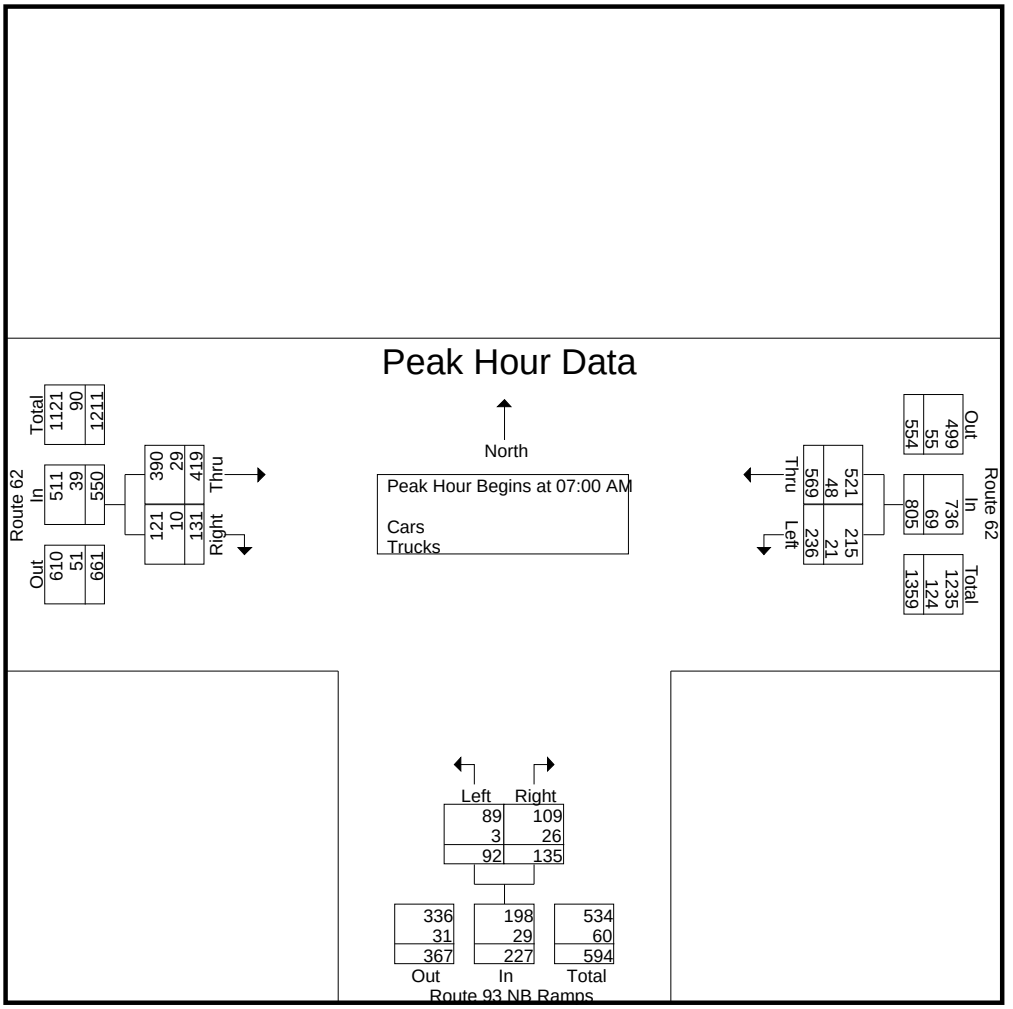
	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	45	**153**	198	18	36	54	**115**	35	**150**	402
07:15 AM	56	151	207	15	**40**	55	108	**42**	150	412
07:30 AM	**75**	152	**227**	**31**	31	**62**	98	27	125	**414**
07:45 AM	60	113	173	28	28	56	98	27	125	354
Total Volume	236	569	805	92	135	227	419	131	550	1582
% App. Total	29.3	70.7		40.5	59.5		76.2	23.8		
PHF	.787	.930	.887	.742	.844	.915	.911	.780	.917	.955
Cars	215	521	736	89	109	198	390	121	511	1445
% Cars	91.1	91.6	91.4	96.7	80.7	87.2	93.1	92.4	92.9	91.3
Trucks	21	48	69	3	26	29	29	10	39	137
% Trucks	8.9	8.4	8.6	3.3	19.3	12.8	6.9	7.6	7.1	8.7

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:00 AM		
+0 mins.	45	**153**	198	26	32	58	**115**	35	**150**
+15 mins.	56	151	207	**36**	30	66	108	**42**	150
+30 mins.	**75**	152	**227**	27	28	55	98	27	125
+45 mins.	60	113	173	33	**34**	**67**	98	27	125
Total Volume	236	569	805	122	124	246	419	131	550
% App. Total	29.3	70.7		49.6	50.4		76.2	23.8	
PHF	.787	.930	.887	.847	.912	.918	.911	.780	.917
Cars	215	521	736	119	97	216	390	121	511
% Cars	91.1	91.6	91.4	97.5	78.2	87.8	93.1	92.4	92.9
Trucks	21	48	69	3	27	30	29	10	39
% Trucks	8.9	8.4	8.6	2.5	21.8	12.2	6.9	7.6	7.1

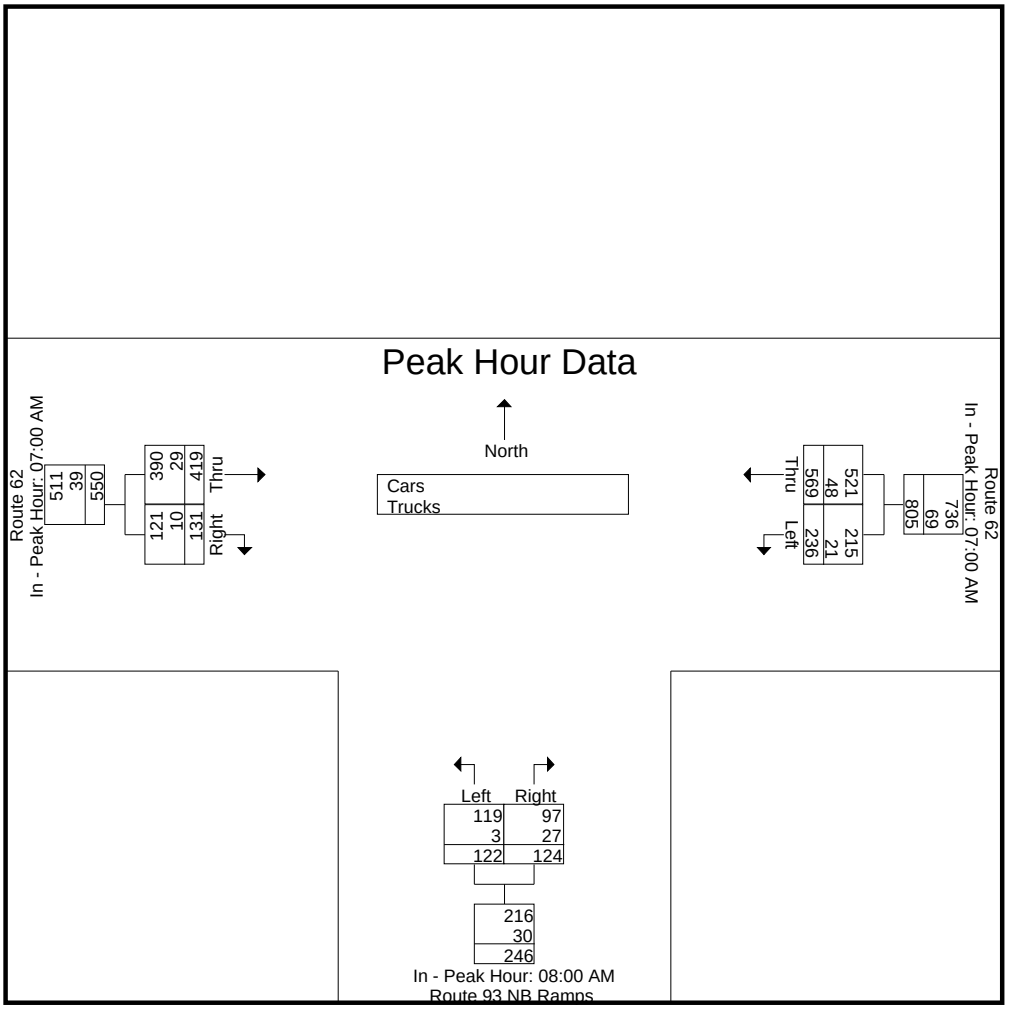
Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 3

Peak Hour Data



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 4

Groups Printed- Cars

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	41	140	18	25	107	30	361
07:15 AM	48	139	15	34	100	39	375
07:30 AM	68	139	30	29	94	25	385
07:45 AM	58	103	26	21	89	27	324
Total	215	521	89	109	390	121	1445
08:00 AM	47	85	26	28	82	25	293
08:15 AM	33	94	35	23	86	22	293
08:30 AM	33	91	25	18	83	24	274
08:45 AM	29	96	33	28	70	20	276
Total	142	366	119	97	321	91	1136
Grand Total	357	887	208	206	711	212	2581
Apprch %	28.7	71.3	50.2	49.8	77	23	
Total %	13.8	34.4	8.1	8	27.5	8.2	

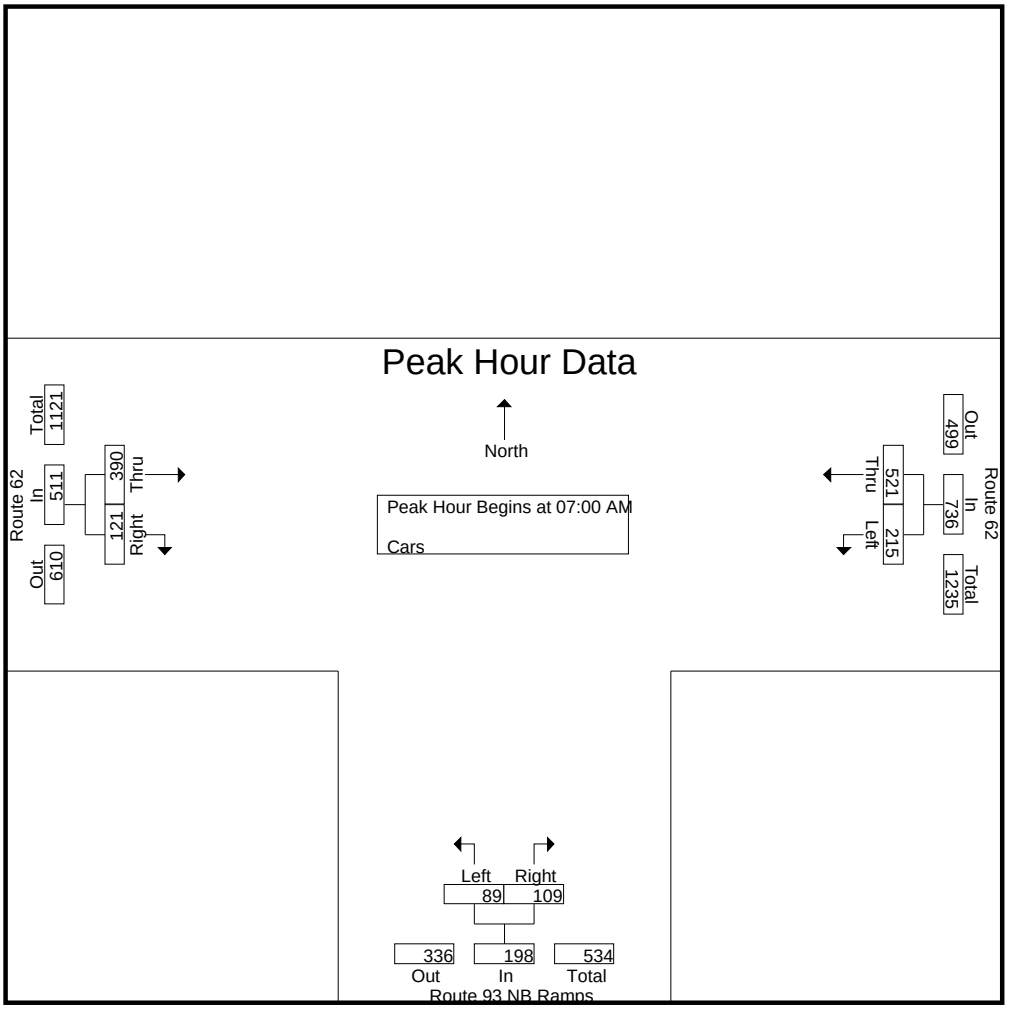
	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	41	**140**	181	18	25	43	**107**	30	137	361
07:15 AM	48	139	187	15	**34**	49	100	**39**	**139**	375
07:30 AM	**68**	139	**207**	**30**	29	**59**	94	25	119	**385**
07:45 AM	58	103	161	26	21	47	89	27	116	324
Total Volume	215	521	736	89	109	198	390	121	511	1445
% App. Total	29.2	70.8		44.9	55.1		76.3	23.7		
PHF	.790	.930	.889	.742	.801	.839	.911	.776	.919	.938

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:30 AM			07:00 AM		
+0 mins.	41	**140**	181	30	**29**	**59**	**107**	30	137
+15 mins.	48	139	187	26	21	47	100	**39**	**139**
+30 mins.	**68**	139	**207**	26	28	54	94	25	119
+45 mins.	58	103	161	**35**	23	58	89	27	116
Total Volume	215	521	736	117	101	218	390	121	511
% App. Total	29.2	70.8		53.7	46.3		76.3	23.7	
PHF	.790	.930	.889	.836	.871	.924	.911	.776	.919

Accurate Counts
978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
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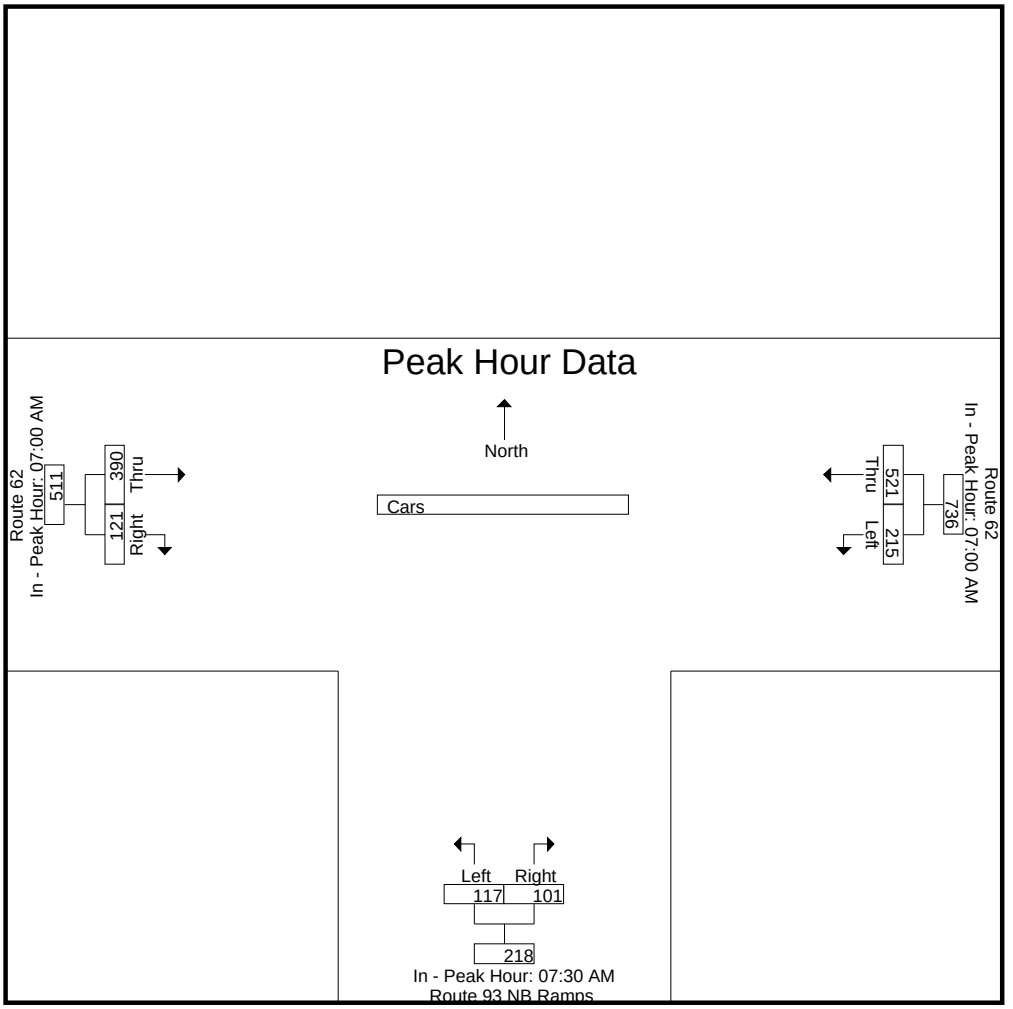


Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022

Groups Printed- Trucks

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	4	13	0	11	8	5	41
07:15 AM	8	12	0	6	8	3	37
07:30 AM	7	13	1	2	4	2	29
07:45 AM	2	10	2	7	9	0	30
Total	21	48	3	26	29	10	137
08:00 AM	6	7	0	4	3	2	22
08:15 AM	4	6	1	7	5	0	23
08:30 AM	3	10	2	10	4	0	29
08:45 AM	3	5	0	6	4	3	21
Total	16	28	3	27	16	5	95
Grand Total	37	76	6	53	45	15	232
Apprch %	32.7	67.3	10.2	89.8	75	25	
Total %	15.9	32.8	2.6	22.8	19.4	6.5	

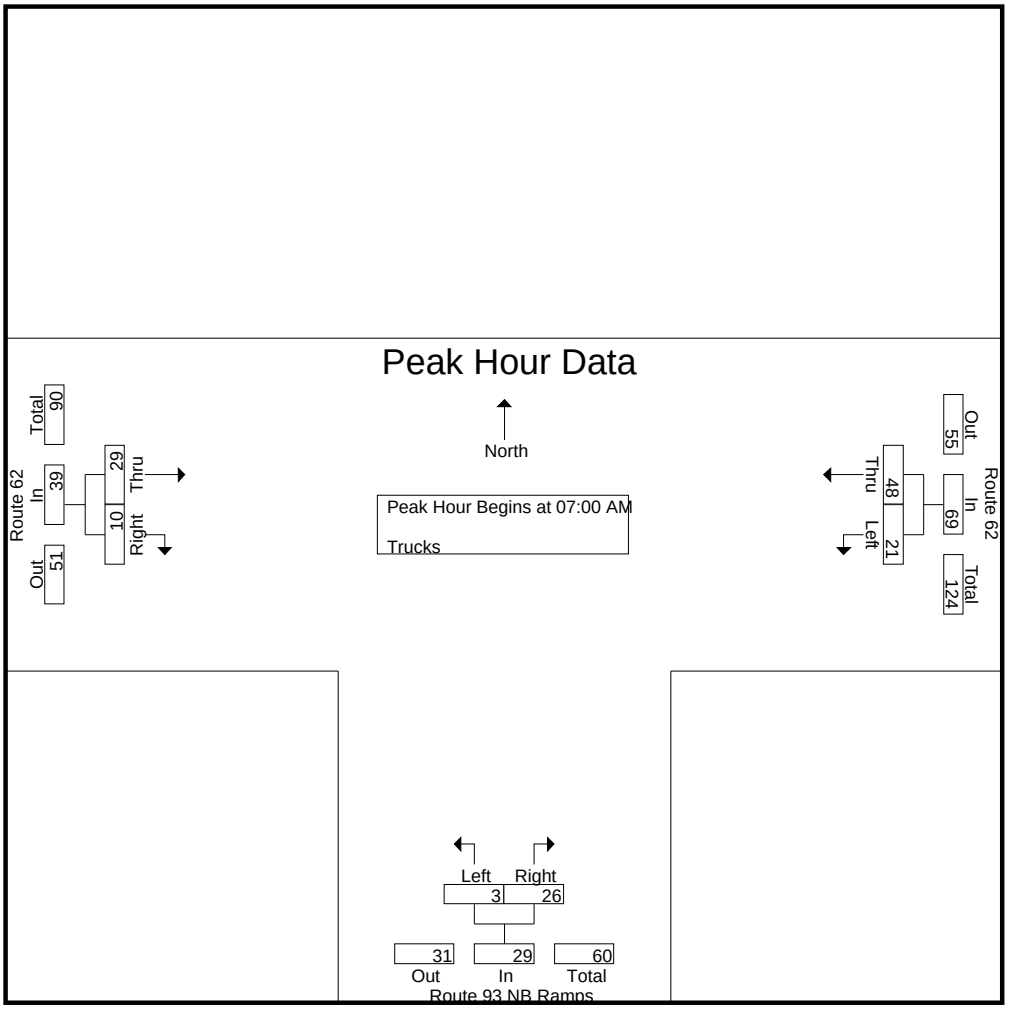
	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	4	**13**	17	0	**11**	**11**	8	**5**	**13**	**41**
07:15 AM	**8**	12	**20**	0	6	6	8	3	11	37
07:30 AM	7	13	20	1	2	3	4	2	6	29
07:45 AM	2	10	12	**2**	7	9	**9**	0	9	30
Total Volume	21	48	69	3	26	29	29	10	39	137
% App. Total	30.4	69.6		10.3	89.7		74.4	25.6		
PHF	.656	.923	.863	.375	.591	.659	.806	.500	.750	.835

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	4	**13**	17	**2**	7	9	8	**5**	**13**
+15 mins.	**8**	12	**20**	0	4	4	8	3	11
+30 mins.	7	13	20	1	7	8	4	2	6
+45 mins.	2	10	12	2	**10**	**12**	**9**	0	9
Total Volume	21	48	69	5	28	33	29	10	39
% App. Total	30.4	69.6		15.2	84.8		74.4	25.6	
PHF	.656	.923	.863	.625	.700	.688	.806	.500	.750

Accurate Counts
978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
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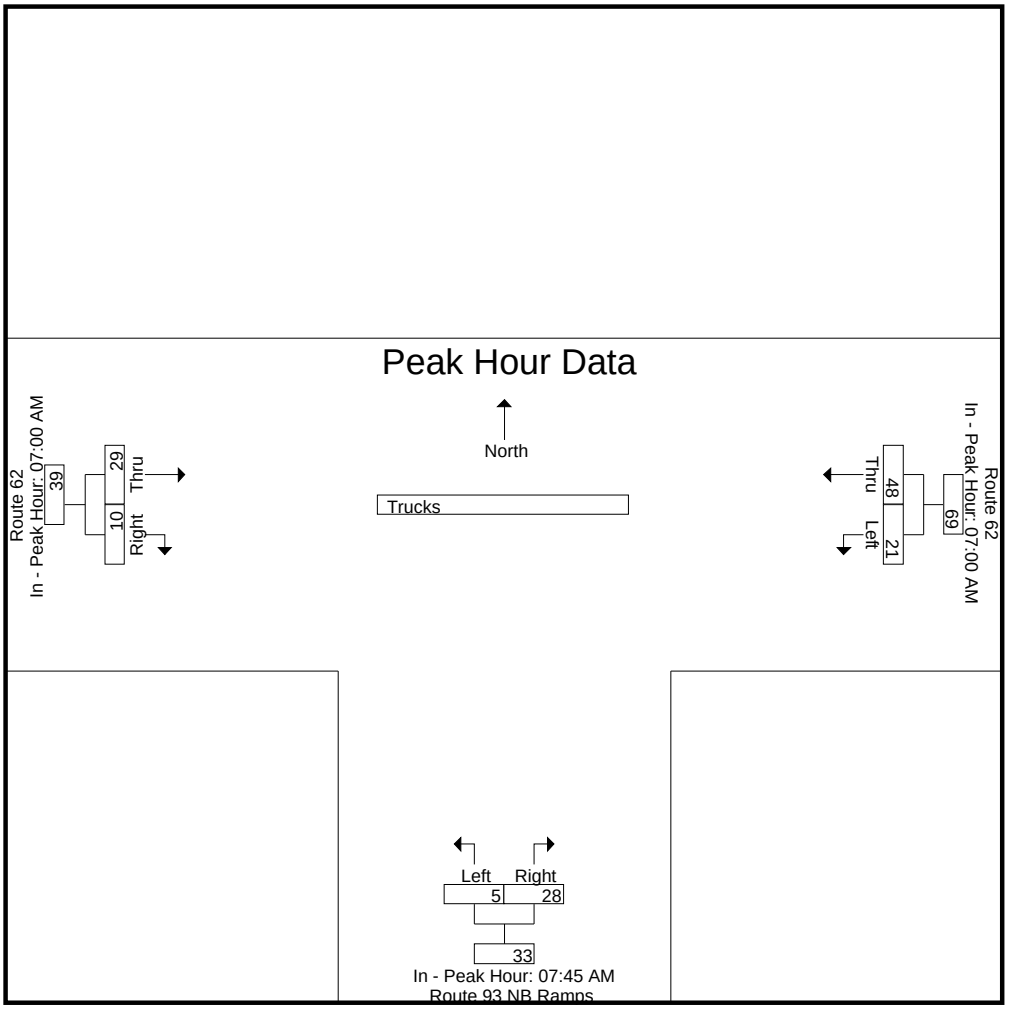


Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022

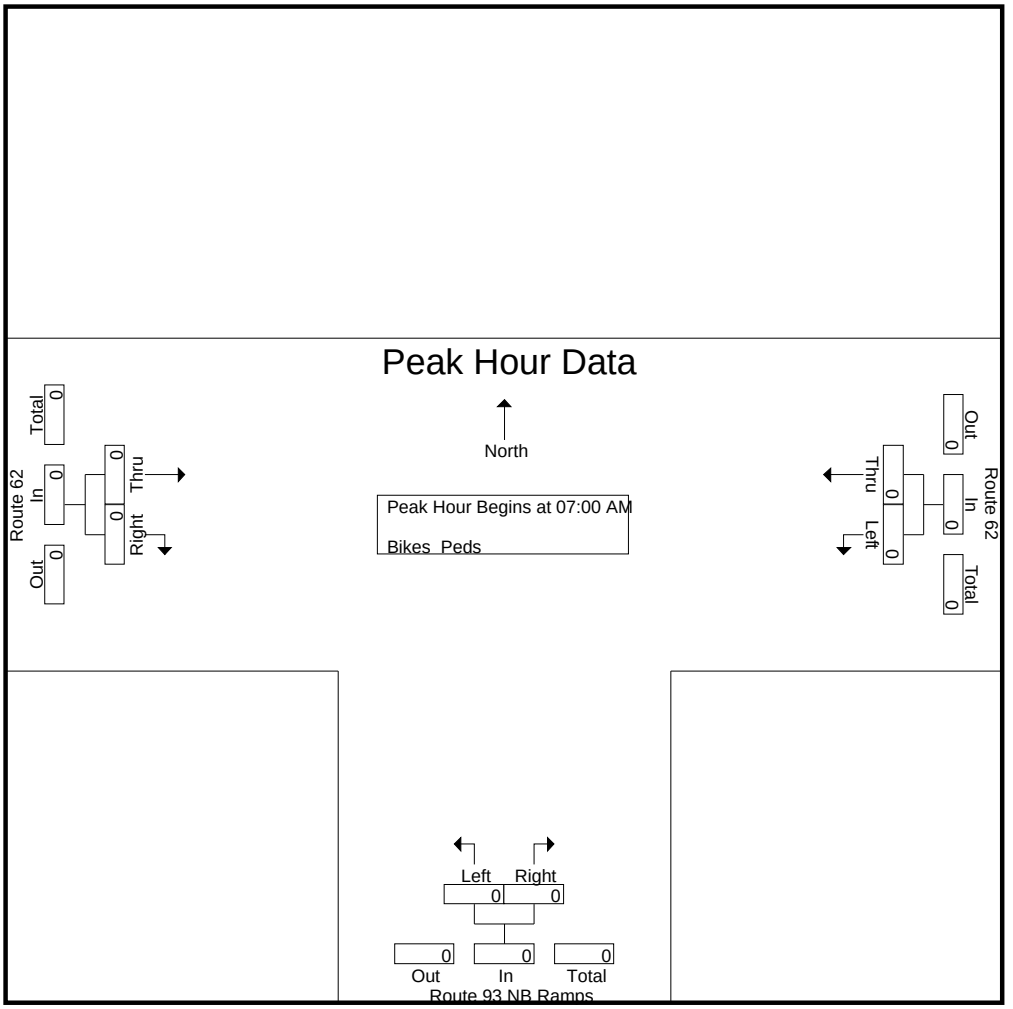
Groups Printed- Bikes Peds

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 11



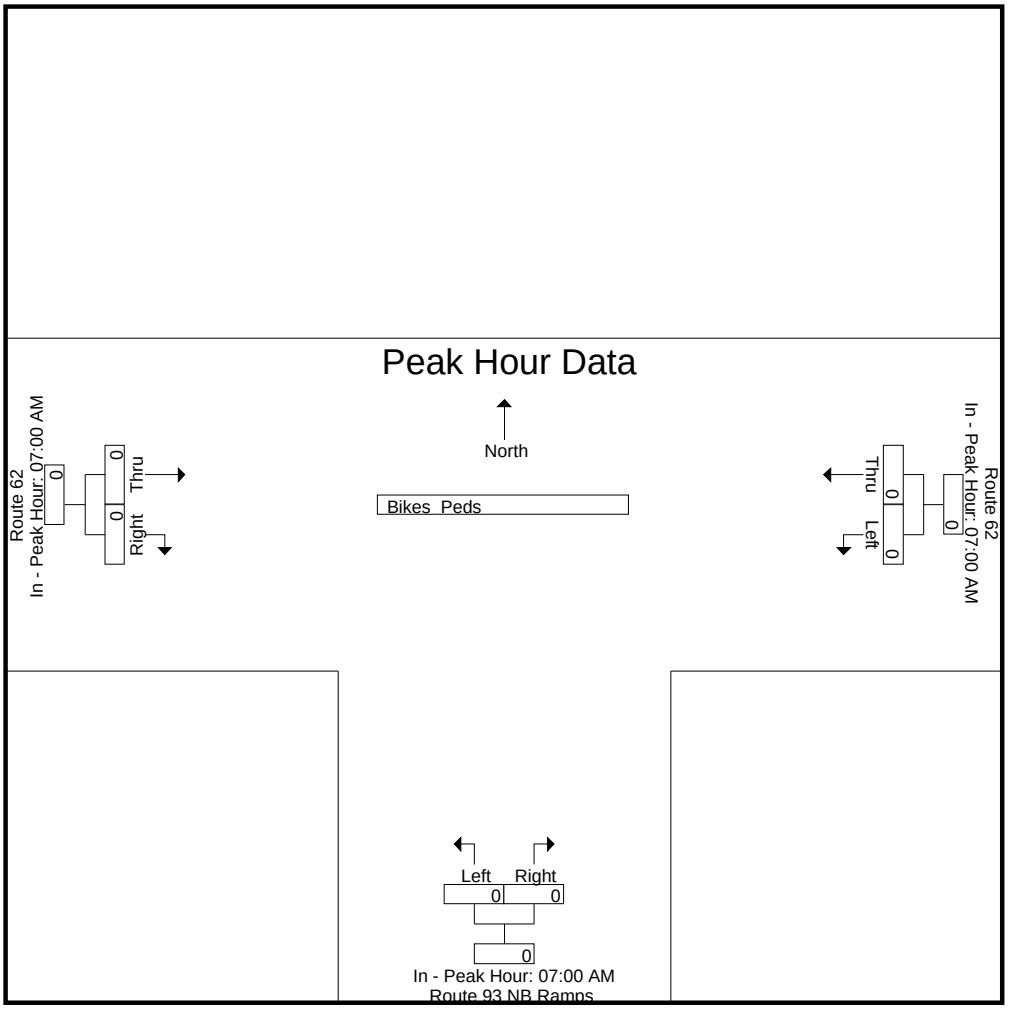
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 1

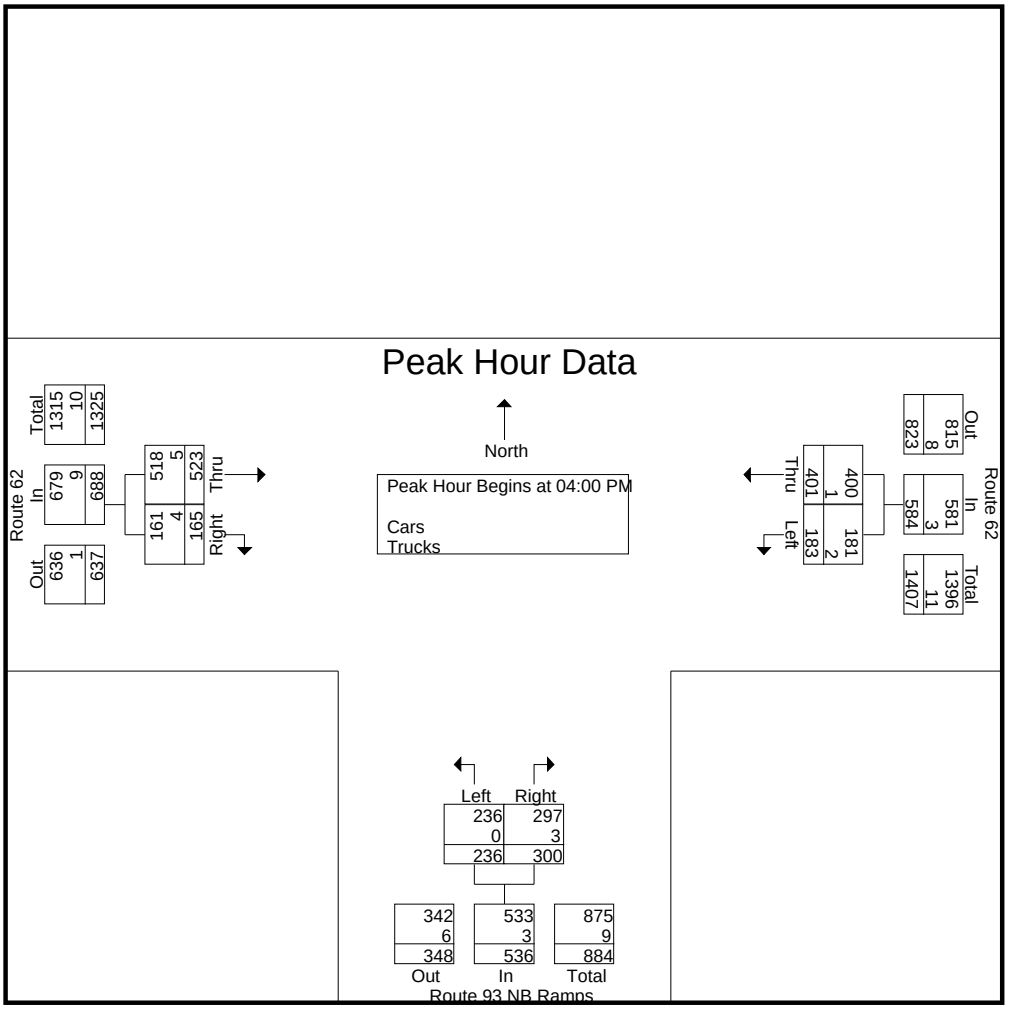
Groups Printed- Cars - Trucks

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	51	114	51	71	104	45	436
04:15 PM	43	116	57	79	135	49	479
04:30 PM	46	94	61	77	143	33	454
04:45 PM	43	77	67	73	141	38	439
Total	183	401	236	300	523	165	1808
05:00 PM	38	74	51	60	91	34	348
05:15 PM	33	69	50	69	83	31	335
05:30 PM	25	67	47	60	88	29	316
05:45 PM	22	61	36	43	70	20	252
Total	118	271	184	232	332	114	1251
Grand Total	301	672	420	532	855	279	3059
Apprch %	30.9	69.1	44.1	55.9	75.4	24.6	
Total %	9.8	22	13.7	17.4	28	9.1	
Cars	294	669	420	529	839	273	3024
% Cars	97.7	99.6	100	99.4	98.1	97.8	98.9
Trucks	7	3	0	3	16	6	35
% Trucks	2.3	0.4	0	0.6	1.9	2.2	1.1

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**51**	114	**165**	51	71	122	104	45	149	436
04:15 PM	43	**116**	159	57	**79**	136	135	**49**	**184**	**479**
04:30 PM	46	94	140	61	77	138	**143**	33	176	454
04:45 PM	43	77	120	**67**	73	**140**	141	38	179	439
Total Volume	183	401	584	236	300	536	523	165	688	1808
% App. Total	31.3	68.7		44	56		76	24		
PHF	.897	.864	.885	.881	.949	.957	.914	.842	.935	.944
Cars	181	400	581	236	297	533	518	161	679	1793
% Cars	98.9	99.8	99.5	100	99.0	99.4	99.0	97.6	98.7	99.2
Trucks	2	1	3	0	3	3	5	4	9	15
% Trucks	1.1	0.2	0.5	0	1.0	0.6	1.0	2.4	1.3	0.8

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

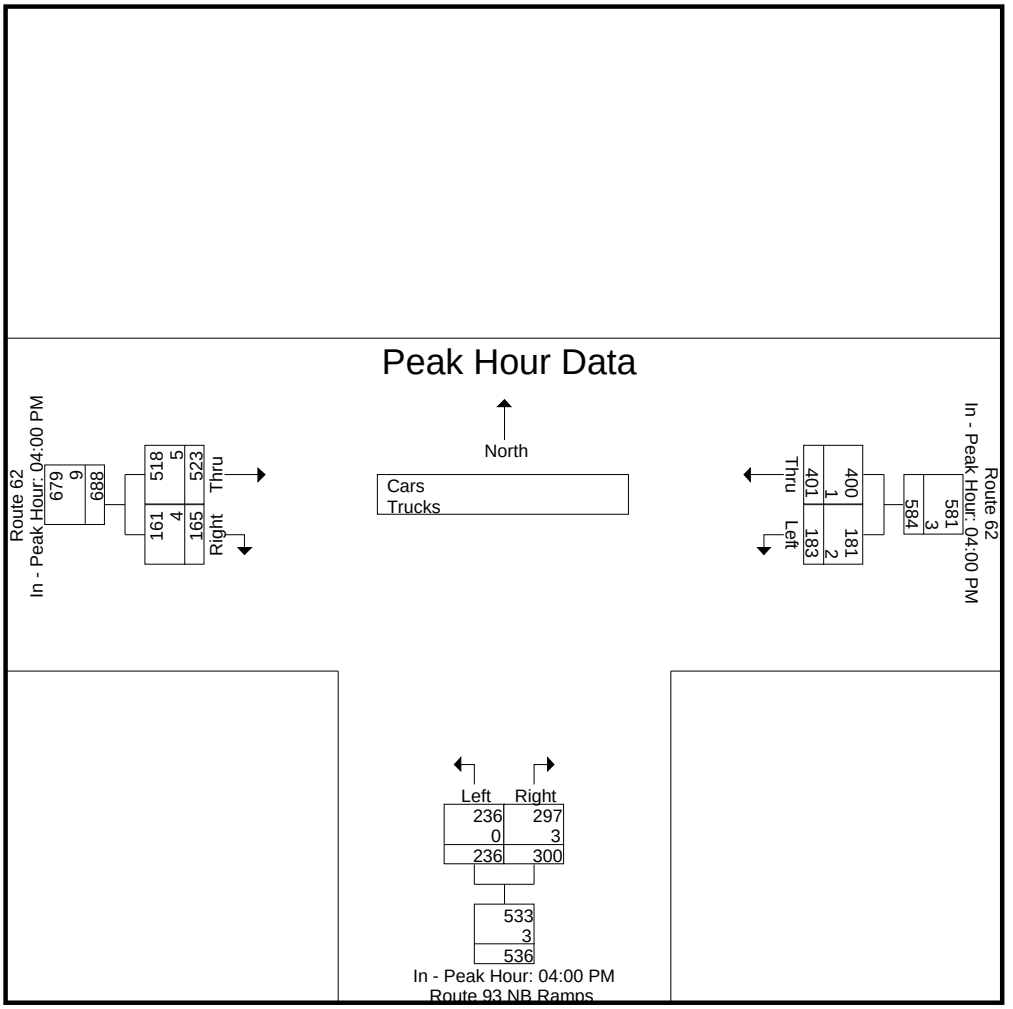
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	**51**	114	**165**	51	71	122	104	45	149
+15 mins.	43	**116**	159	57	**79**	136	135	**49**	**184**
+30 mins.	46	94	140	61	77	138	**143**	33	176
+45 mins.	43	77	120	**67**	73	**140**	141	38	179
Total Volume	183	401	584	236	300	536	523	165	688
% App. Total	31.3	68.7		44	56		76	24	
PHF	.897	.864	.885	.881	.949	.957	.914	.842	.935
Cars	181	400	581	236	297	533	518	161	679
% Cars	98.9	99.8	99.5	100	99	99.4	99	97.6	98.7
Trucks	2	1	3	0	3	3	5	4	9
% Trucks	1.1	0.2	0.5	0	1	0.6	1	2.4	1.3

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 4

Groups Printed- Cars

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	51	113	51	70	103	44	432
04:15 PM	42	116	57	79	135	46	475
04:30 PM	45	94	61	76	142	33	451
04:45 PM	43	77	67	72	138	38	435
Total	181	400	236	297	518	161	1793
05:00 PM	37	72	51	60	87	34	341
05:15 PM	32	69	50	69	79	30	329
05:30 PM	25	67	47	60	86	28	313
05:45 PM	19	61	36	43	69	20	248
Total	113	269	184	232	321	112	1231
Grand Total	294	669	420	529	839	273	3024
Apprch %	30.5	69.5	44.3	55.7	75.4	24.6	
Total %	9.7	22.1	13.9	17.5	27.7	9	

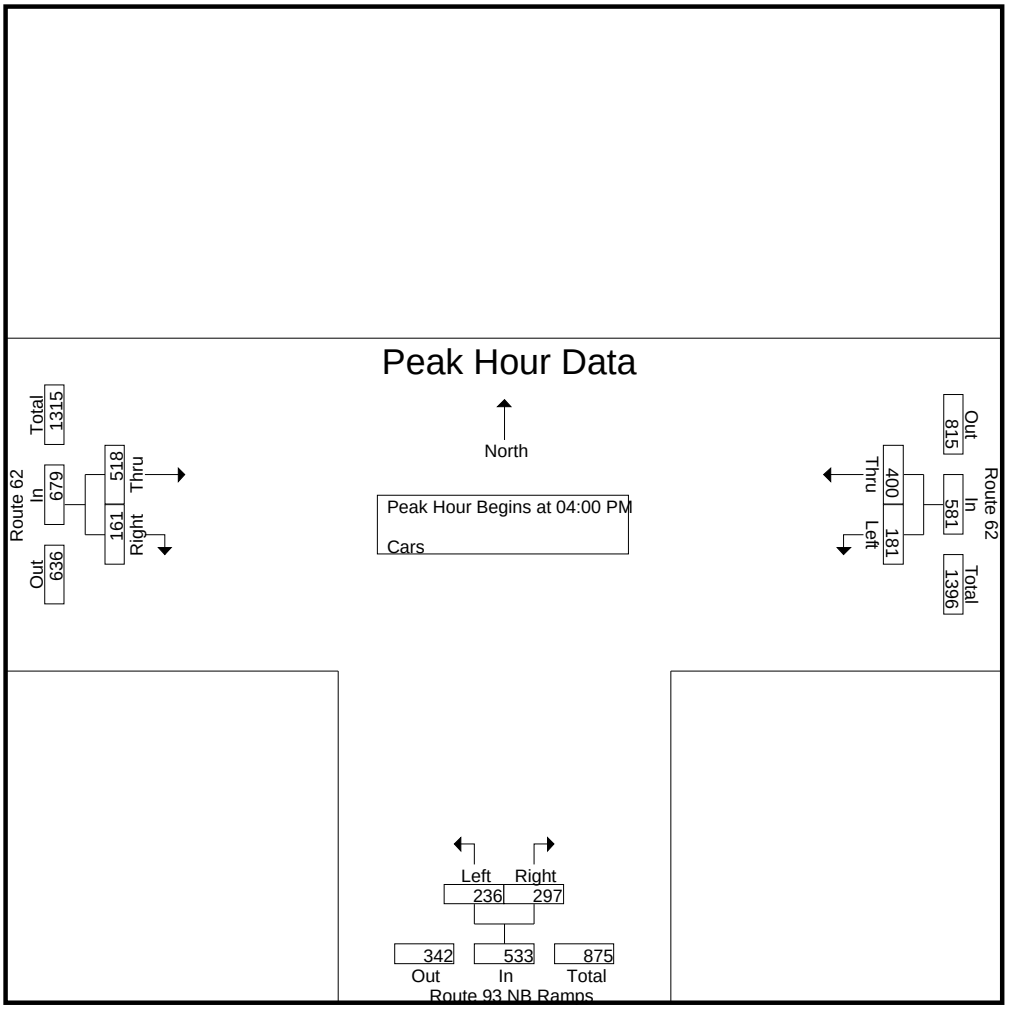
	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**51**	113	**164**	51	70	121	103	44	147	432
04:15 PM	42	**116**	158	57	**79**	136	135	**46**	**181**	**475**
04:30 PM	45	94	139	61	76	137	**142**	33	175	451
04:45 PM	43	77	120	**67**	72	**139**	138	38	176	435
Total Volume	181	400	581	236	297	533	518	161	679	1793
% App. Total	31.2	68.8		44.3	55.7		76.3	23.7		
PHF	.887	.862	.886	.881	.940	.959	.912	.875	.938	.944

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

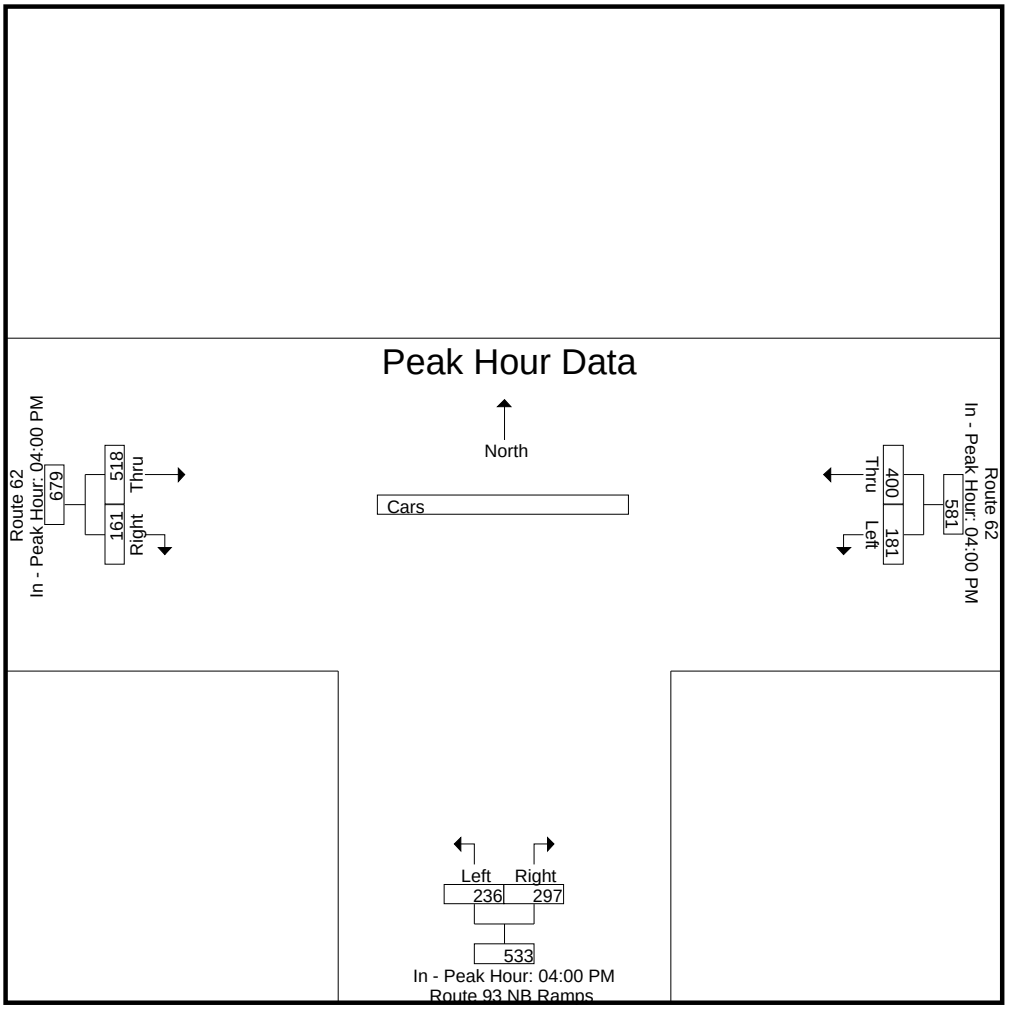
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	**51**	113	**164**	51	70	121	103	44	147
+15 mins.	42	**116**	158	57	**79**	136	135	**46**	**181**
+30 mins.	45	94	139	61	76	137	**142**	33	175
+45 mins.	43	77	120	**67**	72	**139**	138	38	176
Total Volume	181	400	581	236	297	533	518	161	679
% App. Total	31.2	68.8		44.3	55.7		76.3	23.7	
PHF	.887	.862	.886	.881	.940	.959	.912	.875	.938

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 7

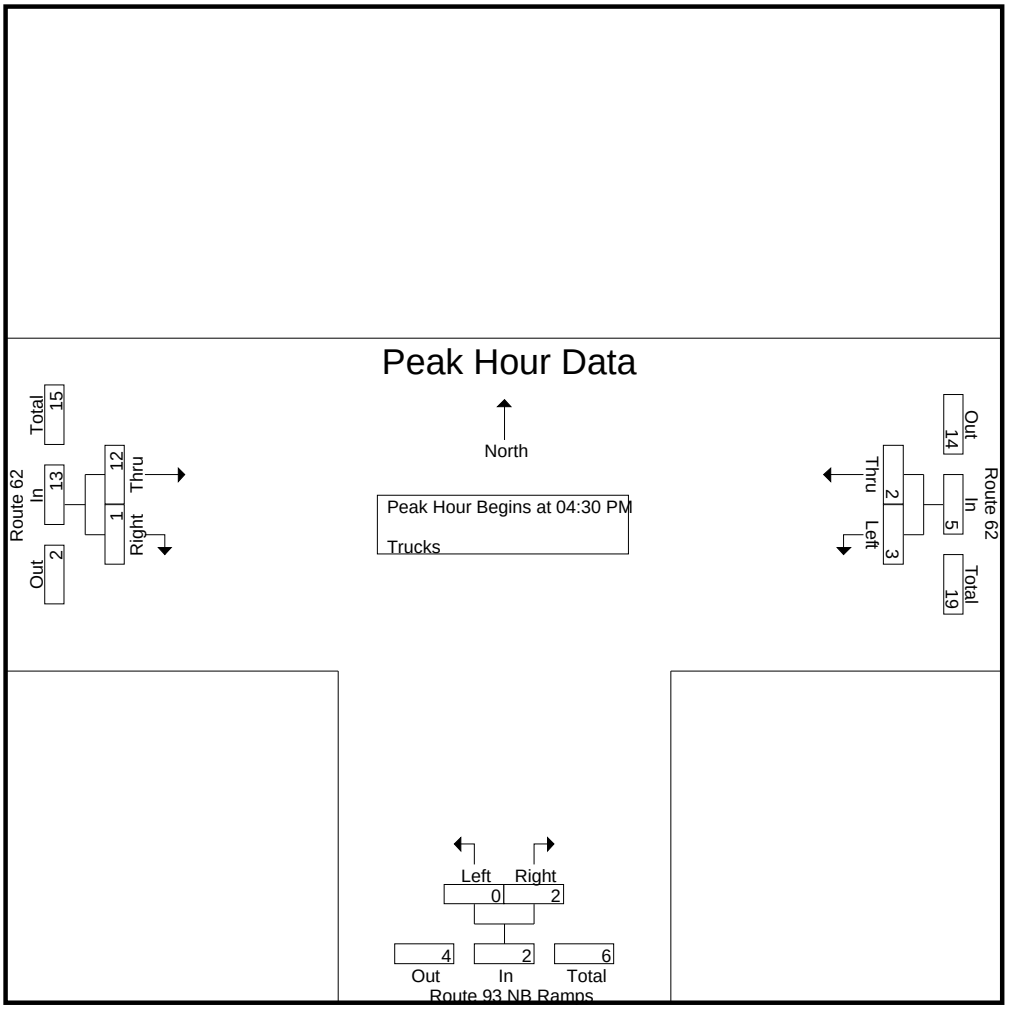
Groups Printed- Trucks

	Route 62 From East		Route 93 NB Ramps From South		Route 62 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	1	0	1	1	1	4
04:15 PM	1	0	0	0	0	3	4
04:30 PM	1	0	0	1	1	0	3
04:45 PM	0	0	0	1	3	0	4
Total	2	1	0	3	5	4	15
05:00 PM	1	2	0	0	4	0	7
05:15 PM	1	0	0	0	4	1	6
05:30 PM	0	0	0	0	2	1	3
05:45 PM	3	0	0	0	1	0	4
Total	5	2	0	0	11	2	20
Grand Total	7	3	0	3	16	6	35
Apprch %	70	30	0	100	72.7	27.3	
Total %	20	8.6	0	8.6	45.7	17.1	

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**1**	0	1	0	**1**	**1**	1	0	1	3
04:45 PM	0	0	0	0	1	1	3	0	3	4
05:00 PM	1	**2**	**3**	0	0	0	**4**	0	4	**7**
05:15 PM	1	0	1	0	0	0	4	**1**	**5**	6
Total Volume	3	2	5	0	2	2	12	1	13	20
% App. Total	60	40		0	100		92.3	7.7		
PHF	.750	.250	.417	.000	.500	.500	.750	.250	.650	.714

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

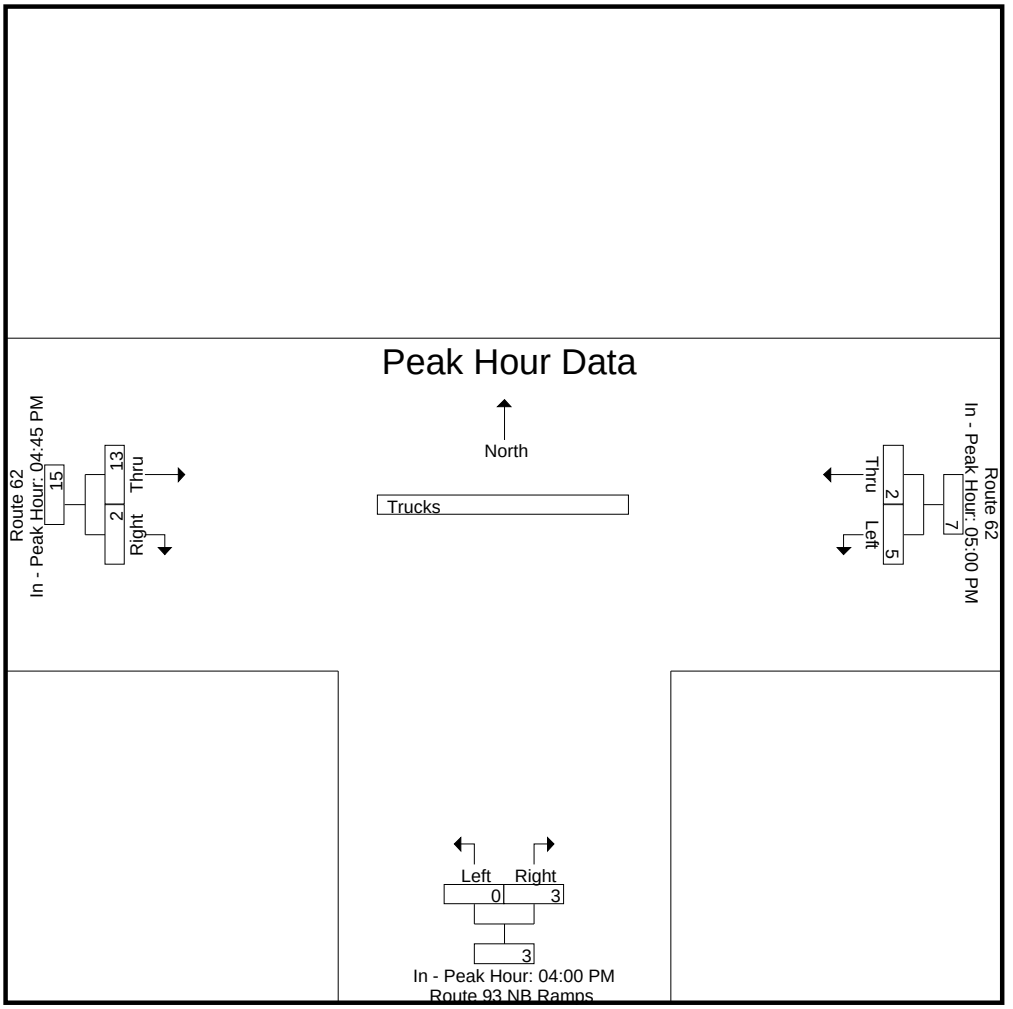
	05:00 PM			04:00 PM			04:45 PM		
+0 mins.	1	**2**	**3**	0	**1**	**1**	3	0	3
+15 mins.	1	0	1	0	0	0	**4**	0	4
+30 mins.	0	0	0	0	1	1	4	**1**	**5**
+45 mins.	**3**	0	3	0	1	1	2	1	3
Total Volume	5	2	7	0	3	3	13	2	15
% App. Total	71.4	28.6		0	100		86.7	13.3	
PHF	.417	.250	.583	.000	.750	.750	.813	.500	.750

Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022

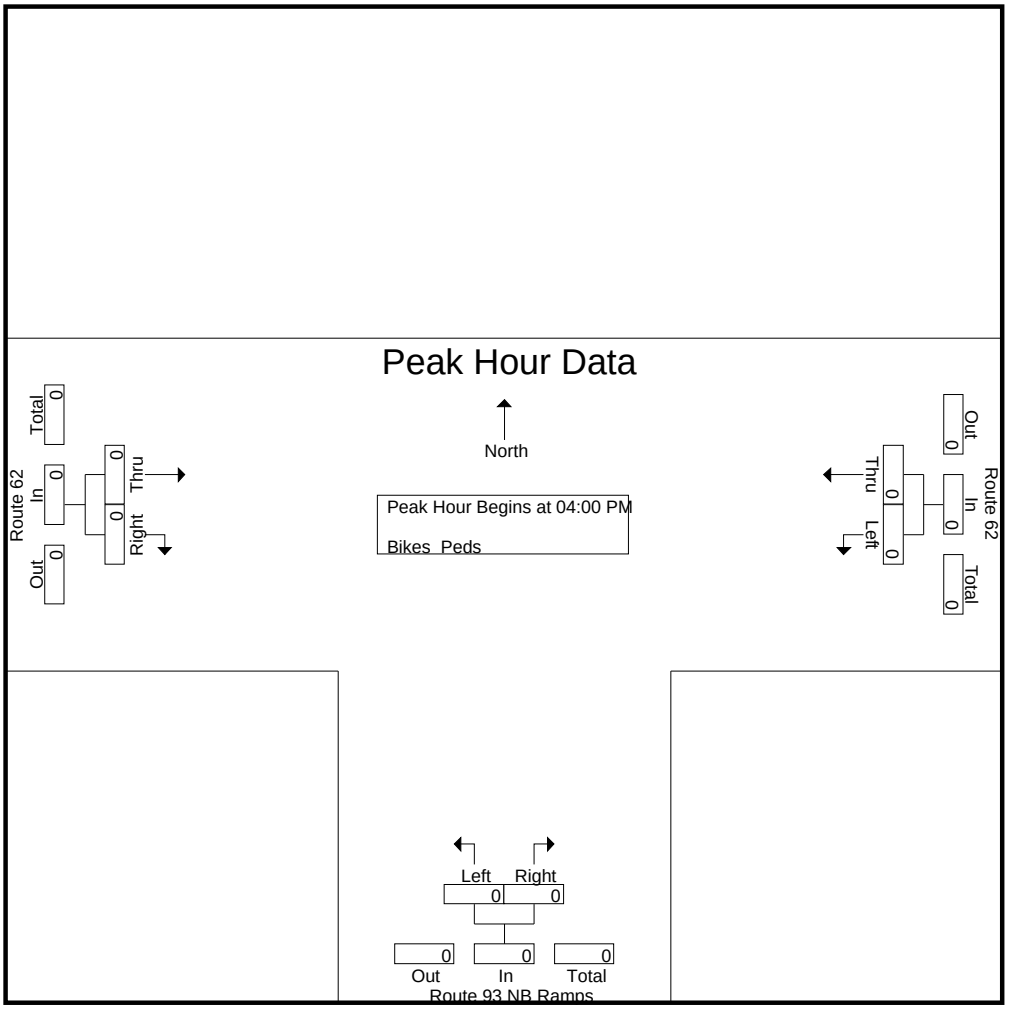
Groups Printed- Bikes Peds

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

	Route 62 From East			Route 93 NB Ramps From South			Route 62 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 11



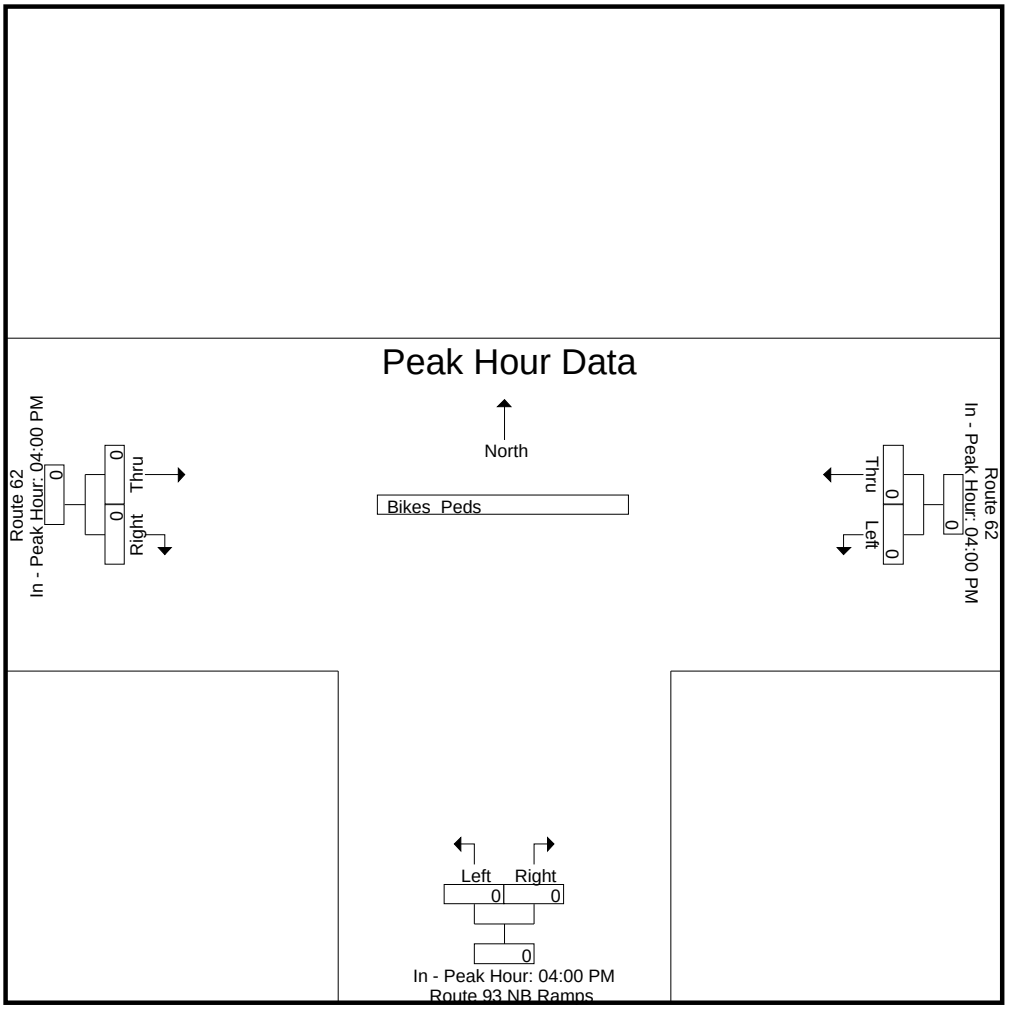
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Route 93 NB Ramps
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110002
Site Code : 93110002
Start Date : 3/29/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	3	18	73	7	118	2	20	1	2	23	88	7	362
07:15 AM	13	22	101	2	138	5	18	5	3	28	105	8	448
07:30 AM	7	26	103	4	148	7	12	5	7	26	109	6	460
07:45 AM	6	31	79	5	137	9	17	16	4	39	122	9	474
Total	29	97	356	18	541	23	67	27	16	116	424	30	1744
08:00 AM	7	30	63	4	141	7	14	16	2	28	105	13	430
08:15 AM	5	17	74	6	110	9	16	17	5	35	126	10	430
08:30 AM	8	21	43	4	140	8	9	10	3	34	112	8	400
08:45 AM	7	20	36	5	121	9	11	8	5	22	111	6	361
Total	27	88	216	19	512	33	50	51	15	119	454	37	1621
Grand Total	56	185	572	37	1053	56	117	78	31	235	878	67	3365
Apprch %	6.9	22.8	70.4	3.2	91.9	4.9	51.8	34.5	13.7	19.9	74.4	5.7	
Total %	1.7	5.5	17	1.1	31.3	1.7	3.5	2.3	0.9	7	26.1	2	
Cars	54	184	568	37	973	56	114	77	31	233	817	66	3210
% Cars	96.4	99.5	99.3	100	92.4	100	97.4	98.7	100	99.1	93.1	98.5	95.4
Trucks	2	1	4	0	80	0	3	1	0	2	61	1	155
% Trucks	3.6	0.5	0.7	0	7.6	0	2.6	1.3	0	0.9	6.9	1.5	4.6

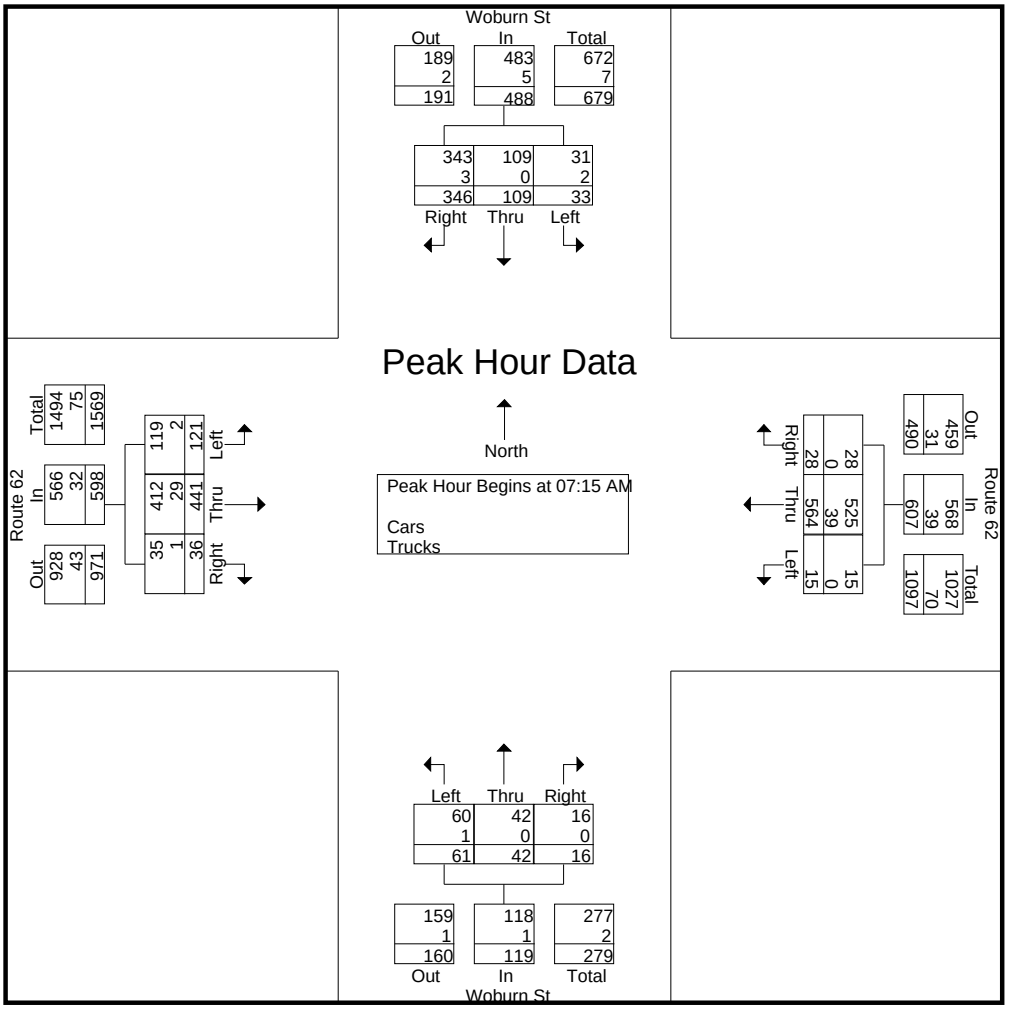
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**13**	22	101	**136**	2	138	5	145	**18**	5	3	26	28	105	8	141	448
07:30 AM	7	26	**103**	136	4	**148**	7	**159**	12	5	**7**	24	26	109	6	141	460
07:45 AM	6	**31**	79	116	**5**	137	**9**	151	17	**16**	4	**37**	**39**	**122**	9	**170**	**474**
08:00 AM	7	30	63	100	4	141	7	152	14	16	2	32	28	105	**13**	146	430
Total Volume	33	109	346	488	15	564	28	607	61	42	16	119	121	441	36	598	1812
% App. Total	6.8	22.3	70.9		2.5	92.9	4.6		51.3	35.3	13.4		20.2	73.7	6		
PHF	.635	.879	.840	.897	.750	.953	.778	.954	.847	.656	.571	.804	.776	.904	.692	.879	.956
Cars	31	109	343	483	15	525	28	568	60	42	16	118	119	412	35	566	1735
% Cars	93.9	100	99.1	99.0	100	93.1	100	93.6	98.4	100	100	99.2	98.3	93.4	97.2	94.6	95.8
Trucks	2	0	3	5	0	39	0	39	1	0	0	1	2	29	1	32	77
% Trucks	6.1	0	0.9	1.0	0	6.9	0	6.4	1.6	0	0	0.8	1.7	6.6	2.8	5.4	4.2

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

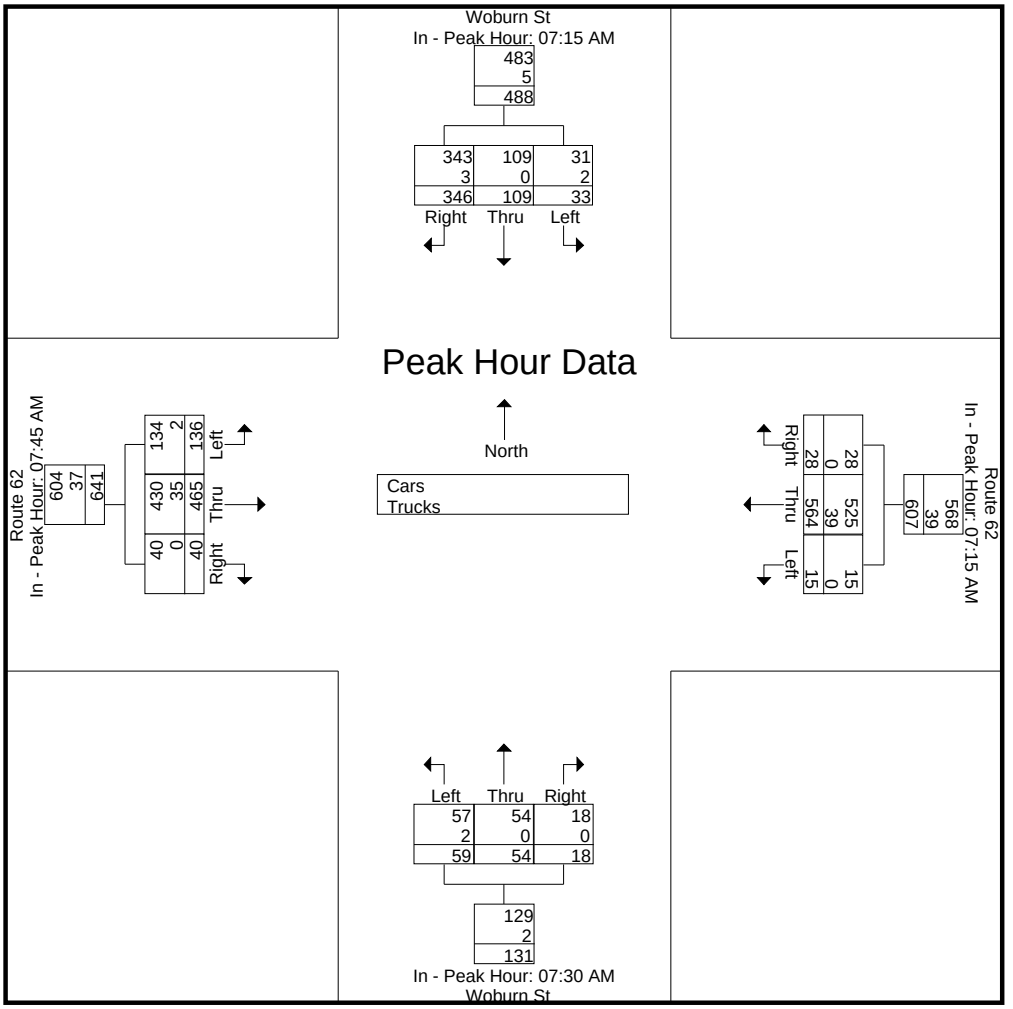
	07:15 AM				07:15 AM				07:30 AM				07:45 AM			
+0 mins.	**13**	22	101	**136**	2	138	5	145	12	5	**7**	24	**39**	122	9	170
+15 mins.	7	26	**103**	136	4	**148**	7	**159**	**17**	16	4	37	28	105	**13**	146
+30 mins.	6	**31**	79	116	**5**	137	**9**	151	14	16	2	32	35	**126**	10	**171**
+45 mins.	7	30	63	100	4	141	7	152	16	**17**	5	**38**	34	112	8	154
Total Volume	33	109	346	488	15	564	28	607	59	54	18	131	136	465	40	641
% App. Total	6.8	22.3	70.9		2.5	92.9	4.6		45	41.2	13.7		21.2	72.5	6.2	
PHF	.635	.879	.840	.897	.750	.953	.778	.954	.868	.794	.643	.862	.872	.923	.769	.937
Cars	31	109	343	483	15	525	28	568	57	54	18	129	134	430	40	604
% Cars	93.9	100	99.1	99	100	93.1	100	93.6	96.6	100	100	98.5	98.5	92.5	100	94.2
Trucks	2	0	3	5	0	39	0	39	2	0	0	2	2	35	0	37
% Trucks	6.1	0	0.9	1	0	6.9	0	6.4	3.4	0	0	1.5	1.5	7.5	0	5.8

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	3	18	73	7	106	2	19	0	2	23	80	7	340
07:15 AM	12	22	101	2	127	5	18	5	3	28	96	8	427
07:30 AM	7	26	101	4	139	7	11	5	7	26	103	5	441
07:45 AM	5	31	78	5	122	9	17	16	4	38	116	9	450
Total	27	97	353	18	494	23	65	26	16	115	395	29	1658
08:00 AM	7	30	63	4	137	7	14	16	2	27	97	13	417
08:15 AM	5	16	74	6	99	9	15	17	5	35	117	10	408
08:30 AM	8	21	42	4	130	8	9	10	3	34	100	8	377
08:45 AM	7	20	36	5	113	9	11	8	5	22	108	6	350
Total	27	87	215	19	479	33	49	51	15	118	422	37	1552
Grand Total	54	184	568	37	973	56	114	77	31	233	817	66	3210
Apprch %	6.7	22.8	70.5	3.5	91.3	5.3	51.4	34.7	14	20.9	73.2	5.9	
Total %	1.7	5.7	17.7	1.2	30.3	1.7	3.6	2.4	1	7.3	25.5	2.1	

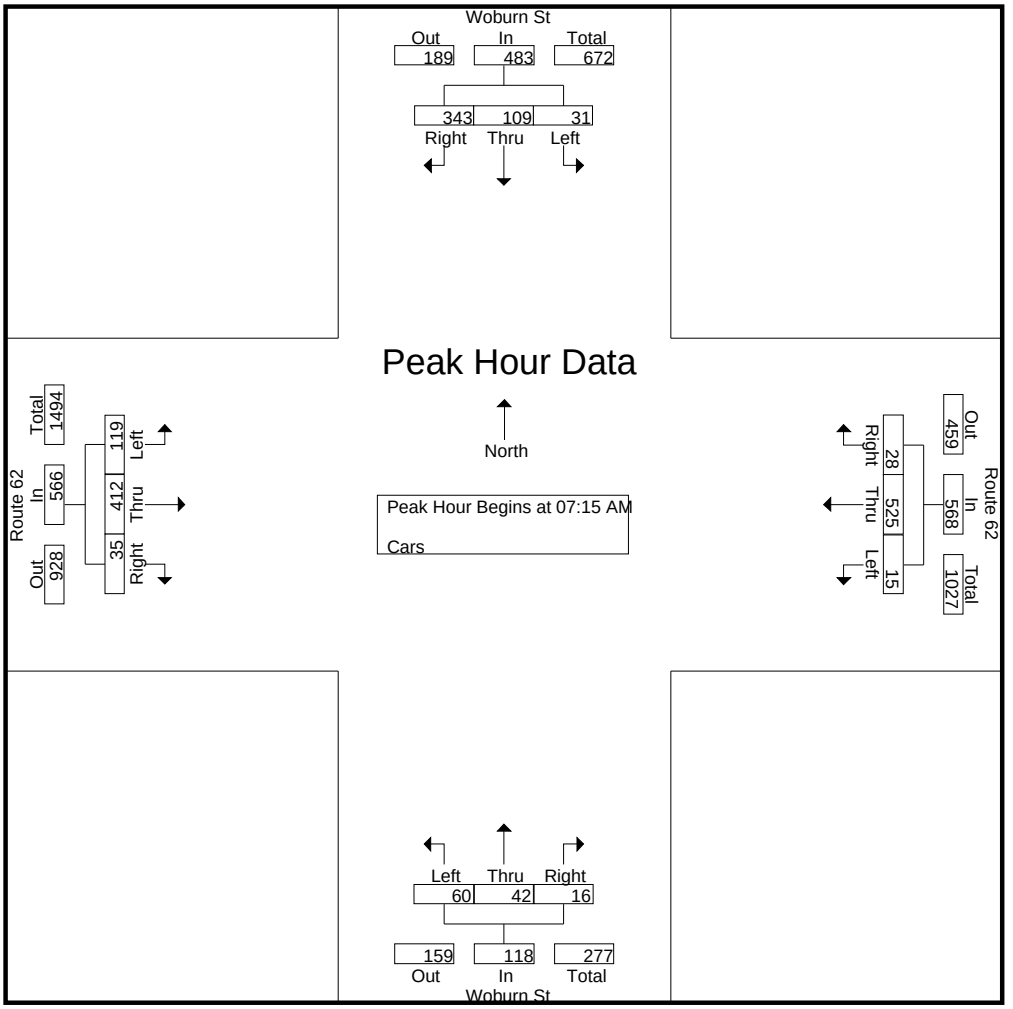
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**12**	22	**101**	**135**	2	127	5	134	**18**	5	3	26	28	96	8	132	427
07:30 AM	7	26	101	134	4	**139**	7	**150**	11	5	**7**	23	26	103	5	134	441
07:45 AM	5	**31**	78	114	**5**	122	**9**	136	17	**16**	4	**37**	**38**	**116**	9	**163**	**450**
08:00 AM	7	30	63	100	4	137	7	148	14	16	2	32	27	97	**13**	137	417
Total Volume	31	109	343	483	15	525	28	568	60	42	16	118	119	412	35	566	1735
% App. Total	6.4	22.6	71		2.6	92.4	4.9		50.8	35.6	13.6		21	72.8	6.2		
PHF	.646	.879	.849	.894	.750	.944	.778	.947	.833	.656	.571	.797	.783	.888	.673	.868	.964

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

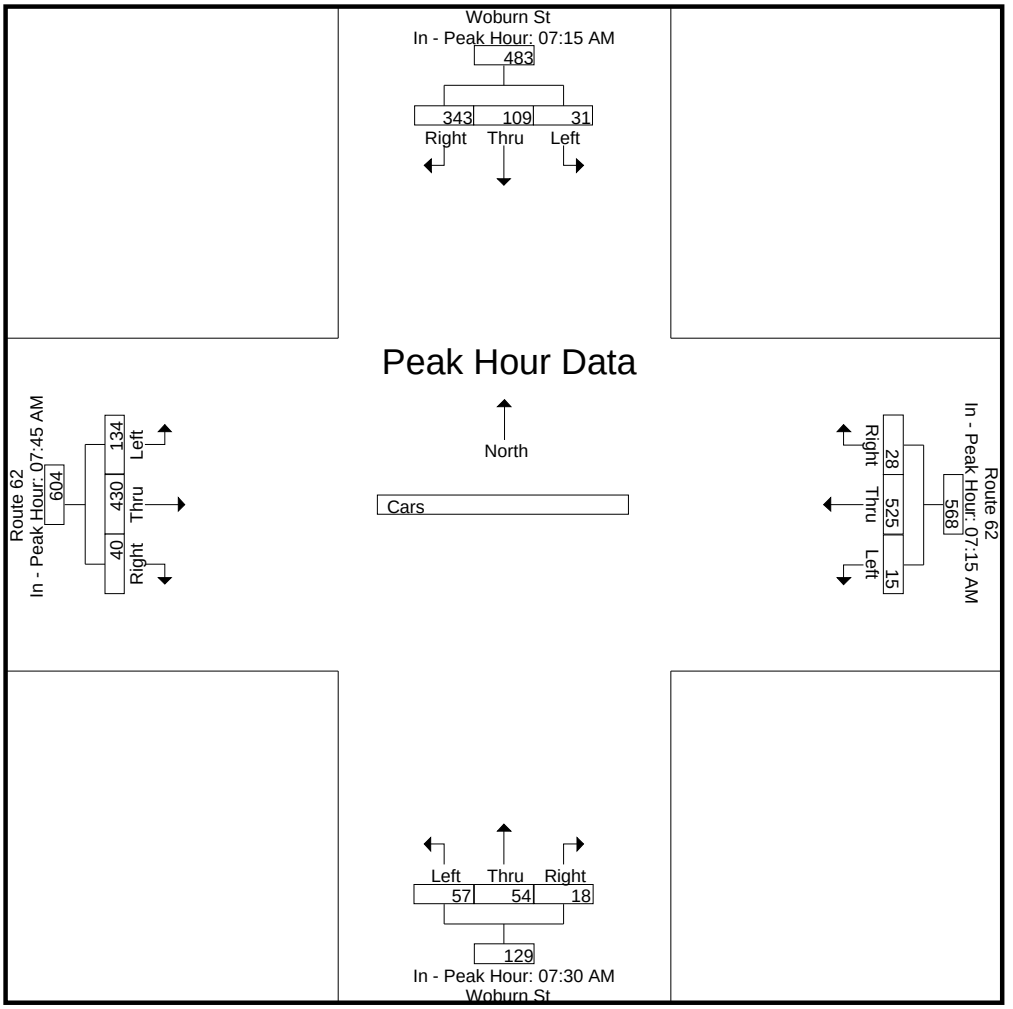
	07:15 AM				07:15 AM				07:30 AM				07:45 AM			
+0 mins.	**12**	22	**101**	**135**	2	127	5	134	11	5	**7**	23	**38**	116	9	**163**
+15 mins.	7	26	101	134	4	**139**	7	**150**	**17**	16	4	**37**	27	97	**13**	137
+30 mins.	5	**31**	78	114	**5**	122	**9**	136	14	16	2	32	35	**117**	10	162
+45 mins.	7	30	63	100	4	137	7	148	15	**17**	5	37	34	100	8	142
Total Volume	31	109	343	483	15	525	28	568	57	54	18	129	134	430	40	604
% App. Total	6.4	22.6	71		2.6	92.4	4.9		44.2	41.9	14		22.2	71.2	6.6	
PHF	.646	.879	.849	.894	.750	.944	.778	.947	.838	.794	.643	.872	.882	.919	.769	.926

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	12	0	1	1	0	0	8	0	22
07:15 AM	1	0	0	0	11	0	0	0	0	0	9	0	21
07:30 AM	0	0	2	0	9	0	1	0	0	0	6	1	19
07:45 AM	1	0	1	0	15	0	0	0	0	1	6	0	24
Total	2	0	3	0	47	0	2	1	0	1	29	1	86
08:00 AM	0	0	0	0	4	0	0	0	0	1	8	0	13
08:15 AM	0	1	0	0	11	0	1	0	0	0	9	0	22
08:30 AM	0	0	1	0	10	0	0	0	0	0	12	0	23
08:45 AM	0	0	0	0	8	0	0	0	0	0	3	0	11
Total	0	1	1	0	33	0	1	0	0	1	32	0	69
Grand Total	2	1	4	0	80	0	3	1	0	2	61	1	155
Apprch %	28.6	14.3	57.1	0	100	0	75	25	0	3.1	95.3	1.6	
Total %	1.3	0.6	2.6	0	51.6	0	1.9	0.6	0	1.3	39.4	0.6	

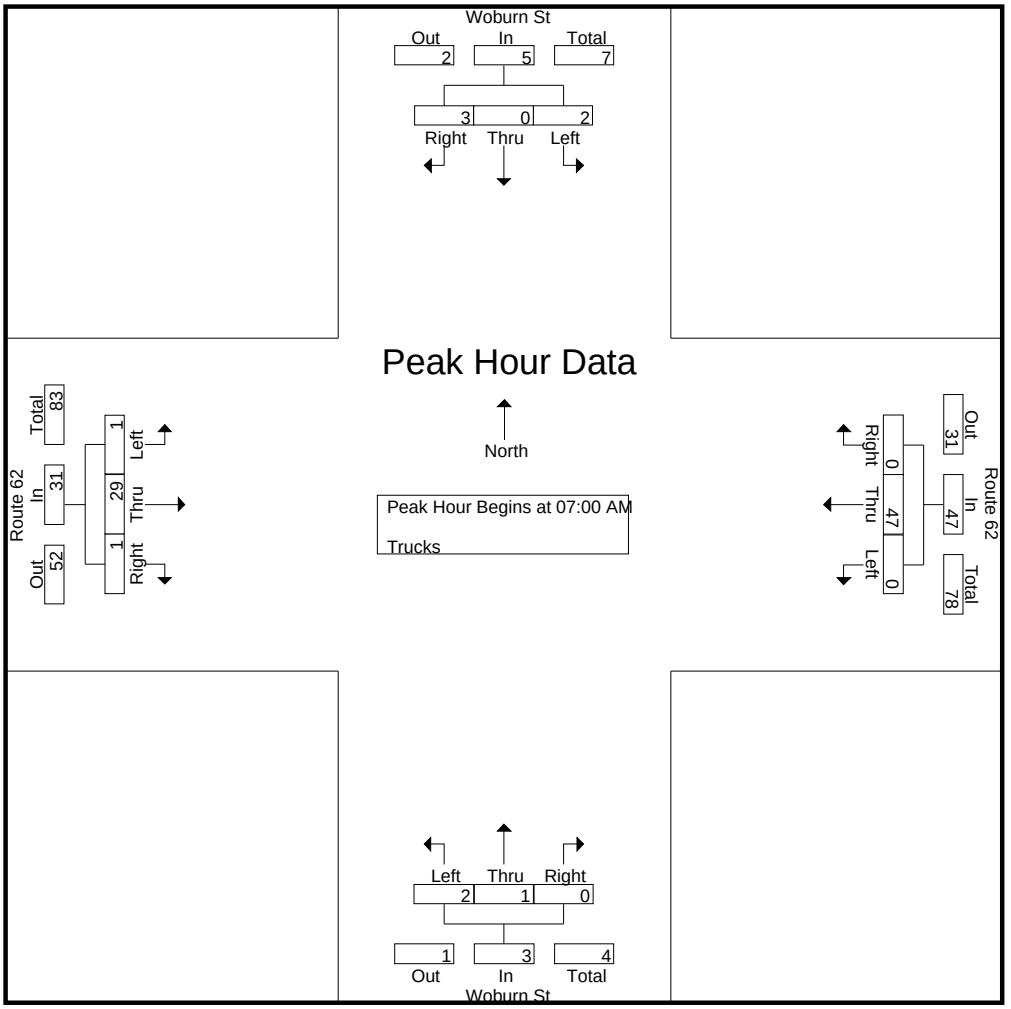
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	12	0	12	**1**	**1**	0	**2**	0	8	0	8	22
07:15 AM	**1**	0	0	1	0	11	0	11	0	0	0	0	0	**9**	0	**9**	21
07:30 AM	0	0	**2**	**2**	0	9	0	9	1	0	0	1	0	6	**1**	7	19
07:45 AM	1	0	1	2	0	**15**	0	**15**	0	0	0	0	**1**	6	0	7	**24**
Total Volume	2	0	3	5	0	47	0	47	2	1	0	3	1	29	1	31	86
% App. Total	40	0	60		0	100	0		66.7	33.3	0		3.2	93.5	3.2		
PHF	.500	.000	.375	.625	.000	.783	.000	.783	.500	.250	.000	.375	.250	.806	.250	.861	.896

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

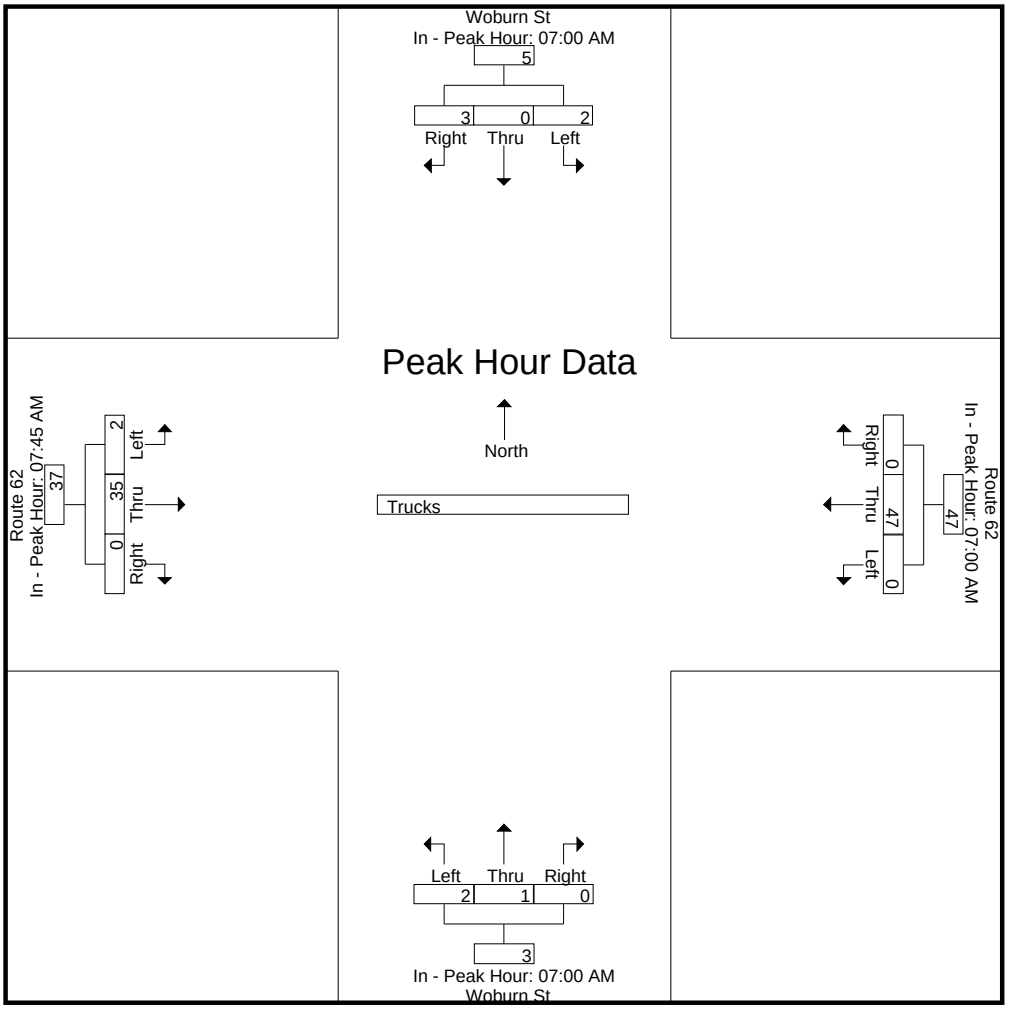
	07:00 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	12	0	12	**1**	**1**	0	**2**	**1**	6	0	7
+15 mins.	**1**	0	0	1	0	11	0	11	0	0	0	0	1	8	0	9
+30 mins.	0	0	**2**	**2**	0	9	0	9	1	0	0	1	0	9	0	9
+45 mins.	1	0	1	2	0	**15**	0	**15**	0	0	0	0	0	**12**	0	**12**
Total Volume	2	0	3	5	0	47	0	47	2	1	0	3	2	35	0	37
% App. Total	40	0	60		0	100	0		66.7	33.3	0		5.4	94.6	0	
PHF	.500	.000	.375	.625	.000	.783	.000	.783	.500	.250	.000	.375	.500	.729	.000	.771

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022

Groups Printed- Bikes Peds

	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

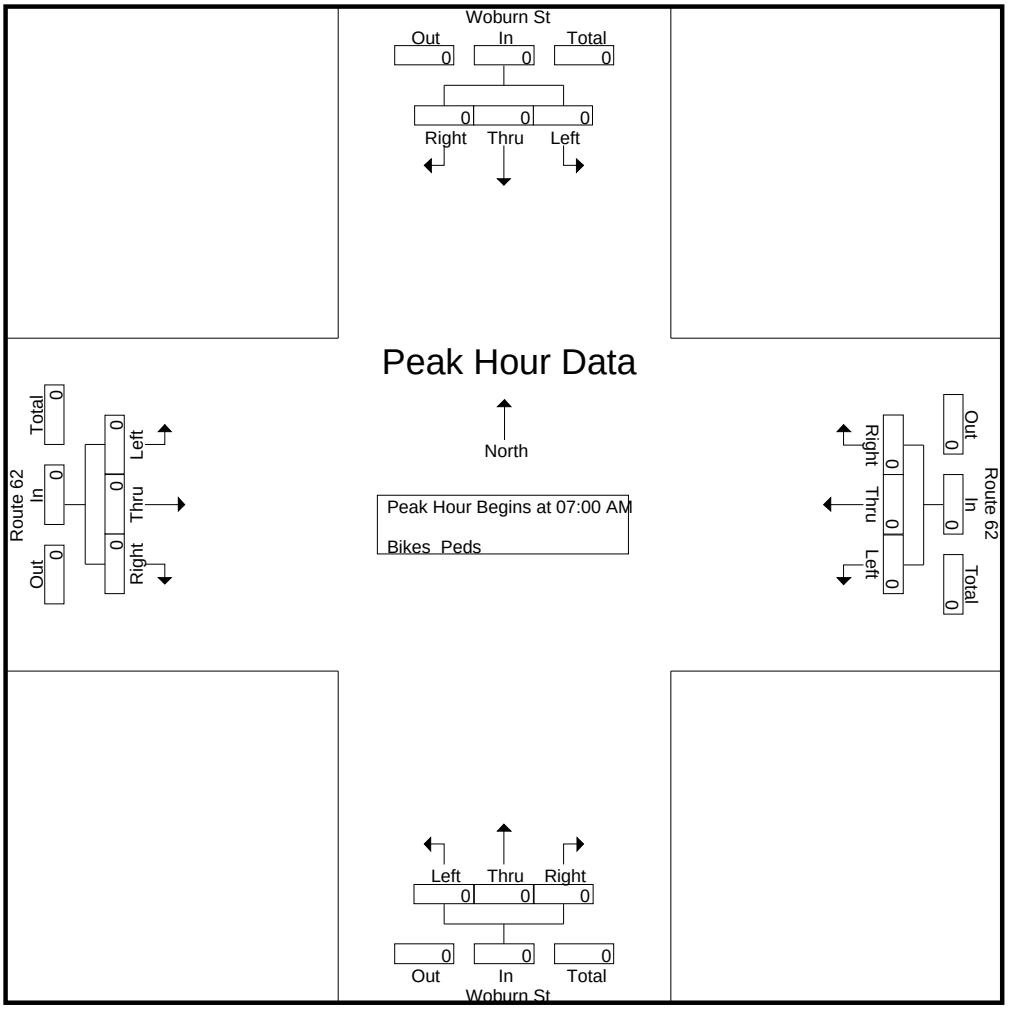
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

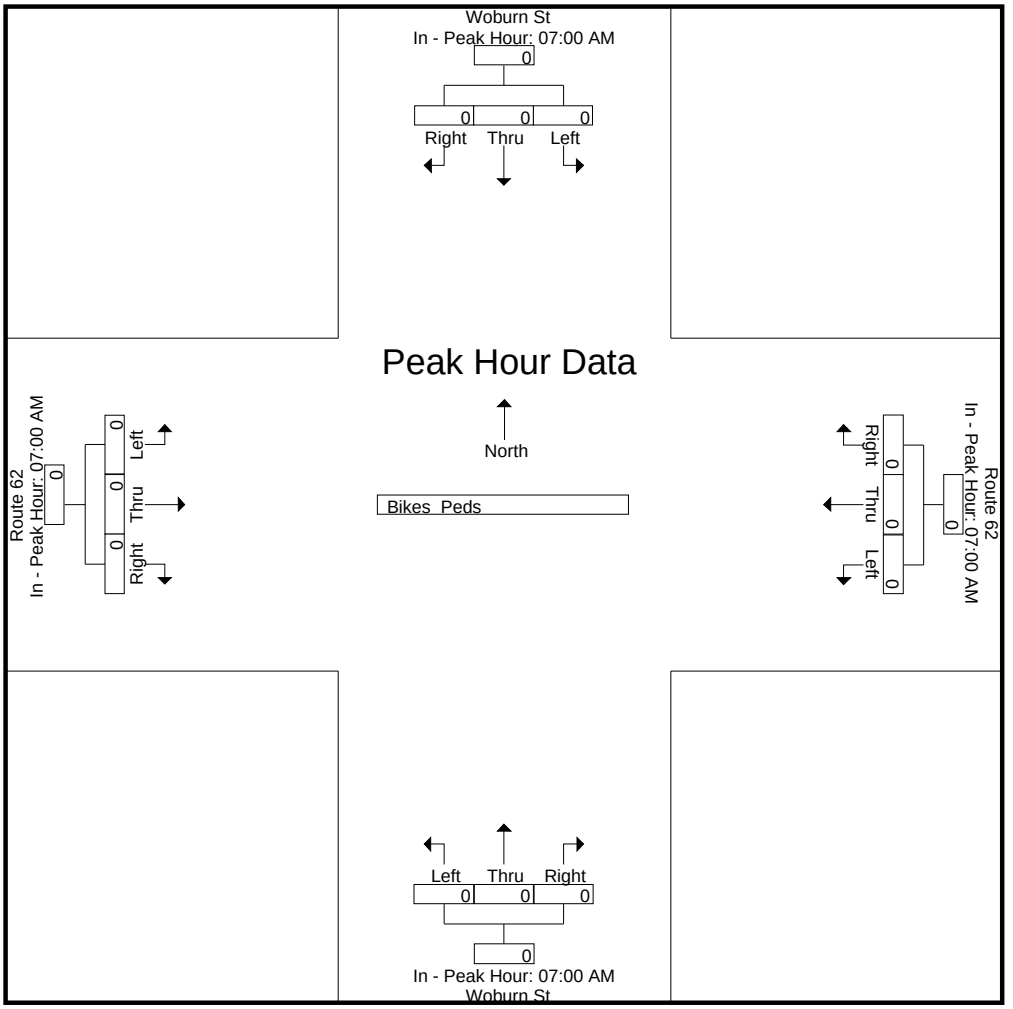
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	18	11	17	2	162	8	10	15	5	39	135	14	436
04:15 PM	10	6	26	5	123	3	14	15	8	38	131	9	388
04:30 PM	13	18	21	2	124	9	11	13	3	43	128	24	409
04:45 PM	15	15	20	0	130	7	10	17	9	28	147	16	414
Total	56	50	84	9	539	27	45	60	25	148	541	63	1647
05:00 PM	9	11	23	2	112	7	9	20	5	36	155	15	404
05:15 PM	7	15	23	6	126	4	18	16	8	30	164	18	435
05:30 PM	8	8	13	0	113	5	13	15	7	36	149	18	385
05:45 PM	4	8	19	5	77	8	10	12	8	40	134	18	343
Total	28	42	78	13	428	24	50	63	28	142	602	69	1567
Grand Total	84	92	162	22	967	51	95	123	53	290	1143	132	3214
Apprch %	24.9	27.2	47.9	2.1	93	4.9	35.1	45.4	19.6	18.5	73	8.4	
Total %	2.6	2.9	5	0.7	30.1	1.6	3	3.8	1.6	9	35.6	4.1	
Cars	84	92	162	22	958	51	95	122	53	290	1124	132	3185
% Cars	100	100	100	100	99.1	100	100	99.2	100	100	98.3	100	99.1
Trucks	0	0	0	0	9	0	0	1	0	0	19	0	29
% Trucks	0	0	0	0	0.9	0	0	0.8	0	0	1.7	0	0.9

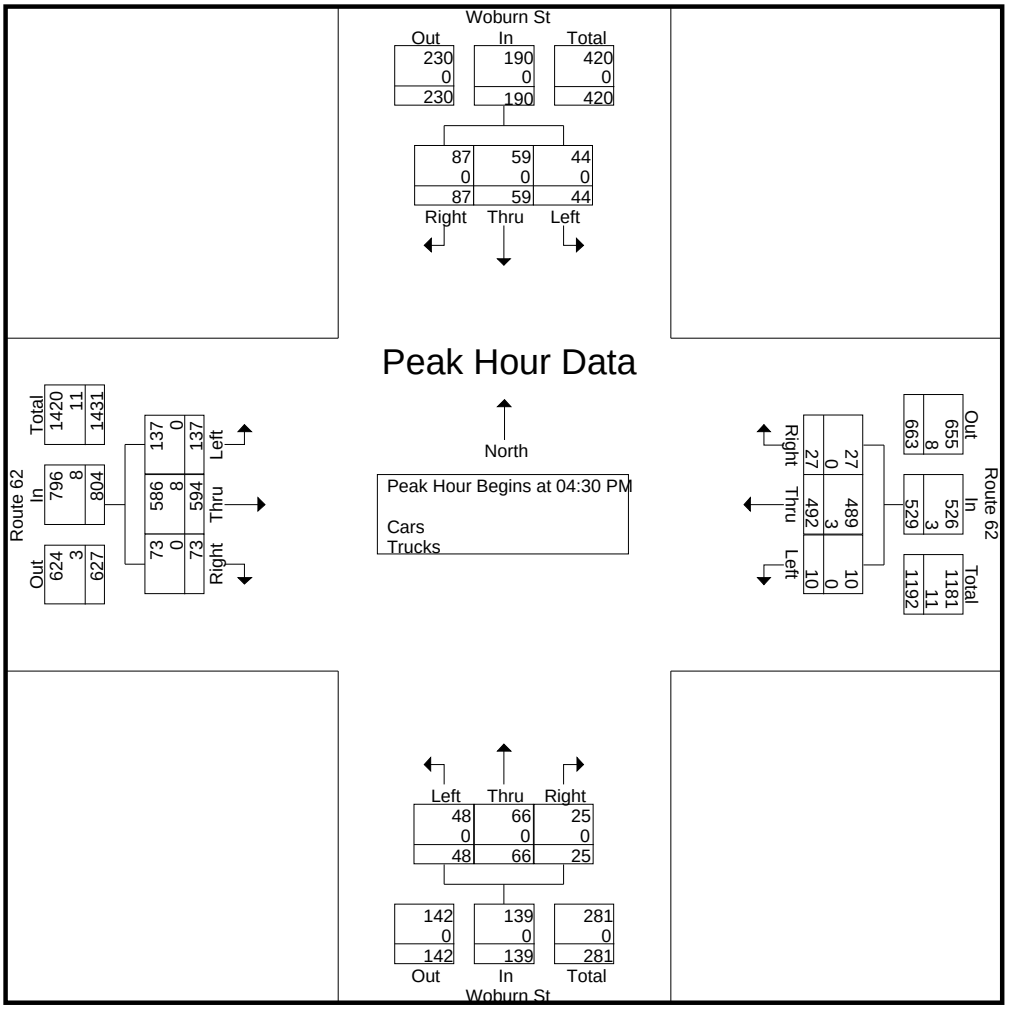
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	13	**18**	21	**52**	2	124	**9**	135	11	13	3	27	**43**	128	**24**	195	409
04:45 PM	**15**	15	20	50	0	**130**	7	**137**	10	17	**9**	36	28	147	16	191	414
05:00 PM	9	11	**23**	43	2	112	7	121	9	**20**	5	34	36	155	15	206	404
05:15 PM	7	15	23	45	**6**	126	4	136	**18**	16	8	**42**	30	**164**	18	**212**	**435**
Total Volume	44	59	87	190	10	492	27	529	48	66	25	139	137	594	73	804	1662
% App. Total	23.2	31.1	45.8		1.9	93	5.1		34.5	47.5	18		17	73.9	9.1		
PHF	.733	.819	.946	.913	.417	.946	.750	.965	.667	.825	.694	.827	.797	.905	.760	.948	.955
Cars	44	59	87	190	10	489	27	526	48	66	25	139	137	586	73	796	1651
% Cars	100	100	100	100	100	99.4	100	99.4	100	100	100	100	100	98.7	100	99.0	99.3
Trucks	0	0	0	0	0	3	0	3	0	0	0	0	0	8	0	8	11
% Trucks	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0	1.3	0	1.0	0.7

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

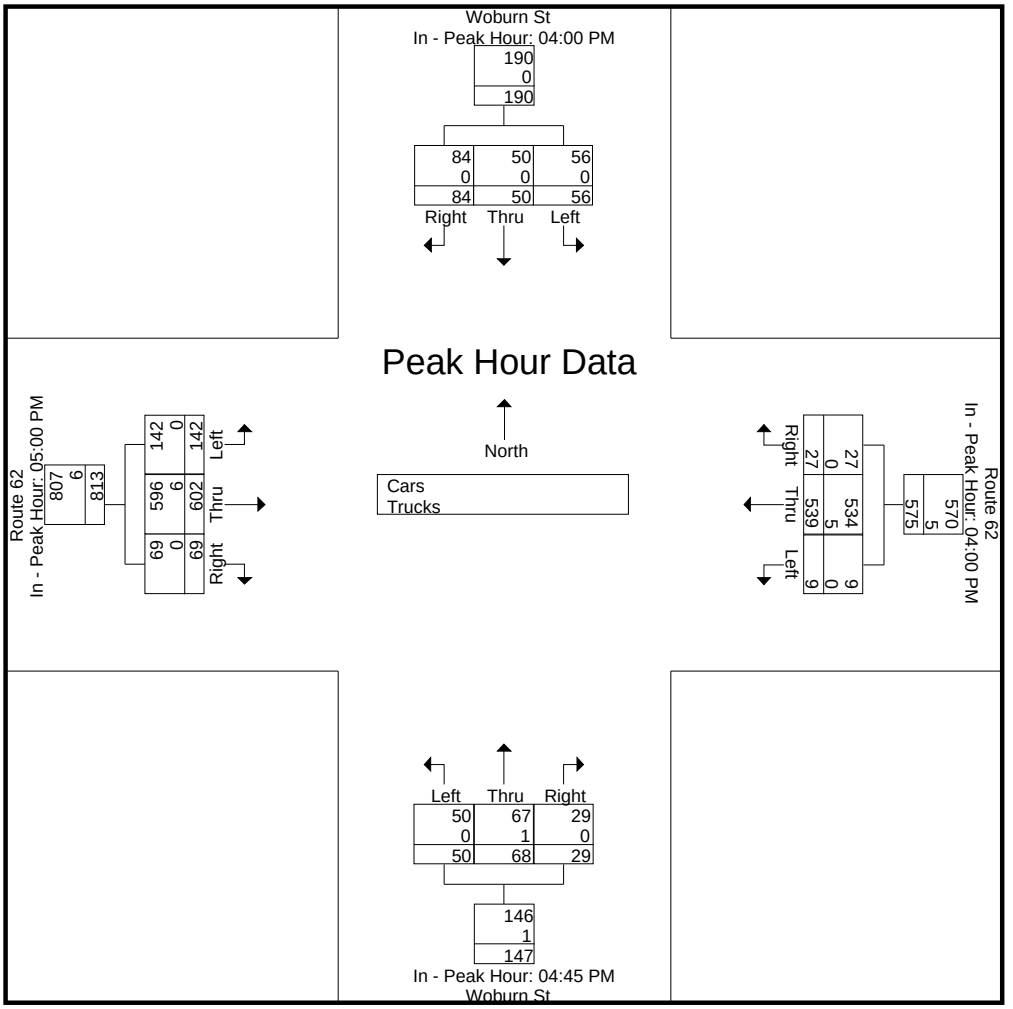
	04:00 PM				04:00 PM				04:45 PM				05:00 PM			
+0 mins.	**18**	11	17	46	2	**162**	8	**172**	10	17	**9**	36	36	155	15	206
+15 mins.	10	6	**26**	42	**5**	123	3	131	9	**20**	5	34	30	**164**	**18**	**212**
+30 mins.	13	**18**	21	**52**	2	124	**9**	135	**18**	16	8	**42**	36	149	18	203
+45 mins.	15	15	20	50	0	130	7	137	13	15	7	35	**40**	134	18	192
Total Volume	56	50	84	190	9	539	27	575	50	68	29	147	142	602	69	813
% App. Total	29.5	26.3	44.2		1.6	93.7	4.7		34	46.3	19.7		17.5	74	8.5	
PHF	.778	.694	.808	.913	.450	.832	.750	.836	.694	.850	.806	.875	.888	.918	.958	.959
Cars	56	50	84	190	9	534	27	570	50	67	29	146	142	596	69	807
% Cars	100	100	100	100	100	99.1	100	99.1	100	98.5	100	99.3	100	99	100	99.3
Trucks	0	0	0	0	0	5	0	5	0	1	0	1	0	6	0	6
% Trucks	0	0	0	0	0	0.9	0	0.9	0	1.5	0	0.7	0	1	0	0.7

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	18	11	17	2	159	8	10	15	5	39	132	14	430
04:15 PM	10	6	26	5	123	3	14	15	8	38	128	9	385
04:30 PM	13	18	21	2	122	9	11	13	3	43	125	24	404
04:45 PM	15	15	20	0	130	7	10	17	9	28	143	16	410
Total	56	50	84	9	534	27	45	60	25	148	528	63	1629
05:00 PM	9	11	23	2	111	7	9	20	5	36	154	15	402
05:15 PM	7	15	23	6	126	4	18	16	8	30	164	18	435
05:30 PM	8	8	13	0	110	5	13	14	7	36	148	18	380
05:45 PM	4	8	19	5	77	8	10	12	8	40	130	18	339
Total	28	42	78	13	424	24	50	62	28	142	596	69	1556
Grand Total	84	92	162	22	958	51	95	122	53	290	1124	132	3185
Apprch %	24.9	27.2	47.9	2.1	92.9	4.9	35.2	45.2	19.6	18.8	72.7	8.5	
Total %	2.6	2.9	5.1	0.7	30.1	1.6	3	3.8	1.7	9.1	35.3	4.1	

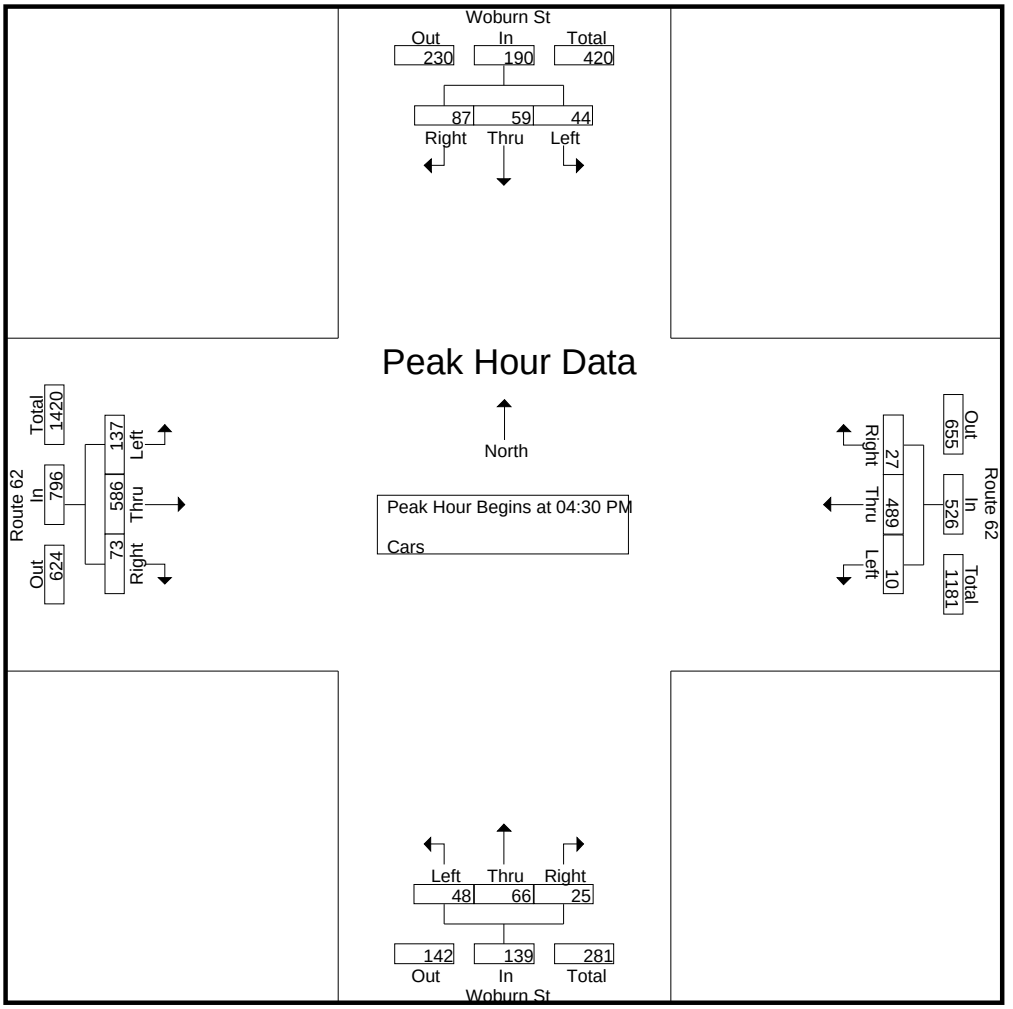
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	13	**18**	21	**52**	2	122	**9**	133	11	13	3	27	**43**	125	**24**	192	404
04:45 PM	**15**	15	20	50	0	**130**	7	**137**	10	17	**9**	36	28	143	16	187	410
05:00 PM	9	11	**23**	43	2	111	7	120	9	**20**	5	34	36	154	15	205	402
05:15 PM	7	15	23	45	**6**	126	4	136	**18**	16	8	**42**	30	**164**	18	**212**	**435**
Total Volume	44	59	87	190	10	489	27	526	48	66	25	139	137	586	73	796	1651
% App. Total	23.2	31.1	45.8		1.9	93	5.1		34.5	47.5	18		17.2	73.6	9.2		
PHF	.733	.819	.946	.913	.417	.940	.750	.960	.667	.825	.694	.827	.797	.893	.760	.939	.949

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 5



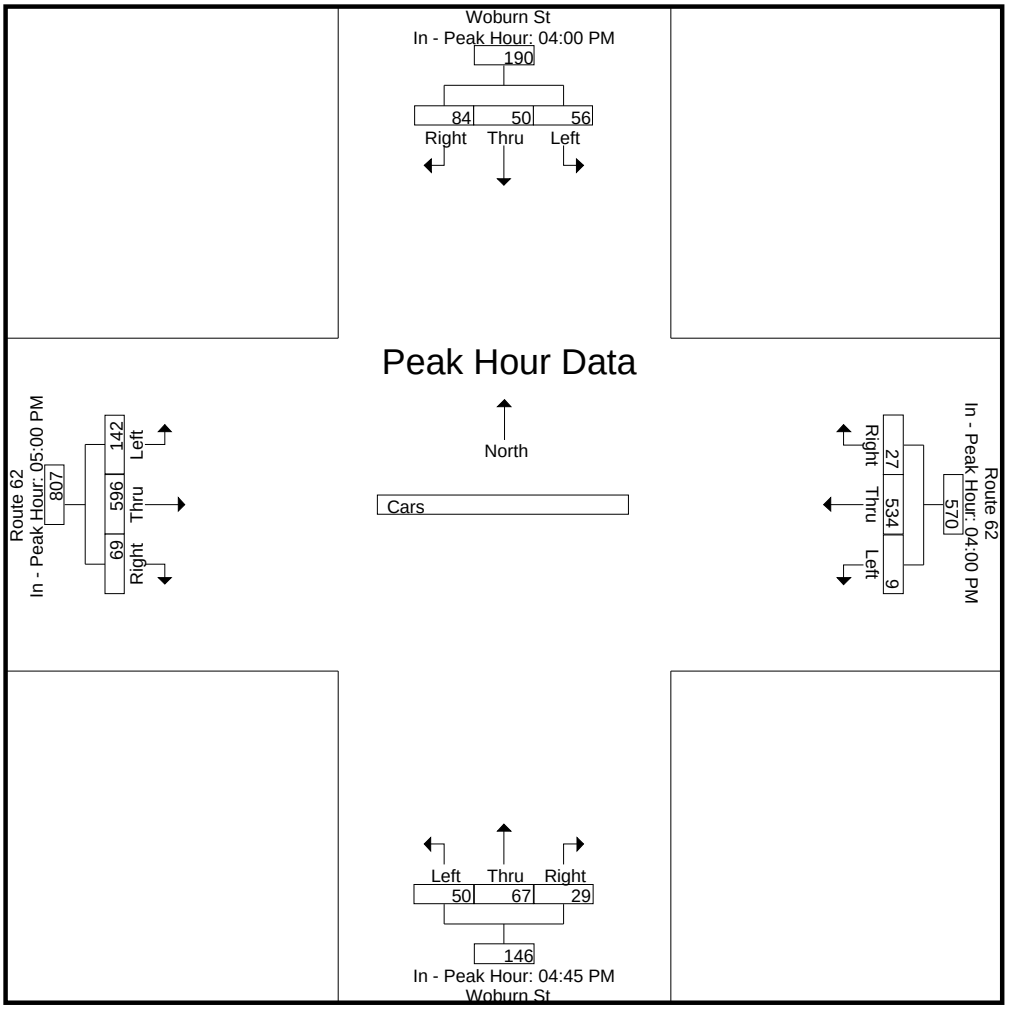
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:45 PM				05:00 PM			
+0 mins.	**18**	11	17	46	2	**159**	8	**169**	10	17	**9**	36	36	154	15	205
+15 mins.	10	6	**26**	42	**5**	123	3	131	9	**20**	5	34	30	**164**	**18**	**212**
+30 mins.	13	**18**	21	**52**	2	122	**9**	133	**18**	16	8	**42**	36	148	18	202
+45 mins.	15	15	20	50	0	130	7	137	13	14	7	34	**40**	130	18	188
Total Volume	56	50	84	190	9	534	27	570	50	67	29	146	142	596	69	807
% App. Total	29.5	26.3	44.2		1.6	93.7	4.7		34.2	45.9	19.9		17.6	73.9	8.6	
PHF	.778	.694	.808	.913	.450	.840	.750	.843	.694	.838	.806	.869	.888	.909	.958	.952

Accurate Counts
978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	Woburn St From North			Route 62 From East			Woburn St From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	0	0	3	0	6
04:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	3
04:30 PM	0	0	0	0	2	0	0	0	0	0	3	0	5
04:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	4
Total	0	0	0	0	5	0	0	0	0	0	13	0	18
05:00 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	3	0	0	1	0	0	1	0	5
05:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	4
Total	0	0	0	0	4	0	0	1	0	0	6	0	11
Grand Total	0	0	0	0	9	0	0	1	0	0	19	0	29
Apprch %	0	0	0	0	100	0	0	100	0	0	100	0	
Total %	0	0	0	0	31	0	0	3.4	0	0	65.5	0	

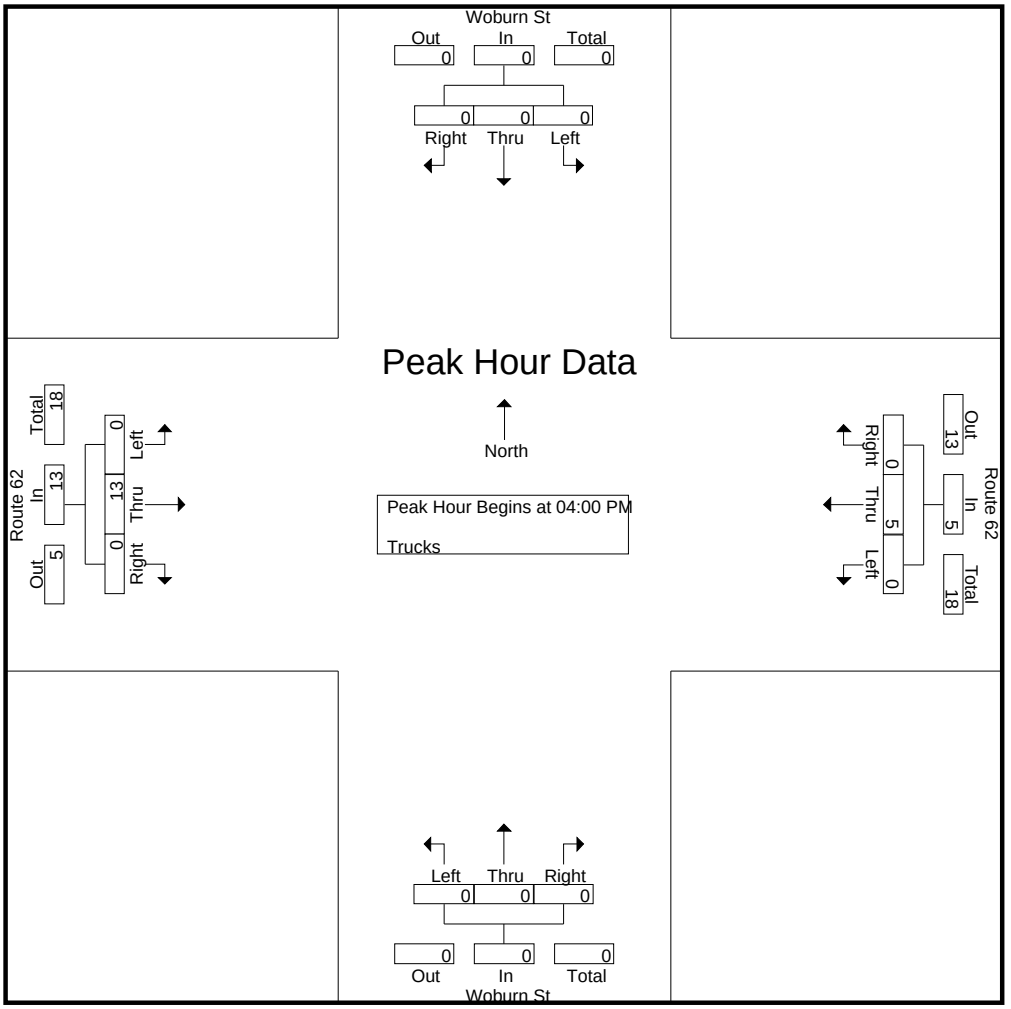
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	3	0	3	**6**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	0	**4**	4
Total Volume	0	0	0	0	0	5	0	5	0	0	0	0	0	13	0	13	18
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000	.000	.813	.000	.813	.750

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

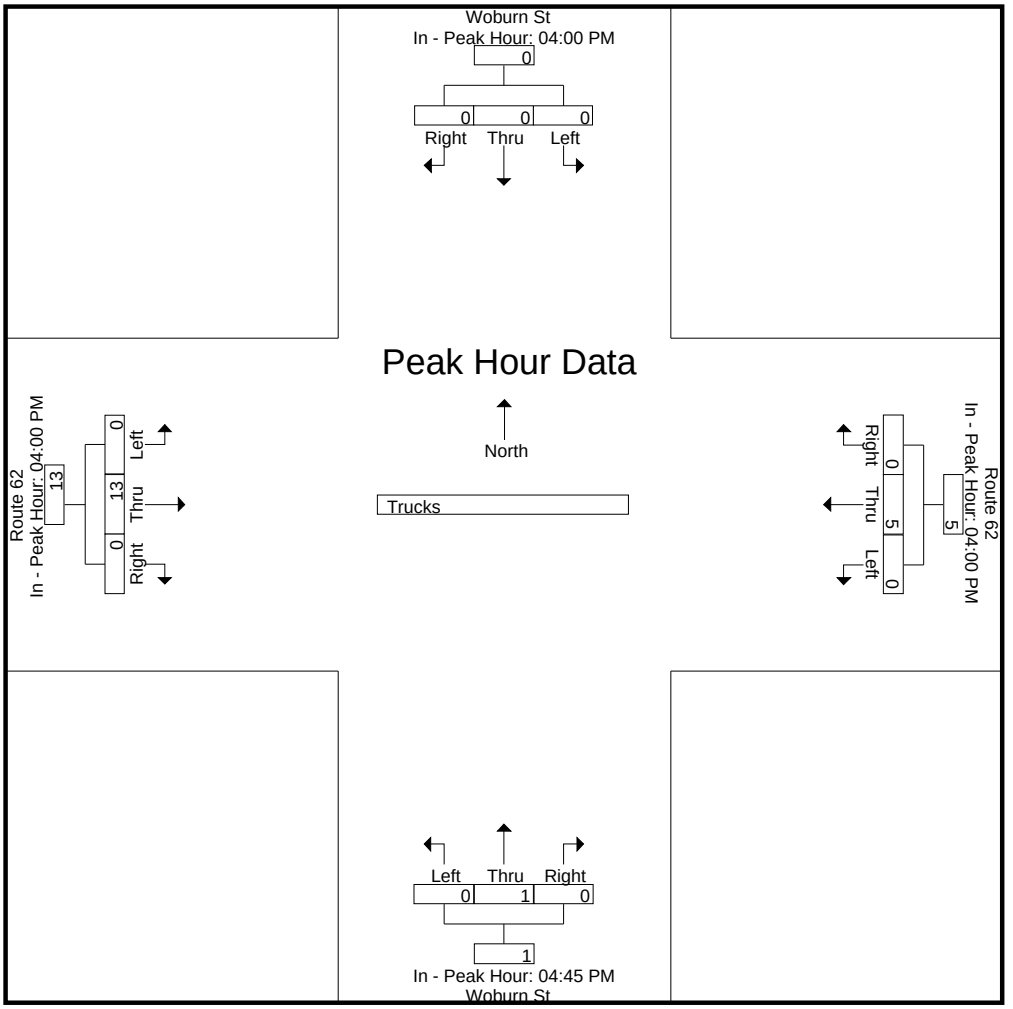
	04:00 PM				04:00 PM				04:45 PM				04:00 PM			
+0 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	3	0	3
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3
+45 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**4**	0	**4**
Total Volume	0	0	0	0	0	5	0	5	0	1	0	1	0	13	0	13
% App. Total	0	0	0		0	100	0		0	100	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.250	.000	.250	.000	.813	.000	.813

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	2
Grand Total	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	2	3
Apprch %	0	0	0		0	0	0		0	100	0		0	100	0				
Total %	0	0	0		0	0	0		0	50	0		0	50	0		33.3	66.7	

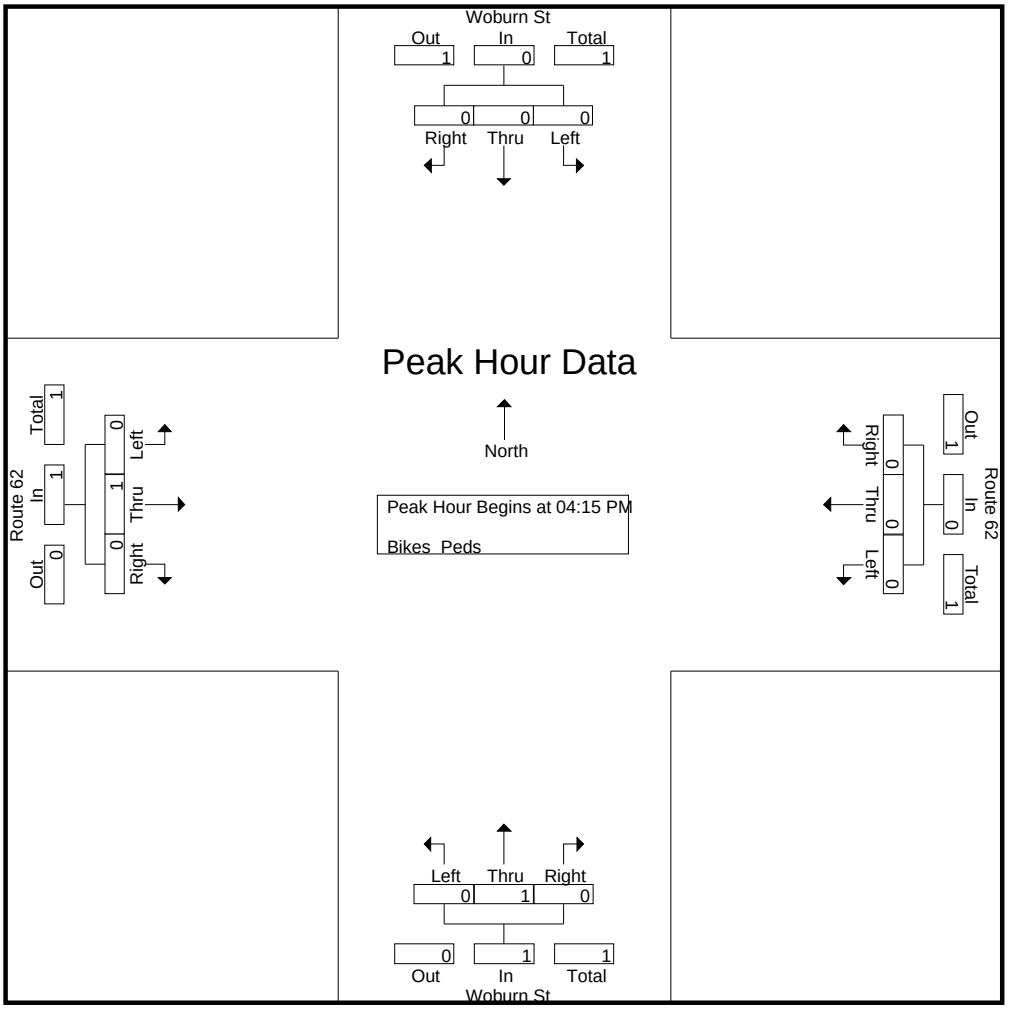
	Woburn St From North				Route 62 From East				Woburn St From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0	**1**	**2**
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
% App. Total	0	0	0		0	0	0		0	100	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

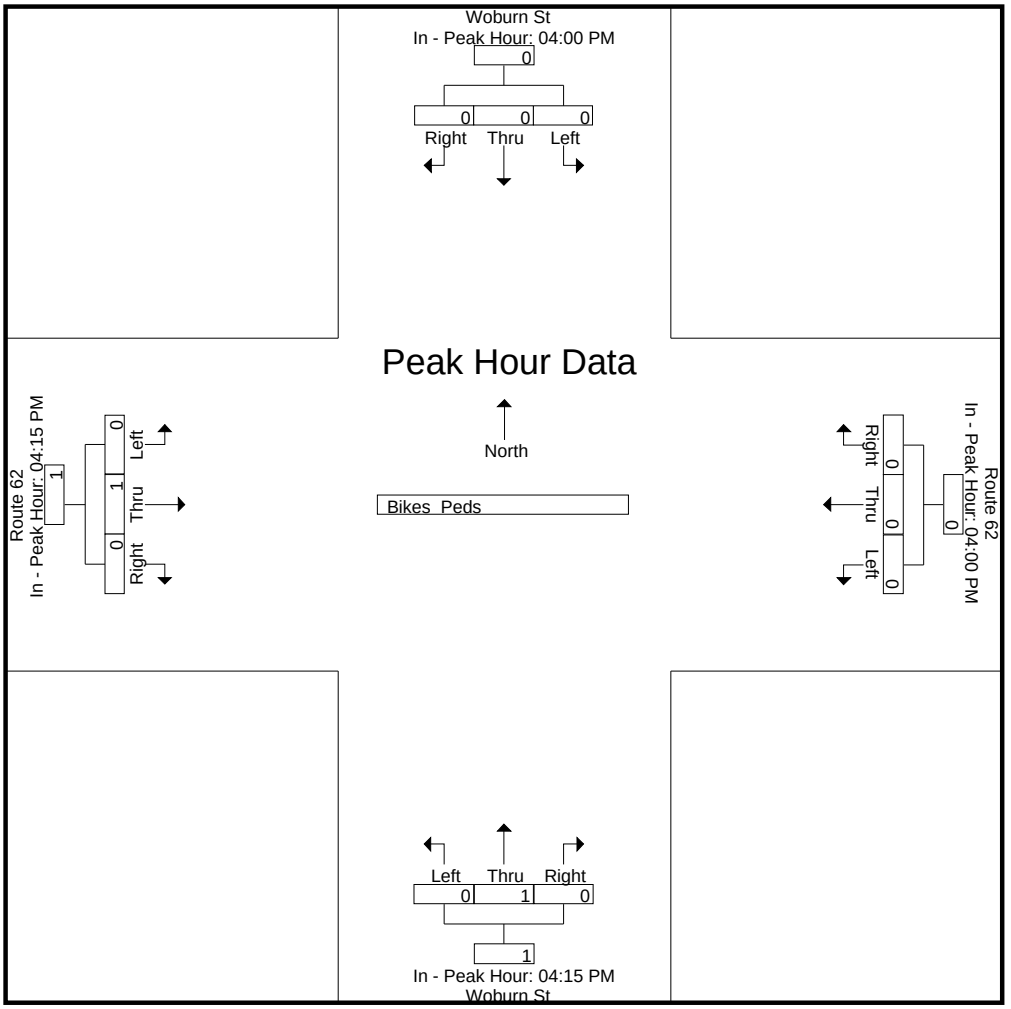
	04:00 PM				04:00 PM				04:15 PM				04:15 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0	**1**
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : Woburn Street
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110003
Site Code : 93110003
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	134	0	0	0	0	1	81	1	217
07:15 AM	0	0	0	0	152	0	0	0	1	2	98	1	254
07:30 AM	0	0	0	0	157	0	2	0	1	3	101	1	265
07:45 AM	0	0	1	1	147	0	0	0	0	2	115	3	269
Total	0	0	1	1	590	0	2	0	2	8	395	6	1005
08:00 AM	0	0	0	0	143	0	0	0	3	0	97	0	243
08:15 AM	0	0	0	1	142	0	0	0	0	3	122	0	268
08:30 AM	0	0	2	1	130	0	0	0	1	2	105	0	241
08:45 AM	0	0	0	0	130	0	2	0	0	0	109	0	241
Total	0	0	2	2	545	0	2	0	4	5	433	0	993
Grand Total	0	0	3	3	1135	0	4	0	6	13	828	6	1998
Apprch %	0	0	100	0.3	99.7	0	40	0	60	1.5	97.8	0.7	
Total %	0	0	0.2	0.2	56.8	0	0.2	0	0.3	0.7	41.4	0.3	
Cars	0	0	0	2	1053	0	3	0	4	8	765	5	1840
% Cars	0	0	0	66.7	92.8	0	75	0	66.7	61.5	92.4	83.3	92.1
Trucks	0	0	3	1	82	0	1	0	2	5	63	1	158
% Trucks	0	0	100	33.3	7.2	0	25	0	33.3	38.5	7.6	16.7	7.9

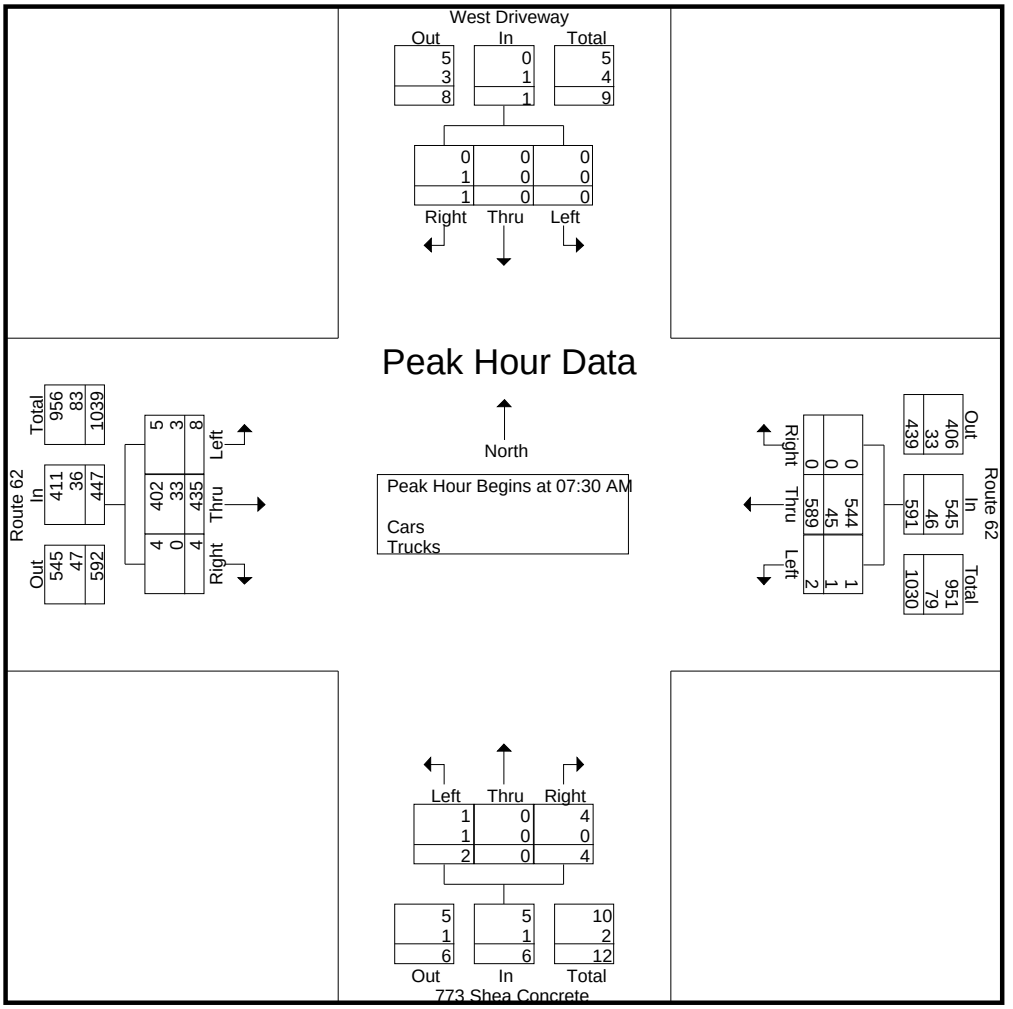
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	**157**	0	**157**	**2**	0	1	**3**	**3**	101	1	105	265
07:45 AM	0	0	**1**	**1**	**1**	147	0	148	0	0	0	0	2	115	**3**	120	**269**
08:00 AM	0	0	0	0	0	143	0	143	0	0	**3**	3	0	97	0	97	243
08:15 AM	0	0	0	0	1	142	0	143	0	0	0	0	3	**122**	0	**125**	268
Total Volume	0	0	1	1	2	589	0	591	2	0	4	6	8	435	4	447	1045
% App. Total	0	0	100		0.3	99.7	0		33.3	0	66.7		1.8	97.3	0.9		
PHF	.000	.000	.250	.250	.500	.938	.000	.941	.250	.000	.333	.500	.667	.891	.333	.894	.971
Cars	0	0	0	0	1	544	0	545	1	0	4	5	5	402	4	411	961
% Cars	0	0	0	0	50.0	92.4	0	92.2	50.0	0	100	83.3	62.5	92.4	100	91.9	92.0
Trucks	0	0	1	1	1	45	0	46	1	0	0	1	3	33	0	36	84
% Trucks	0	0	100	100	50.0	7.6	0	7.8	50.0	0	0	16.7	37.5	7.6	0	8.1	8.0

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

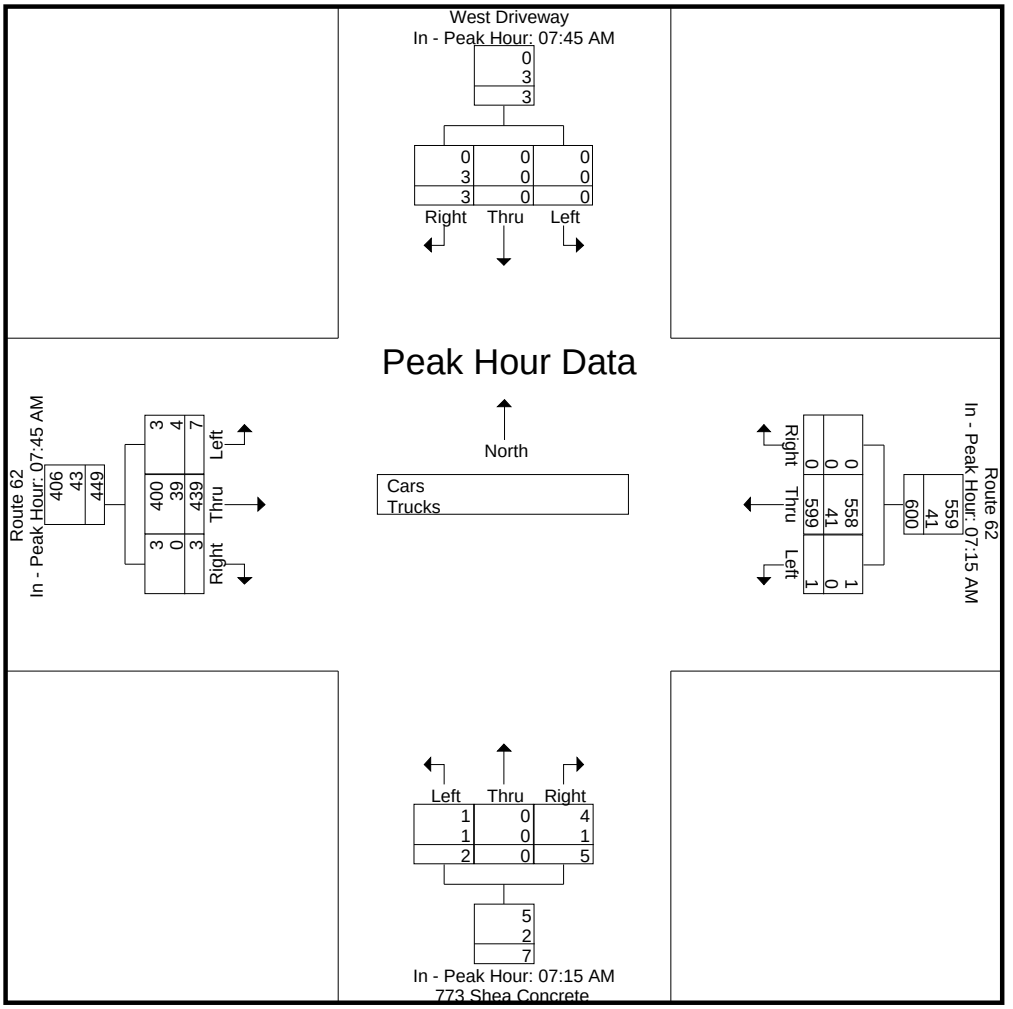
	07:45 AM				07:15 AM				07:15 AM				07:45 AM			
+0 mins.	0	0	1	1	0	152	0	152	0	0	1	1	2	115	**3**	120
+15 mins.	0	0	0	0	0	**157**	0	**157**	**2**	0	1	**3**	0	97	0	97
+30 mins.	0	0	0	0	**1**	147	0	148	0	0	0	0	**3**	**122**	0	**125**
+45 mins.	0	0	**2**	**2**	0	143	0	143	0	0	**3**	3	2	105	0	107
Total Volume	0	0	3	3	1	599	0	600	2	0	5	7	7	439	3	449
% App. Total	0	0	100		0.2	99.8	0		28.6	0	71.4		1.6	97.8	0.7	
PHF	.000	.000	.375	.375	.250	.954	.000	.955	.250	.000	.417	.583	.583	.900	.250	.898
Cars	0	0	0	0	1	558	0	559	1	0	4	5	3	400	3	406
% Cars	0	0	0	0	100	93.2	0	93.2	50	0	80	71.4	42.9	91.1	100	90.4
Trucks	0	0	3	3	0	41	0	41	1	0	1	2	4	39	0	43
% Trucks	0	0	100	100	0	6.8	0	6.8	50	0	20	28.6	57.1	8.9	0	9.6

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	122	0	0	0	0	1	75	0	198
07:15 AM	0	0	0	0	141	0	0	0	0	2	88	1	232
07:30 AM	0	0	0	0	147	0	1	0	1	2	96	1	248
07:45 AM	0	0	0	1	133	0	0	0	0	1	107	3	245
Total	0	0	0	1	543	0	1	0	1	6	366	5	923
08:00 AM	0	0	0	0	137	0	0	0	3	0	87	0	227
08:15 AM	0	0	0	0	127	0	0	0	0	2	112	0	241
08:30 AM	0	0	0	1	123	0	0	0	0	0	94	0	218
08:45 AM	0	0	0	0	123	0	2	0	0	0	106	0	231
Total	0	0	0	1	510	0	2	0	3	2	399	0	917
Grand Total	0	0	0	2	1053	0	3	0	4	8	765	5	1840
Apprch %	0	0	0	0.2	99.8	0	42.9	0	57.1	1	98.3	0.6	
Total %	0	0	0	0.1	57.2	0	0.2	0	0.2	0.4	41.6	0.3	

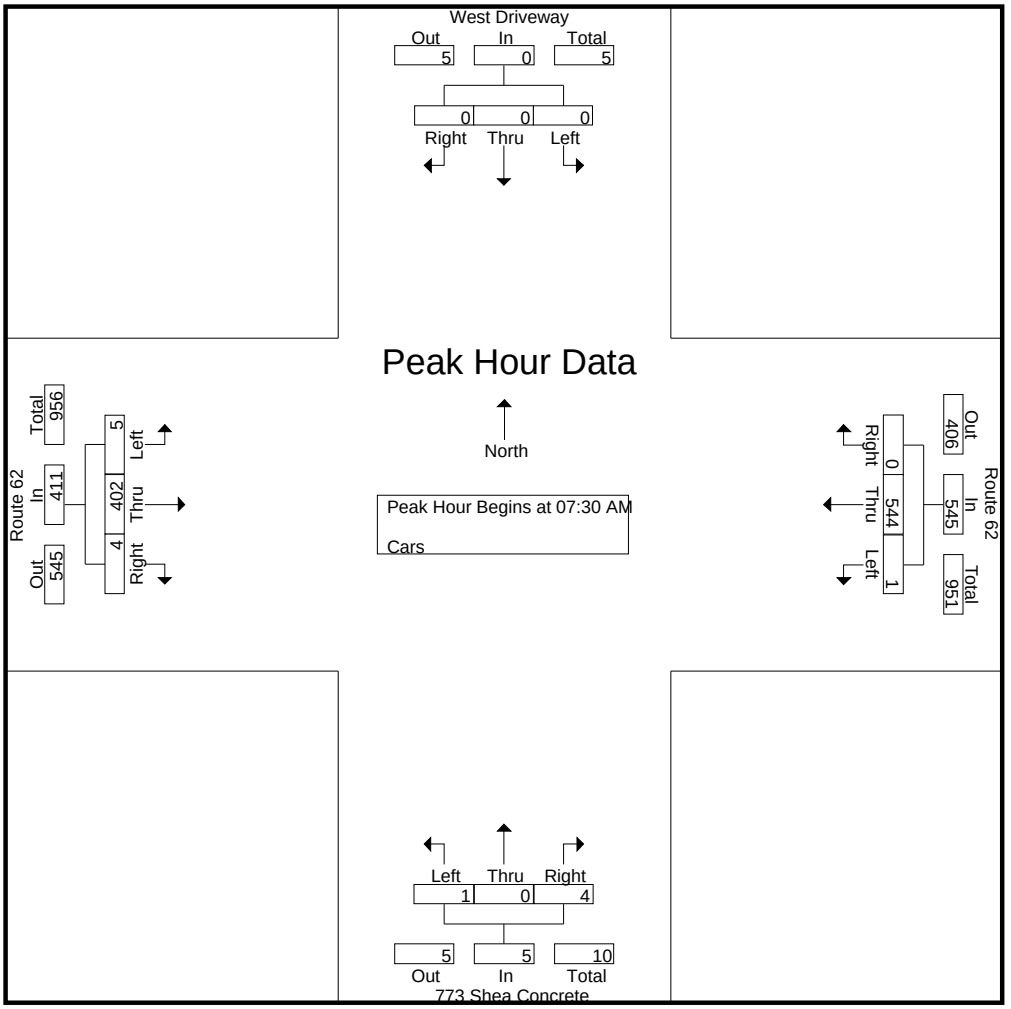
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	**147**	0	**147**	**1**	0	1	2	**2**	96	1	99	**248**
07:45 AM	0	0	0	0	**1**	133	0	134	0	0	0	0	1	107	**3**	111	245
08:00 AM	0	0	0	0	0	137	0	137	0	0	**3**	**3**	0	87	0	87	227
08:15 AM	0	0	0	0	0	127	0	127	0	0	0	0	2	**112**	0	**114**	241
Total Volume	0	0	0	0	1	544	0	545	1	0	4	5	5	402	4	411	961
% App. Total	0	0	0		0.2	99.8	0		20	0	80		1.2	97.8	1		
PHF	.000	.000	.000	.000	.250	.925	.000	.927	.250	.000	.333	.417	.625	.897	.333	.901	.969

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

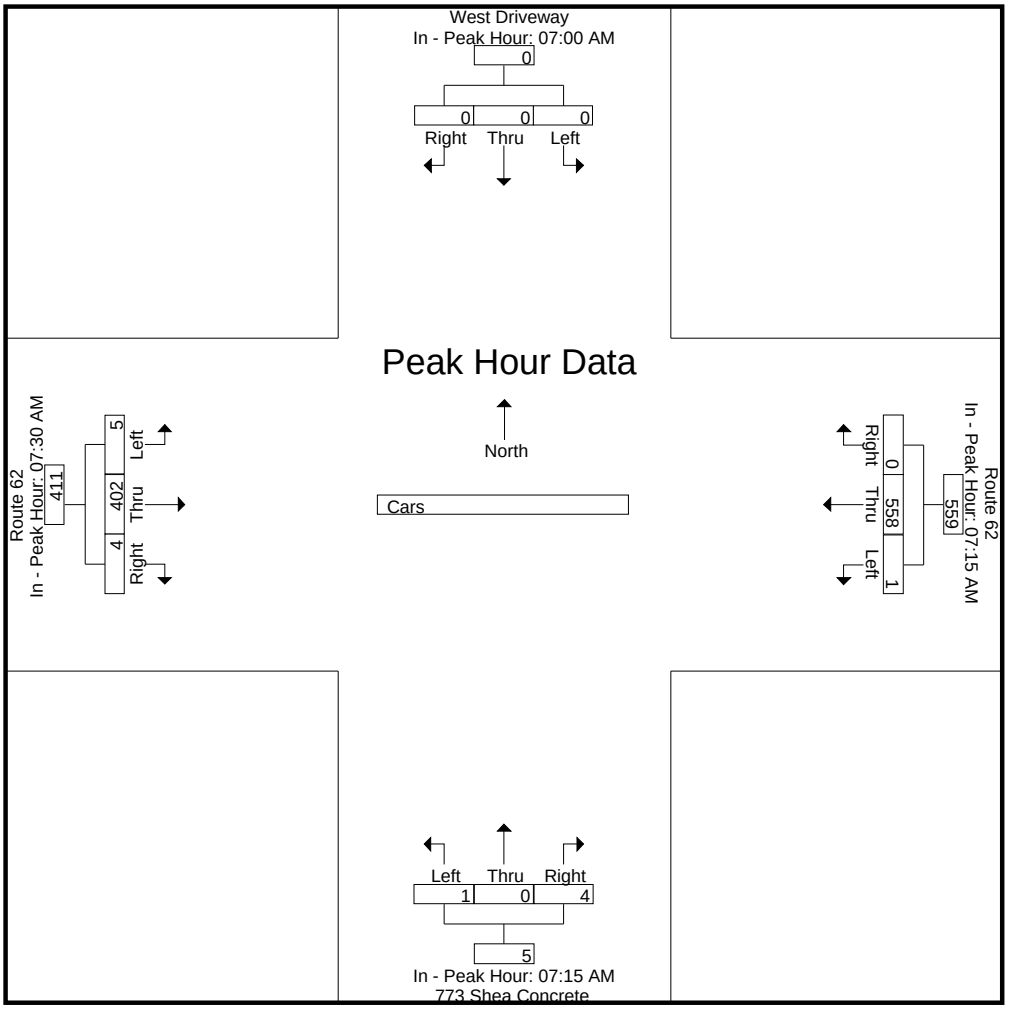
	07:00 AM				07:15 AM				07:15 AM				07:30 AM			
+0 mins.	0	0	0	0	0	141	0	141	0	0	0	0	**2**	96	1	99
+15 mins.	0	0	0	0	0	**147**	0	**147**	**1**	0	1	2	1	107	**3**	111
+30 mins.	0	0	0	0	**1**	133	0	134	0	0	0	0	0	87	0	87
+45 mins.	0	0	0	0	0	137	0	137	0	0	**3**	**3**	2	**112**	0	**114**
Total Volume	0	0	0	0	1	558	0	559	1	0	4	5	5	402	4	411
% App. Total	0	0	0		0.2	99.8	0		20	0	80		1.2	97.8	1	
PHF	.000	.000	.000	.000	.250	.949	.000	.951	.250	.000	.333	.417	.625	.897	.333	.901

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	12	0	0	0	0	0	6	1	19
07:15 AM	0	0	0	0	11	0	0	0	1	0	10	0	22
07:30 AM	0	0	0	0	10	0	1	0	0	1	5	0	17
07:45 AM	0	0	1	0	14	0	0	0	0	1	8	0	24
Total	0	0	1	0	47	0	1	0	1	2	29	1	82
08:00 AM	0	0	0	0	6	0	0	0	0	0	10	0	16
08:15 AM	0	0	0	1	15	0	0	0	0	1	10	0	27
08:30 AM	0	0	2	0	7	0	0	0	1	2	11	0	23
08:45 AM	0	0	0	0	7	0	0	0	0	0	3	0	10
Total	0	0	2	1	35	0	0	0	1	3	34	0	76
Grand Total	0	0	3	1	82	0	1	0	2	5	63	1	158
Apprch %	0	0	100	1.2	98.8	0	33.3	0	66.7	7.2	91.3	1.4	
Total %	0	0	1.9	0.6	51.9	0	0.6	0	1.3	3.2	39.9	0.6	

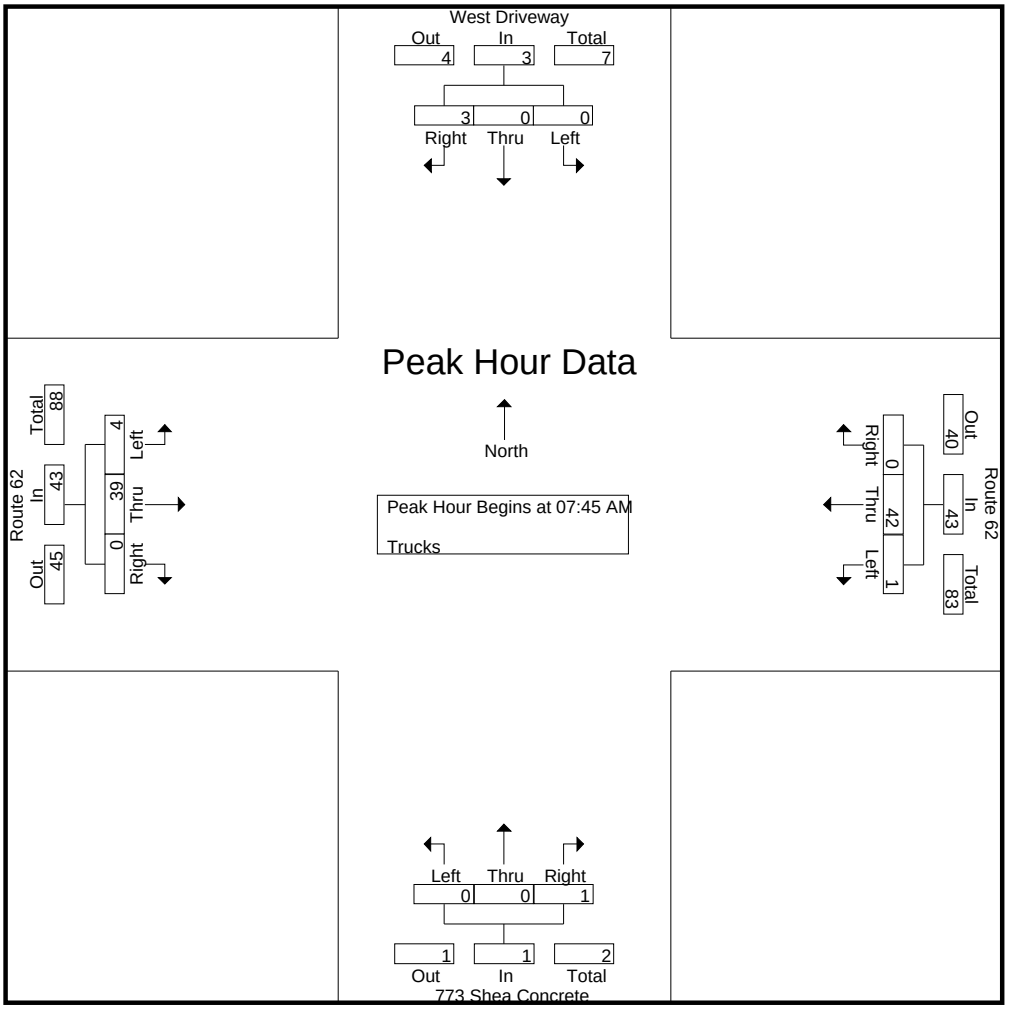
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	1	1	0	14	0	14	0	0	0	0	1	8	0	9	24
08:00 AM	0	0	0	0	0	6	0	6	0	0	0	0	0	10	0	10	16
08:15 AM	0	0	0	0	**1**	**15**	0	**16**	0	0	0	0	1	10	0	11	**27**
08:30 AM	0	0	**2**	**2**	0	7	0	7	0	0	**1**	**1**	**2**	**11**	0	**13**	23
Total Volume	0	0	3	3	1	42	0	43	0	0	1	1	4	39	0	43	90
% App. Total	0	0	100		2.3	97.7	0		0	0	100		9.3	90.7	0		
PHF	.000	.000	.375	.375	.250	.700	.000	.672	.000	.000	.250	.250	.500	.886	.000	.827	.833

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

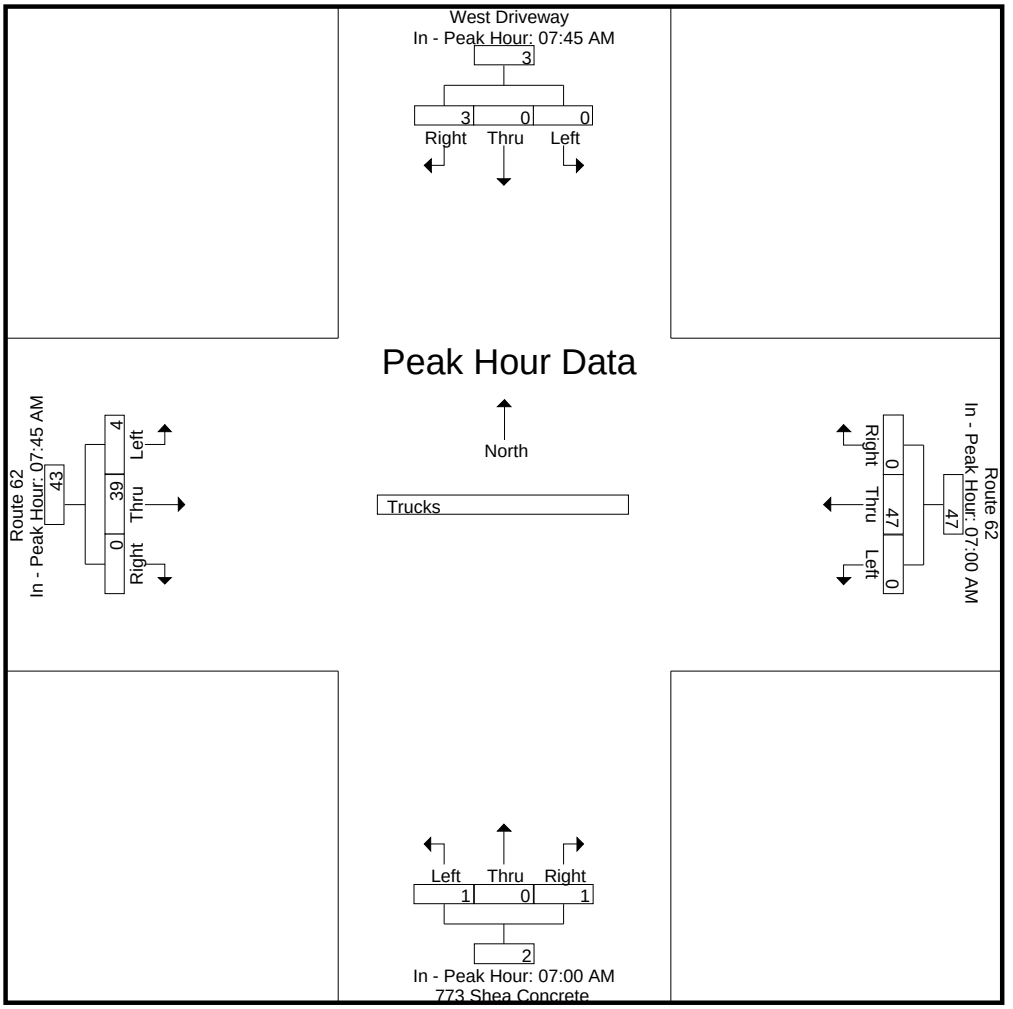
	07:45 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	1	1	0	12	0	12	0	0	0	0	1	8	0	9
+15 mins.	0	0	0	0	0	11	0	11	0	0	**1**	**1**	0	10	0	10
+30 mins.	0	0	0	0	0	10	0	10	**1**	0	0	1	1	10	0	11
+45 mins.	0	0	**2**	**2**	0	**14**	0	**14**	0	0	0	0	**2**	**11**	0	**13**
Total Volume	0	0	3	3	0	47	0	47	1	0	1	2	4	39	0	43
% App. Total	0	0	100		0	100	0		50	0	50		9.3	90.7	0	
PHF	.000	.000	.375	.375	.000	.839	.000	.839	.250	.000	.250	.500	.500	.886	.000	.827

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	0	0	

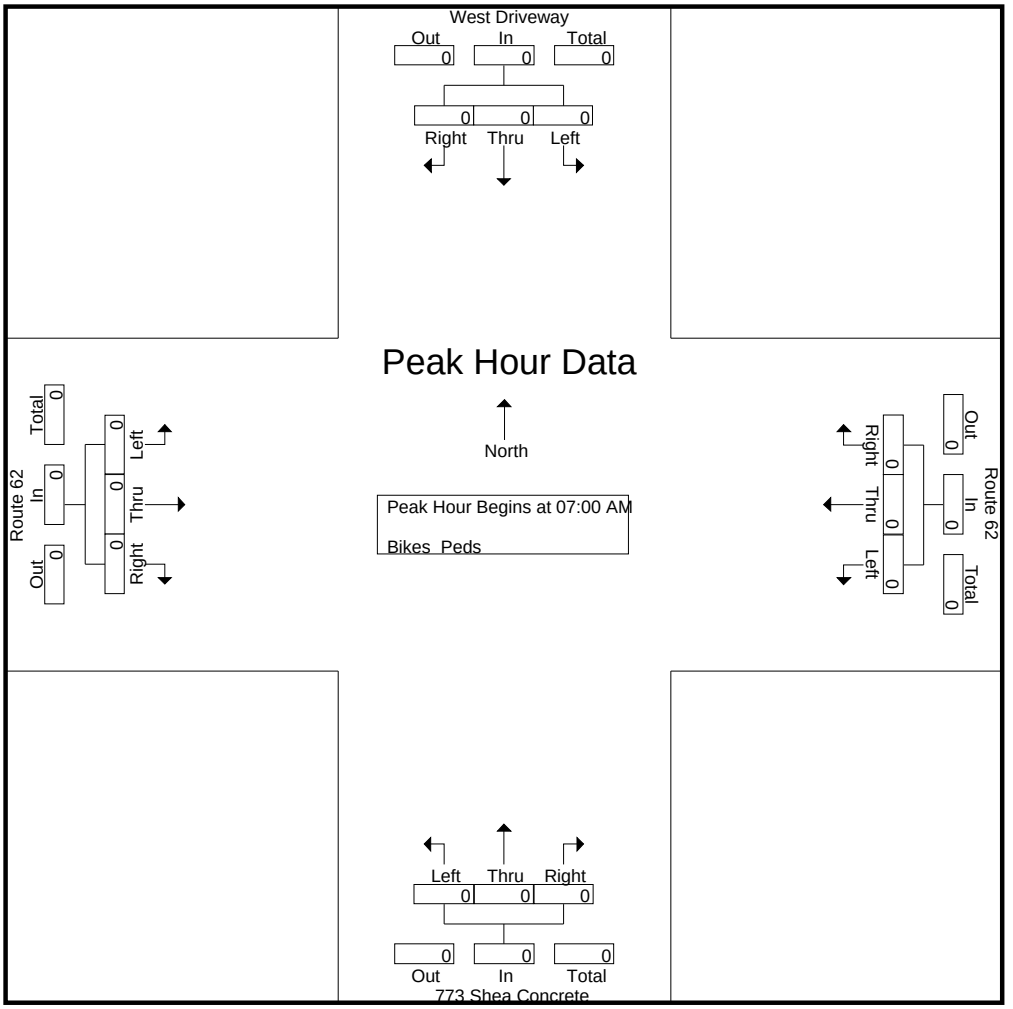
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

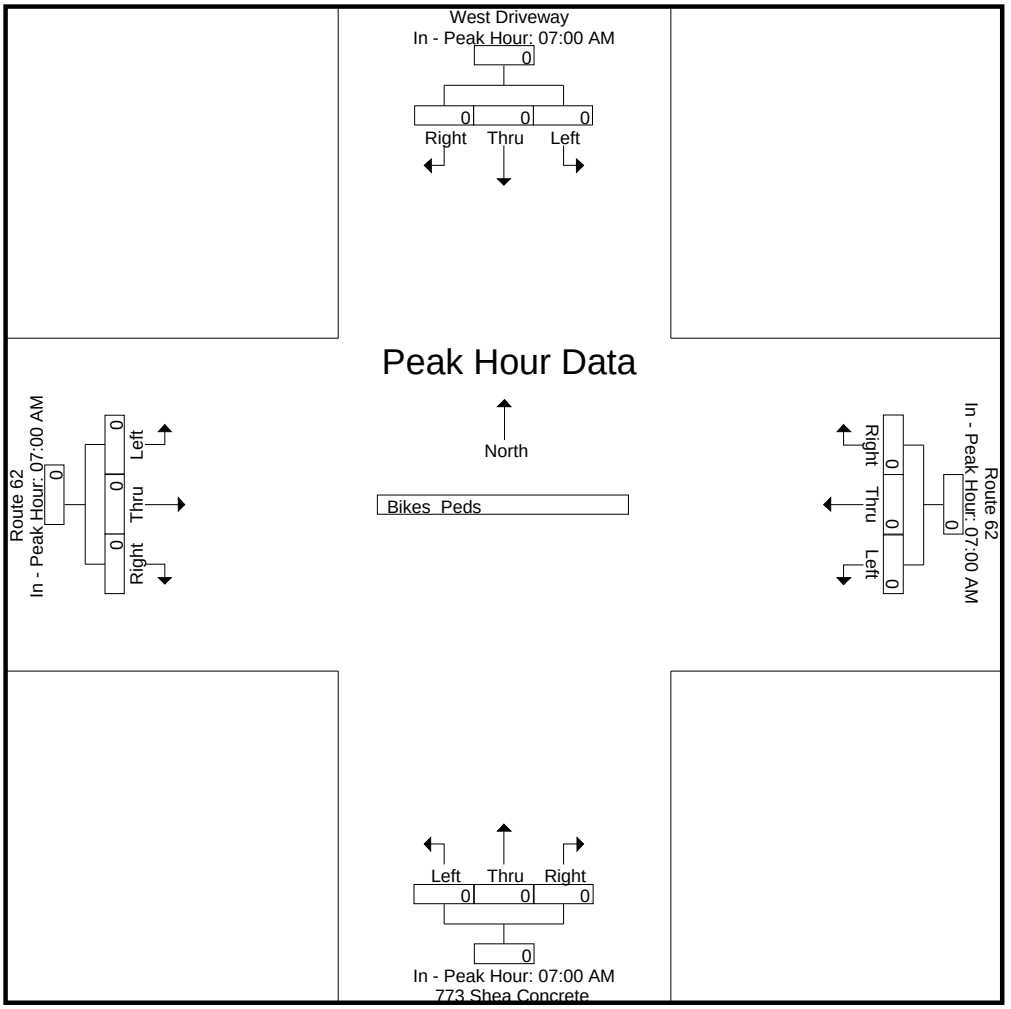
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	157	0	0	0	0	0	146	0	303
04:15 PM	0	0	0	0	126	0	0	0	1	0	153	1	281
04:30 PM	0	0	0	1	128	0	0	0	1	0	136	0	266
04:45 PM	0	0	0	0	123	0	0	0	0	1	168	0	292
Total	0	0	0	1	534	0	0	0	2	1	603	1	1142
05:00 PM	1	0	0	0	117	0	0	0	0	0	162	0	280
05:15 PM	0	0	0	0	132	0	0	0	0	0	178	0	310
05:30 PM	0	0	0	0	102	0	0	0	0	0	167	0	269
05:45 PM	0	0	0	0	94	0	0	0	0	0	139	0	233
Total	1	0	0	0	445	0	0	0	0	0	646	0	1092
Grand Total	1	0	0	1	979	0	0	0	2	1	1249	1	2234
Apprch %	100	0	0	0.1	99.9	0	0	0	100	0.1	99.8	0.1	
Total %	0	0	0	0	43.8	0	0	0	0.1	0	55.9	0	
Cars	1	0	0	1	970	0	0	0	2	1	1229	1	2205
% Cars	100	0	0	100	99.1	0	0	0	100	100	98.4	100	98.7
Trucks	0	0	0	0	9	0	0	0	0	0	20	0	29
% Trucks	0	0	0	0	0.9	0	0	0	0	0	1.6	0	1.3

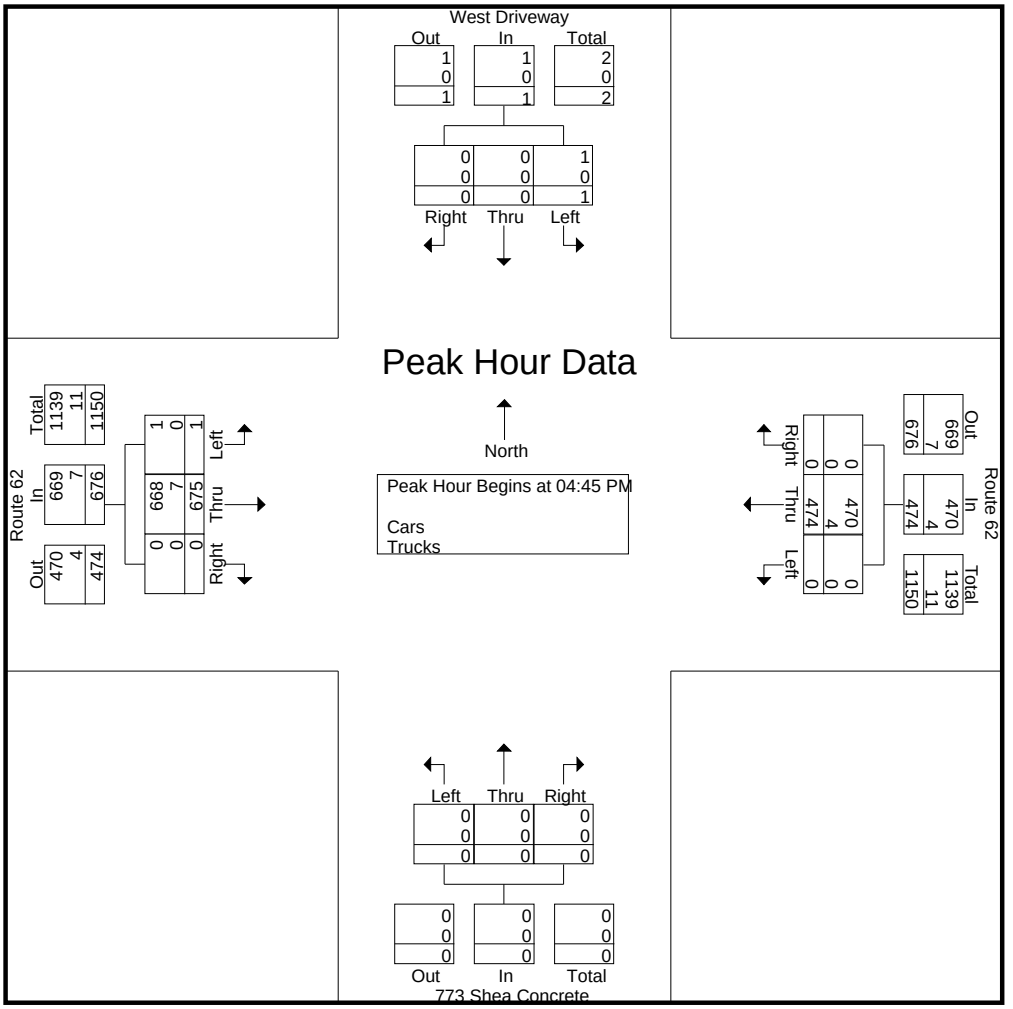
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	123	0	123	0	0	0	0	**1**	168	0	169	292
05:00 PM	**1**	0	0	**1**	0	117	0	117	0	0	0	0	0	162	0	162	280
05:15 PM	0	0	0	0	0	**132**	0	**132**	0	0	0	0	0	**178**	0	**178**	**310**
05:30 PM	0	0	0	0	0	102	0	102	0	0	0	0	0	167	0	167	269
Total Volume	1	0	0	1	0	474	0	474	0	0	0	0	1	675	0	676	1151
% App. Total	100	0	0		0	100	0		0	0	0		0.1	99.9	0		
PHF	.250	.000	.000	.250	.000	.898	.000	.898	.000	.000	.000	.000	.250	.948	.000	.949	.928
Cars	1	0	0	1	0	470	0	470	0	0	0	0	1	668	0	669	1140
% Cars	100	0	0	100	0	99.2	0	99.2	0	0	0	0	100	99.0	0	99.0	99.0
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	7	0	7	11
% Trucks	0	0	0	0	0	0.8	0	0.8	0	0	0	0	0	1.0	0	1.0	1.0

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

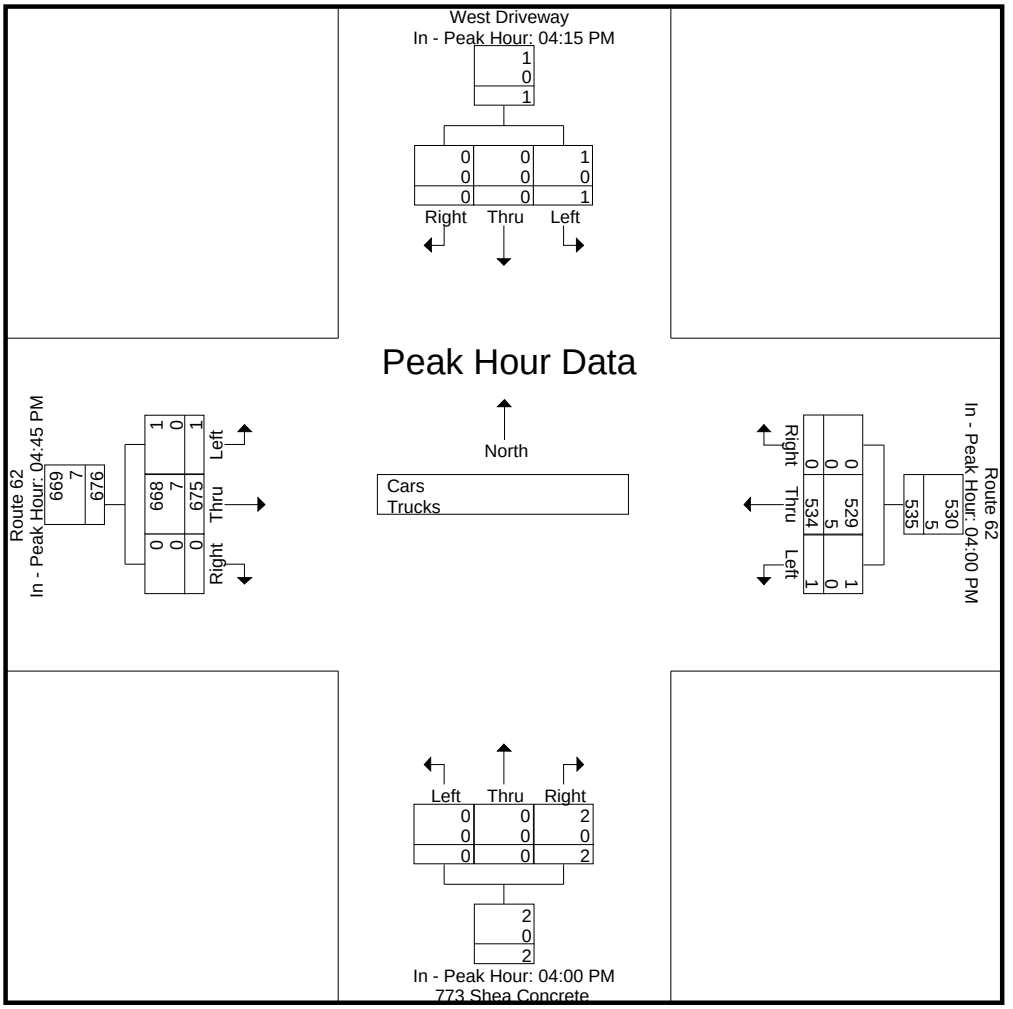
	04:15 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	**157**	0	**157**	0	0	0	0	**1**	168	0	169
+15 mins.	0	0	0	0	0	126	0	126	0	0	**1**	**1**	0	162	0	162
+30 mins.	0	0	0	0	**1**	128	0	129	0	0	1	1	0	**178**	0	**178**
+45 mins.	**1**	0	0	**1**	0	123	0	123	0	0	0	0	0	167	0	167
Total Volume	1	0	0	1	1	534	0	535	0	0	2	2	1	675	0	676
% App. Total	100	0	0		0.2	99.8	0		0	0	100		0.1	99.9	0	
PHF	.250	.000	.000	.250	.250	.850	.000	.852	.000	.000	.500	.500	.250	.948	.000	.949
Cars	1	0	0	1	1	529	0	530	0	0	2	2	1	668	0	669
% Cars	100	0	0	100	100	99.1	0	99.1	0	0	100	100	100	99	0	99
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	7	0	7
% Trucks	0	0	0	0	0	0.9	0	0.9	0	0	0	0	0	1	0	1

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	154	0	0	0	0	0	144	0	298
04:15 PM	0	0	0	0	126	0	0	0	1	0	149	1	277
04:30 PM	0	0	0	1	126	0	0	0	1	0	133	0	261
04:45 PM	0	0	0	0	123	0	0	0	0	1	164	0	288
Total	0	0	0	1	529	0	0	0	2	1	590	1	1124
05:00 PM	1	0	0	0	116	0	0	0	0	0	160	0	277
05:15 PM	0	0	0	0	132	0	0	0	0	0	178	0	310
05:30 PM	0	0	0	0	99	0	0	0	0	0	166	0	265
05:45 PM	0	0	0	0	94	0	0	0	0	0	135	0	229
Total	1	0	0	0	441	0	0	0	0	0	639	0	1081
Grand Total	1	0	0	1	970	0	0	0	2	1	1229	1	2205
Apprch %	100	0	0	0.1	99.9	0	0	0	100	0.1	99.8	0.1	
Total %	0	0	0	0	44	0	0	0	0.1	0	55.7	0	

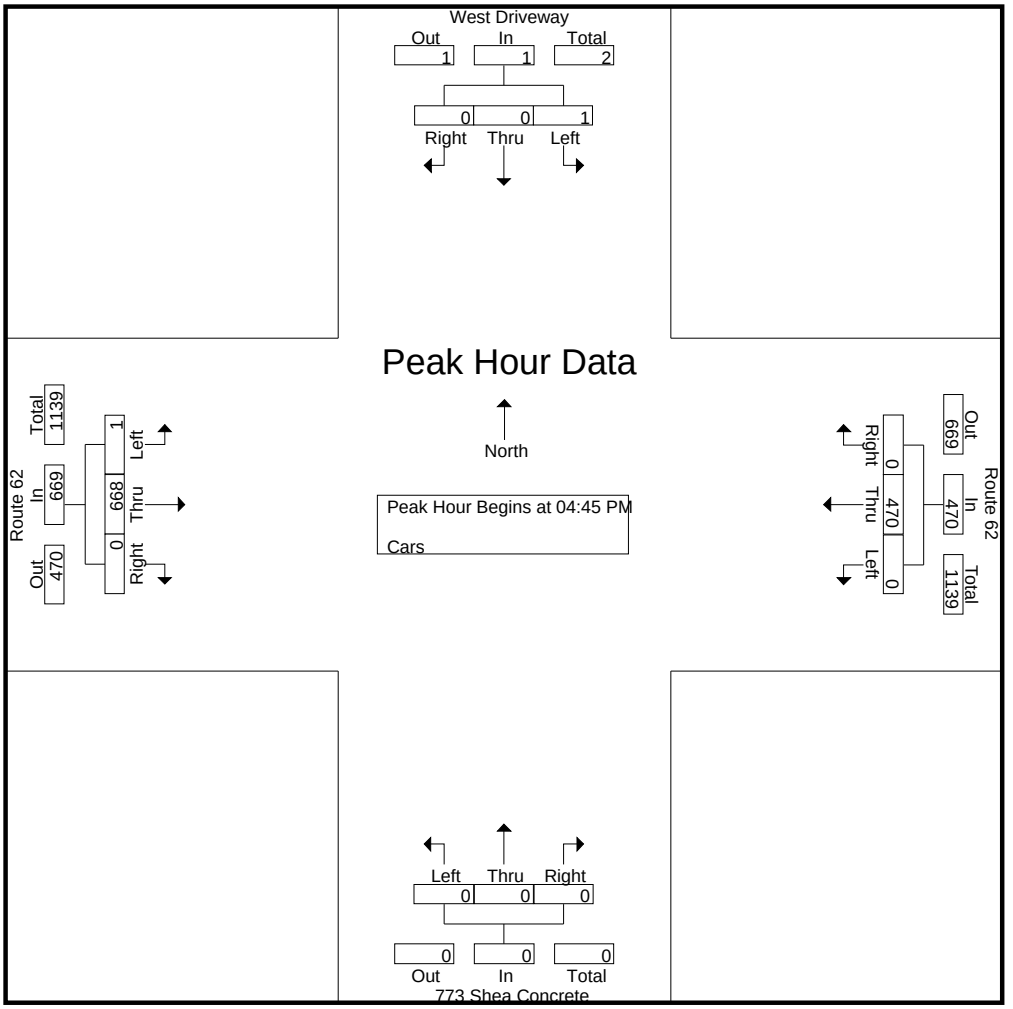
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	123	0	123	0	0	0	0	**1**	164	0	165	288
05:00 PM	**1**	0	0	**1**	0	116	0	116	0	0	0	0	0	160	0	160	277
05:15 PM	0	0	0	0	0	**132**	0	**132**	0	0	0	0	0	**178**	0	**178**	**310**
05:30 PM	0	0	0	0	0	99	0	99	0	0	0	0	0	166	0	166	265
Total Volume	1	0	0	1	0	470	0	470	0	0	0	0	1	668	0	669	1140
% App. Total	100	0	0		0	100	0		0	0	0		0.1	99.9	0		
PHF	.250	.000	.000	.250	.000	.890	.000	.890	.000	.000	.000	.000	.250	.938	.000	.940	.919

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

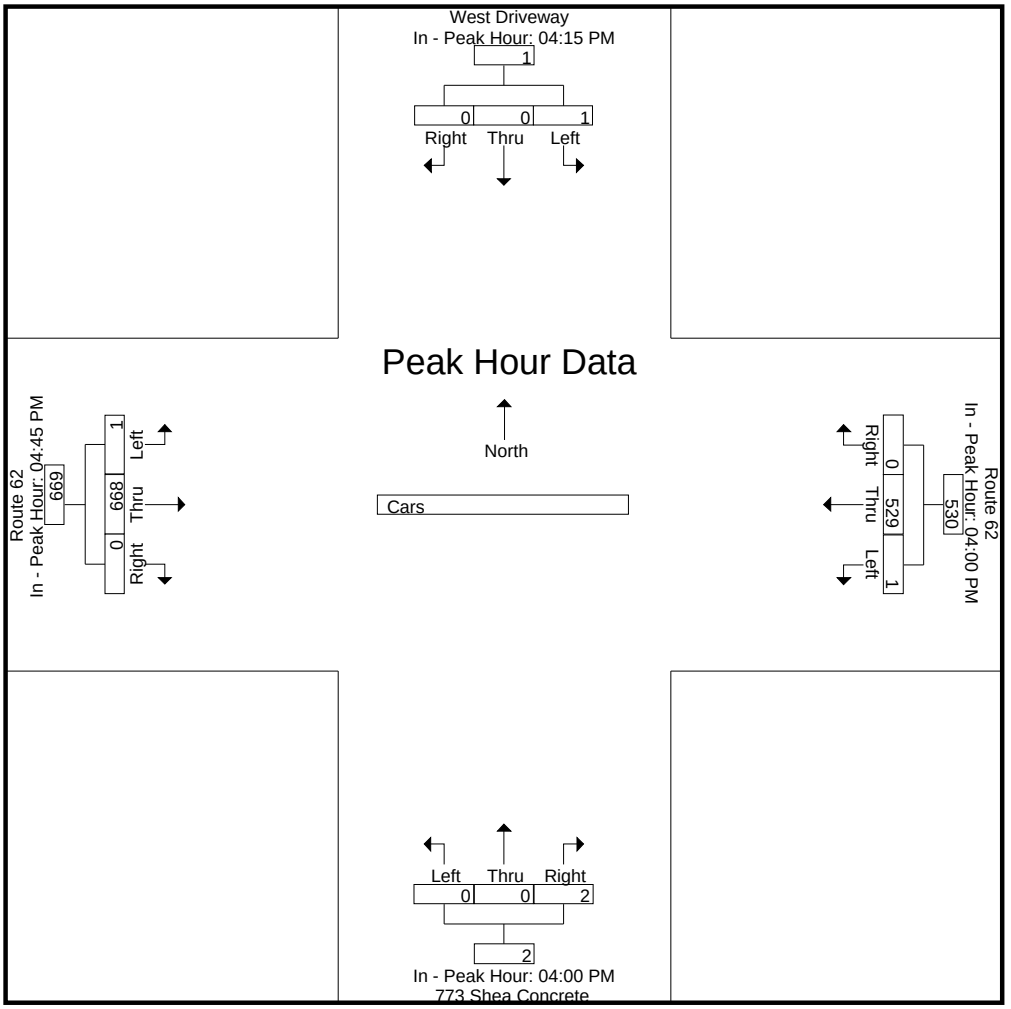
	04:15 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	**154**	0	**154**	0	0	0	0	**1**	164	0	165
+15 mins.	0	0	0	0	0	126	0	126	0	0	**1**	**1**	0	160	0	160
+30 mins.	0	0	0	0	**1**	126	0	127	0	0	1	1	0	**178**	0	**178**
+45 mins.	**1**	0	0	**1**	0	123	0	123	0	0	0	0	0	166	0	166
Total Volume	1	0	0	1	1	529	0	530	0	0	2	2	1	668	0	669
% App. Total	100	0	0		0.2	99.8	0		0	0	100		0.1	99.9	0	
PHF	.250	.000	.000	.250	.250	.859	.000	.860	.000	.000	.500	.500	.250	.938	.000	.940

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	West Driveway From North			Route 62 From East			773 Shea Concrete From South			Route 62 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	0	0	2	0	5
04:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	4
04:30 PM	0	0	0	0	2	0	0	0	0	0	3	0	5
04:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	4
Total	0	0	0	0	5	0	0	0	0	0	13	0	18
05:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	3	0	0	0	0	0	1	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	4
Total	0	0	0	0	4	0	0	0	0	0	7	0	11
Grand Total	0	0	0	0	9	0	0	0	0	0	20	0	29
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	31	0	0	0	0	0	69	0	

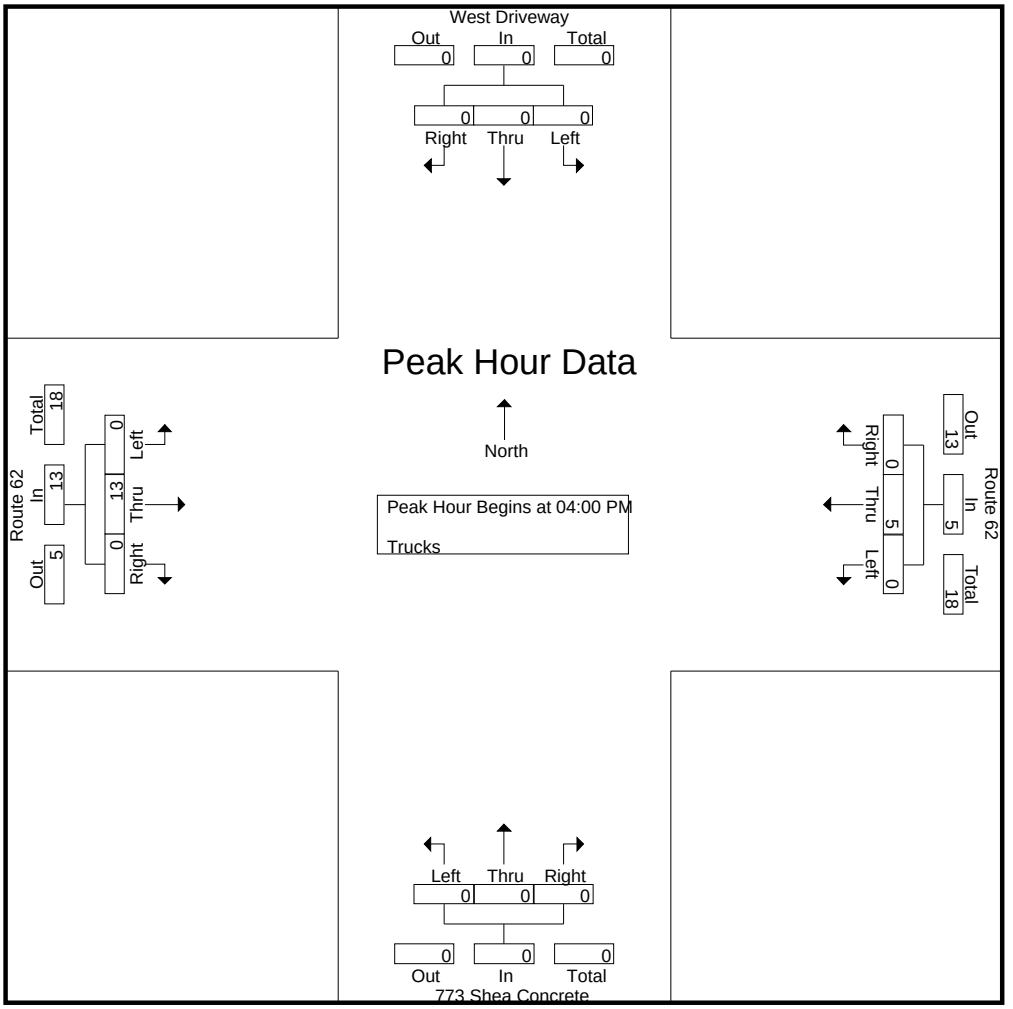
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	2	0	2	**5**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	0	**4**	4
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4
Total Volume	0	0	0	0	0	5	0	5	0	0	0	0	0	13	0	13	18
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000	.000	.813	.000	.813	.900

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

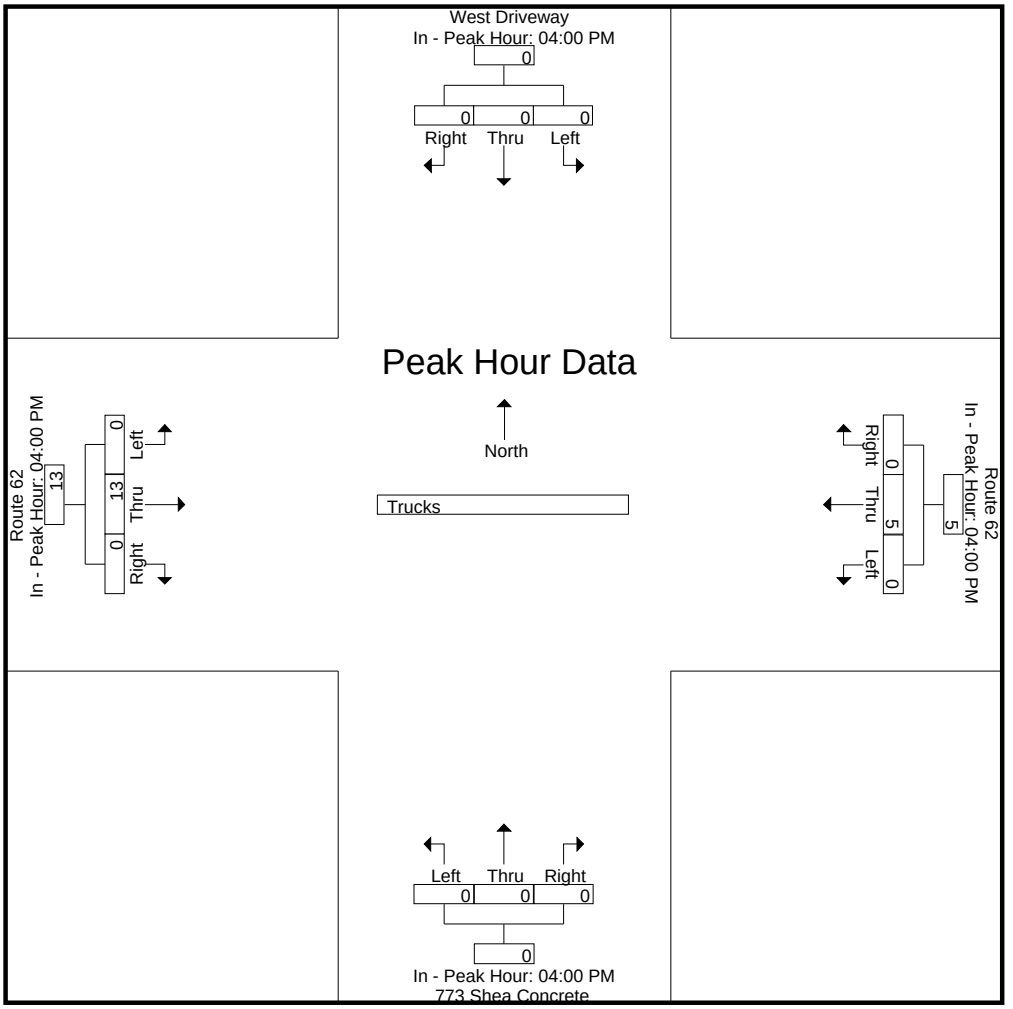
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	2	0	2
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	0	**4**
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Total Volume	0	0	0	0	0	5	0	5	0	0	0	0	0	13	0	13
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000	.000	.813	.000	.813

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Grand Total	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		50	50	

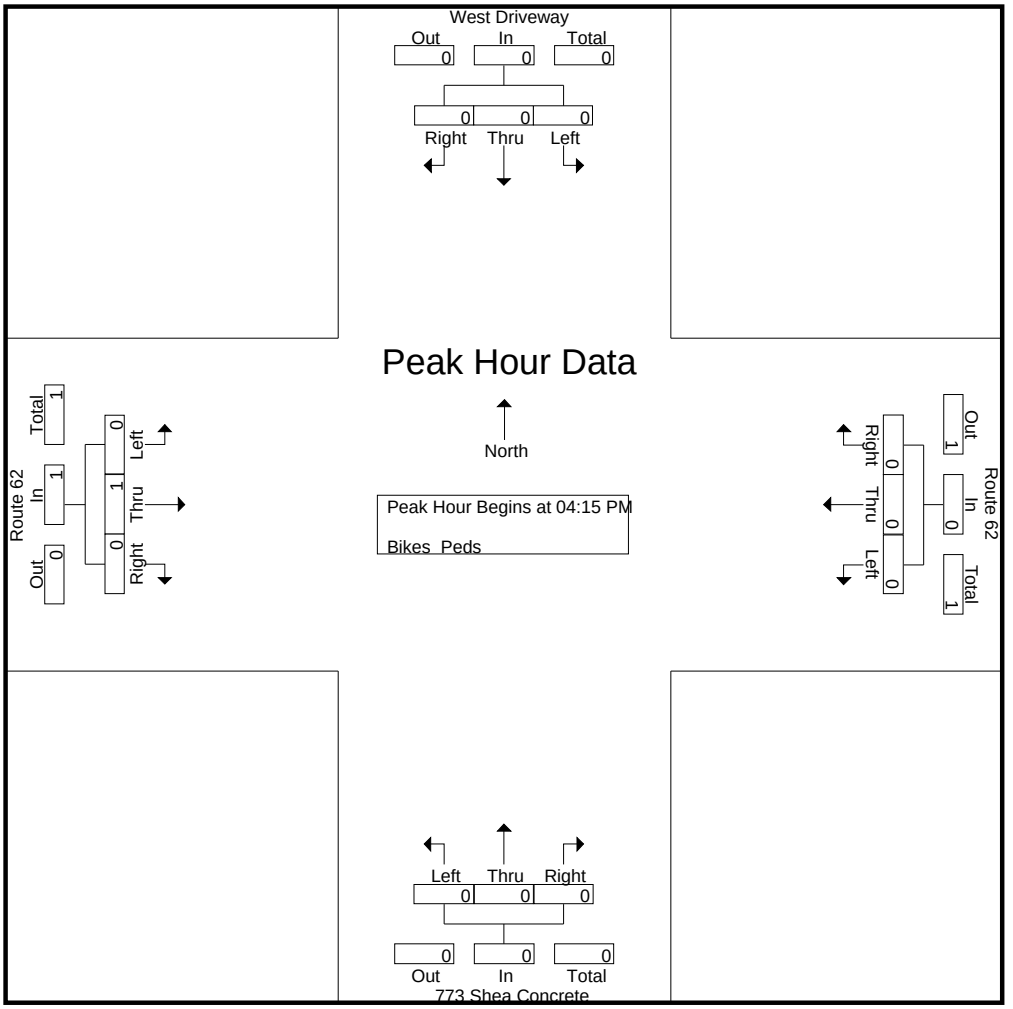
	West Driveway From North				Route 62 From East				773 Shea Concrete From South				Route 62 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

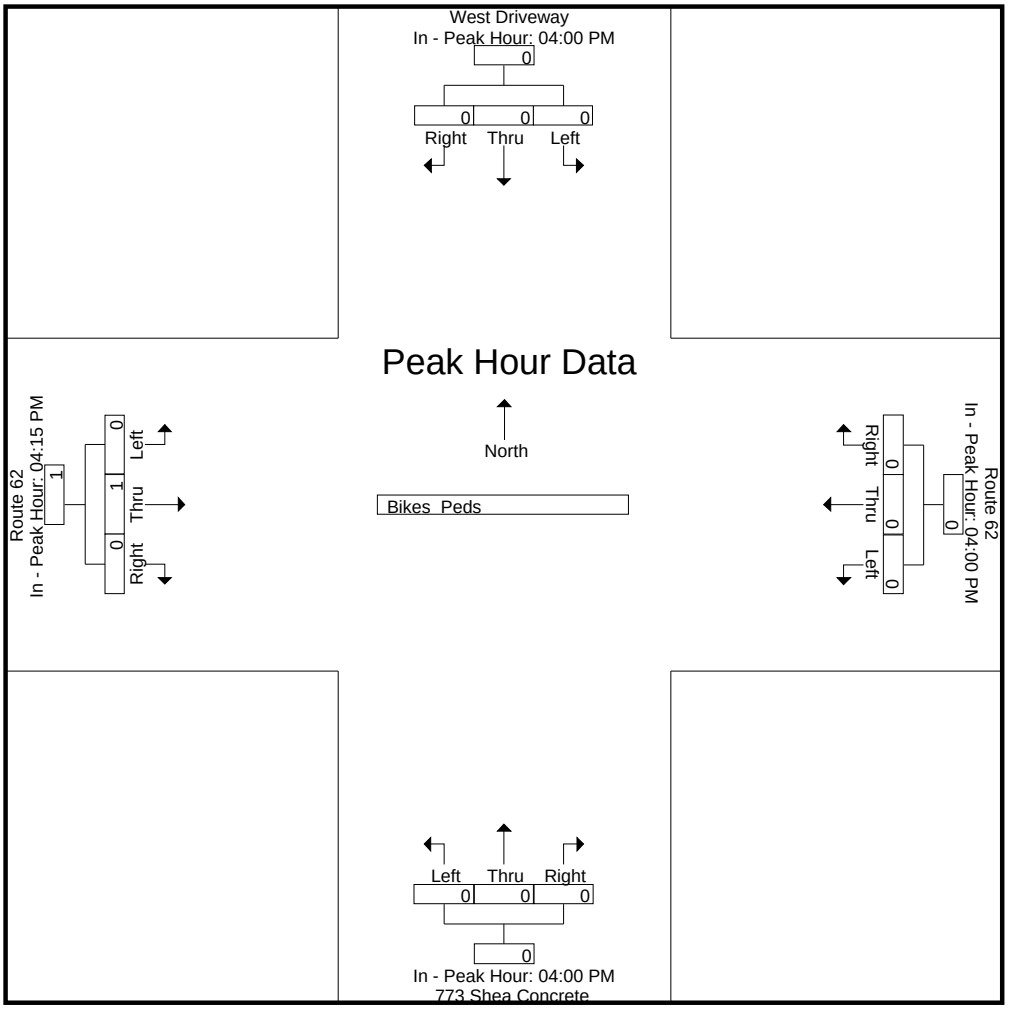
	04:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : West Driveway/773 Shea Conrcete
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110004
Site Code : 93110004
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 1

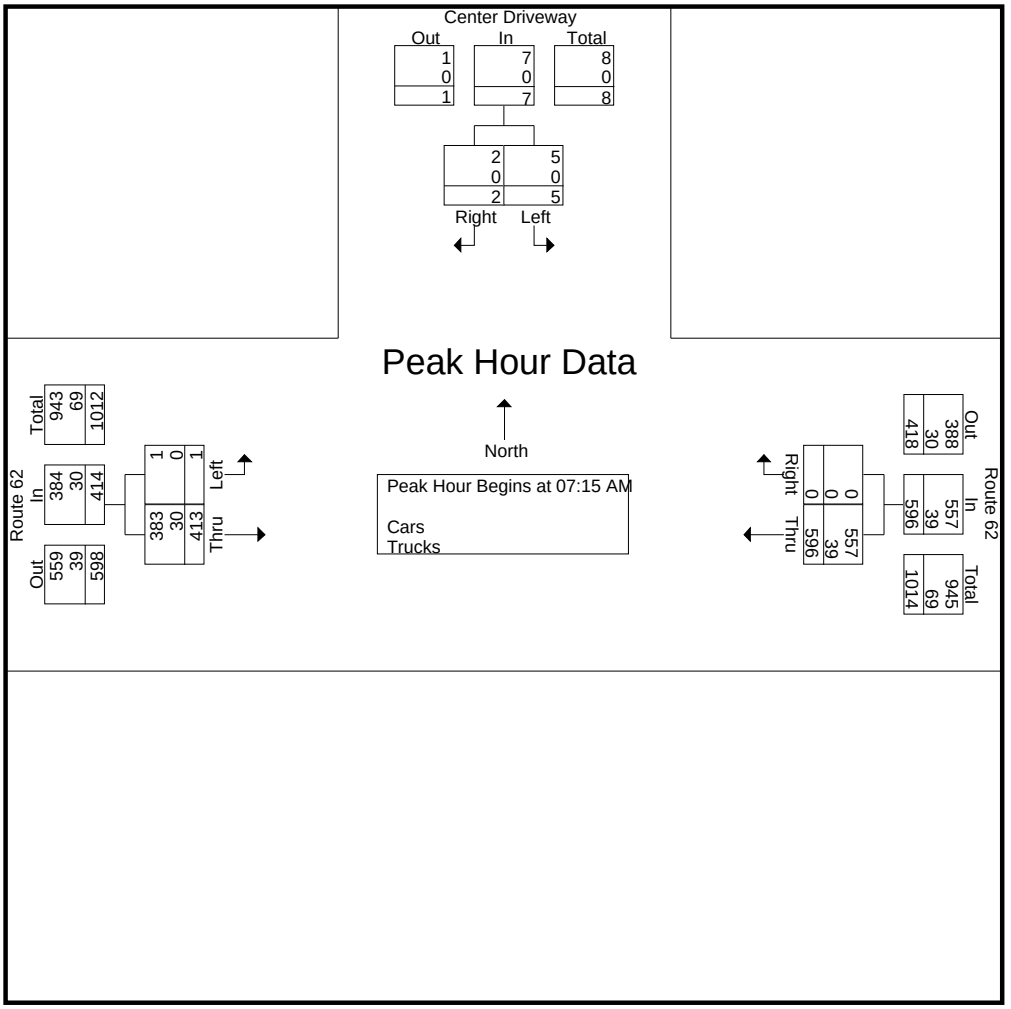
Groups Printed- Cars - Trucks

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	2	132	1	0	82	217
07:15 AM	0	1	152	0	0	101	254
07:30 AM	0	0	153	0	1	100	254
07:45 AM	2	0	144	0	0	114	260
Total	2	3	581	1	1	397	985
08:00 AM	3	1	147	0	0	98	249
08:15 AM	1	2	131	0	1	118	253
08:30 AM	0	2	131	0	1	107	241
08:45 AM	0	2	124	0	0	112	238
Total	4	7	533	0	2	435	981
Grand Total	6	10	1114	1	3	832	1966
Apprch %	37.5	62.5	99.9	0.1	0.4	99.6	
Total %	0.3	0.5	56.7	0.1	0.2	42.3	
Cars	6	4	1038	1	2	768	1819
% Cars	100	40	93.2	100	66.7	92.3	92.5
Trucks	0	6	76	0	1	64	147
% Trucks	0	60	6.8	0	33.3	7.7	7.5

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	**1**	1	152	0	152	0	101	101	254
07:30 AM	0	0	0	**153**	0	**153**	**1**	100	101	254
07:45 AM	2	0	2	144	0	144	0	**114**	**114**	**260**
08:00 AM	**3**	1	**4**	147	0	147	0	98	98	249
Total Volume	5	2	7	596	0	596	1	413	414	1017
% App. Total	71.4	28.6		100	0		0.2	99.8		
PHF	.417	.500	.438	.974	.000	.974	.250	.906	.908	.978
Cars	5	2	7	557	0	557	1	383	384	948
% Cars	100	100	100	93.5	0	93.5	100	92.7	92.8	93.2
Trucks	0	0	0	39	0	39	0	30	30	69
% Trucks	0	0	0	6.5	0	6.5	0	7.3	7.2	6.8

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

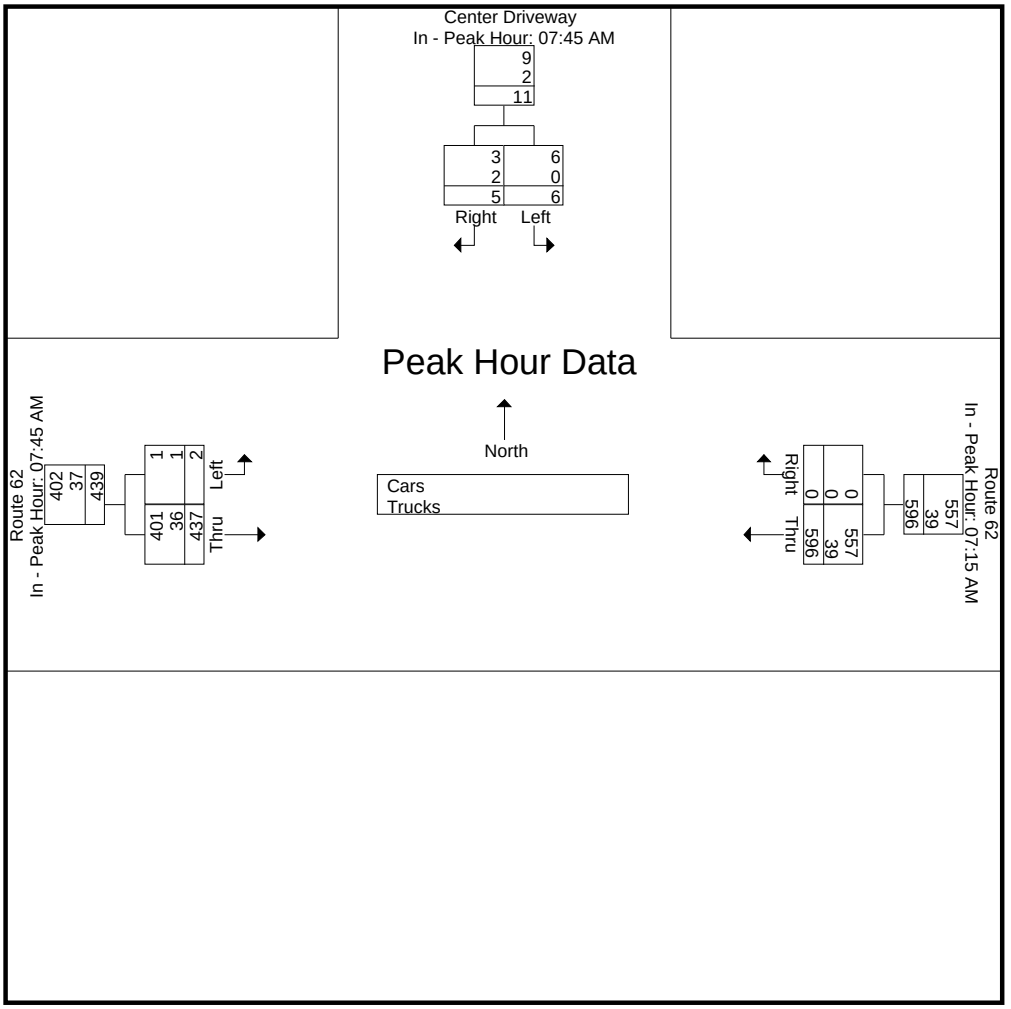
	07:45 AM			07:15 AM			07:45 AM		
+0 mins.	2	0	2	152	0	152	0	114	114
+15 mins.	**3**	1	**4**	**153**	0	**153**	0	98	98
+30 mins.	1	**2**	3	144	0	144	**1**	**118**	**119**
+45 mins.	0	2	2	147	0	147	1	107	108
Total Volume	6	5	11	596	0	596	2	437	439
% App. Total	54.5	45.5		100	0		0.5	99.5	
PHF	.500	.625	.688	.974	.000	.974	.500	.926	.922
Cars	6	3	9	557	0	557	1	401	402
% Cars	100	60	81.8	93.5	0	93.5	50	91.8	91.6
Trucks	0	2	2	39	0	39	1	36	37
% Trucks	0	40	18.2	6.5	0	6.5	50	8.2	8.4

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 4

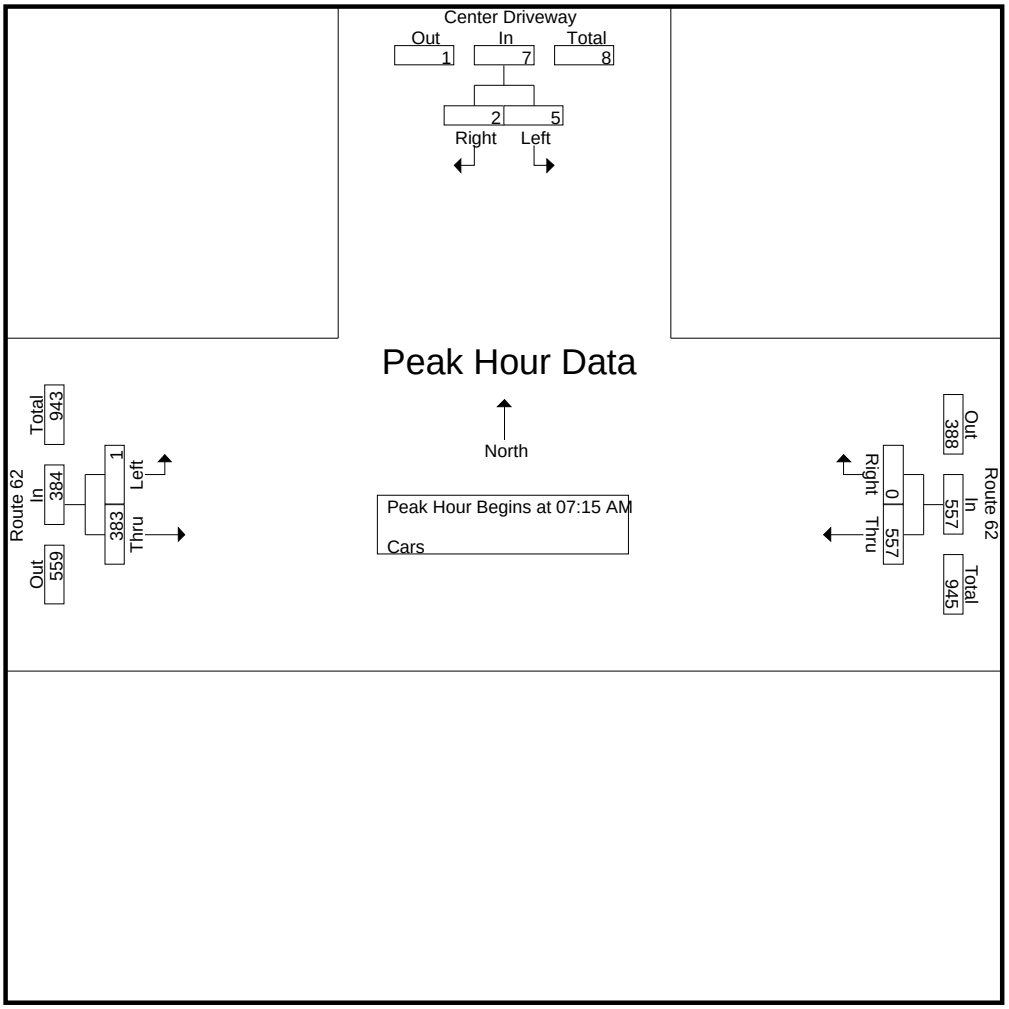
Groups Printed- Cars

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	119	1	0	73	193
07:15 AM	0	1	142	0	0	90	233
07:30 AM	0	0	144	0	1	95	240
07:45 AM	2	0	130	0	0	107	239
Total	2	1	535	1	1	365	905
08:00 AM	3	1	141	0	0	91	236
08:15 AM	1	1	119	0	1	107	229
08:30 AM	0	1	125	0	0	96	222
08:45 AM	0	0	118	0	0	109	227
Total	4	3	503	0	1	403	914
Grand Total	6	4	1038	1	2	768	1819
Apprch %	60	40	99.9	0.1	0.3	99.7	
Total %	0.3	0.2	57.1	0.1	0.1	42.2	

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	**1**	1	142	0	142	0	90	90	233
07:30 AM	0	0	0	**144**	0	**144**	**1**	95	96	**240**
07:45 AM	2	0	2	130	0	130	0	**107**	**107**	239
08:00 AM	**3**	1	**4**	141	0	141	0	91	91	236
Total Volume	5	2	7	557	0	557	1	383	384	948
% App. Total	71.4	28.6		100	0		0.3	99.7		
PHF	.417	.500	.438	.967	.000	.967	.250	.895	.897	.988

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

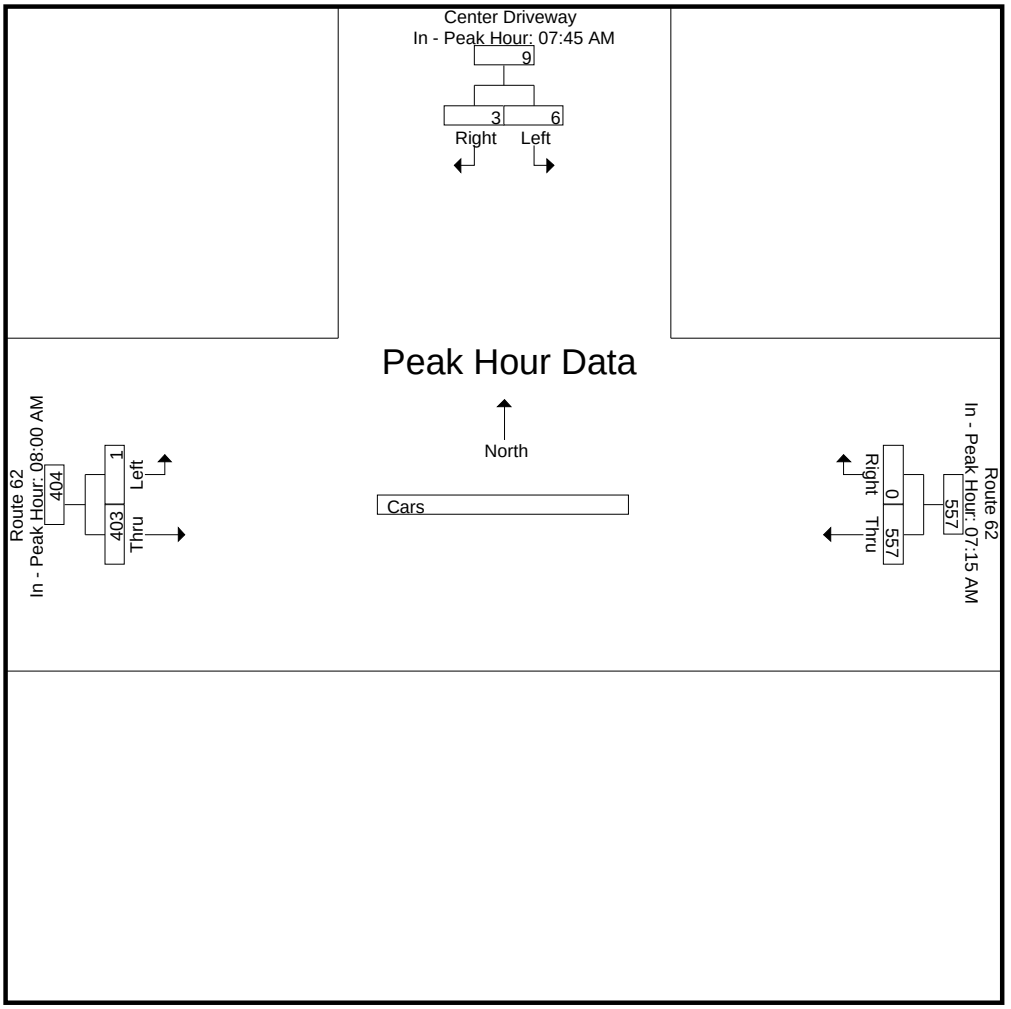
	07:45 AM			07:15 AM			08:00 AM		
+0 mins.	2	0	2	142	0	142	0	91	91
+15 mins.	**3**	**1**	**4**	**144**	0	**144**	**1**	107	108
+30 mins.	1	1	2	130	0	130	0	96	96
+45 mins.	0	1	1	141	0	141	0	**109**	**109**
Total Volume	6	3	9	557	0	557	1	403	404
% App. Total	66.7	33.3		100	0		0.2	99.8	
PHF	.500	.750	.563	.967	.000	.967	.250	.924	.927

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 7

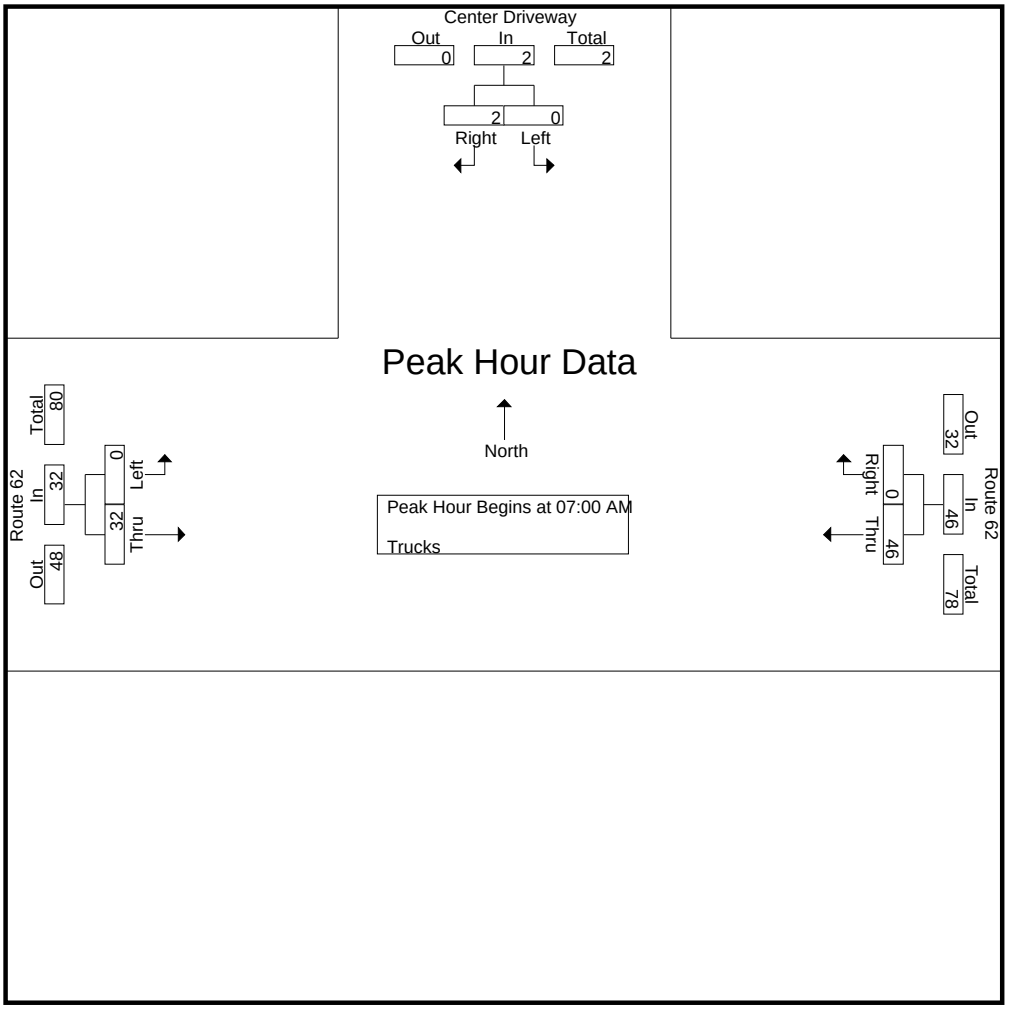
Groups Printed- Trucks

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	2	13	0	0	9	24
07:15 AM	0	0	10	0	0	11	21
07:30 AM	0	0	9	0	0	5	14
07:45 AM	0	0	14	0	0	7	21
Total	0	2	46	0	0	32	80
08:00 AM	0	0	6	0	0	7	13
08:15 AM	0	1	12	0	0	11	24
08:30 AM	0	1	6	0	1	11	19
08:45 AM	0	2	6	0	0	3	11
Total	0	4	30	0	1	32	67
Grand Total	0	6	76	0	1	64	147
Apprch %	0	100	100	0	1.5	98.5	
Total %	0	4.1	51.7	0	0.7	43.5	

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	**2**	**2**	13	0	13	0	9	9	**24**
07:15 AM	0	0	0	10	0	10	0	**11**	**11**	21
07:30 AM	0	0	0	9	0	9	0	5	5	14
07:45 AM	0	0	0	**14**	0	**14**	0	7	7	21
Total Volume	0	2	2	46	0	46	0	32	32	80
% App. Total	0	100		100	0		0	100		
PHF	.000	.250	.250	.821	.000	.821	.000	.727	.727	.833

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

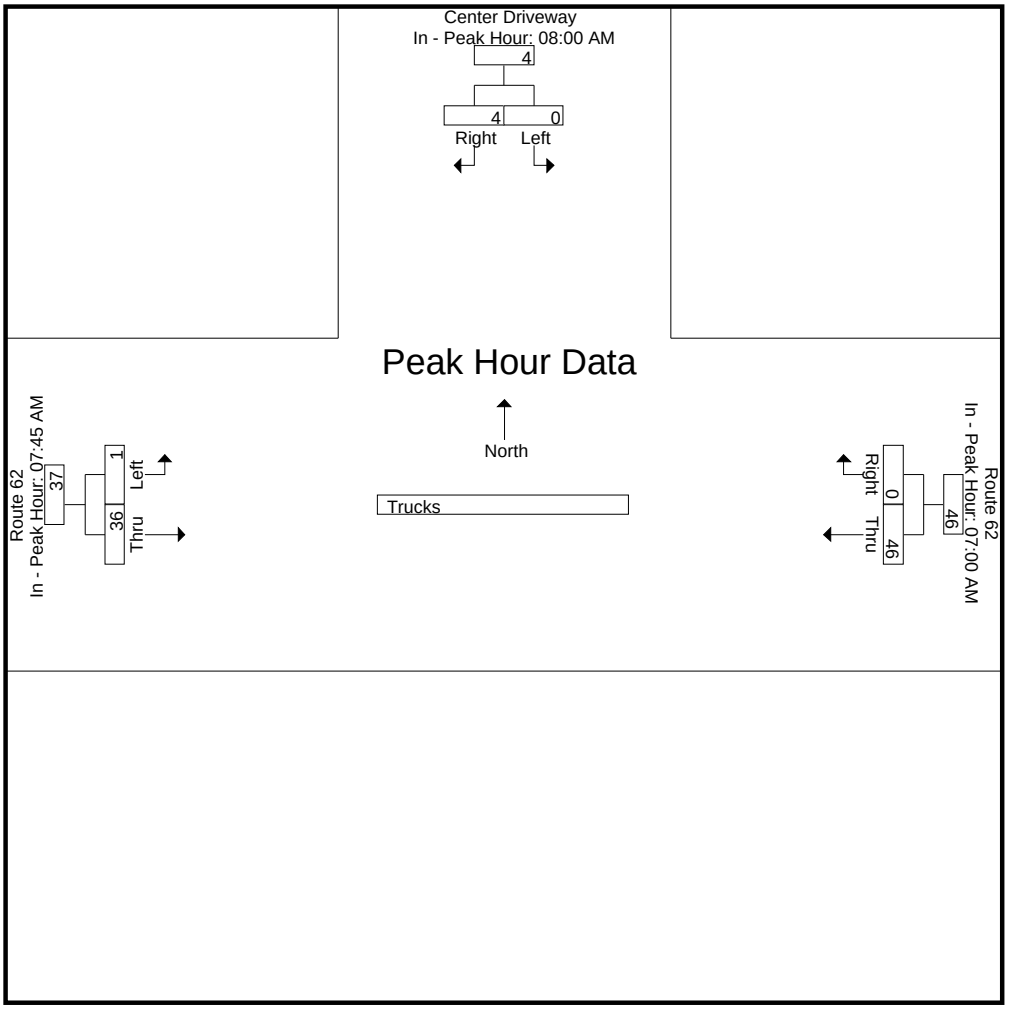
	08:00 AM			07:00 AM			07:45 AM		
+0 mins.	0	0	0	13	0	13	0	7	7
+15 mins.	0	1	1	10	0	10	0	7	7
+30 mins.	0	1	1	9	0	9	0	**11**	11
+45 mins.	0	**2**	**2**	**14**	0	**14**	**1**	11	**12**
Total Volume	0	4	4	46	0	46	1	36	37
% App. Total	0	100		100	0		2.7	97.3	
PHF	.000	.500	.500	.821	.000	.821	.250	.818	.771

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	Center Driveway From North			Route 62 From East			Route 62 From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

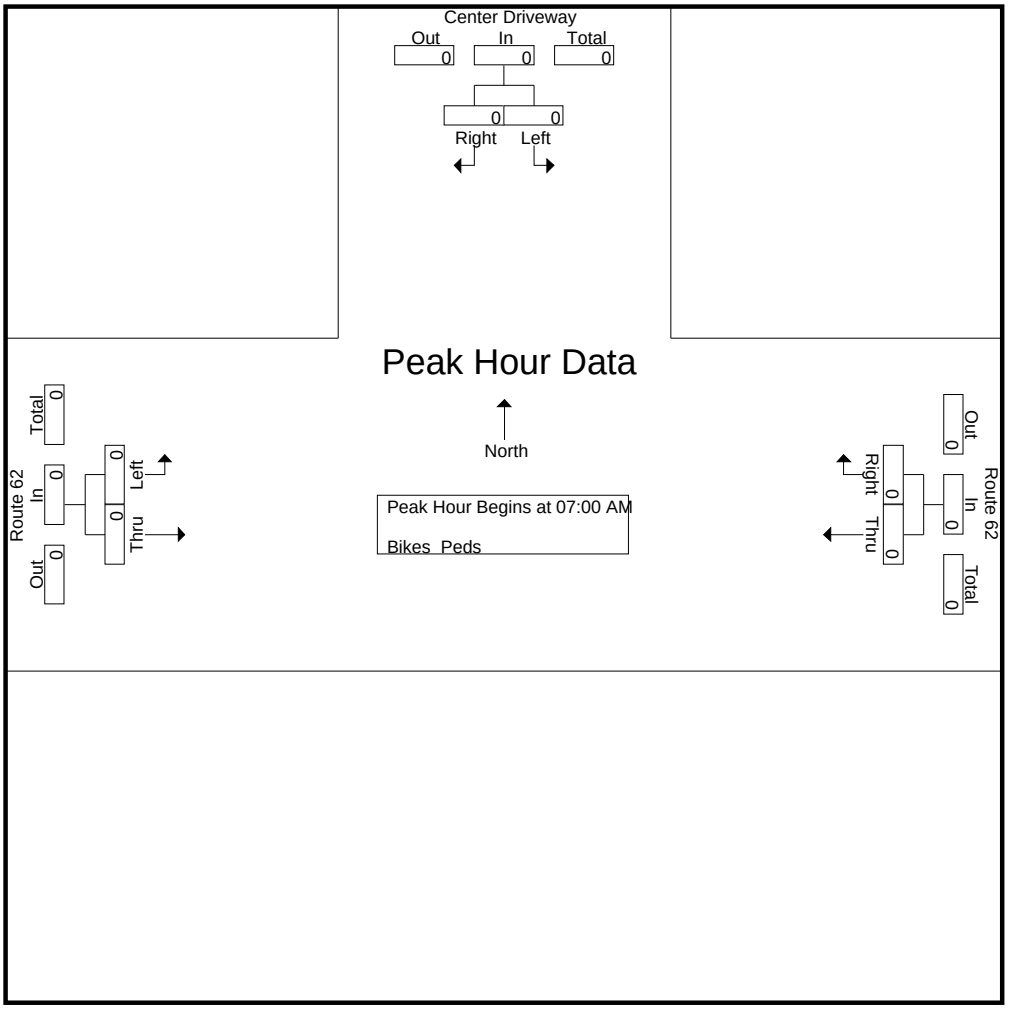
	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 11

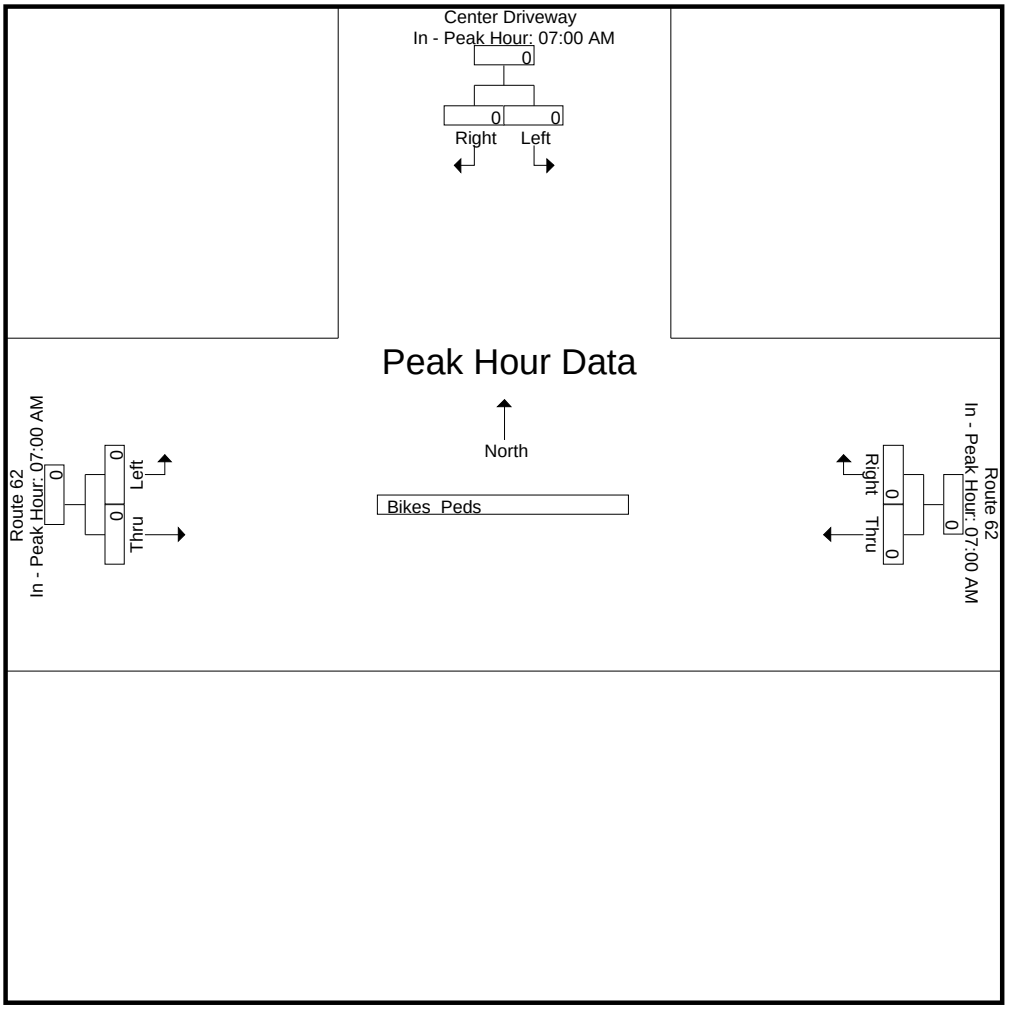


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 1

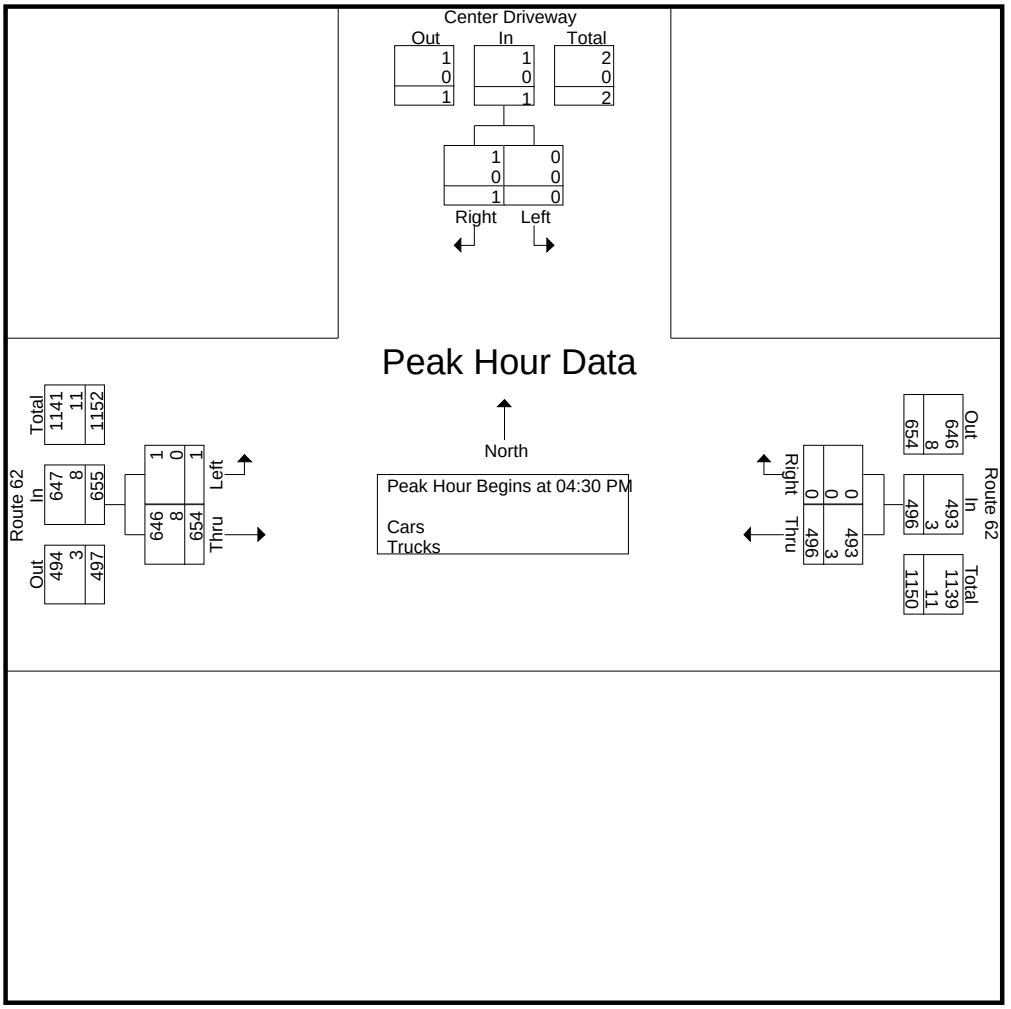
Groups Printed- Cars - Trucks

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	152	0	0	151	303
04:15 PM	0	0	124	0	0	146	270
04:30 PM	0	0	129	0	0	144	273
04:45 PM	0	1	121	0	1	163	286
Total	0	1	526	0	1	604	1132
05:00 PM	0	0	115	0	0	162	277
05:15 PM	0	0	131	0	0	185	316
05:30 PM	0	0	103	0	0	161	264
05:45 PM	0	0	94	0	0	146	240
Total	0	0	443	0	0	654	1097
Grand Total	0	1	969	0	1	1258	2229
Apprch %	0	100	100	0	0.1	99.9	
Total %	0	0	43.5	0	0	56.4	
Cars	0	1	959	0	1	1239	2200
% Cars	0	100	99	0	100	98.5	98.7
Trucks	0	0	10	0	0	19	29
% Trucks	0	0	1	0	0	1.5	1.3

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	129	0	129	0	144	144	273
04:45 PM	0	**1**	**1**	121	0	121	**1**	163	164	286
05:00 PM	0	0	0	115	0	115	0	162	162	277
05:15 PM	0	0	0	**131**	0	**131**	0	**185**	**185**	**316**
Total Volume	0	1	1	496	0	496	1	654	655	1152
% App. Total	0	100		100	0		0.2	99.8		
PHF	.000	.250	.250	.947	.000	.947	.250	.884	.885	.911
Cars	0	1	1	493	0	493	1	646	647	1141
% Cars	0	100	100	99.4	0	99.4	100	98.8	98.8	99.0
Trucks	0	0	0	3	0	3	0	8	8	11
% Trucks	0	0	0	0.6	0	0.6	0	1.2	1.2	1.0

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 2

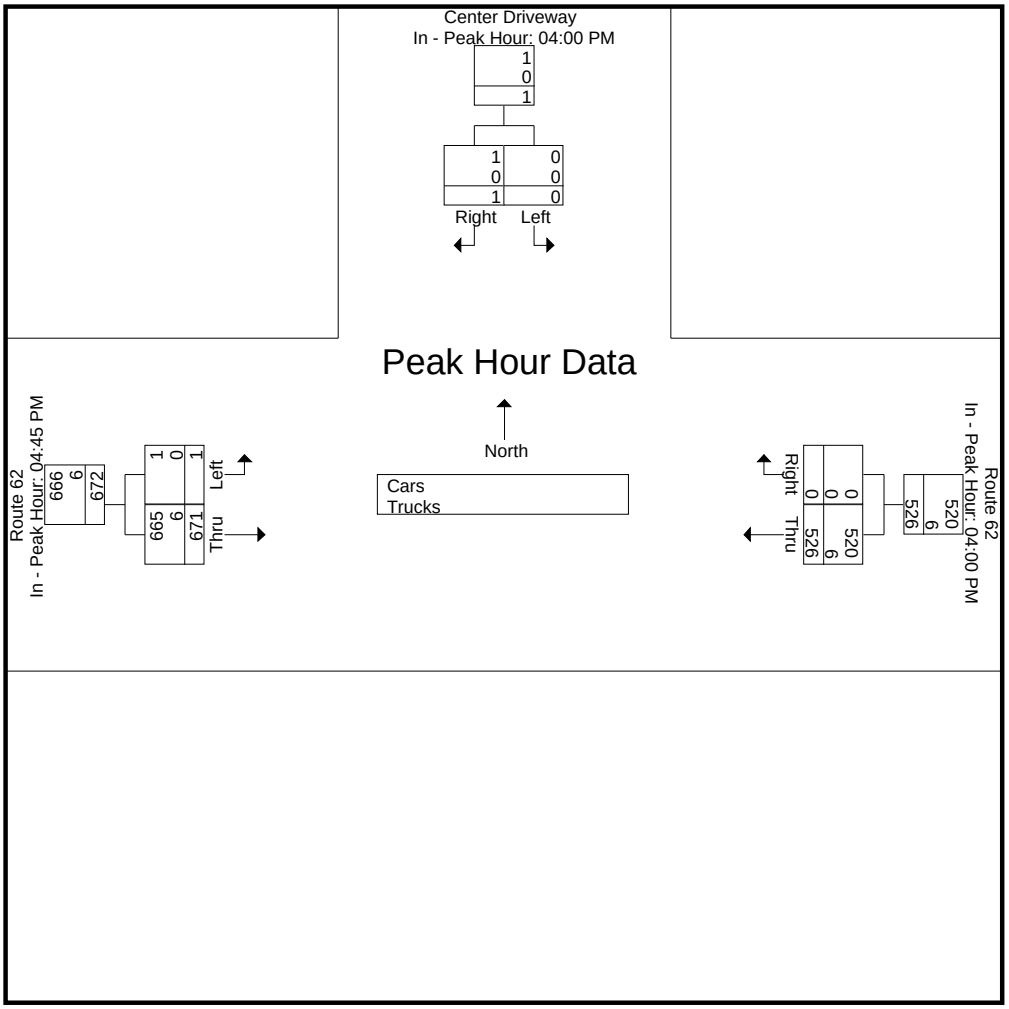


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:45 PM		
+0 mins.	0	0	0	**152**	0	**152**	**1**	163	164
+15 mins.	0	0	0	124	0	124	0	162	162
+30 mins.	0	0	0	129	0	129	0	**185**	**185**
+45 mins.	0	**1**	**1**	121	0	121	0	161	161
Total Volume	0	1	1	526	0	526	1	671	672
% App. Total	0	100		100	0		0.1	99.9	
PHF	.000	.250	.250	.865	.000	.865	.250	.907	.908
Cars	0	1	1	520	0	520	1	665	666
% Cars	0	100	100	98.9	0	98.9	100	99.1	99.1
Trucks	0	0	0	6	0	6	0	6	6
% Trucks	0	0	0	1.1	0	1.1	0	0.9	0.9

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 4

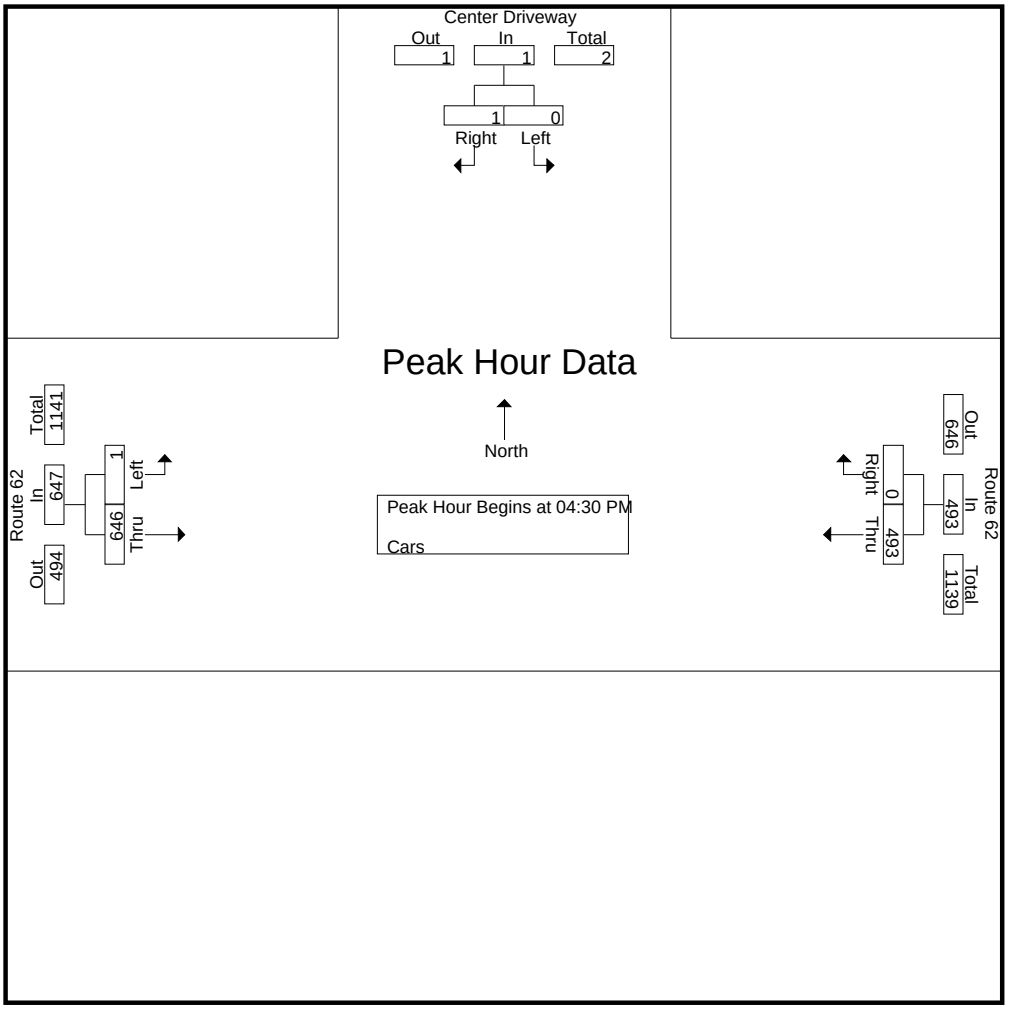
Groups Printed- Cars

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	148	0	0	148	296
04:15 PM	0	0	124	0	0	143	267
04:30 PM	0	0	127	0	0	142	269
04:45 PM	0	1	121	0	1	159	282
Total	0	1	520	0	1	592	1114
05:00 PM	0	0	114	0	0	160	274
05:15 PM	0	0	131	0	0	185	316
05:30 PM	0	0	100	0	0	161	261
05:45 PM	0	0	94	0	0	141	235
Total	0	0	439	0	0	647	1086
Grand Total	0	1	959	0	1	1239	2200
Apprch %	0	100	100	0	0.1	99.9	
Total %	0	0	43.6	0	0	56.3	

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	127	0	127	0	142	142	269
04:45 PM	0	**1**	**1**	121	0	121	**1**	159	160	282
05:00 PM	0	0	0	114	0	114	0	160	160	274
05:15 PM	0	0	0	**131**	0	**131**	0	**185**	**185**	**316**
Total Volume	0	1	1	493	0	493	1	646	647	1141
% App. Total	0	100		100	0		0.2	99.8		
PHF	.000	.250	.250	.941	.000	.941	.250	.873	.874	.903

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

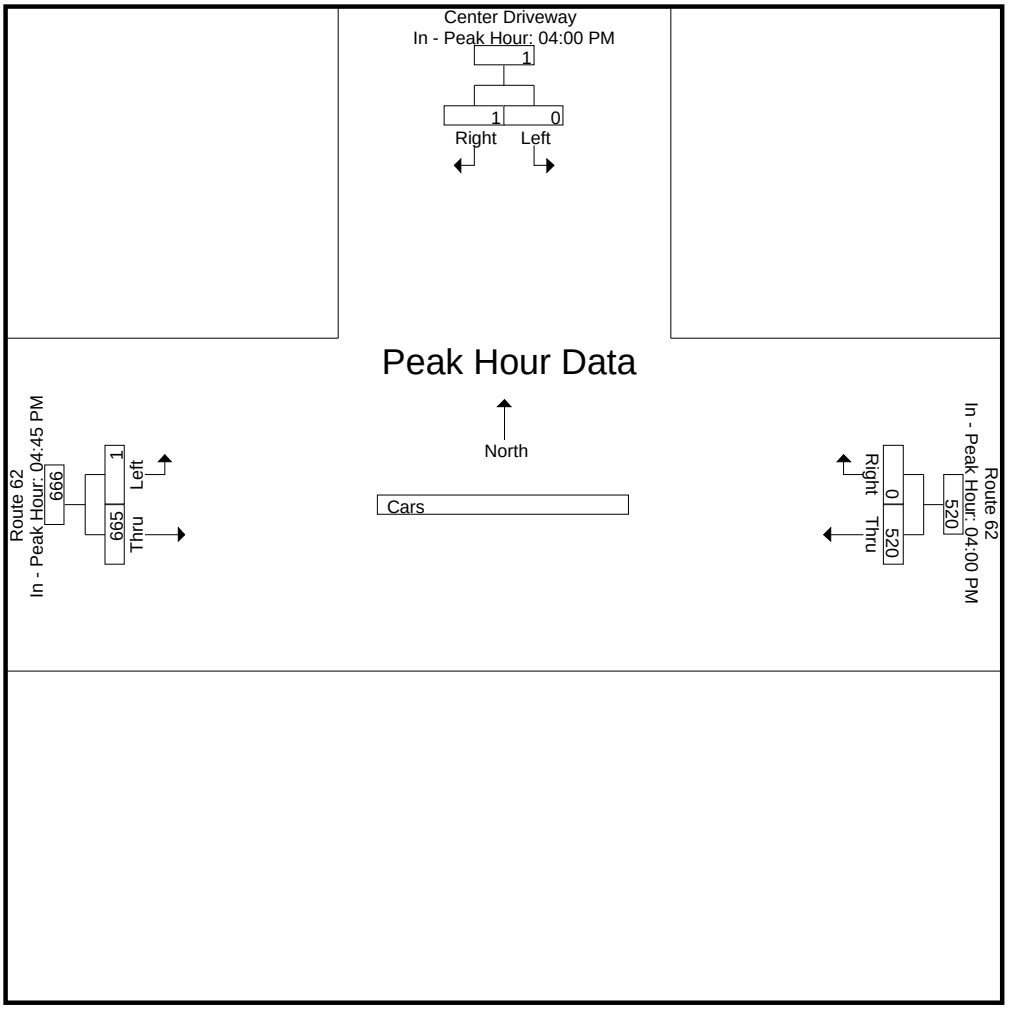
	04:00 PM			04:00 PM			04:45 PM		
+0 mins.	0	0	0	**148**	0	**148**	**1**	159	160
+15 mins.	0	0	0	124	0	124	0	160	160
+30 mins.	0	0	0	127	0	127	0	**185**	**185**
+45 mins.	0	**1**	**1**	121	0	121	0	161	161
Total Volume	0	1	1	520	0	520	1	665	666
% App. Total	0	100		100	0		0.2	99.8	
PHF	.000	.250	.250	.878	.000	.878	.250	.899	.900

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	Center Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	4	0	0	3	7
04:15 PM	0	0	0	0	0	3	3
04:30 PM	0	0	2	0	0	2	4
04:45 PM	0	0	0	0	0	4	4
Total	0	0	6	0	0	12	18
05:00 PM	0	0	1	0	0	2	3
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	3	0	0	0	3
05:45 PM	0	0	0	0	0	5	5
Total	0	0	4	0	0	7	11
Grand Total	0	0	10	0	0	19	29
Apprch %	0	0	100	0	0	100	
Total %	0	0	34.5	0	0	65.5	

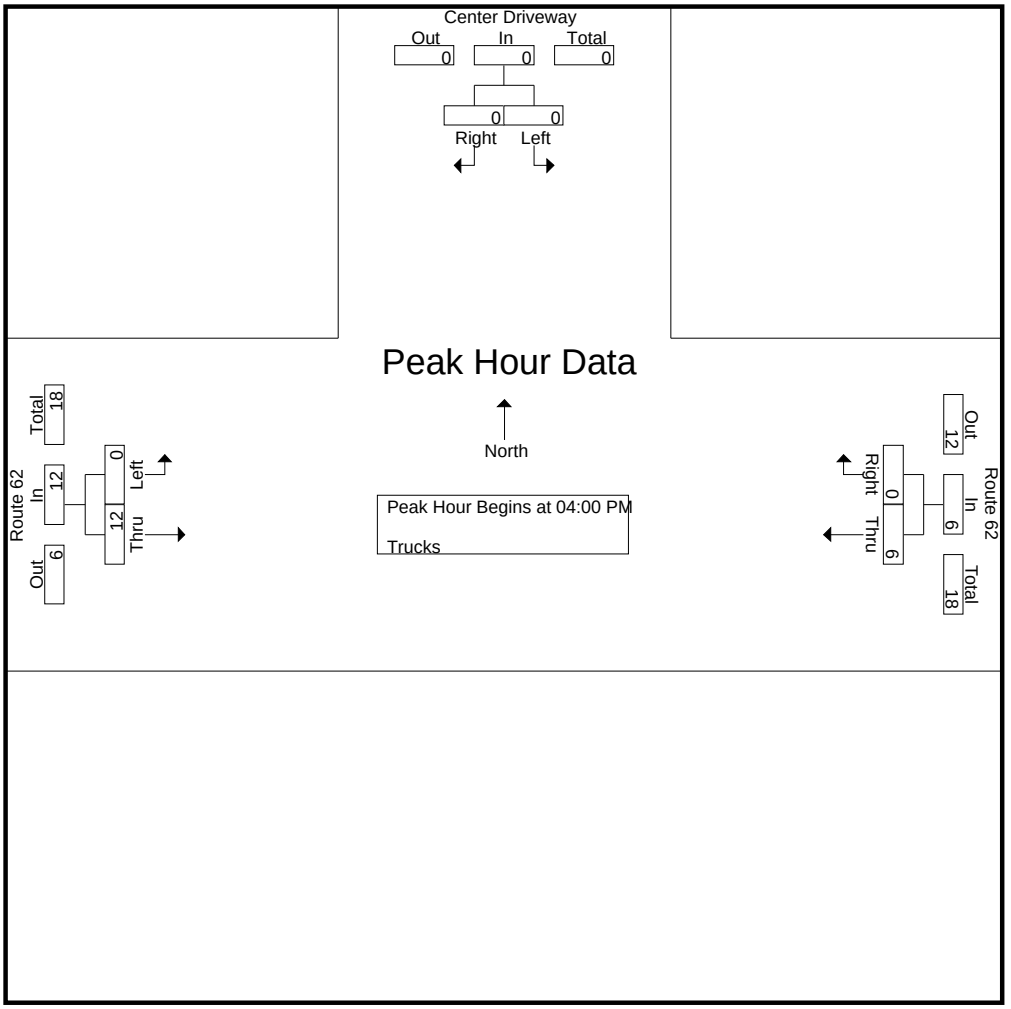
	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	**4**	0	**4**	0	3	3	**7**
04:15 PM	0	0	0	0	0	0	0	3	3	3
04:30 PM	0	0	0	2	0	2	0	2	2	4
04:45 PM	0	0	0	0	0	0	0	**4**	**4**	4
Total Volume	0	0	0	6	0	6	0	12	12	18
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.375	.000	.375	.000	.750	.750	.643

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

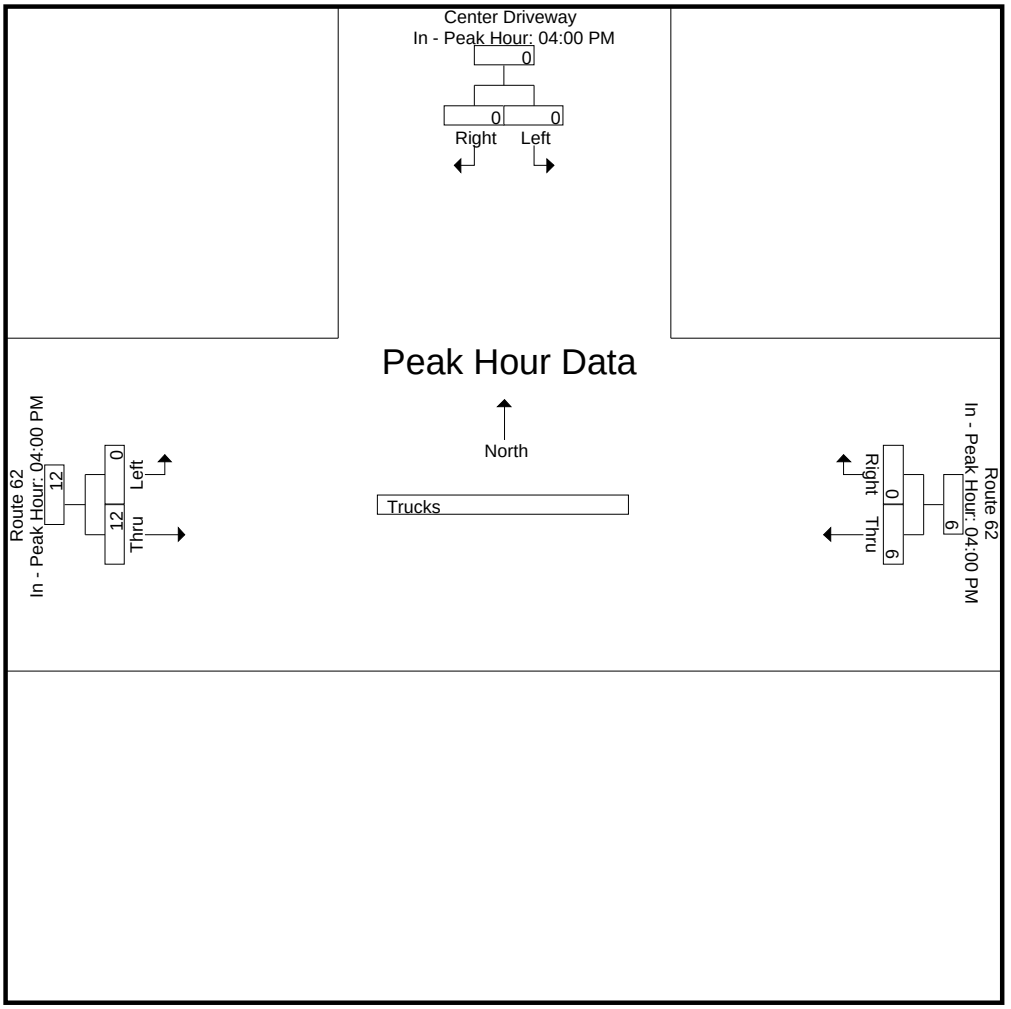
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	**4**	0	**4**	0	3	3
+15 mins.	0	0	0	0	0	0	0	3	3
+30 mins.	0	0	0	2	0	2	0	2	2
+45 mins.	0	0	0	0	0	0	0	**4**	**4**
Total Volume	0	0	0	6	0	6	0	12	12
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.375	.000	.375	.000	.750	.750

Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022

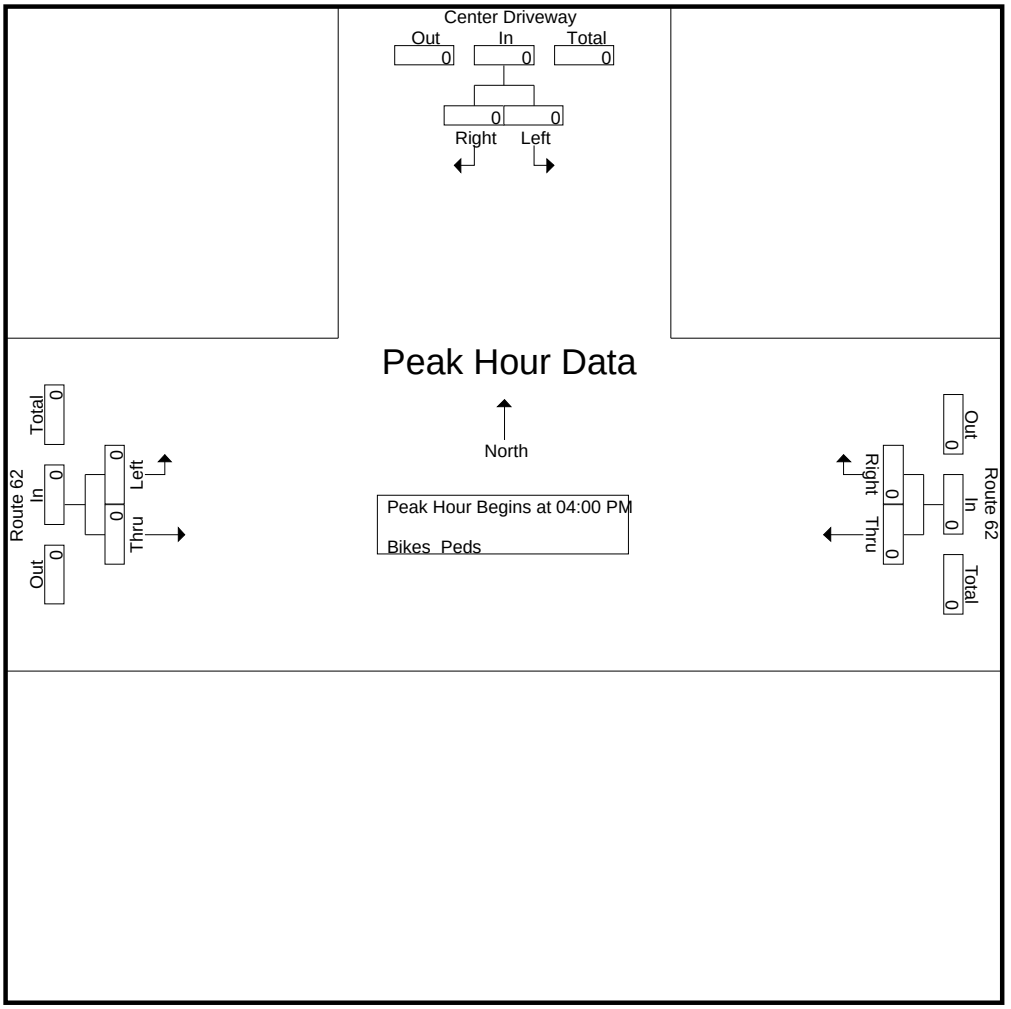
Groups Printed- Bikes Peds

	Center Driveway From North			Route 62 From East			Route 62 From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	1	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	0	0	0	0	0	1	0	1
Apprch %	0	0		0	0		0	0				
Total %										100	0	

	Center Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 11

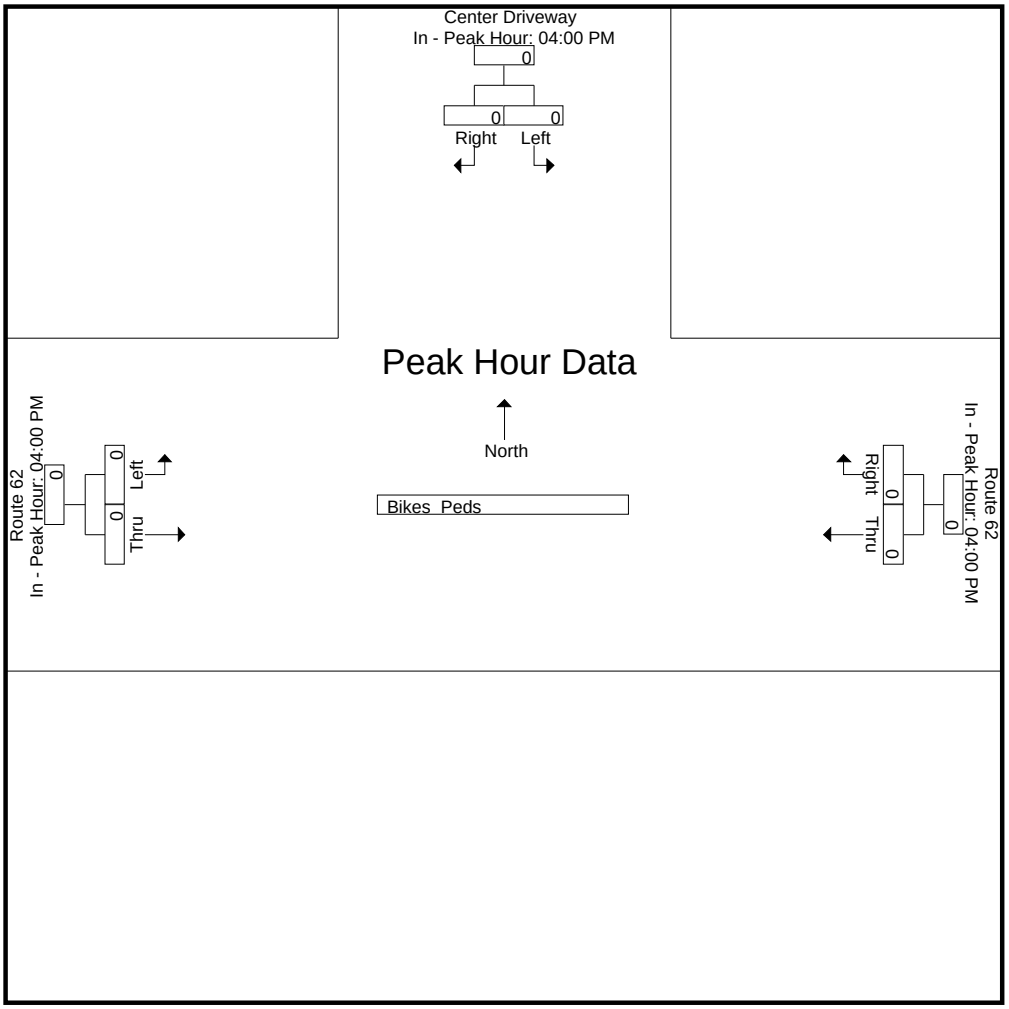


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Center Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110005
Site Code : 93110005
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	0	3	0	0	3
07:15 AM	1	0	0	1	0	0	2
07:30 AM	0	0	0	4	0	0	4
07:45 AM	3	1	0	3	0	0	7
Total	4	1	0	11	0	0	16
08:00 AM	1	0	0	1	0	0	2
08:15 AM	1	0	0	3	0	0	4
08:30 AM	0	0	0	1	0	0	1
08:45 AM	0	0	0	4	0	0	4
Total	2	0	0	9	0	0	11
Grand Total	6	1	0	20	0	0	27
Apprch %	85.7	14.3	0	100	0	0	
Total %	22.2	3.7	0	74.1	0	0	
Cars	2	1	0	12	0	0	15
% Cars	33.3	100	0	60	0	0	55.6
Trucks	4	0	0	8	0	0	12
% Trucks	66.7	0	0	40	0	0	44.4

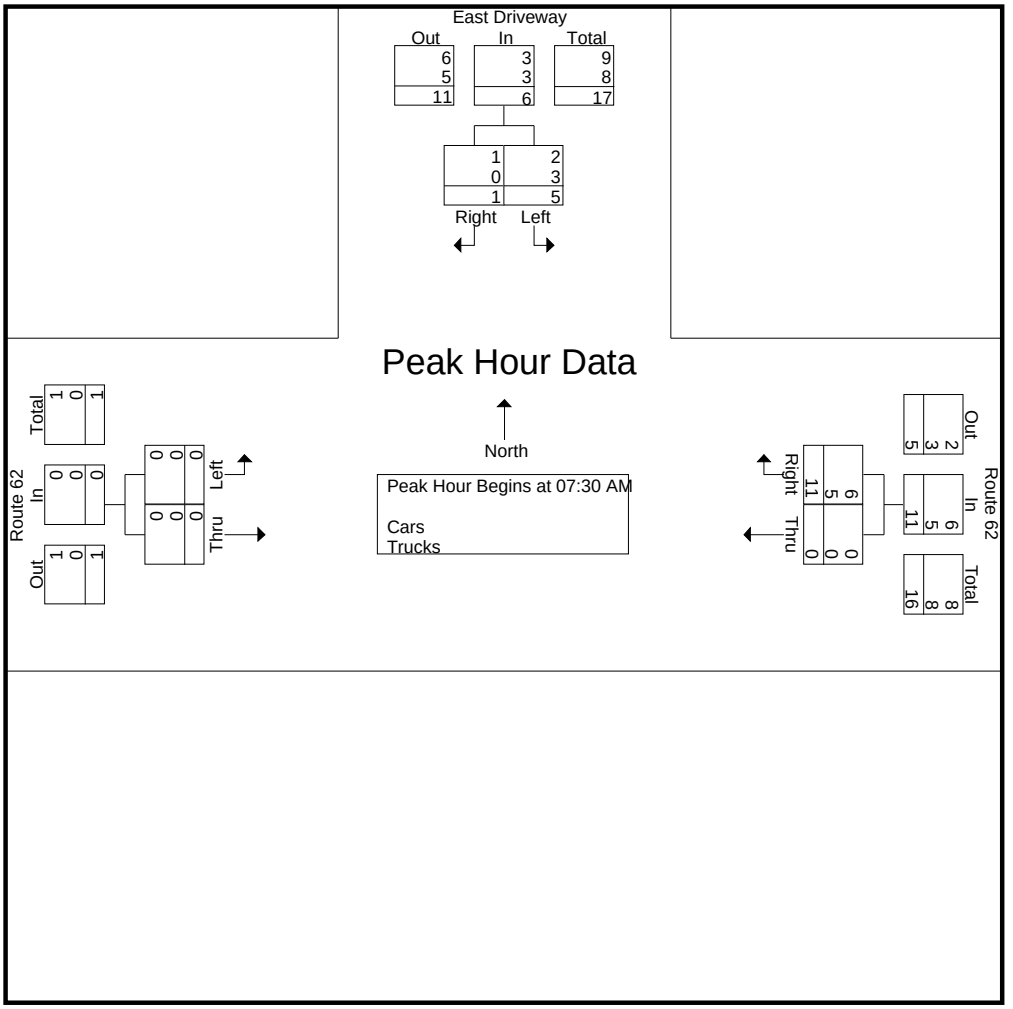
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	0	0	0	**4**	**4**	0	0	0	4
07:45 AM	**3**	**1**	**4**	0	3	3	0	0	0	**7**
08:00 AM	1	0	1	0	1	1	0	0	0	2
08:15 AM	1	0	1	0	3	3	0	0	0	4
Total Volume	5	1	6	0	11	11	0	0	0	17
% App. Total	83.3	16.7		0	100		0	0		
PHF	.417	.250	.375	.000	.688	.688	.000	.000	.000	.607
Cars	2	1	3	0	6	6	0	0	0	9
% Cars	40.0	100	50.0	0	54.5	54.5	0	0	0	52.9
Trucks	3	0	3	0	5	5	0	0	0	8
% Trucks	60.0	0	50.0	0	45.5	45.5	0	0	0	47.1

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

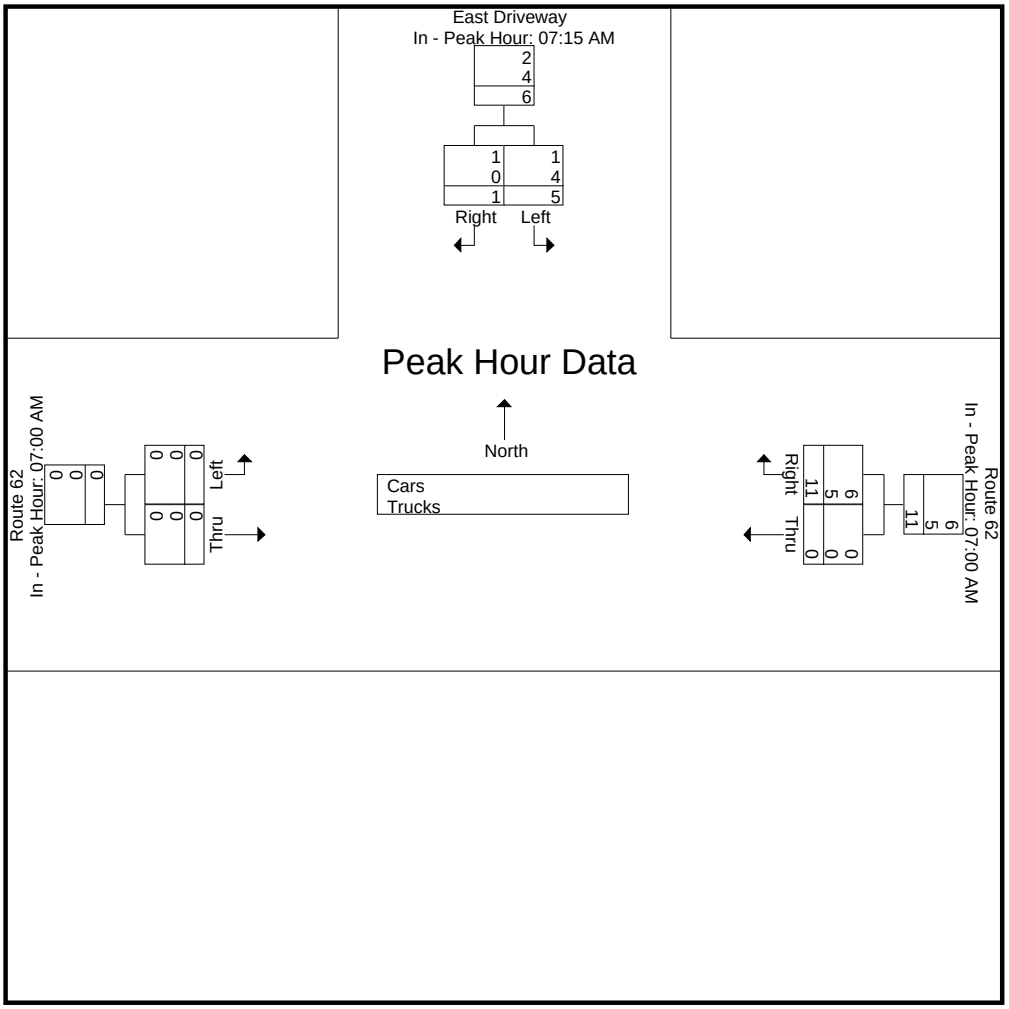
	07:15 AM			07:00 AM			07:00 AM		
+0 mins.	1	0	1	0	3	3	0	0	0
+15 mins.	0	0	0	0	1	1	0	0	0
+30 mins.	**3**	**1**	**4**	0	**4**	**4**	0	0	0
+45 mins.	1	0	1	0	3	3	0	0	0
Total Volume	5	1	6	0	11	11	0	0	0
% App. Total	83.3	16.7		0	100		0	0	
PHF	.417	.250	.375	.000	.688	.688	.000	.000	.000
Cars	1	1	2	0	6	6	0	0	0
% Cars	20	100	33.3	0	54.5	54.5	0	0	0
Trucks	4	0	4	0	5	5	0	0	0
% Trucks	80	0	66.7	0	45.5	45.5	0	0	0

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	0	1	0	0	1
07:15 AM	0	0	0	1	0	0	1
07:30 AM	0	0	0	1	0	0	1
07:45 AM	1	1	0	3	0	0	5
Total	1	1	0	6	0	0	8
08:00 AM	0	0	0	1	0	0	1
08:15 AM	1	0	0	1	0	0	2
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	4	0	0	4
Total	1	0	0	6	0	0	7
Grand Total	2	1	0	12	0	0	15
Apprch %	66.7	33.3	0	100	0	0	
Total %	13.3	6.7	0	80	0	0	

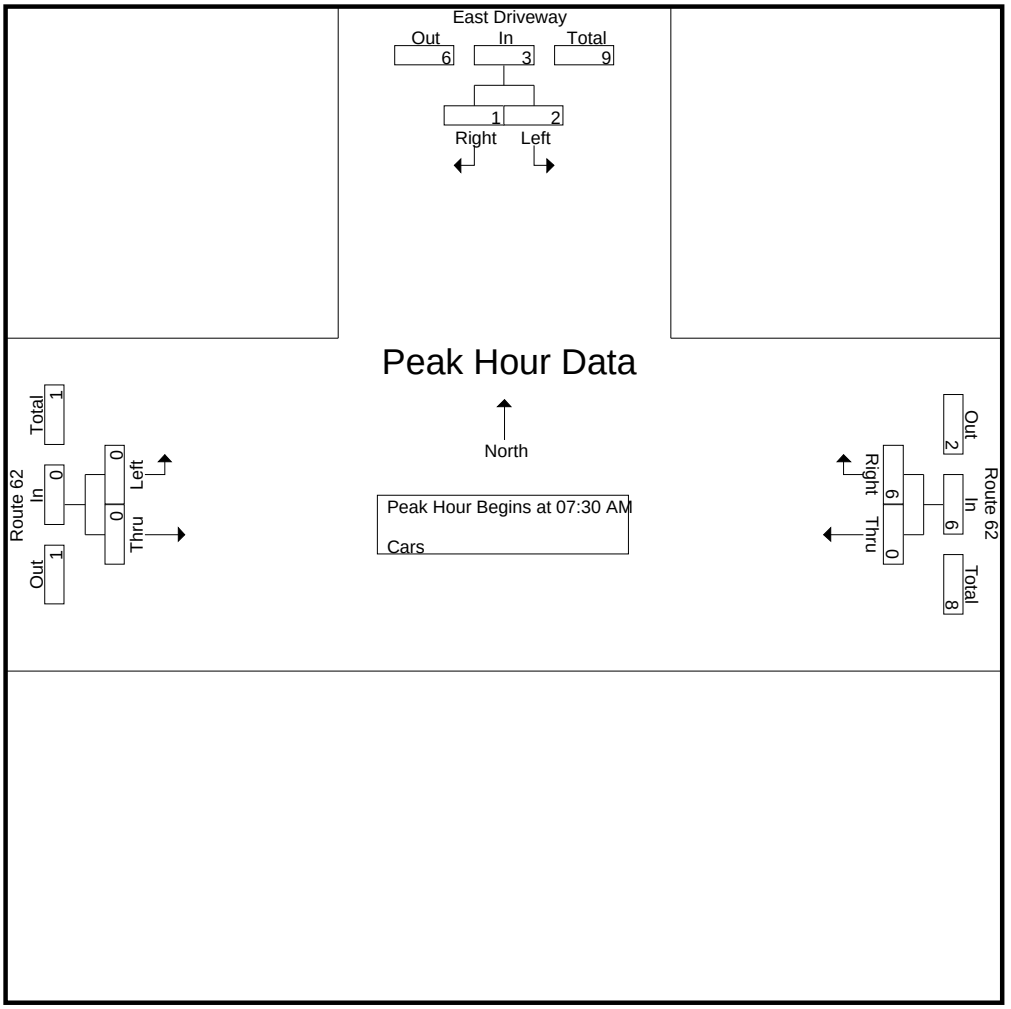
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	0	0	0	1	1	0	0	0	1
07:45 AM	**1**	**1**	**2**	0	**3**	**3**	0	0	0	**5**
08:00 AM	0	0	0	0	1	1	0	0	0	1
08:15 AM	1	0	1	0	1	1	0	0	0	2
Total Volume	2	1	3	0	6	6	0	0	0	9
% App. Total	66.7	33.3		0	100		0	0		
PHF	.500	.250	.375	.000	.500	.500	.000	.000	.000	.450

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

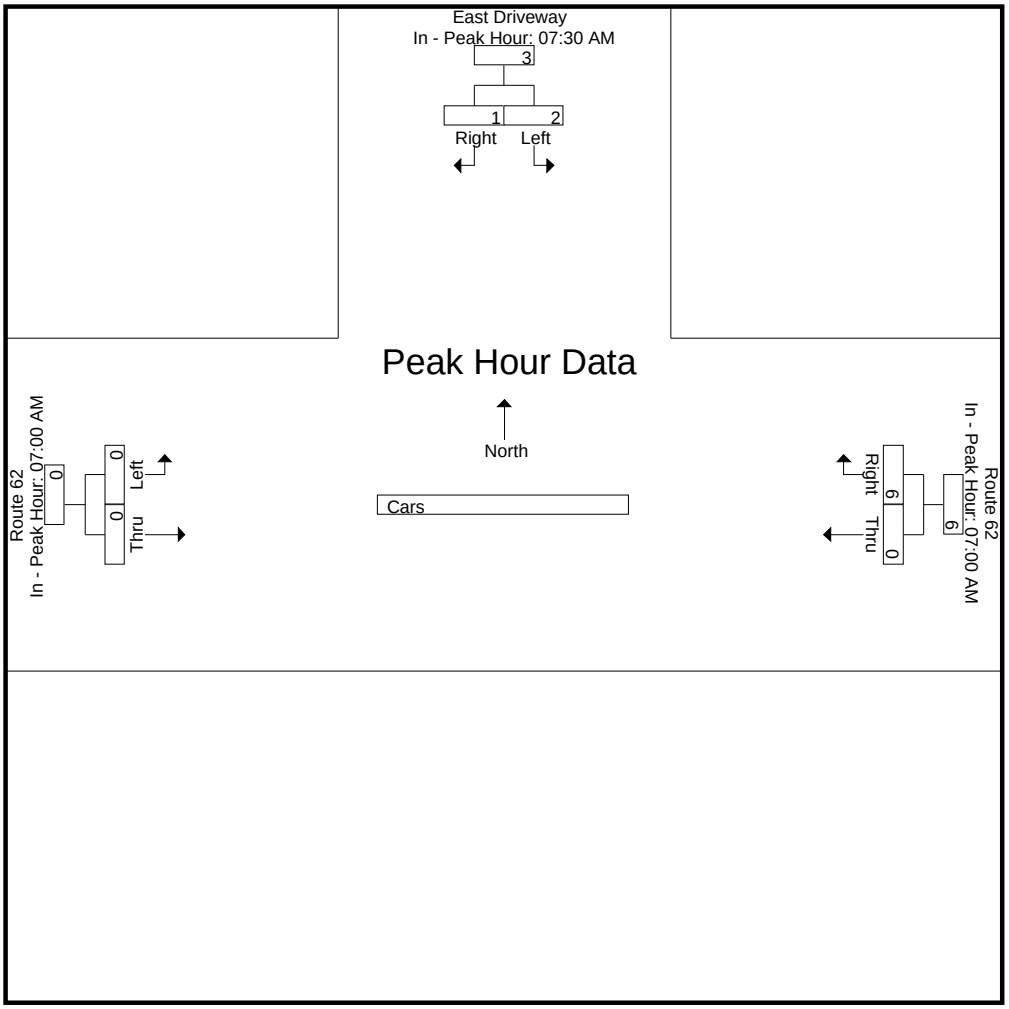
	07:30 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	1	1	0	0	0
+15 mins.	**1**	**1**	**2**	0	1	1	0	0	0
+30 mins.	0	0	0	0	1	1	0	0	0
+45 mins.	1	0	1	0	**3**	**3**	0	0	0
Total Volume	2	1	3	0	6	6	0	0	0
% App. Total	66.7	33.3		0	100		0	0	
PHF	.500	.250	.375	.000	.500	.500	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	0	2	0	0	2
07:15 AM	1	0	0	0	0	0	1
07:30 AM	0	0	0	3	0	0	3
07:45 AM	2	0	0	0	0	0	2
Total	3	0	0	5	0	0	8
08:00 AM	1	0	0	0	0	0	1
08:15 AM	0	0	0	2	0	0	2
08:30 AM	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	0	0
Total	1	0	0	3	0	0	4
Grand Total	4	0	0	8	0	0	12
Apprch %	100	0	0	100	0	0	
Total %	33.3	0	0	66.7	0	0	

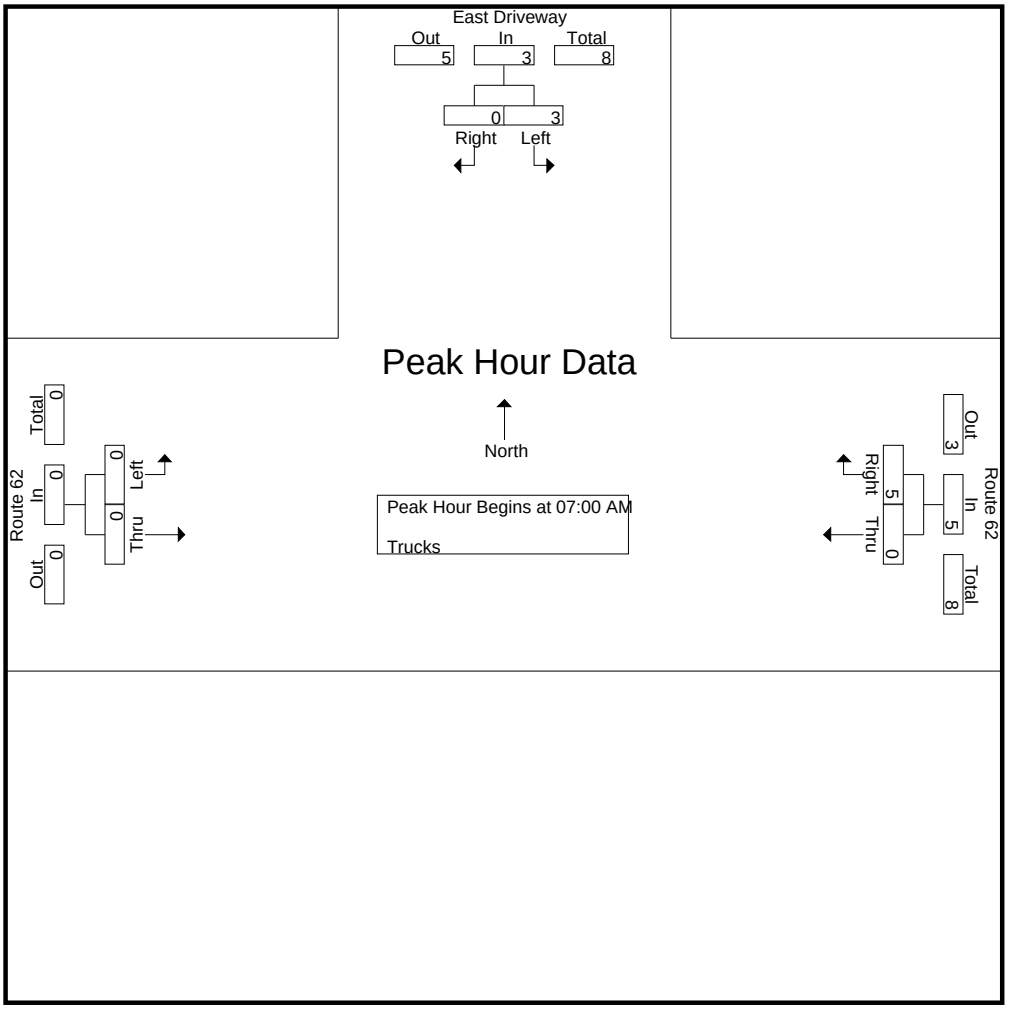
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	2	2	0	0	0	2
07:15 AM	1	0	1	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	**3**	**3**	0	0	0	**3**
07:45 AM	**2**	0	**2**	0	0	0	0	0	0	2
Total Volume	3	0	3	0	5	5	0	0	0	8
% App. Total	100	0		0	100		0	0		
PHF	.375	.000	.375	.000	.417	.417	.000	.000	.000	.667

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

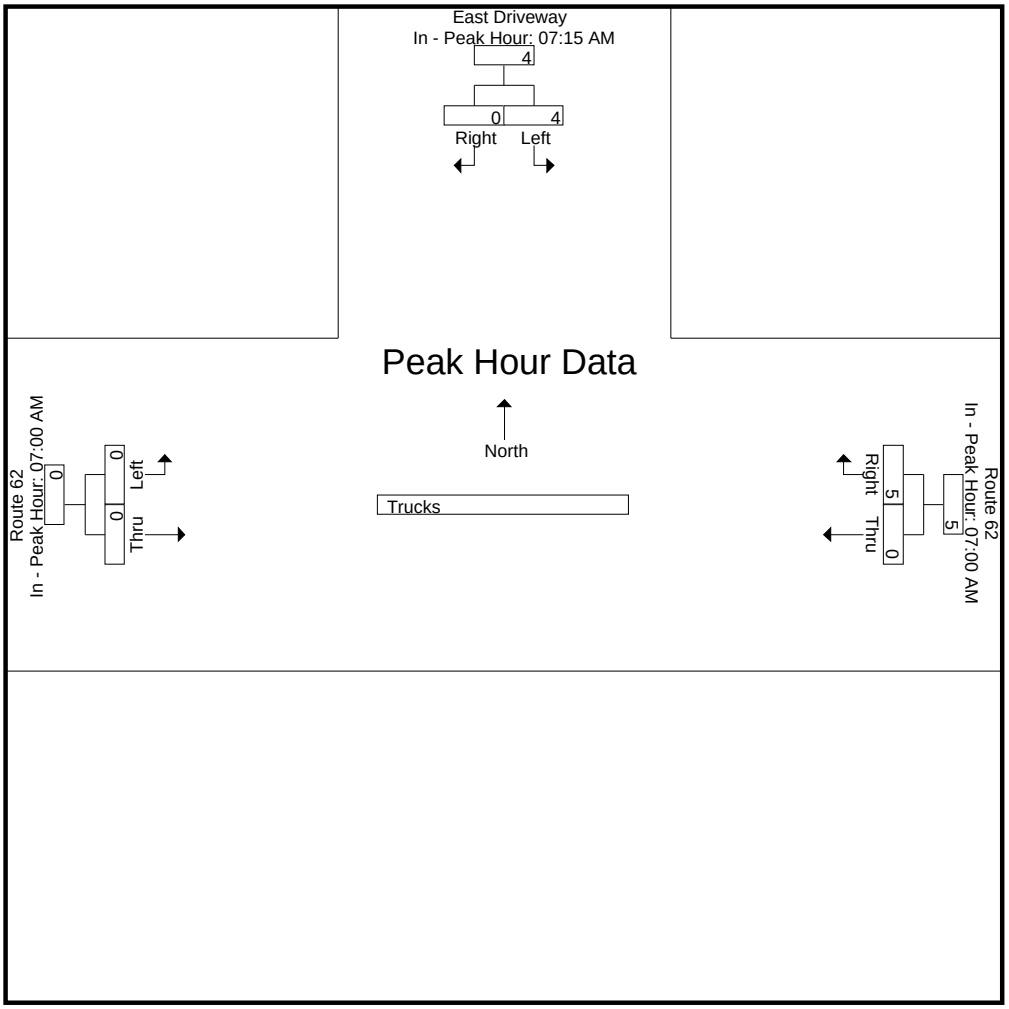
	07:15 AM			07:00 AM			07:00 AM		
+0 mins.	1	0	1	0	2	2	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	**2**	0	**2**	0	**3**	**3**	0	0	0
+45 mins.	1	0	1	0	0	0	0	0	0
Total Volume	4	0	4	0	5	5	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.500	.000	.500	.000	.417	.417	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022

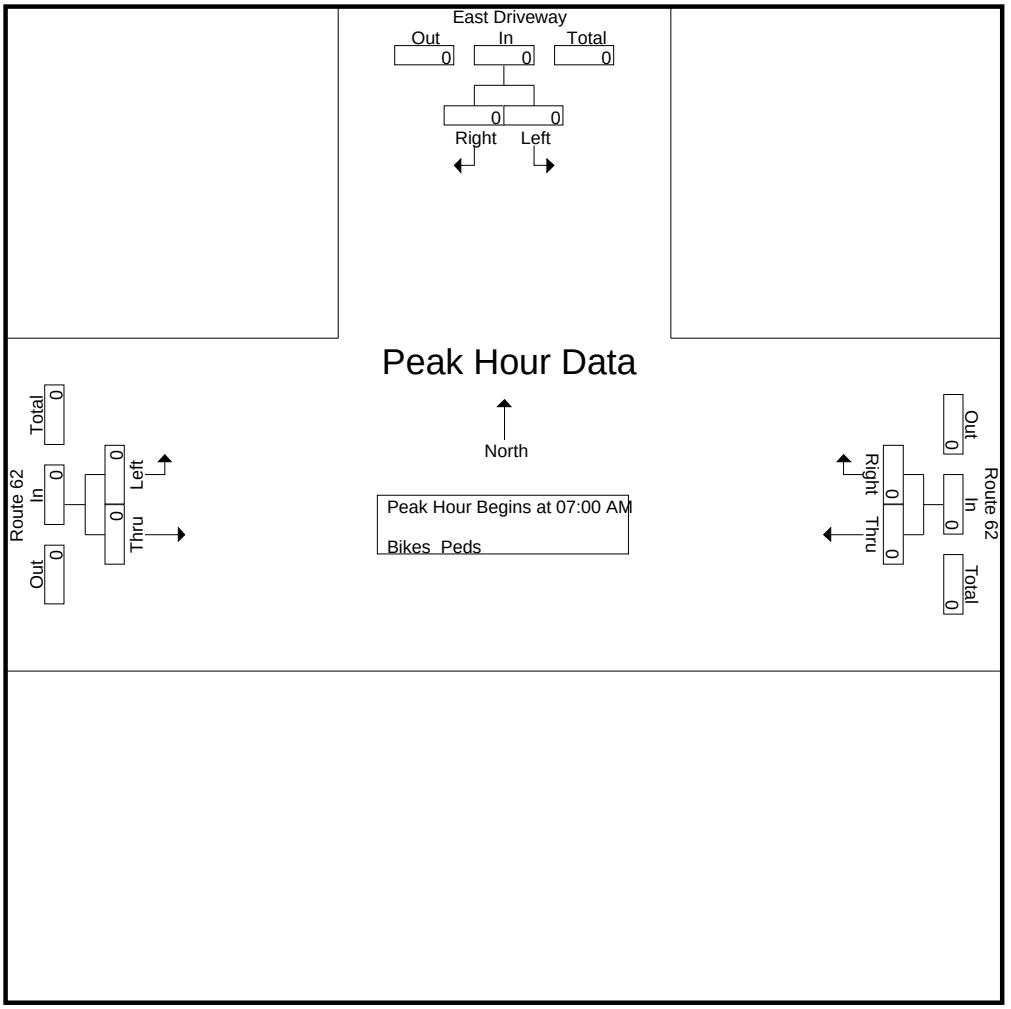
Groups Printed- Bikes Peds

	East Driveway From North			Route 62 From East			Route 62 From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

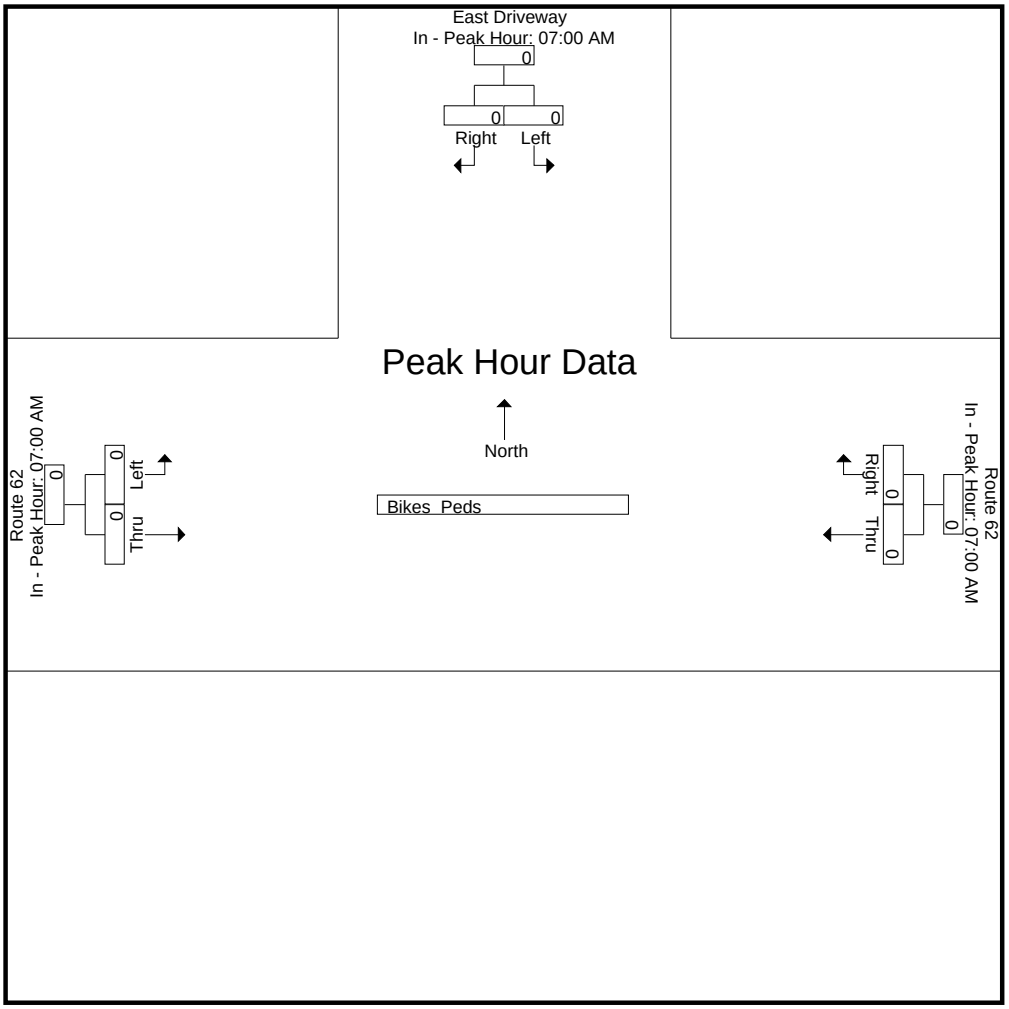
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							
Cars							0
% Cars	0	0	0	0	0	0	0
Trucks							0
% Trucks	0	0	0	0	0	0	0

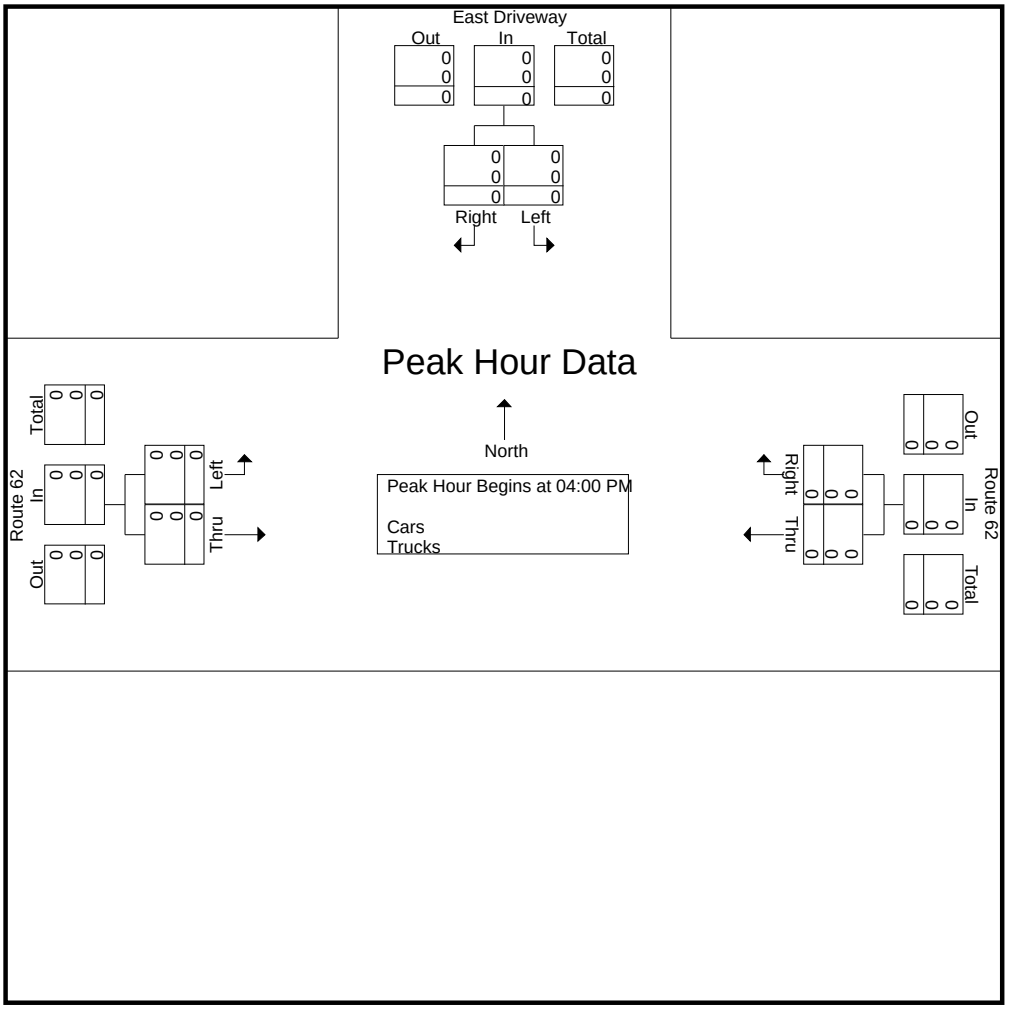
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cars	0	0	0	0	0	0	0	0	0	0
% Cars	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

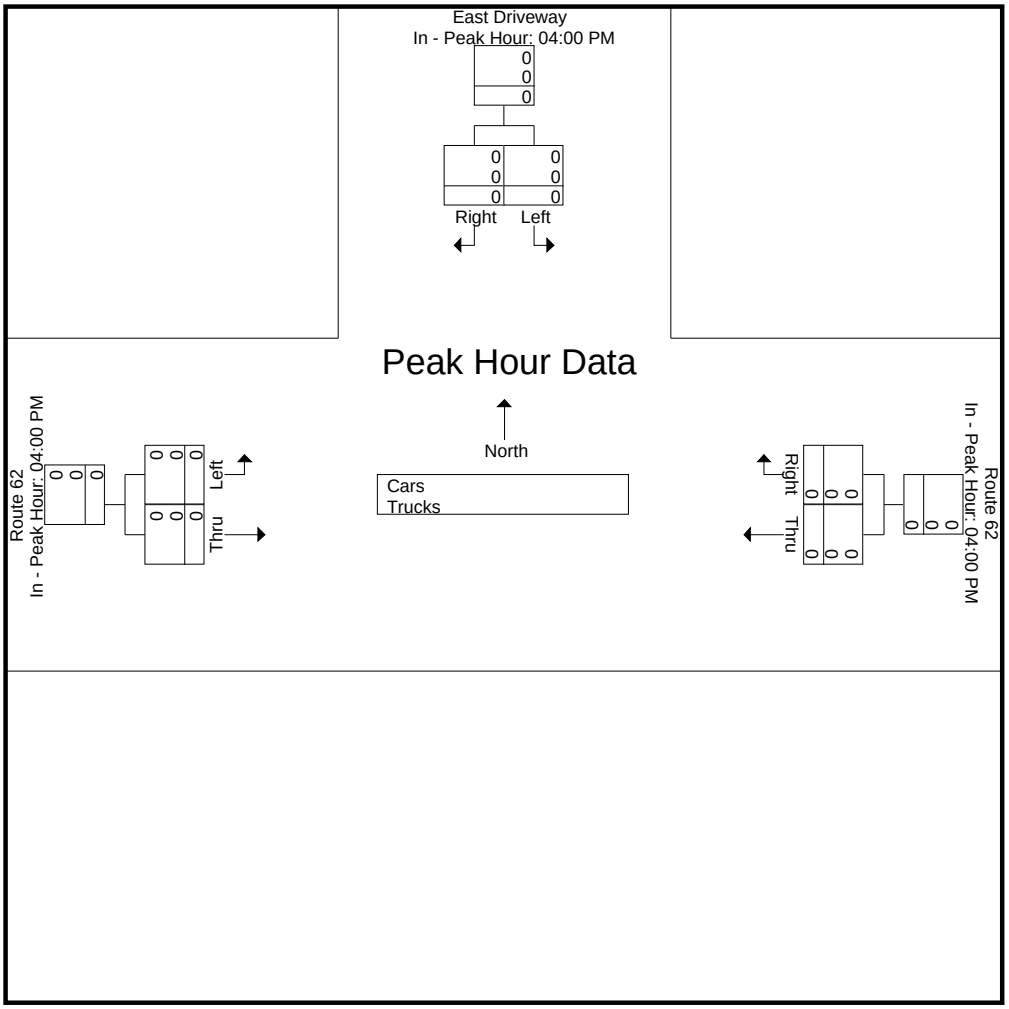
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cars	0	0	0	0	0	0	0	0	0
% Cars	0	0	0	0	0	0	0	0	0
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

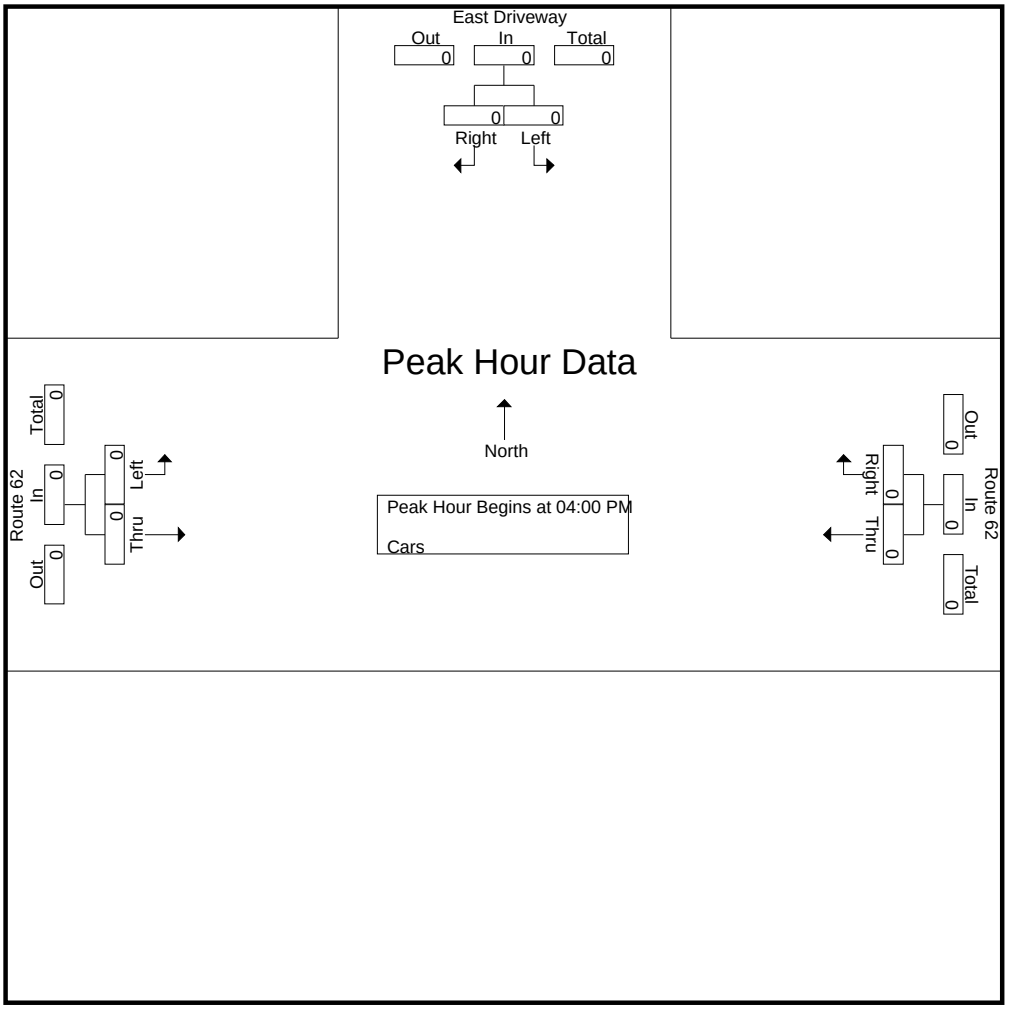
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

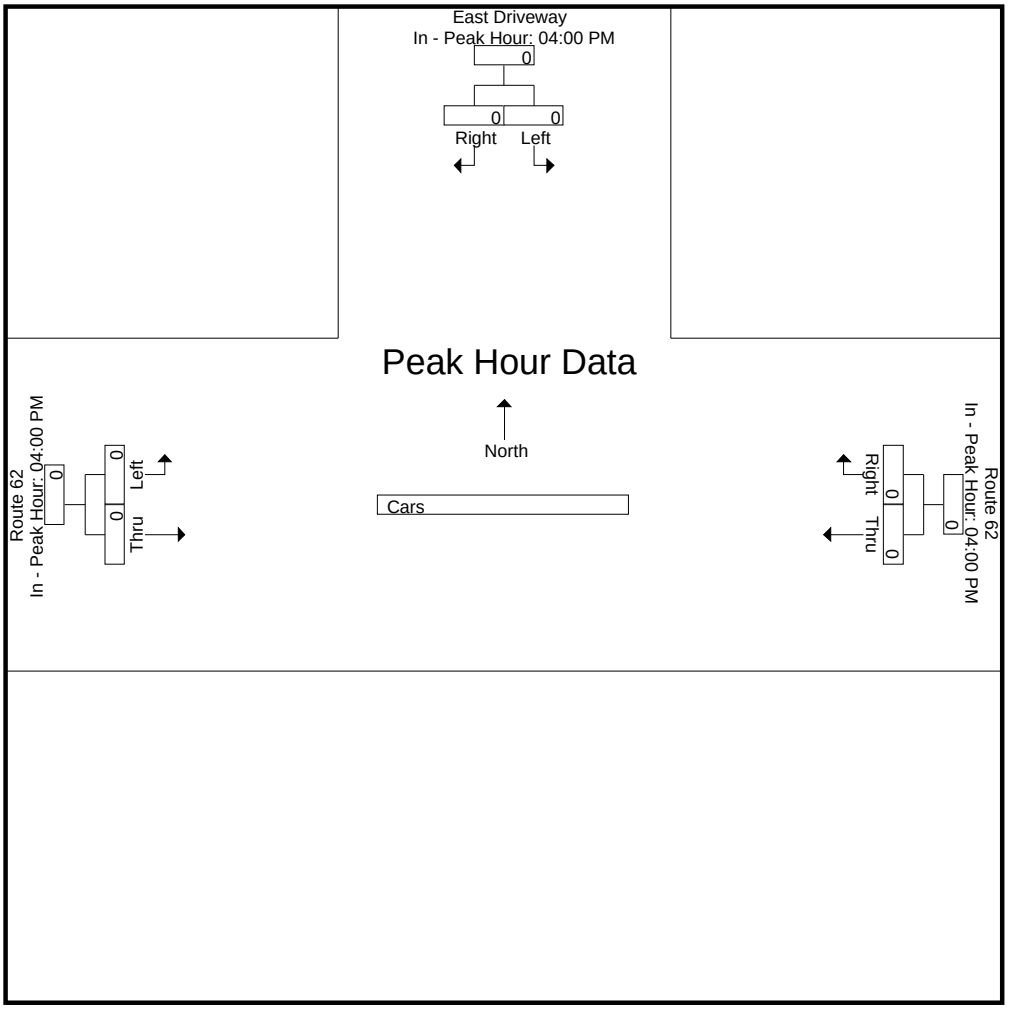
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 7

Groups Printed- Trucks

	East Driveway From North		Route 62 From East		Route 62 From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

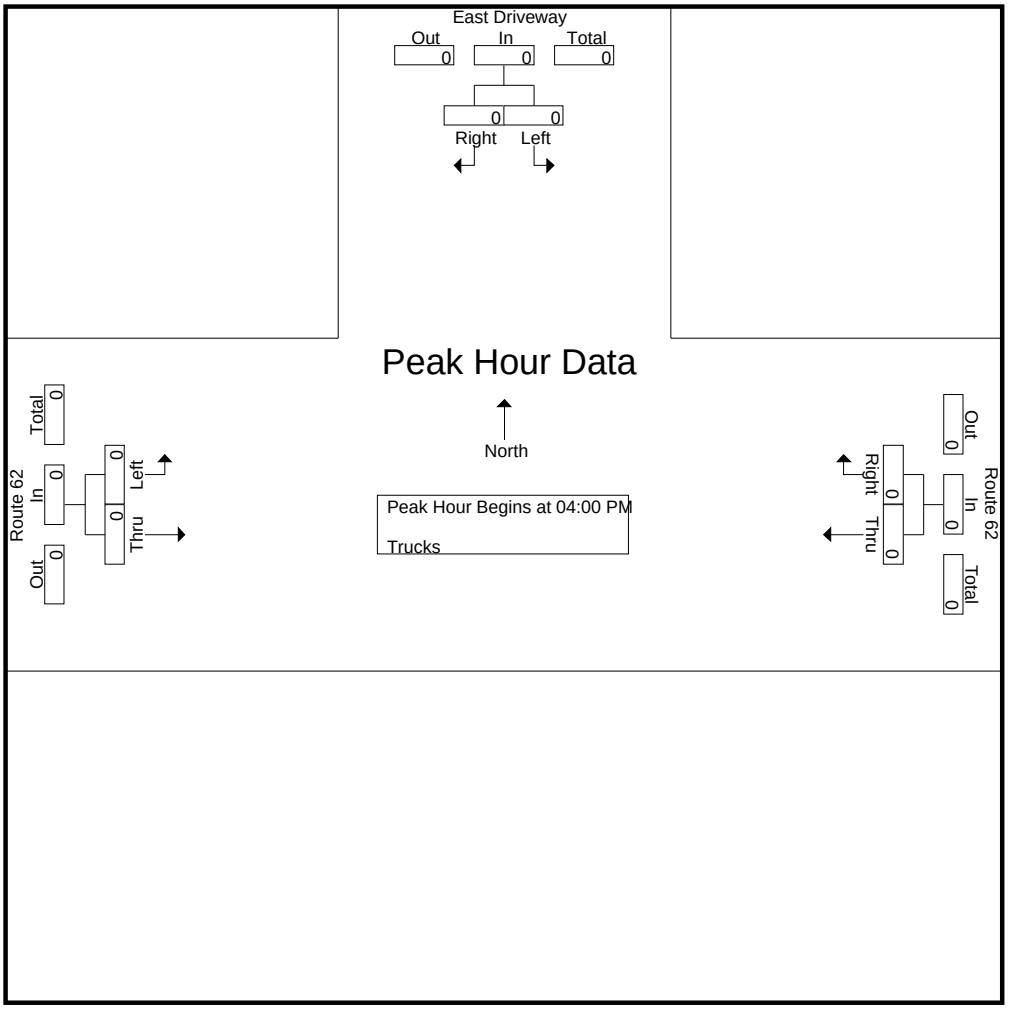
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

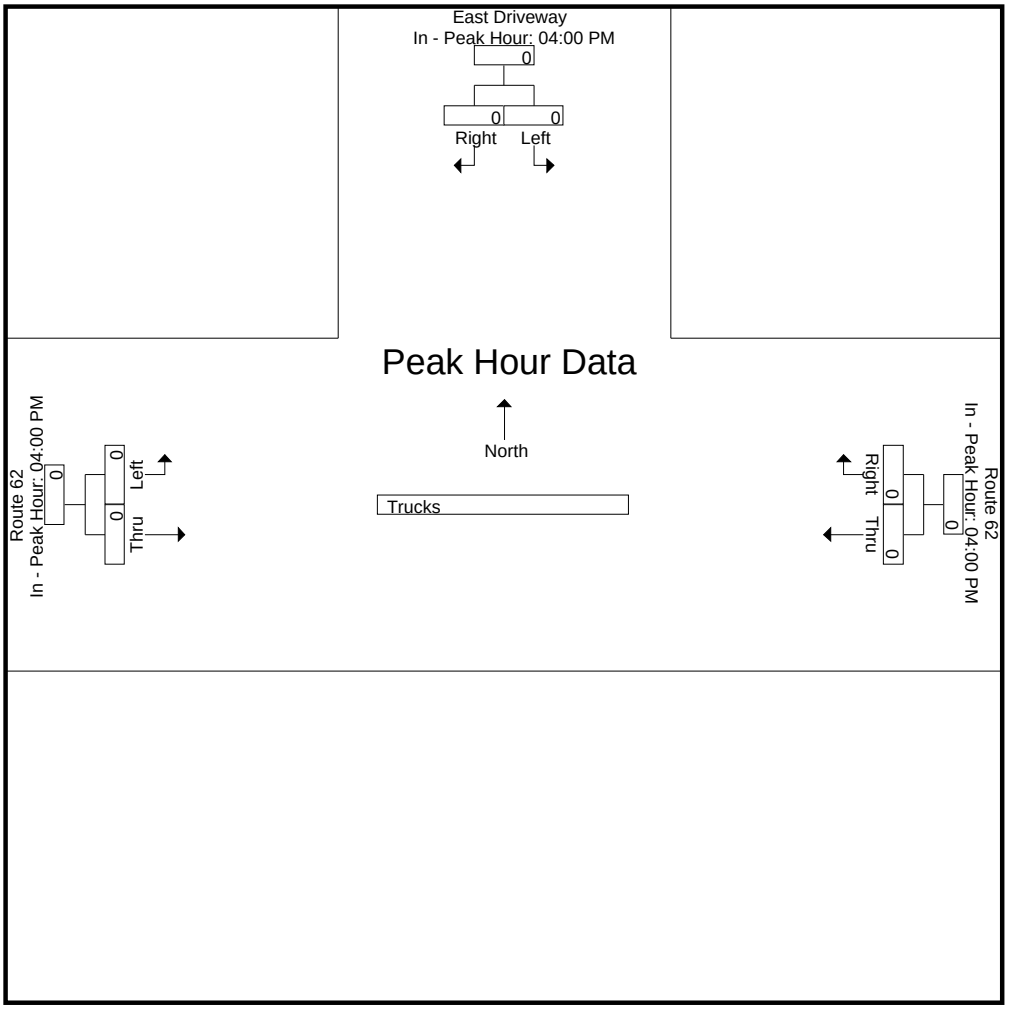
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	East Driveway From North			Route 62 From East			Route 62 From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

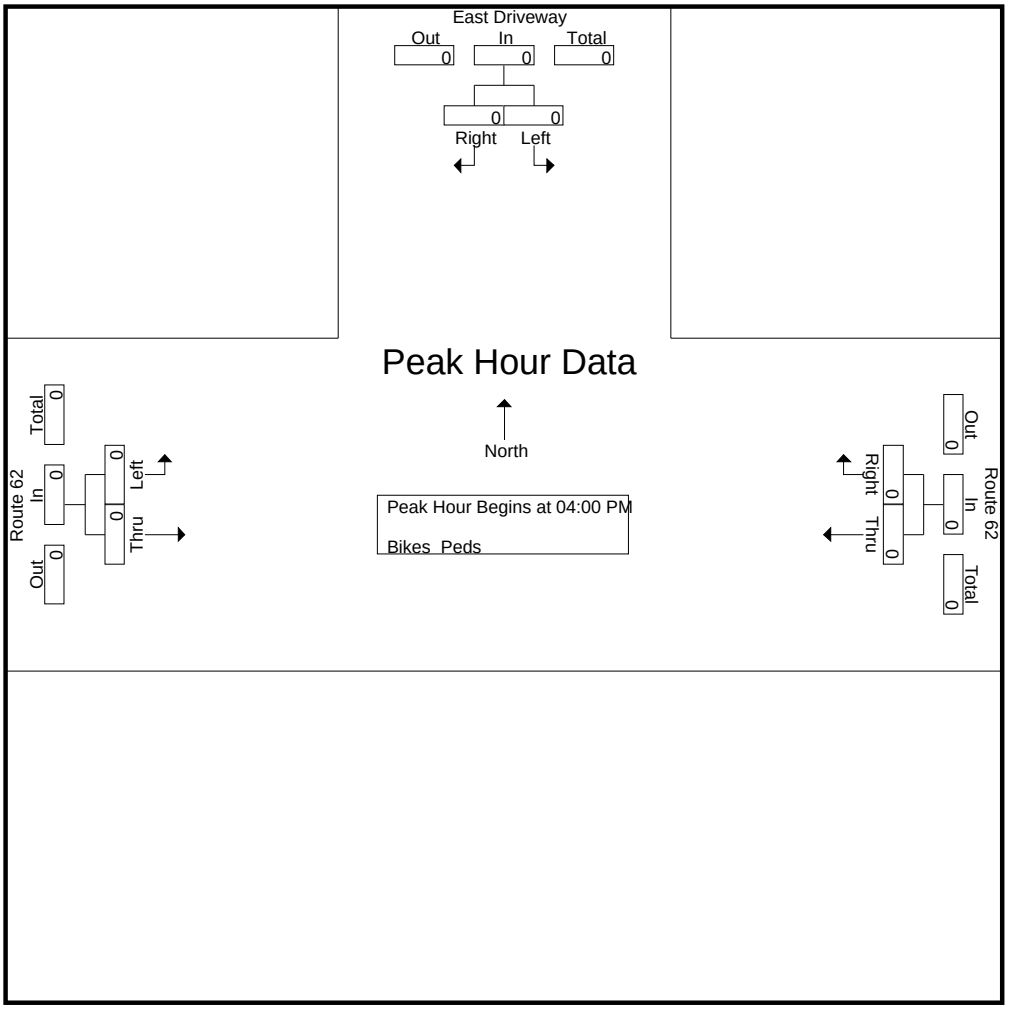
	East Driveway From North			Route 62 From East			Route 62 From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 11



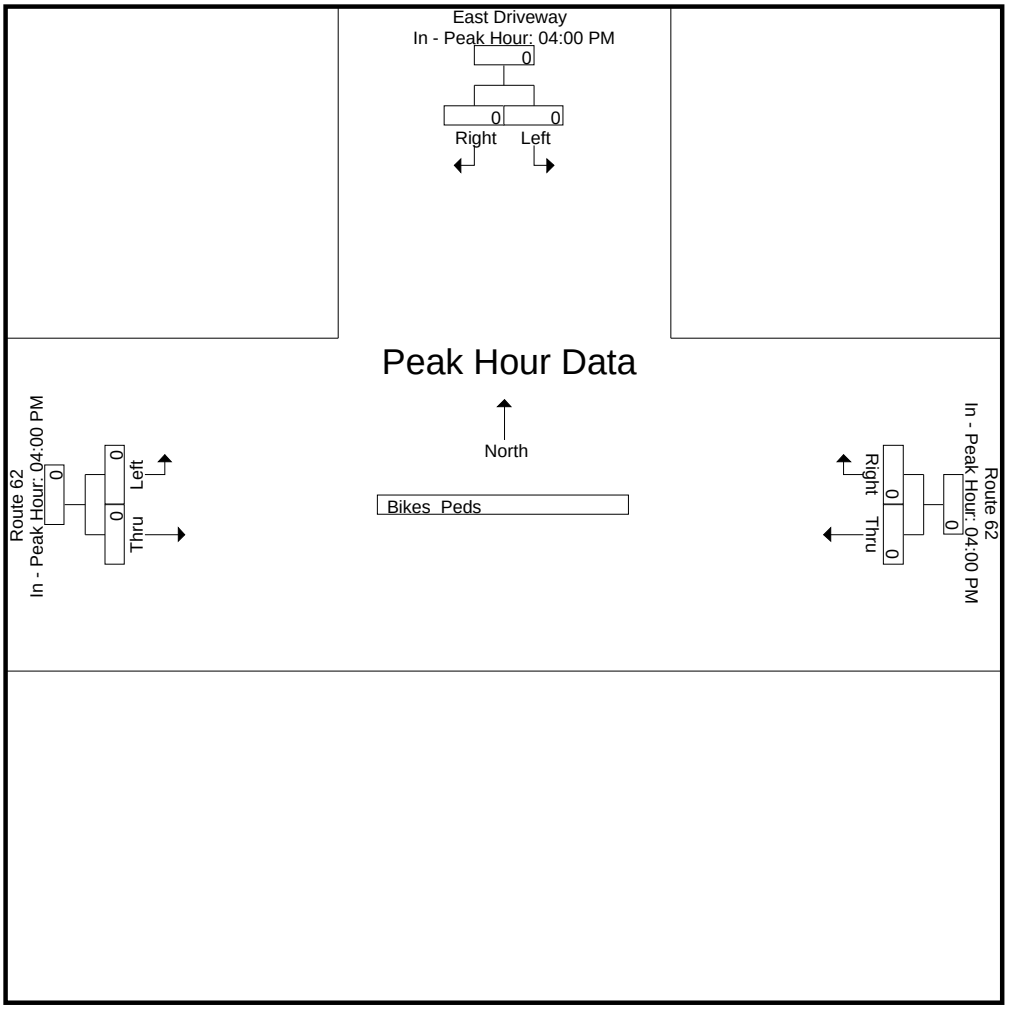
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : East Driveway
E/W Street : Route 62
City/State : Wilmington, MA
Weather : Clear

File Name : 93110006
Site Code : 93110006
Start Date : 3/23/2022
Page No : 12



SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department

5127: Monthly Hourly Volume for March 2019

Location ID:	**5127**	**Seasonal Factor Group:**	**U3**
County:	**Essex**	**Daily Factor Group:**	
Functional Class	**3**	**Axle Factor Group:**	**U3**
Location:	**ANDOVER BY PASS**	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	66	44	37	48	165	606	1003	1589	1416	875	804	908	1051	990	1225	1491	1698	1719	1156	725	598	423	341	233	19211	Accepted
2	106	73	52	37	71	119	211	324	420	554	539	627	659	651	688	745	738	698	537	414	327	352	312	190	9444	Accepted
3	106	53	48	36	28	84	153	229	397	526	677	831	863	887	835	840	815	791	597	485	340	228	131	91	10071	Accepted
4	52	54	43	59	126	298	392	523	621	728	681	565	632	566	635	752	981	1106	716	428	364	230	149	85	10786	Accepted
5	54	54	38	56	190	683	1183	1921	1712	1022	734	795	837	847	1032	1369	1481	1001	744	359	611	478	367	193	17761	Accepted
6	87	47	28	56	184	689	987	1405	1385	858	820	1001	977	995	1167	1294	1529	1873	1492	947	630	510	246	180	19387	Accepted
7	87	56	41	77	254	760	1280	2003	1704	1079	906	1028	1122	1038	1265	1612	1863	2195	1704	1164	777	609	400	193	23217	Accepted
8	110	66	63	90	253	690	1250	1902	1542	1059	915	1029	1308	1192	1451	1505	1549	1837	1337	977	735	500	336	144	21840	Accepted
9	56	33	20	26	56	138	300	515	716	665	849	895	955	892	883	916	831	1134	708	377	275	368	360	291	12259	Accepted
10	161	69	58	72	100	175	263	363	524	622	623	728	680	697	806	835	681	566	538	394	271	200	110	70	9606	Accepted
11	43	43	49	203	759	1303	1747	1107	599	1108	750	822	773	1081	1293	1709	1791	1123	812	484	266	230	125	72	18292	Accepted
12	48	42	83	237	716	1336	1287	1276	847	724	737	807	817	1131	1428	1727	1838	1258	712	469	330	239	116	62	18267	Accepted
13																										
14	59	43	29	51	192	631	616	738	1490	867	704	702	870	791	1172	1225	1699	1821	1127	740	513	423	270	167	16940	Accepted
15	68	50	29	52	168	584	962	1409	1357	890	802	856	981	911	1178	1345	1690	1707	1023	654	444	448	325	246	18179	Accepted
16	136	59	50	36	65	124	224	396	498	682	835	909	940	919	927	895	883	814	751	549	412	406	392	239	12141	Accepted
17	141	91	42	37	48	86	140	240	379	522	664	857	934	868	812	837	829	774	689	622	518	323	189	106	10748	Accepted
18	63	43	24	46	174	655	1113	1746	1594	978	806	770	854	850	1076	1260	1642	1834	1205	751	458	346	238	109	18635	Accepted
19	50	38	25	40	177	663	1105	1780	1600	973	757	835	913	873	1063	1275	1585	1881	1325	765	506	389	193	132	18943	Accepted
20	48	29	23	47	187	663	1101	1812	1636	923	774	808	906	937	1108	1307	1688	1926	1230	791	609	395	230	147	19325	Accepted
21	64	39	26	51	174	668	1121	1799	1487	888	733	871	957	850	1240	1436	1683	1812	1187	783	566	455	236	164	19290	Accepted
22	77	53	37	50	165	574	948	1591	1398	920	811	814	949	1020	1145	1402	1725	1737	955	662	427	383	320	224	18387	Accepted
23	123	70	30	37	44	126	224	347	530	710	838	906	932	926	986	947	861	828	694	464	399	413	350	235	12020	Accepted
24	129	68	58	34	50	89	152	215	413	580	768	826	1072	1017	931	937	900	760	683	536	408	298	204	112	11240	Accepted
25	50	34	23	50	180	668	1049	1719	1568	941	749	780	895	816	1048	1270	1398	1697	1146	621	493	297	183	106	17781	Accepted
26	53	31	21	52	185	676	1262	1893	1695	954	745	841	898	873	1161	1312	1767	2035	1288	736	549	385	209	132	19753	Accepted
27	57	24	25	49	168	670	1128	1754	1618	961	801	777	935	905	1097	1375	1685	1874	1240	777	579	474	255	158	19386	Accepted
28	79	33	25	67	243	712	1168	1868	1618	992	747	846	871	940	1156	1430	1663	1877	1316	631	560	423	292	150	19707	Accepted
29	69	37	21	49	162	619	1026	1577	1390	980	763	862	1010	974	1200	1422	1868	1943	1101	671	458	396	337	228	19163	Accepted
30	127	59	48	36	63	137	261	383	598	719	887	954	982	898	953	1036	941	855	739	577	469	367	372	232	12693	Accepted
31	146	67	38	39	34	87	138	221	450	570	742	953	1017	964	997	995	818	735	556	466	384	278	164	130	10989	Accepted
																									16182.03	March 2019 ADT
																									17055	2019 AADT
																									-0.05395	**5.4% below**

COVID ADJUSTMENT DATA

Massachusetts Highway Department

4096: Monthly Hourly Volume for March 2017

Location ID:	**4096**	**Seasonal Factor Group:**	**U1-Boston**
County:	**Middlesex**	**Daily Factor Group:**	
Functional Class	**1**	**Axle Factor Group:**	**U1-Boston**
Location:	**INTERSTATE 93**	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	1147	630	564	876	2307	7635	10334	13214	12906	10103	8746	8670	9010	9508	11659	12678	13824	14739	11550	7916	5742	4337	3126	2837	184058	Accepted
2	1251	701	650	929	2321	8249	10587	13567	13081	10146	8903	8497	9303	9710	11725	12598	12815	14360	11975	8203	6077	4761	4118	2604	187131	Accepted
3	1511	795	728	954	2198	7637	9742	12406	12124	9823	9169	9591	10199	10868	12316	12725	13617	13788	11587	8555	6234	5008	4122	3413	189110	Accepted
4	2264	1158	960	888	1033	2495	3802	5435	6723	8050	9299	9944	10796	10509	10393	10549	9928	9614	8376	6320	5087	4791	4736	3311	146461	Accepted
5	2042	1526	1193	1072	895	1257	2341	3227	4267	5824	7732	9148	10267	10209	10146	9377	10218	9288	8100	6539	4911	3604	2370	1776	127329	Accepted
6	877	597	588	861	2379	6030	8031	12610	11811	9455	8339	7904	8442	8994	11292	12286	13601	14566	11493	7081	5008	3907	2826	2293	171271	Accepted
7	1033	624	607	901	2375	8163	10418	12902	12639	10037	8312	8125	8693	9126	11397	12367	13267	13688	11848	7901	5563	4298	3108	2240	179632	Accepted
8	1114	645	524	866	2180	7934	9096	13253	12220	10546	8547	8604	9128	9534	11796	12705	12823	14474	12554	8086	5950	4487	3418	3071	183555	Accepted
9	1290	693	637	937	2469	8183	9772	12054	13163	10415	8933	8863	9172	9736	11685	12561	13702	14755	11794	8530	6326	4746	3750	2551	186717	Accepted
10	1349	824	752	954	2349	7477	10198	12807	11761	9685	8342	8669	9684	10105	11391	10965	10212	11992	11101	7813	5643	4551	3883	3382	175889	Accepted
11	1968	1117	1062	925	1095	2377	3664	5272	6612	7928	8965	9045	10587	10040	10168	9936	8601	9467	8489	6420	5317	4535	4457	3277	141324	Accepted
12	2040	1503	1103	905	1181	1930	2988	3773	5220	6789	8278	9835	10154	10128	9956	9932	9293	8612	6926	5545	3937	2711	1791	999	125529	Accepted
13	709	621	900	2337	7730	10177	9648	10119	10142	8725	8592	9045	9554	11493	12259	12779	14483	12417	8679	6217	4961	3338	2466	1370	178761	Accepted
14	814	726	857	1457	3149	3298	2786	2171	1969	1883	1587	1890	1243	1014	769	819	788	805	968	978	820	824	697	501	32813	Accepted
15	345	341	525	1371	5137	7141	9382	10246	8770	7538	6892	6976	7507	9893	10844	11933	13357	10372	7002	5249	4202	3564	2319	1276	152182	Accepted
16	810	711	924	2270	7660	10147	12605	12089	11255	8722	8567	8868	9595	11184	12589	13258	14037	12234	8905	6540	5095	3584	2732	1481	185862	Accepted
17	887	831	939	2171	7385	9783	12422	12101	9856	8739	9421	9639	10295	11801	11694	12911	13638	11387	8847	6309	4985	4220	3568	2050	185879	Accepted
18	1260	1204	890	1176	2612	3889	5423	6694	7717	8796	9791	10648	10352	10513	10348	10456	10042	8598	6802	5720	5071	4845	3441	2148	148436	Accepted
19	1393	960	699	710	1172	2247	2869	3953	5393	7070	8432	9576	9572	9326	9645	9659	9084	8521	7153	5459	4009	3127	1826	1058	122913	Accepted
20	679	644	877	2338	7852	10128	12910	12745	10027	8621	8138	8753	9013	11131	12450	13571	14492	11733	7540	5390	3957	3301	2186	1083	179559	Accepted
21	693	651	886	2341	7949	9977	13679	13159	10301	8356	8638	8786	9363	11458	12428	12471	14278	12416	7764	5874	4533	3910	2346	1139	183396	Accepted
22																										
23																										
24	1404	811	740	963	2162	7511	9968	12789	12493	9800	8861	9201	9916	10359	11333	11849	13060	14022	11757	7988	5893	4671	4463	3536	185550	Accepted
25	1857	1178	1033	845	986	2600	3951	5395	7040	8063	9120	10048	10512	10433	10190	10380	10223	9774	8262	6507	5518	4924	4437	3346	146622	Accepted
26	2085	1434	929	654	578	1072	2198	3133	4180	5969	7910	9098	10339	10424	10392	10262	10037	9353	8030	6608	5067	4197	2711	1727	128387	Accepted
27	931	643	580	834	2342	7664	9728	12084	12098	10422	7865	7706	8260	8682	10915	11859	12868	13249	11280	6998	5168	3835	2838	2133	170982	Accepted
28	1102	667	661	884	2366	8046	10542	12624	13515	10200	8694	8440	8543	9414	11570	12279	12773	13098	11779	7781	5731	4534	3706	2335	181284	Accepted
29	1205	653	612	865	2162	7719	9270	12686	12384	11201	8903	8501	9075	9547	11771	10893	13950	15250	12058	7875	6076	4619	3672	2567	183514	Accepted
30	1239	742	703	932	2379	8149	10767	13619	12764	10501	8895	8609	9260	9935	11972	12769	14212	14715	12105	8795	6582	5262	4069	2920	191895	Accepted
31	1429	921	770	985	2331	7637	9971	12946	11846	9631	8907	9024	9390	9863	10569	10735	12052	11888	8578	5507	4051	3479	2913	2593	168016	Accepted
																									162898.5	March 2017 ADT

Massachusetts Highway Department

4096: Monthly Hourly Volume for March 2022

Location ID:	**4096**	**Seasonal Factor Group:**	**U1-Boston**
County:	**Middlesex**	**Daily Factor Group:**	
Functional Class	**1**	**Axle Factor Group:**	**U1-Boston**
Location:	**INTERSTATE 93**	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	1267	726	722	875	2473	7189	10312	11647	10814	9194	7993	8122	8505	9200	10904	11302	11266	9867	7702	5903	4324	3324	2919	2164	158714	Accepted
2	1117	743	682	828	2302	6973	10383	11833	11078	8640	8093	8354	8381	8487	9641	9722	9601	10495	8427	5656	4558	3986	2846	2169	154995	Accepted
3																										
4	1354	925	747	964	2487	6819	8642	9511	10527	8466	8863	9027	9659	10597	11510	12088	12339	11925	10213	8251	6193	4713	4025	3033	172878	Accepted
5	1981	1256	1009	865	1342	2848	4508	5952	7029	8447	9704	10868	11290	11456	11229	10715	11247	10420	9124	7042	5661	4878	4417	3121	156409	Accepted
6	1906	1559	1014	810	757	1306	2216	3110	4197	5882	8240	9593	10451	10672	9815	10553	10562	8953	8040	6452	4773	3484	2477	1855	128677	Accepted
7	1035	739	660	889	2455	7186	10303	12271	11078	8639	8042	7863	8251	9097	10862	11526	11817	12134	8452	5736	4319	3450	2906	1970	161680	Accepted
8	1040	722	687	855	2497	7493	10597	12280	11703	9348	8320	7943	8435	9299	11206	11835	12021	12238	9703	6438	5070	3693	2690	2032	168145	Accepted
9	1117	692	666	826	2389	7536	10728	12729	11140	8878	7988	8099	8576	9602	10694	10479	10972	10469	8497	5547	4346	3477	2527	2036	160010	Accepted
10	1143	768	731	901	2454	6864	9879	10457	11436	9729	8335	8598	9001	9622	11474	12292	12279	13413	9819	7068	5504	4204	3819	2535	172325	Accepted
11	1343	884	849	1033	2481	6748	10067	11656	10364	9037	9011	9283	9691	10496	11306	12190	12678	12335	10679	7804	6135	4707	4336	3167	178280	Accepted
12	1963	1278	1014	832	1345	2490	3571	4734	5935	6893	8130	8592	9031	8964	8877	8600	8244	7878	6439	5136	4406	3997	4141	2700	125190	Accepted
13	1735	1312	0	1108	1102	1371	2397	3062	3855	5245	6922	9067	8466	10323	10223	10092	9818	9311	8624	7391	6233	4164	2756	1754	126331	Accepted
14	1137	759	669	934	2441	7202	10069	11797	11326	8695	7828	7949	8361	9314	11010	11330	12545	11667	9409	6337	4866	3695	2704	2013	164057	Accepted
15	1131	742	722	889	2441	7453	9879	10981	11742	9420	8159	8166	8704	9417	11306	12517	13044	12990	9626	6723	5211	3816	2971	2213	170263	Accepted
16	1171	771	725	897	2429	7015	10479	12291	11547	9374	8183	8500	9003	9804	11306	12421	12314	12481	9801	7234	5538	4272	3001	2330	172887	Accepted
17	1397	846	698	933	2441	7207	10223	11795	11289	9329	8383	8521	8920	9839	11344	11508	12795	11753	9965	6828	5313	4125	3315	2396	171163	Accepted
18	1438	1002	883	1029	2423	6813	9544	11333	10631	9122	9030	9303	10378	10573	12219	12379	12663	12063	9887	7566	6193	5171	4498	3439	179580	Accepted
19	2035	1377	1206	925	1230	2481	3485	4673	6120	7323	8677	9572	10230	10294	10340	10157	9507	9216	7844	6226	5316	4803	4535	3189	140761	Accepted
20	2119	1415	1036	770	807	1233	2330	3245	4387	6253	8267	9754	10790	10738	10436	10242	9905	9275	8457	6882	5689	3915	2732	1835	132512	Accepted
21	1027	714	658	885	2527	7248	10137	12147	11194	9139	8140	8157	8497	9527	11186	12179	12461	12025	8650	6086	4596	3485	2586	1877	165128	Accepted
22	1058	654	699	875	2548	7364	10778	12318	11452	9524	8274	8536	8660	9510	11241	11850	12558	12650	9861	6549	5032	3926	2878	2140	170935	Accepted
23																										
24																										
25	1323	983	793	1048	2523	7094	6530	10989	11259	9367	9048	9446	10037	10785	11792	12033	12552	12696	9829	7671	5906	4668	4125	3059	175556	Accepted
26	2078	1220	1032	911	1350	2712	4012	5441	6849	8597	9960	10840	11046	11346	11075	10641	10639	9838	8261	6216	5710	4884	4320	3188	152166	Accepted
27	1993	1485	1082	783	830	1292	2367	3296	4304	6174	8531	9771	10613	10757	10562	10293	9918	9135	7765	6502	5527	4164	2567	2105	131816	Accepted
28	1118	826	694	993	2549	5818	6038	8025	10794	9269	8171	8229	8586	9316	11103	11880	11561	11811	8579	5874	4603	3433	2615	1881	153766	Accepted
29	1062	808	786	915	2547	7537	10812	12518	11236	9310	8523	8424	8892	9563	11333	12073	12613	13413	9859	6731	5144	3893	3451	2225	173668	Accepted
30	1111	764	682	937	2548	7615	10791	12628	11887	9617	8553	8534	9059	9944	11347	12398	12916	13558	9968	6931	5393	4126	3487	2624	177418	Accepted
31	1311	827	776	1008	2649	7566	10852	12808	11624	9629	8660	8750	9269	9972	11307	12718	13601	13450	9913	7045	5571	4265	3726	2396	179693	Accepted
																									159821.5	March 2022 ADT

MassDOT Yearly Growth Rates

for data from 2014 to 2018

Growth Group	Grow 2014 to 2015	Grow 2015 to 2016	Grow 2016 to 2017	Grow 2017 to 2018	Grow 2018 to 2019
R1	0	0.023	0.004	0.018	0.016
R2	0.05	0.068	0.004	0.014	0.014
R3	-0.038	0.002	0.008	0.011	0.06
R4-7	-0.01	0.003	0.001	0.011	0.012
Rec - East		0.032	0.02	0.041	0.025
Rec - West		0.051	-0.008	0.029	0
U1-Boston	0.061	0.07	-0.003	0.012	0.006
U1-Essex	0.024	0.025	0.007	0.014	0.011
U1-Southeast	0.05	0.062	0.021	0.014	0
U1-West	0.03	-0.027	0.02	0.028	0.013
U1-Worcester	0.042	0.005	0.018	0.01	0.01
U2	0.04	0.048	0.008	0.01	0.02
U3	0.011	0.013	0.011	0.014	0.004
U4-7	0.023	0.062	0.017	0.003	-0.004

updated 5/1/2020

2017 Average Count Data – Sta. 4096

March ADT: 162,899

Growth Rate (2017-2018): 0.3% [MassDOT Yearly Growth Rates (U4-7)]
Growth Rate (2018-2019): -0.4% [MassDOT Yearly Growth Rates (U4-7)]

$$162{,}899 \times (1.003) \times (0.996) = 162{,}734$$

2022 Average Count Data – Sta. 4096

March ADT: 159,822

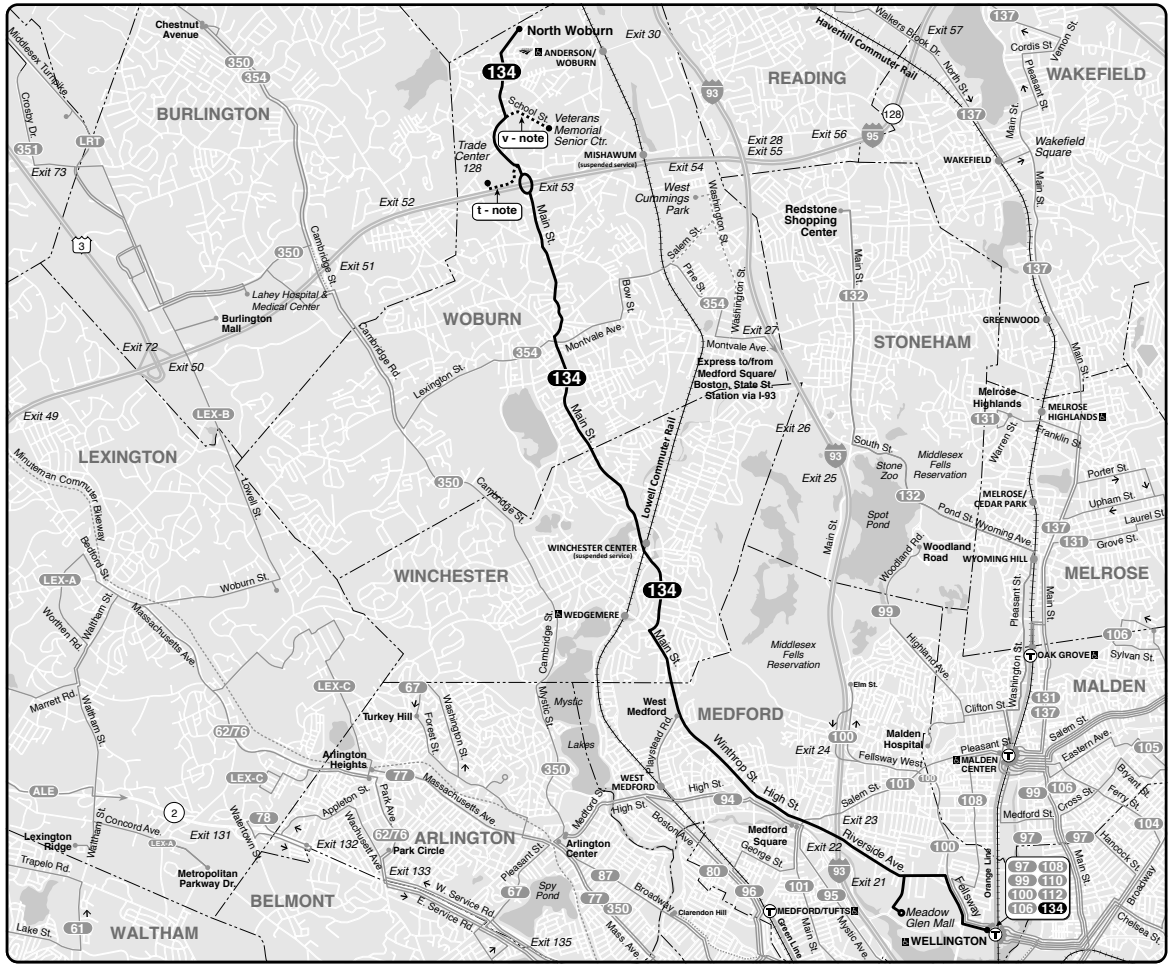
COVID Adjustment

$$1 - \frac{162{,}899}{159{,}822} = -0.019$$

PUBLIC TRANSPORTATION SCHEDULES

Effective **March 13, 2022**

134 North Woburn – Wellington Sta



- Transfer to bus/subway available on CharlieCard—good for 2 hours, pay fare difference.
- Children 11 & under ride free with a paying customer.

All MBTA buses are accessible to people with disabilities.

	CharlieCard	Cash on board	Reduced fare
Bus	**$1.70**	**$1.70**	**$0.85**
Bus + Subway	**$2.40**	**$4.10**	**$1.10**

Complete fare/pass rules and free/reduced fare eligibility:
mbta.com/fares or call **617-222-3200**

Connections

ORANGE LINE

LOWELL LINE

Information **617-222-3200**
Lost and Found **617-222-2229**
TTY **617-222-5146**

Realtime arrival information, maps, and more
mbta.com

A126-3-22.0

Weekday 134

Inbound

North Woburn	Woburn Square	Winthrop St & Playstead Rd	Wellington Station
-	-	5:40	5:54
6:00	6:10	6:19	6:33
6:50	7:00	7:11	7:31
T 7:10	7:20	7:31	7:51
T 7:50	8:00	8:11	8:31
T 8:35	8:46	8:57	9:17
T 9:10	9:21	9:32	9:52
V 10:00	10:17	10:28	10:55
T 11:00	11:12	11:24	11:47
T 12:00	**12:12**	**12:24**	**12:47**
T 1:00	**1:13**	**1:25**	**1:47**
T 2:00	**2:13**	**2:25**	**2:47**
S 2:25	**-**	**-**	**-**
S 2:30	**-**	**-**	**-**
S 2:45	**-**	**-**	**-**
T 3:00	**3:13**	**3:28**	**3:53**
T 4:00	**4:13**	**4:28**	**4:53**
T 5:00	**5:13**	**5:28**	**5:53**
T 6:00	**6:13**	**6:28**	**6:52**
7:00	**7:13**	**7:25**	**7:43**
-	**-**	**8:00**	**8:18**
8:00	**8:13**	**8:25**	**8:43**
-	**-**	**8:55**	**9:13**
-	**-**	**9:50**	**10:08**
-	**-**	**10:45**	**11:03**
-	**-**	**11:45**	12:03
-	-	12:45	1:03

Outbound

Wellington Station	Winthrop St & Playstead Rd	Woburn Square	North Woburn
5:15	5:29	5:39	5:56
6:00	6:16	6:27	6:44
T 6:45	7:02	7:16	7:37
S 6:55	-	-	-
S 7:10	-	-	-
T 7:35	7:55	8:09	8:30
T 8:00	8:20	8:34	8:55
T 9:00	9:20	9:34	9:55
V 10:00	10:20	10:34	10:52
T 11:00	11:20	11:34	11:55
T 12:00	**12:21**	**12:37**	**12:55**
T 1:00	**1:21**	**1:37**	**1:55**
V 2:00	**2:21**	**2:37**	**2:55**
T 3:00	**3:23**	**3:38**	**3:55**
T 4:00	**4:23**	**4:38**	**4:55**
T 5:00	**5:23**	**5:38**	**5:55**
6:00	**6:23**	**6:38**	**6:55**
7:00	**7:17**	**7:32**	**7:49**
7:30	**7:47**	**-**	**-**
8:25	**8:42**	**-**	**-**
9:20	**9:37**	**-**	**-**
10:15	**10:32**	**-**	**-**
11:10	**11:24**	**-**	**-**
12:10	12:24	-	-
W 1:20	1:34	-	-

Saturday 134

Inbound

North Woburn	Woburn Square	Winthrop St & Playstead Rd	Wellington Station
-	-	5:55	6:13
-	-	6:25	6:43
-	-	6:55	7:13
7:00	7:10	7:21	7:39
-	-	7:55	8:13
8:00	8:10	8:21	8:39
-	-	8:55	9:13
9:00	9:10	9:21	9:39
-	-	9:55	10:14
10:00	10:11	10:26	10:46
-	-	10:55	11:19
11:00	11:12	11:28	11:52
-	-	11:55	**12:19**
12:00	**12:11**	**12:24**	**12:48**
-	**-**	**12:55**	**1:19**
1:00	**1:11**	**1:24**	**1:48**
-	**-**	**1:55**	**2:16**
2:00	**2:11**	**2:24**	**2:44**
-	**-**	**2:55**	**3:15**
3:00	**3:11**	**3:24**	**3:44**
-	**-**	**3:55**	**4:15**
4:00	**4:11**	**4:24**	**4:44**
-	**-**	**4:55**	**5:15**
5:00	**5:13**	**5:26**	**5:46**
-	**-**	**5:55**	**6:15**
6:00	**6:10**	**6:23**	**6:43**
-	**-**	**6:55**	**7:15**
7:00	**7:09**	**7:22**	**7:42**
-	**-**	**7:55**	**8:15**
8:00	**8:09**	**8:22**	**8:42**
-	**-**	**8:25**	**8:45**
-	**-**	**8:55**	**9:15**
-	**-**	**9:25**	**9:45**
-	**-**	**9:55**	**10:15**
-	**-**	**10:25**	**10:45**
-	**-**	**10:55**	**11:15**
-	**-**	**11:25**	**11:45**
M 12:15	-	-	12:31
M 1:00	-	-	1:16

Outbound

Wellington Station	Winthrop St & Playstead Rd	Woburn Square	North Woburn
6:00	6:15	6:25	6:36
6:30	6:45	-	-
7:00	7:15	7:25	7:36
7:30	7:45	-	-
8:00	8:15	8:25	8:36
8:30	8:45	-	-
9:00	9:17	9:30	9:41
9:30	9:47	-	-
10:00	10:18	10:33	10:45
10:30	10:48	-	-
11:00	11:18	11:36	11:48
11:30	11:48	-	-
12:00	**12:17**	**12:34**	**12:45**
12:30	**12:47**	**-**	**-**
1:00	**1:17**	**1:34**	**1:45**
1:30	**1:47**	**-**	**-**
2:00	**2:19**	**2:33**	**2:46**
2:30	**2:49**	**-**	**-**
3:00	**3:18**	**3:32**	**3:45**
3:30	**3:48**	**-**	**-**
4:00	**4:20**	**4:32**	**4:47**
4:30	**4:50**	**-**	**-**
5:00	**5:18**	**5:30**	**5:42**
5:30	**5:48**	**-**	**-**
6:00	**6:18**	**6:30**	**6:42**
6:30	**6:48**	**-**	**-**
7:00	**7:18**	**7:30**	**7:42**
7:30	**7:48**	**-**	**-**
8:00	**8:15**	**-**	**-**
8:30	**8:45**	**-**	**-**
9:00	**9:15**	**-**	**-**
9:30	**9:45**	**-**	**-**
10:00	**10:15**	**-**	**-**
10:30	**10:45**	**-**	**-**
11:00	**11:15**	**-**	**-**
11:30	**11:45**	**-**	**-**
M 12:00	-	-	-
M 12:45	-	-	-
W 1:30	-	-	-

Sunday 134

Inbound

Woburn Square	Winthrop St & Playstead Rd	Medford Square	Wellington Station
-	-	6:20	6:34
-	-	7:00	7:14
-	-	7:40	7:54
-	-	8:20	8:34
-	-	9:00	9:14
-	-	9:40	9:54
-	-	10:20	10:35
10:40	10:55	-	11:19
11:55	**12:09**	**-**	**12:33**
1:10	**1:23**	**-**	**1:47**
2:25	**2:38**	**-**	**2:58**
3:40	**3:53**	**-**	**4:13**
4:55	**5:08**	**-**	**5:28**
6:10	**6:23**	**-**	**6:43**
7:25	**7:38**	**-**	**7:58**
-	**-**	**8:20**	**8:36**
-	**-**	**9:00**	**9:16**
-	**-**	**9:40**	**9:56**
-	**-**	**10:20**	**10:36**
-	**-**	**11:00**	**11:16**
-	**-**	**11:40**	**11:56**

Outbound

Wellington Station	Medford Square	Winthrop St & Playstead Rd	North Woburn
6:00	6:10	-	-
6:40	6:50	-	-
7:20	7:30	-	-
8:00	8:10	-	-
8:40	8:50	-	-
9:20	9:32	-	-
10:00	-	10:18	10:33
11:15	-	11:33	11:51
12:30	**-**	**12:47**	**1:04**
1:45	**-**	**2:02**	**2:16**
3:00	**-**	**3:18**	**3:32**
4:15	**-**	**4:35**	**4:47**
5:30	**-**	**5:48**	**6:00**
6:45	**-**	**7:03**	**7:15**
7:20	**7:32**	**-**	**-**
8:00	**8:10**	**-**	**-**
8:40	**8:50**	**-**	**-**
9:20	**9:30**	**-**	**-**
10:00	**10:10**	**-**	**-**
10:40	**10:50**	**-**	**-**
11:20	**11:30**	**-**	**-**
12:00	12:10	-	-

T serves TradeCenter 128 & Middlesex Superior Court

V serves Veterans Memorial Senior Center

S to/from Winthrop St & Brooks St only on school days

M to/from Medford Square

W waits for last train to arrive station

PM times are **bold**

Information in this timetable is subject to change without notice. Traffic and weather may affect running times.

Always check bus destination signs before boarding. Some buses may only serve a part, or skip portions of this route.

2022 Holidays

- SUN Memorial Day
- SUN Independence Day
- SUN Labor Day
- SUN Thanksgiving Day
- SUN Christmas Day
- SUN Christmas Day Observed
- SAT New Year's Eve
- SUN New Year's Day

LOWELL LINE 2022 SPRING/SUMMER SCHEDULE

Effective May 23, 2022

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM									PM												
	Bikes Allowed		300	302	304	306	308	310	312	314	316	318	320	322	324	326	328	330	332	334	336	338	340	342
6	Lowell	♿	5:05	5:50	6:35	7:20	8:05	8:50	9:30	10:12	11:12	12:12	1:12	2:12	3:12	4:12	5:05	5:50	6:35	7:20	8:05	8:50	9:50	10:50
5	North Billerica	♿	5:13	5:58	6:43	7:28	8:13	8:58	9:38	10:20	11:20	12:20	1:20	2:20	3:20	4:20	5:13	5:58	6:43	7:28	8:13	8:58	9:58	10:58
3	Wilmington	♿	5:20	6:05	6:51	7:36	8:21	9:05	9:45	10:27	11:27	12:27	1:27	2:27	3:27	4:27	5:20	6:05	6:50	7:35	8:20	9:05	10:05	11:05
2	Anderson/Woburn	♿	5:24	6:09	6:55	7:40	8:25	9:09	9:49	10:31	11:31	12:31	1:31	2:31	3:31	4:31	5:24	6:09	6:54	7:39	8:24	9:09	10:09	11:09
1	Wedgemere	♿	5:31	6:16	7:02	7:47	8:32	9:16	f 9:56	f 10:38	f 11:38	f 12:38	f 1:38	f 2:38	f 3:38	f 4:38	f 5:31	f 6:16	f 7:01	f 7:46	f 8:31	f 9:16	f 10:16	f 11:16
1A	West Medford		5:34	6:20	7:06	7:51	8:36	9:20	f 9:59	f 10:41	f 11:41	f 12:41	f 1:41	f 2:41	f 3:41	f 4:41	f 5:34	f 6:19	f 7:04	f 7:49	f 8:34	f 9:19	f 10:19	f 11:19
1A	North Station	♿	5:48	6:34	7:20	8:05	8:50	9:34	10:13	10:55	11:55	12:55	1:55	2:55	3:55	4:55	5:48	6:33	7:18	8:03	8:48	9:33	10:33	11:33

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM								PM													
	Bikes Allowed		301	303	305	307	309	311	313	315	317	319	321	323	325	327	329	331	333	335	337	339	341	
1A	North Station	♿	5:25	6:10	6:55	7:40	8:25	9:10	10:10	11:10	12:10	1:10	2:10	3:10	3:55	4:40	5:25	6:10	6:55	7:45	8:45	9:45	11:00	
1A	West Medford		f 5:36	f 6:21	f 7:06	f 7:51	f 8:36	f 9:21	f 10:21	f 11:21	f 12:21	f 1:21	f 2:21	f 3:21	4:06	4:51	5:36	6:21	7:06	f 7:56	f 8:56	f 9:56	f 11:11	
1	Wedgemere	♿	f 5:39	f 6:24	f 7:09	f 7:54	f 8:39	f 9:24	f 10:24	f 11:24	f 12:24	f 1:24	f 2:24	f 3:24	4:09	4:54	5:39	6:24	7:09	f 7:59	f 8:59	f 9:59	f 11:14	
2	Anderson/Woburn	♿	5:46	6:31	7:16	8:01	8:46	9:31	10:31	11:31	12:31	1:31	2:31	3:31	4:16	5:01	5:46	6:31	7:16	8:06	9:06	10:06	11:21	
3	Wilmington	♿	5:49	6:34	7:19	8:04	8:49	9:34	10:34	11:34	12:34	1:34	2:34	3:34	4:19	5:05	5:50	6:34	7:19	8:09	9:09	10:09	11:24	
5	North Billerica	♿	5:58	6:43	7:28	8:13	8:58	9:43	10:43	11:43	12:43	1:43	2:43	3:43	4:29	5:15	6:00	6:44	7:29	8:18	9:18	10:18	11:33	
6	Lowell	♿	6:10	6:55	7:40	8:25	9:10	9:55	10:55	11:55	12:55	1:55	2:55	3:55	4:41	5:27	6:12	6:56	7:41	8:30	9:30	10:30	11:45	

Weekend

Inbound to Boston

ZONE	STATION		SATURDAY TRAIN # / SUNDAY TRAIN #	AM				PM				
	Bikes Allowed			1300 2300	1302 2302	1304 2304	1306 2306	1308 2308	1310 2310	1312 2312	1314 2314	1316 2316
6	Lowell	♿		5:30	7:30	9:30	11:30	1:30	3:30	5:30	7:30	9:30
5	North Billerica	♿		5:38	7:38	9:38	11:38	1:38	3:38	5:38	7:38	9:38
3	Wilmington	♿		5:45	7:45	9:45	11:45	1:45	3:45	5:45	7:45	9:45
2	Anderson/Woburn	♿		5:49	7:49	9:49	11:49	1:49	3:49	5:49	7:49	9:49
1	Wedgemere	♿		f 5:56	f 7:56	f 9:56	f 11:56	f 1:56	f 3:56	f 5:56	f 7:56	f 9:56
1A	West Medford			f 5:59	f 7:59	f 9:59	f 11:59	f 1:59	f 3:59	f 5:59	f 7:59	f 9:59
1A	North Station	♿		6:13	8:13	10:13	12:13	2:13	4:13	6:13	8:13	10:13

Weekend

Outbound from Boston

ZONE	STATION		SATURDAY TRAIN # / SUNDAY TRAIN #	AM			PM					
	Bikes Allowed			1301 2301	1303 2303	1305 2305	1307 2307	1309 2309	1311 2311	1313 2313	1315 2315	1317 2317
1A	North Station	♿		6:30	8:30	10:30	12:30	2:30	4:30	6:30	8:30	11:00
1A	West Medford			f 6:41	f 8:41	f 10:41	f 12:41	f 2:41	f 4:41	f 6:41	f 8:41	f 11:11
1	Wedgemere	♿		f 6:44	f 8:44	f 10:44	f 12:44	f 2:44	f 4:44	f 6:44	f 8:44	f 11:14
2	Anderson/Woburn	♿		6:51	8:51	10:51	12:51	2:51	4:51	6:51	8:51	11:21
3	Wilmington	♿		6:54	8:54	10:54	12:54	2:54	4:54	6:54	8:54	11:24
5	North Billerica	♿		7:03	9:03	11:03	1:03	3:03	5:03	7:03	9:03	11:33
6	Lowell	♿		7:15	9:15	11:15	1:15	3:15	5:15	7:15	9:15	11:45

Keep in Mind:

This schedule will be effective from May 23, 2022 and will replace the schedule of October 11, 2021.

Holiday Service
Memorial Day (May 30th), July 4th and Labor Day (September 5th) operate on a weekend schedule.
Columbus Day (October 10th) and Juneteenth (observed on June 20th) operate on a regular weekday schedule.

For all holiday schedules, please check MBTA.com/holidays or call 617-222-3200.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

High level platform and bridge plate available. Visit **mbta.com/accessibility** for more information.

LRTA MONDAY THROUGH FRIDAY SCHEDULE

★ ROUTES 1 & 8 COMBINED INTO ONE ROUTE
★★ ROUTES 3 & 4 COMBINED INTO ONE ROUTE
★★★ ROUTES 6 & 9 COMBINED INTO ONE ROUTE

	01 CHRISTIAN HILL	02 BELVIDERE	03 SOUTH LOWELL	04 HIGHLANDS VIA STEVENS	05 WESTFORD STREET/ DRUM HILL	06 BROADWAY/ UMASS SOUTH	07 PAWTUCKETVILLE/ UMASS NORTH	08 CENTRALVILLE	09 LOWELL CIRCULATOR	10 DRACUT/ TYNGSBORO	11 IRS/ RAYTHEON VIA RTE. 133	12 TEWKSBURY VIA RTE. 38	13 BILLERICA VIA EDSON	14 BURLINGTON MALL/ LAHEY CLINIC	15 CHELMSFORD/ WESTFORD VIA RTES. 129/110	16 CHELMSFORD VIA CHELMSFORD STREET	17 NORTH CHELMSFORD VIA MIDDLESEX	18 DOWNTOWN SHUTTLE	20 DOWNTOWN/ UMASS NORTH
OUTBOUND LEAVING KENNEDY CENTER	★ AM 6:00 7:00 8:00 9:00 10:00 11:00	AM 6:15 7:45 8:45 9:45 10:45 11:45	★★ AM 6:00 7:00 8:00 9:00 10:00 11:00	★★ SEE ROUTE 3 FOR TIMES	AM 6:00 7:00 7:45 8:45 9:45 10:45 11:45	★★★ AM 7:00 8:00 9:00 10:00 11:00	AM 6:00 6:45 7:45 8:45 9:45 10:45 11:45	★ SEE ROUTE 1 FOR TIMES	★★★ SEE ROUTE 6 FOR TIMES	AM 6:35 7:35 8:30 9:30 10:30 11:30	AM 6:00 7:00	AM 7:00 8:00 9:00 10:00 11:00	AM 6:30 7:30 8:30 9:30 10:30 11:30	AM 6:00 7:00 8:00 9:00 10:00 11:00	AM 6:45 8:00 9:30 11:00	AM 6:15 C 6:40 C 7:10 8:00 9:00 10:00 11:00	AM 6:20 7:00 8:00 9:00 10:00 11:00	AM 5:45 SERVICE RUNS EVERY 30 MINUTES	AM 7:30 UM SERVICE RUNS EVERY 20 MINUTES
	PM 12:00 1:00 2:00 3:00 4:00 5:00 6:00	PM 12:45 1:45 2:40 S,P,1 2:40 S,P,2 2:45 3:45 4:45 5:45 6:45	PM 12:00 1:00 2:00 2:40 S,P,E 3:00 4:00 5:00 6:00	BOARD BUS AT BAY A2 2:40 S,P 2:40 S,P	PM 12:45 1:45 2:40 S,P,3 2:40 S,P,4 2:45 3:45 4:45 5:45 R 6:55 R	PM 12:00 1:00 2:00 3:00 4:00 5:00 6:00	PM 12:45 1:45 2:40 S,P,5 2:40 S,P,6 2:45 3:45 4:50 5:50 6:50	BOARD BUS AT BAY A1	BOARD BUS AT BAY B1	PM 12:30 1:30 2:30 3:30 4:30 5:30	PM 3:00 4:00	PM 12:00 1:00 2:00 3:00 4:00 5:00 6:00	PM 12:30 1:30 2:30 2:40 S,P,E 3:30 4:30 5:30	PM 12:00 1:00 2:00 3:00 4:00 5:00 6:00	PM 12:30 2:00 3:30 5:00 6:30	PM 12:00 1:00 2:00 2:40 S,P,E 3:00 4:00 5:00 6:00	PM 12:00 1:00 2:00 2:40 S,P,E 3:00 4:00 5:00 6:00	PM LAST SHUTTLE FROM KENNEDY CENTER DEPARTS 6:45 PM	PM NO SERVICE
INBOUND TO KENNEDY CENTER	AM 6:20 7:20 8:15 9:15 10:15 11:15	AM 6:50 7:05 S 8:20 9:20 10:20 11:20	AM 6:25 7:20 D 7:25 8:25 9:25 10:25 11:25	SEE ROUTE 3 FOR TIMES 7:15 S	AM 6:20 7:05 S,B,E 7:20 S,B,E 7:20 8:05 9:05 10:05 11:05	AM 7:20 8:20 9:20 10:20 11:20	AM 6:30 7:00 S 7:05 S 7:20 8:20 9:20 10:20 11:20	SEE ROUTE 1 FOR TIMES	SEE ROUTE 6 FOR TIMES	AM 7:20 8:20 9:15 10:15 11:15	AM 6:30 7:30	AM 7:45 8:45 9:45 10:45 11:45	AM 7:10 7:10 S,E 8:10 9:10 10:10 11:10	AM 7:00 8:00 8:55 9:55 10:55 11:55	AM 7:30 8:45 10:15 11:45	AM 6:25 C 6:50 C 7:05 S,E 7:45 8:45 9:45 10:45 11:45	AM 7:00 7:40 I 8:40 9:40 10:40 11:40	AM 6:00 SERVICE RUNS EVERY 30 MINUTES	AM 7:50 UM SERVICE RUNS EVERY 20 MINUTES
	PM 12:15 1:15 2:15 3:15 4:15 5:15 6:15	PM 12:20 1:20 2:20 3:20 4:20 5:20 6:20 7:20	PM 12:25 1:25 2:25 3:25 4:25 5:25 6:25	BOARD BUS AT BAY A2	PM 12:05 1:05 2:05 3:05 4:05 5:05 6:15 7:15	PM 12:20 1:20 2:20 3:20 4:20 5:20 6:20	PM 12:20 1:20 2:20 3:20 4:20 5:20 6:25 7:25	BOARD BUS AT BAY A1	BOARD BUS AT BAY B1	PM 12:15 1:15 2:15 3:15 4:15 5:15 6:15	PM 3:30 4:30	PM 12:45 1:45 2:45 3:45 4:45 5:45 6:45	PM 12:10 1:10 2:10 3:10 4:10 5:10 6:10	PM 12:55 1:55 2:55 3:55 4:55 5:55 6:55	PM 1:15 2:45 4:15 5:45 7:15	PM 12:45 1:45 2:45 3:45 4:45 5:45 6:45	PM 12:40 I,W 1:40 2:40 I 3:40 I 4:40 5:40 6:40	PM LAST SHUTTLE FROM DOWNTOWN DEPARTS 7:00 PM	PM NO SERVICE

1 Starts at Andover St./Ends at River Rd.
2 Starts at High St./Ends at Wentworth Ave.
3 Starts at Stevens St./Ends at Technology Drive Lowell
4 Starts at Chelmsford St. & Westford St./Ends at Stevens St.
5 Starts at Woodward Ave./Ends at 6 Lowell Voices
6 Starts at University Ave./Ends at McAvenue School
B Starts at Princeton Blvd. & Baldwin St.
C Starts/Terminates at the Radisson (Does Not Service Meadow Brook Center)
D Drop Students at Washington Savings Bank
E Starts/Terminates at Lowell Line
I Service on Innovation Academy School Days Only
P On School Days Leaves from Paige & Kirk
R No Service to Research Place
S Supplemental Service on School Days Only (Does Not Service Kennedy Center)
W Service Wednesday School Days Only
UM Service on UMass Lowell School Days Only

★ ROUTES 1 & 8 COMBINED
CHRISTIAN HILL & CENTRALVILLE

OUTBOUND
DEPARTS FROM LRTA KENNEDY CENTER

1. LRTA Kennedy Center
2. French & John Streets
3. Bridge & West 6th Streets
4. Lowell Provision (Aiken Ave)
5. Sladen & Pleasant Streets
6. Shop & Save

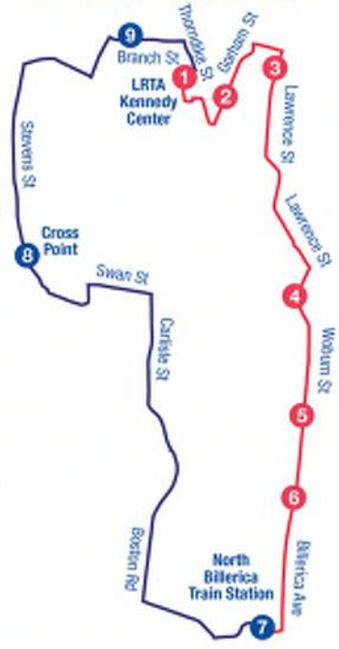
INBOUND
RETURNS TO LRTA KENNEDY CENTER

7. Hildreth Street & Lily Ave
8. Hildreth & Bridge Streets
9. Sunrise Plaza
10. Beacon & Methuen Streets
11. Merrimack & John Streets

★★ ROUTES 3 & 4 COMBINED
SOUTH LOWELL & HIGHLANDS VIA STEVENS

OUTBOUND
DEPARTS FROM LRTA KENNEDY CENTER

1. LRTA Kennedy Center
2. Lowell Superior Court
3. Church & Lawrence Streets
4. Riverside School
5. Riverview Commerce Center
6. Billerica Business Center



INBOUND
RETURNS TO LRTA KENNEDY CENTER

7. North Billerica Train Station
8. Cross Point
9. The Boy's Club

★★★ ROUTES 6 & 9 COMBINED
BROADWAY/UMASS SOUTH & LOWELL CIRCULATOR

OUTBOUND
DEPARTS FROM LRTA KENNEDY CENTER

1. LRTA Kennedy Center
2. Towers Motor Parts Central Plaza
3. John & Merrimack Streets
4. Tsongas Arena
5. UMass Lowell Fox Hall
6. University Crossing Transit Hub
7. Mt. Vernon & Bowers Streets

INBOUND
RETURNS TO LRTA KENNEDY CENTER

8. UMass Lowell South Campus
9. Francis Gate
10. Market Basket & Senior Center

WHERE TO GET YOUR RELOADABLE CHARLIECARD AND RENEW YOUR LRTA MONTHLY PASSES

You must be issued a Reloadable CharlieCard before you can purchase any LRTA Monthly Passes at these locations:

LRTA GALLAGHER TERMINAL (115 Thorndike Street, Lowell)
All LRTA Monthly Passes can be purchased on the last 5 days of each month until the 18th day of the following month at the following locations:

TICKET VENDING MACHINE (INSIDE LOBBY)
Also Issues Adult CharlieCards.

RIDER INFORMATION BOOTH (KENNEDY CENTER)
Regular Hours: Monday - Friday: 8 AM to 4 PM
Extended Hours last 2 and first 2 business days of each month: Monday - Friday: 6 AM to 6 PM
Also Issues Adult & Student CharlieCards.
To Get Your Student CharlieCard bring a valid Student ID or Class Schedule from your school.

LRTA DISPATCH OFFICE (100 Hale Street, Lowell)
Monday - Friday: 7 AM to 7 PM
Issues Adult & Student CharlieCards.

LOWELL HIGH SCHOOL CAFETERIA
LHS Students can go to the LHS Cafeteria the last and first school day of each month from 10:40 AM to 1:40 PM during the school year. **(YOUR CHARLIECARD IS RELOADABLE)**
Issues Student CharlieCards and Purchase Student Passes

LRTA ROAD RUNNER OFFICE (978-459-0152) (APPOINTMENTS REQUIRED)
113 Thorndike Street, Lowell (Located next to the Kennedy Center)
Monday - Friday: 9 AM to 4 PM
Only Issues Senior CharlieCards & CharlieCards for Persons with Disabilities/TAP.

Monthly Passes cannot be purchased at this location.

To Get Your Senior CharlieCard:
- Bring Photo ID that includes Date of Birth (Must be 60+ years)
- Must Fill Out an Application.
- Senior CharlieCard Registration Fee: $5

To Get Your CharlieCard for Persons with Disabilites/TAP:
- First time applicants for the TAP ID, or applicants with expired TAP ID Cards need to fill out an application.
- The LRTA will process your application within 14 days of receipt.
- Once approved, you will need to bring a photo ID.
- CharlieCard Registration Fee: $5

TO CATCH A BUS...

1 USE AN LRTA DESIGNATED BUS STOP
The bus will pick you up and take you to your destination. Please raise your hand to alert driver.

2 WAVE YOUR HAND ALONG ANY LRTA BUS ROUTE
Simply wave your hand in order to alert the driver to stop. You need to be at a safe location on the same side of the street as the bus. We encourage you to be at a bus stop.

LRTA FARE RATES

BUS FARES

City/Local/Shuttle	Full Fare	$1.25
	Reduced Fare	$ .60
Suburban	Full Fare	$1.85
	Reduced Fare	$ .90

TRANSFERS
REQUEST TRANSFER BEFORE PAYING

- **Issued on Inbound Routes Only**
- **Accepted on Outbound Routes Only**
- **FREE to the Downtown Shuttle Outbound**
- **FREE from the Downtown Shuttle Inbound to Local Routes**

In-Town	Full Fare	$ .25
	Reduced Fare	$ .10
Suburban	Full Fare	$ .50
	Reduced Fare	$ .25

LRTA MONTHLY PASSES
STORED ON YOUR CHARLIECARD
RIDE SYSTEMWIDE UNLIMITED

ADULT PASS for Adult CharlieCard ..... $ 44
STUDENT PASS for Student CharlieCard ..... $ 25
SENIOR PASS for Senior CharlieCard ..... $ 25
PERSONS WITH DISABILITIES PASS
for Persons with Disabilities/TAP CharlieCard ..... $ 25

CHARLIECARD INFORMATION
Stored Value Minimum First Time Purchase: ..... $ 5

Registration Fee for Senior CharlieCards & CharlieCards for Persons with Disabilities: ..... $ 5

LRTA FARE CATEGORIES

FULL FARE **Persons from 13 to 59 Years of Age**
Students: Elementary, Middle and High School students up to and including Grade 12 can purchase an LRTA Monthly Pass at a discounted rate.
Students without the LRTA Monthly Pass pay Full Fare

REDUCED FARE

Senior Citizens	Persons with Disabilities	Children
60 Years of Age or Older with I.D.	With Statewide Transportation Access Pass (TAP) or Medicare Card.	6 to 12 Years of Age

Children 5 and Under Ride Free
Must be accompanied by an adult.

2 WAYS TO GET REAL-TIME BUS INFORMATION

VIEW INTERACTIVE GPS BUS ROUTE MAPS ON YOUR COMPUTER

GET REAL-TIME LRTA BUS STOP ARRIVAL & DEPARTURE TIMES ON YOUR SMART PHONE

FOR MORE DETAILS ABOUT LRTA BUS TRACKER VISIT LRTA.com

Lowell Regional Transit Authority

DAILY BUS SCHEDULES
MONDAY - FRIDAY

EFFECTIVE JUNE 20, 2022

BUS INFORMATION: 978-452-6161
Service updates and changes will be posted on LRTA.com

LRTA
DOWNTOWN SHUTTLE

The LRTA offers a Shuttle between
DOWNTOWN LOWELL (JOHN & MERRIMACK STREETS)
&
ROBERT B. KENNEDY BUS TRANSFER CENTER

Monday - Friday:
5:45 am - 7:00 pm Every 30 minutes
First Shuttle departs Downtown Lowell at 6:00 AM
Last Shuttle departs Downtown Lowell at 7:00 PM

Saturday: 7:15 am - 7:00 pm Every 30 minutes
First Shuttle departs Downtown Lowell at 7:30 AM
Last Shuttle departs Downtown Lowell at 7:00 PM

VEHICLE TRAVEL SPEED DATA

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: EB,

3/23/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	1	4	7	2	2	0	0	0	0	16
1:00	0	0	0	3	0	3	3	2	0	1	0	0	0	12
2:00	0	0	0	0	1	5	4	1	0	0	0	0	0	11
3:00	0	0	0	0	4	1	2	4	0	0	0	0	0	11
4:00	0	0	0	0	2	8	14	6	0	1	0	0	0	31
5:00	0	0	0	0	7	28	46	14	1	0	0	0	0	96
6:00	0	0	0	4	14	87	74	22	5	1	0	0	0	207
7:00	2	0	1	9	62	126	138	28	1	3	1	0	0	371
8:00	1	3	3	12	38	164	178	28	1	0	0	0	0	428
9:00	0	2	0	12	75	168	111	14	2	0	0	0	0	384
10:00	0	0	1	18	63	135	103	25	0	0	0	0	0	345
11:00	0	1	4	11	72	223	119	22	0	0	0	0	0	452
12:00 PM	1	3	13	12	67	187	146	16	0	0	0	0	0	445
1:00	0	2	8	21	70	183	137	20	1	0	0	0	0	442
2:00	0	0	2	6	43	215	164	28	4	2	0	0	0	464
3:00	0	0	3	1	46	228	239	50	1	0	0	0	0	568
4:00	0	0	1	2	22	185	332	67	5	2	0	1	0	617
5:00	0	0	1	3	34	223	327	68	6	0	0	0	0	662
6:00	0	0	0	3	14	145	238	58	6	0	0	0	0	464
7:00	0	0	0	4	27	125	121	39	3	0	0	0	0	319
8:00	0	0	0	0	15	51	89	23	4	1	0	0	0	183
9:00	0	0	0	0	14	57	66	21	2	0	0	0	0	160
10:00	0	0	2	0	2	25	41	16	6	0	0	0	0	92
11:00	0	0	0	0	4	15	28	15	4	1	0	0	0	67
Total	4	11	39	121	697	2591	2727	589	54	12	1	1	0	6847

Percentile	15th	50th	85th	95th
Speed	35	40	44	47

Mean Speed (Average)	39.7
10 MPH Pace Speed	35-44
Number in Pace	5277
Percent in Pace	77.1%
Number > 40 MPH	3384
Percent > 40 MPH	49.4%

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: EB,

3/24/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	8	5	2	3	1	0	0	0	19
1:00	0	0	0	0	3	8	2	1	0	0	0	0	0	14
2:00	0	0	0	0	2	4	2	2	0	0	0	0	0	10
3:00	0	0	0	0	0	3	6	0	2	0	0	0	0	11
4:00	0	0	0	0	3	10	11	2	1	0	0	0	0	27
5:00	0	0	0	0	7	27	30	12	3	0	0	0	0	79
6:00	0	0	0	6	38	92	67	14	0	0	0	0	0	217
7:00	0	0	1	10	43	183	107	17	1	0	0	0	0	362
8:00	0	0	4	29	66	191	105	16	0	1	0	0	0	412
9:00	0	3	1	8	48	139	111	15	1	0	0	0	0	326
10:00	1	1	3	18	67	138	82	12	0	0	0	0	0	322
11:00	0	1	6	12	104	179	93	6	2	0	0	0	0	403
12:00 PM	0	1	8	18	72	198	93	17	1	0	0	0	0	408
1:00	1	1	14	37	56	135	126	18	0	0	0	0	0	388
2:00	0	3	3	10	75	212	118	13	0	0	0	0	0	434
3:00	0	0	0	2	43	216	209	32	2	0	0	0	0	504
4:00	0	1	1	4	58	294	188	33	1	0	0	0	0	580
5:00	0	0	0	0	24	271	255	46	4	0	0	0	0	600
6:00	0	0	0	4	50	210	153	38	2	0	0	0	0	457
7:00	0	0	0	5	24	121	108	23	1	0	0	0	0	282
8:00	0	0	0	6	27	83	85	27	1	0	0	0	0	229
9:00	0	0	1	2	5	49	67	22	2	0	0	0	0	148
10:00	0	0	0	2	6	28	46	16	7	0	0	0	0	105
11:00	0	0	1	0	2	16	20	12	1	1	0	0	0	53
Total	2	11	43	173	823	2815	2089	396	35	3	0	0	0	6390
			Percentile	15th	50th	85th	95th							
			Speed	35	39	43	45							
		Mean Speed (Average)		38.8										
		10 MPH Pace Speed		35-44										
		Number in Pace		4879										
		Percent in Pace		76.4%										
		Number > 40 MPH		2523										
		Percent > 40 MPH		39.5%										
Grand Total	6	22	82	294	1520	5406	4816	985	89	15	1	1	0	13237
Stats			Percentile	15th	50th	85th	95th							
			Speed	35	40	43	46							
		Mean Speed (Average)		39.3										
		10 MPH Pace Speed		35-44										
		Number in Pace		10156										
		Percent in Pace		76.7%										
		Number > 40 MPH		5907										
		Percent > 40 MPH		44.6%										

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: WB,

3/23/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	4	5	5	4	2	0	1	0	0	21
1:00	0	0	0	0	0	2	4	3	1	0	1	1	0	12
2:00	0	0	0	0	1	3	10	4	2	0	0	0	0	20
3:00	0	0	0	1	1	5	1	4	5	2	0	0	0	19
4:00	0	0	0	0	0	6	17	14	5	0	0	0	0	42
5:00	0	0	0	0	1	34	58	37	5	2	1	0	0	138
6:00	0	2	1	0	16	80	153	56	6	0	0	0	0	314
7:00	0	0	2	6	67	206	230	66	7	1	0	0	1	586
8:00	2	2	5	3	59	154	256	84	6	2	0	0	0	573
9:00	8	0	4	6	48	166	161	41	5	0	0	0	0	439
10:00	0	0	5	11	39	125	167	38	6	0	0	0	1	392
11:00	5	6	3	7	44	157	150	11	0	1	0	2	3	389
12:00 PM	2	5	14	7	57	180	150	24	0	0	0	1	0	440
1:00	3	6	3	6	50	144	174	46	2	0	1	0	1	436
2:00	4	6	3	16	60	177	155	25	2	0	0	1	0	449
3:00	1	0	4	5	36	155	255	59	5	0	0	0	0	520
4:00	0	0	3	3	31	157	269	77	5	0	0	0	0	545
5:00	1	0	0	1	7	114	240	87	12	1	0	0	0	463
6:00	0	0	0	6	5	67	191	80	6	0	0	0	0	355
7:00	0	0	0	1	8	88	136	25	3	1	0	0	0	262
8:00	0	0	0	0	3	55	64	31	7	0	1	0	1	162
9:00	0	0	0	0	8	30	44	18	7	1	0	0	0	108
10:00	0	0	0	0	3	23	49	23	1	1	0	0	0	100
11:00	0	0	0	0	1	13	14	8	4	0	0	0	1	41
Total	26	27	47	79	549	2146	2953	865	104	12	5	5	8	6826
			Percentile	15th	50th	85th	95th							
			Speed	36	41	45	48							
		Mean Speed (Average)		40.6										
		10 MPH Pace Speed		35-44										
		Number in Pace		5051										
		Percent in Pace		74.0%										
		Number > 40 MPH		3952										
		Percent > 40 MPH		57.9%										

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: WB,

3/24/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	5	6	4	3	1	1	0	0	20
1:00	0	0	0	0	0	1	7	3	0	0	0	0	0	11
2:00	0	0	0	1	0	5	5	5	1	1	0	0	0	18
3:00	0	0	0	0	2	1	14	3	4	0	0	0	0	24
4:00	0	0	0	1	1	5	23	5	1	0	0	0	0	36
5:00	1	0	0	0	12	39	53	17	5	1	0	0	0	128
6:00	0	1	1	2	28	102	123	37	5	0	0	0	0	299
7:00	1	4	3	8	58	159	194	57	4	1	0	0	0	489
8:00	0	1	3	6	105	216	221	28	2	1	0	0	0	583
9:00	2	1	0	5	34	172	145	25	7	0	0	0	0	391
10:00	0	1	2	6	50	115	138	22	5	0	0	0	0	339
11:00	5	7	1	3	58	140	166	16	2	0	0	0	0	398
12:00 PM	7	2	5	19	44	174	121	22	3	0	0	0	0	397
1:00	4	2	6	14	46	159	117	30	6	0	0	0	1	385
2:00	3	4	8	14	55	125	151	42	1	0	0	0	0	403
3:00	0	0	0	11	27	125	231	38	2	1	0	0	0	435
4:00	0	0	2	1	16	154	199	61	7	0	0	0	0	440
5:00	0	0	0	0	20	125	209	60	2	0	0	0	0	416
6:00	0	0	0	0	5	83	173	58	7	0	0	0	0	326
7:00	0	0	0	1	18	79	100	26	3	1	0	0	0	228
8:00	0	0	0	2	10	82	86	18	5	1	0	0	0	204
9:00	0	0	0	1	11	37	43	14	2	0	0	0	0	108
10:00	0	0	0	1	13	34	39	20	7	0	0	0	0	114
11:00	0	0	1	0	2	21	22	3	1	0	0	0	0	50
Total	23	23	32	96	615	2158	2586	614	85	8	1	0	1	6242
			Percentile	15th	50th	85th	95th							
			Speed	35	40	44	47							
			Mean Speed (Average)	40.0										
			10 MPH Pace Speed	35-44										
			Number in Pace	4705										
			Percent in Pace	75.4%										
			Number > 40 MPH	3295										
			Percent > 40 MPH	52.8%										
Grand Total	49	50	79	175	1164	4304	5539	1479	189	20	6	5	9	13068
Stats			Percentile	15th	50th	85th	95th							
			Speed	36	40	45	47							
			Mean Speed (Average)	40.3										
			10 MPH Pace Speed	35-44										
			Number in Pace	9756										
			Percent in Pace	74.7%										
			Number > 40 MPH	7247										
			Percent > 40 MPH	55.5%										

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: Combined

3/23/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	5	9	12	6	4	0	1	0	0	37
1:00	0	0	0	3	0	5	7	5	1	1	1	1	0	24
2:00	0	0	0	0	2	8	14	5	2	0	0	0	0	31
3:00	0	0	0	1	5	6	3	8	5	2	0	0	0	30
4:00	0	0	0	0	2	14	31	20	5	1	0	0	0	73
5:00	0	0	0	0	8	62	104	51	6	2	1	0	0	234
6:00	0	2	1	4	30	167	227	78	11	1	0	0	0	521
7:00	2	0	3	15	129	332	368	94	8	4	1	0	1	957
8:00	3	5	8	15	97	318	434	112	7	2	0	0	0	1001
9:00	8	2	4	18	123	334	272	55	7	0	0	0	0	823
10:00	0	0	6	29	102	260	270	63	6	0	0	0	1	737
11:00	5	7	7	18	116	380	269	33	0	1	0	2	3	841
12:00 PM	3	8	27	19	124	367	296	40	0	0	0	1	0	885
1:00	3	8	11	27	120	327	311	66	3	0	1	0	1	878
2:00	4	6	5	22	103	392	319	53	6	2	0	1	0	913
3:00	1	0	7	6	82	383	494	109	6	0	0	0	0	1088
4:00	0	0	4	5	53	342	601	144	10	2	0	1	0	1162
5:00	1	0	1	4	41	337	567	155	18	1	0	0	0	1125
6:00	0	0	0	9	19	212	429	138	12	0	0	0	0	819
7:00	0	0	0	5	35	213	257	64	6	1	0	0	0	581
8:00	0	0	0	0	18	106	153	54	11	1	1	0	1	345
9:00	0	0	0	0	22	87	110	39	9	1	0	0	0	268
10:00	0	0	2	0	5	48	90	39	7	1	0	0	0	192
11:00	0	0	0	0	5	28	42	23	8	1	0	0	1	108
Total	30	38	86	200	1246	4737	5680	1454	158	24	6	6	8	13673

Percentile	15th	50th	85th	95th
Speed	36	40	45	47

Mean Speed (Average)	40.2
10 MPH Pace Speed	35-44
Number in Pace	10328
Percent in Pace	75.5%
Number > 40 MPH	7336
Percent > 40 MPH	53.7%

Location : Salem Street 93110001
Location : in front of Shea Concrete
City/State: Wilmington, MA
Direction: Combined

3/24/2022 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	13	11	6	6	2	1	0	0	39
1:00	0	0	0	0	3	9	9	4	0	0	0	0	0	25
2:00	0	0	0	1	2	9	7	7	1	1	0	0	0	28
3:00	0	0	0	0	2	4	20	3	6	0	0	0	0	35
4:00	0	0	0	1	4	15	34	7	2	0	0	0	0	63
5:00	1	0	0	0	19	66	83	29	8	1	0	0	0	207
6:00	0	1	1	8	66	194	190	51	5	0	0	0	0	516
7:00	1	4	4	18	101	342	301	74	5	1	0	0	0	851
8:00	0	1	7	35	171	407	326	44	2	2	0	0	0	995
9:00	2	4	1	13	82	311	256	40	8	0	0	0	0	717
10:00	1	2	5	24	117	253	220	34	5	0	0	0	0	661
11:00	5	8	7	15	162	319	259	22	4	0	0	0	0	801
12:00 PM	7	3	13	37	116	372	214	39	4	0	0	0	0	805
1:00	5	3	20	51	102	294	243	48	6	0	0	0	1	773
2:00	3	7	11	24	130	337	269	55	1	0	0	0	0	837
3:00	0	0	0	13	70	341	440	70	4	1	0	0	0	939
4:00	0	1	3	5	74	448	387	94	8	0	0	0	0	1020
5:00	0	0	0	0	44	396	464	106	6	0	0	0	0	1016
6:00	0	0	0	4	55	293	326	96	9	0	0	0	0	783
7:00	0	0	0	6	42	200	208	49	4	1	0	0	0	510
8:00	0	0	0	8	37	165	171	45	6	1	0	0	0	433
9:00	0	0	1	3	16	86	110	36	4	0	0	0	0	256
10:00	0	0	0	3	19	62	85	36	14	0	0	0	0	219
11:00	0	0	2	0	4	37	42	15	2	1	0	0	0	103
Total	25	34	75	269	1438	4973	4675	1010	120	11	1	0	1	12632
			Percentile	15th	50th	85th	95th							
			Speed	35	40	43	47							
		Mean Speed (Average)		39.4										
		10 MPH Pace Speed		35-44										
		Number in Pace		9583										
		Percent in Pace		75.9%										
		Number > 40 MPH		5818										
		Percent > 40 MPH		46.1%										
Grand Total	55	72	161	469	2684	9710	10355	2464	278	35	7	6	9	26305
Stats			Percentile	15th	50th	85th	95th							
			Speed	35	40	44	47							
		Mean Speed (Average)		39.8										
		10 MPH Pace Speed		35-44										
		Number in Pace		19912										
		Percent in Pace		75.7%										
		Number > 40 MPH		13154										
		Percent > 40 MPH		50.0%										

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington COUNT DATE : 3/23/2022

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 62

MINOR STREET(S) : I-93 SB Ramps

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	339	0	734	891		**1,964**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **21,822**

TOTAL # OF CRASHES : 14 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.80**

CRASH RATE CALCULATION : **0.35** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below MassDOT District/Statewide Crash Rates

Project Title & Date: 9311 - Wilmington: Proposed Warehouse Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington COUNT DATE : 3/23/2022

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 62

MINOR STREET(S) : I-93 NB Ramps

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	577	0	748	676		**2,001**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **22,233**

TOTAL # OF CRASHES : 20 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **4.00**

CRASH RATE CALCULATION : **0.49** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below MassDOT District/Statewide Crash Rates

Project Title & Date: 9311 - Wilmington: Proposed Warehouse Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington | COUNT DATE : 3/23/2022

DISTRICT : 4 | UNSIGNALIZED : | SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Route 62

MINOR STREET(S) : Woburn Street

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	150	204	891	570		**1,815**

" K " FACTOR : **0.090** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **20,167**

TOTAL # OF CRASHES : 18 | # OF YEARS : 5 | AVERAGE # OF CRASHES PER YEAR (**A**) : **3.60**

CRASH RATE CALCULATION : **0.49**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : Below MassDOT District/Statewide Crash Rates

Project Title & Date: 9311 - Wilmington: Proposed Warehouse Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wilmington COUNT DATE : 3/23/2022

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 62

MINOR STREET(S) : West Project Site Driveway

Shea Concrete Driveway

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	0	1	726	534		**1,261**

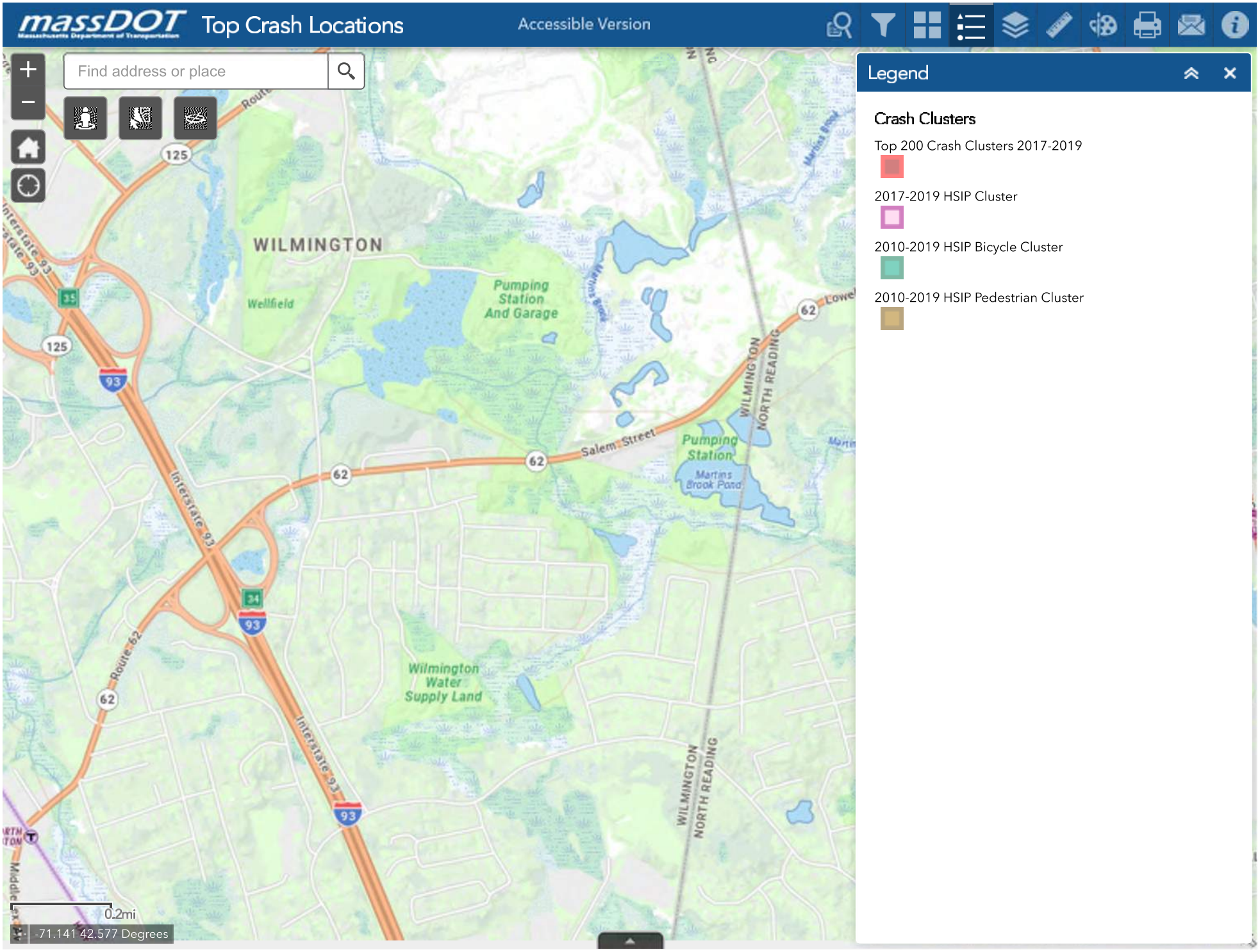
" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **14,011**

TOTAL # OF CRASHES : 5 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : **0.20** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below MassDOT District/Statewide Crash Rates

Project Title & Date: 9311 - Wilmington: Proposed Warehouse Development

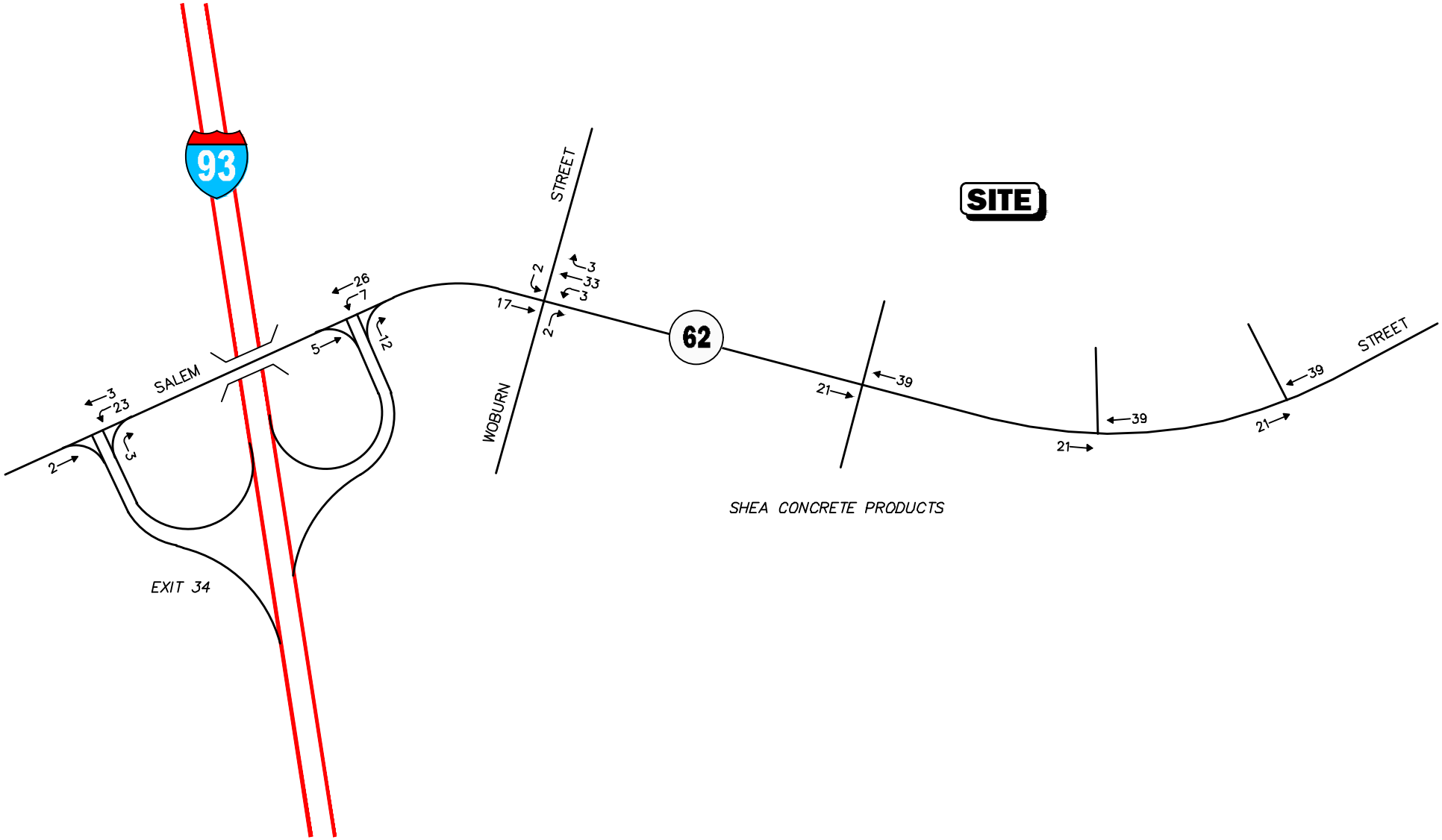

massDOT
Top Crash Locations
Accessible Version
Find address or place
Legend
Crash Clusters
Top 200 Crash Clusters 2017-2019
2017-2019 HSIP Cluster
2010-2019 HSIP Bicycle Cluster
2010-2019 HSIP Pedestrian Cluster
WILMINGTON
Wellfield
Pumping Station And Garage
Salem Street
Pumping Station
Martins Brook Pond
WILMINGTON NORTH READING
Interstate 93
Route 62
Wilmington Water Supply Land
125
93
62
35
34
0.2mi
-71.141 42.577 Degrees

GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth - Daily Traffic Volumes

CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth Rate
Wilmington	I-93	North of RTE. 129		131,000						169,706	169,385	171,418	173,765	**0.79%**
Wilmington	I-93	North of Concord St.	147,345	151,486	148,887	149,934	150,904	131,707	157,568	155,837	155,369	159,483	171,302	**1.80%**
Andover	I-93	North of RTE. 125	134,844	137,116		135,921	136,213	136,495	142,104	145,189	151,255	148,240	151,424	**1.59%**
Andover	ANDOVER BY PASS	South of Route 28	14,051	15,210	15,173	15,312	15008	15,292	15,659	17587	17357	16,906	17,055	**2.05%**
Woburn	Yankee Div. Highway (I-95)	South of I-93		167,000	113,231		168,006	148,731	160,441	175,105	178,801	169,687	175,038	**-3.78%**
Wilmington	Main Street	Wilmington						12,251	12,386	12,547	12,685	12,863	12,914	**1.06%**
Tewksbury	Main Street	South of South Street							12,033	12,189	12,323	12,496	12,546	**1.05%**
Andover	I-93	North of RTE. 133	130,287	126,391			131,816	133,482	119,415	137,886	142,206	135,114	139,986	**0.71%**
Andover	I-495	RTE. I-93	114,291	108,190			113,110	114,378	129,383	120,002	120,842	122,810	124,161	**0.73%**
Andover	I-495	North of I-93	108,363	101,236	104,915	106,340	105,045	101,368	115,962	113,807	114,604	116,470	117,751	**0.97%**
														0.70%

BACKGROUND DEVELOPMENT TRAFFIC VOLUMES NETWORKS



Not To Scale

Figure A-1

104 Lowell Road Condominiums
Weekday Morning
Peak Hour Traffic Volumes

Vanasse & Associates inc

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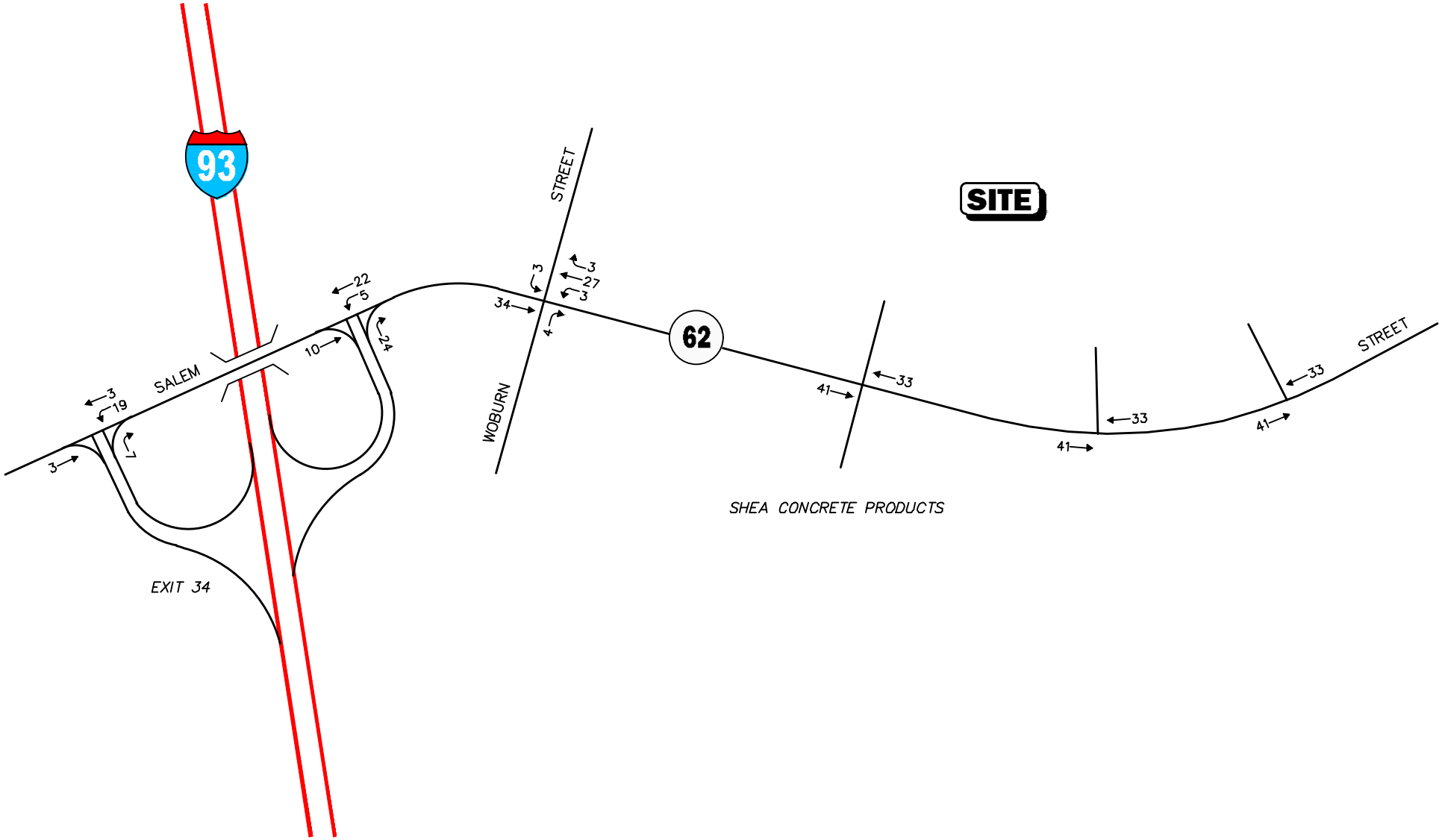

Not To Scale

Figure A-2

104 Lowell Road Condominiums
Weekday Evening Peak Hour
Traffic Volumes

Vanasse & Associates inc

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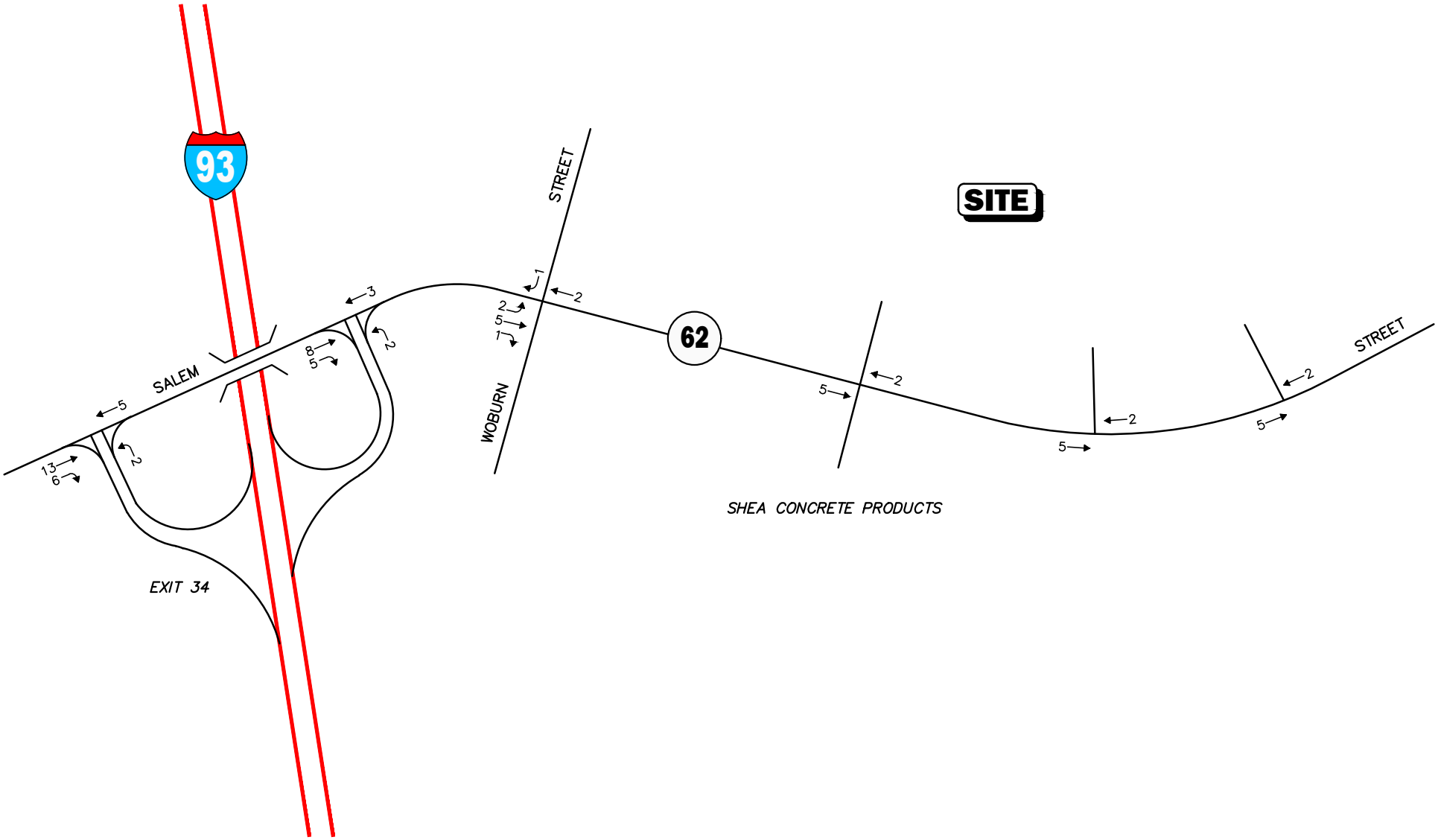

Not To Scale

Figure A-3

Jefferson Road Residential Development
Weekday Morning Peak Hour Traffic Volumes

Vanasse & Associates inc

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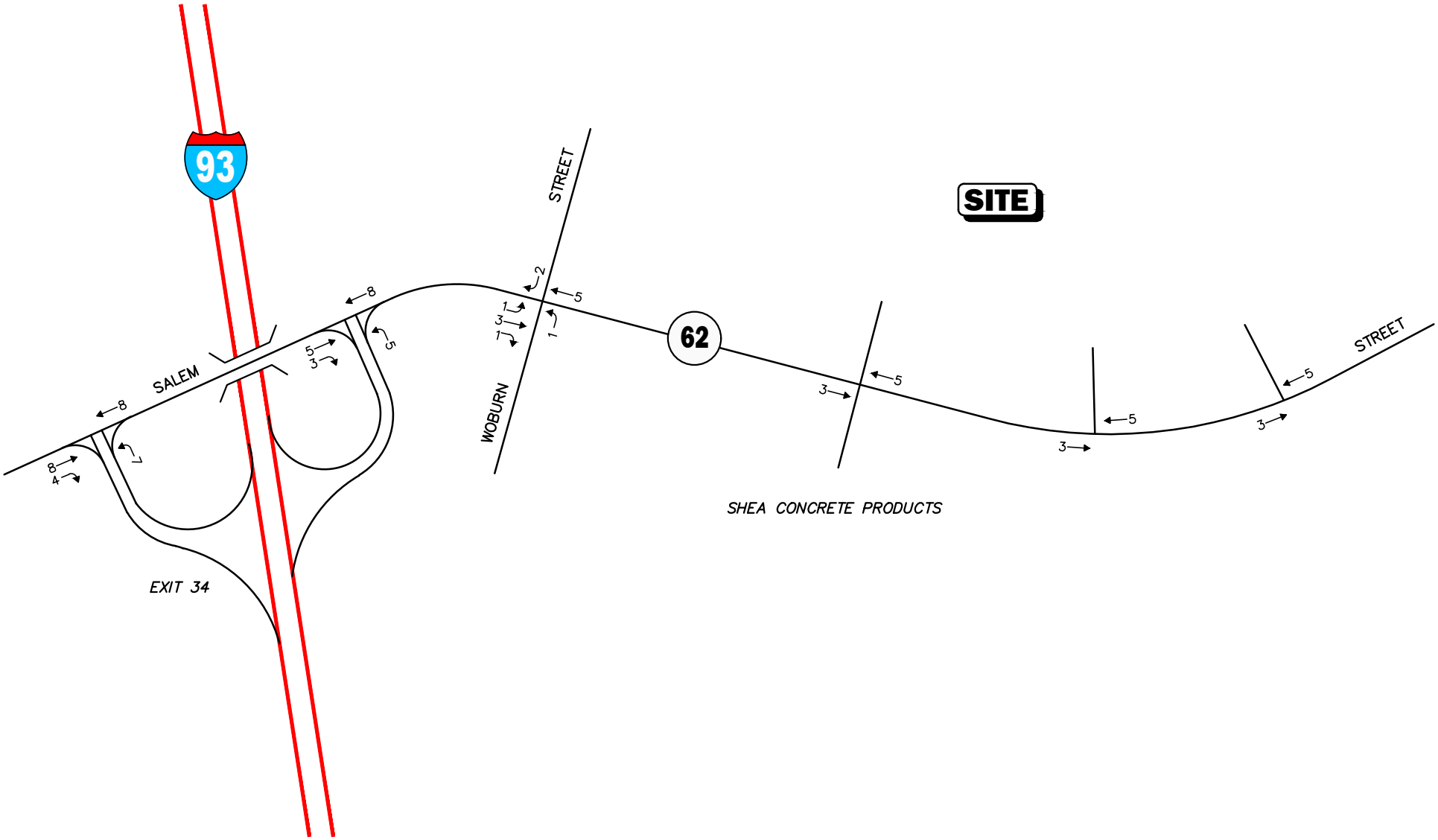
R:\9311\9311NT1.dwg, 7/28/2022 9:05:15 AM



Not To Scale

Figure A-4

Jefferson Road Residential Development
Weekday Evening Peak Hour Traffic Volumes

Vanasse & Associates inc

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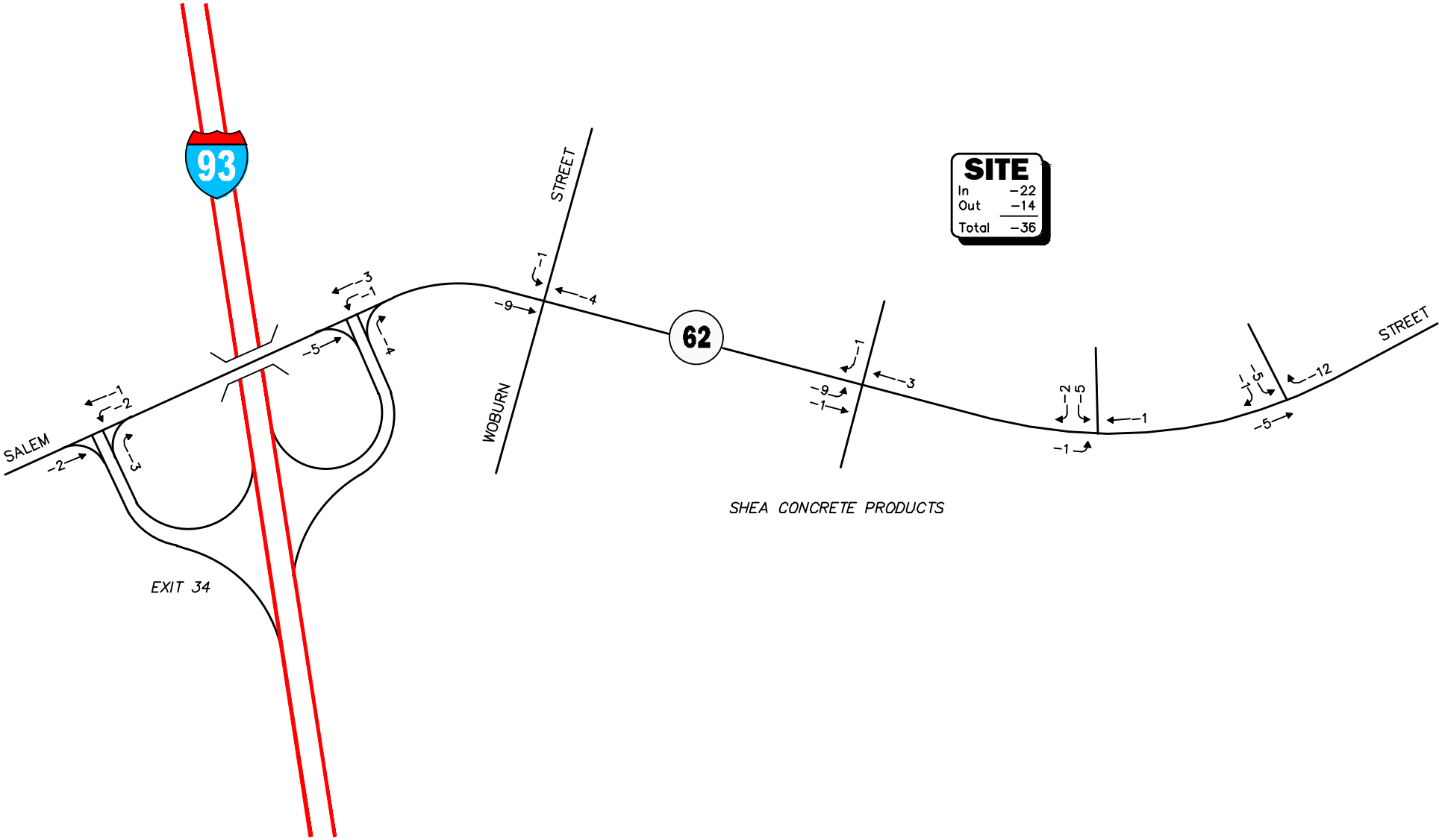
R:\9311\9311NT1.dwg, 7/28/2022 9:03:58 AM



Not To Scale

Figure A-5

Existing Site Trips Removed
Weekday Morning
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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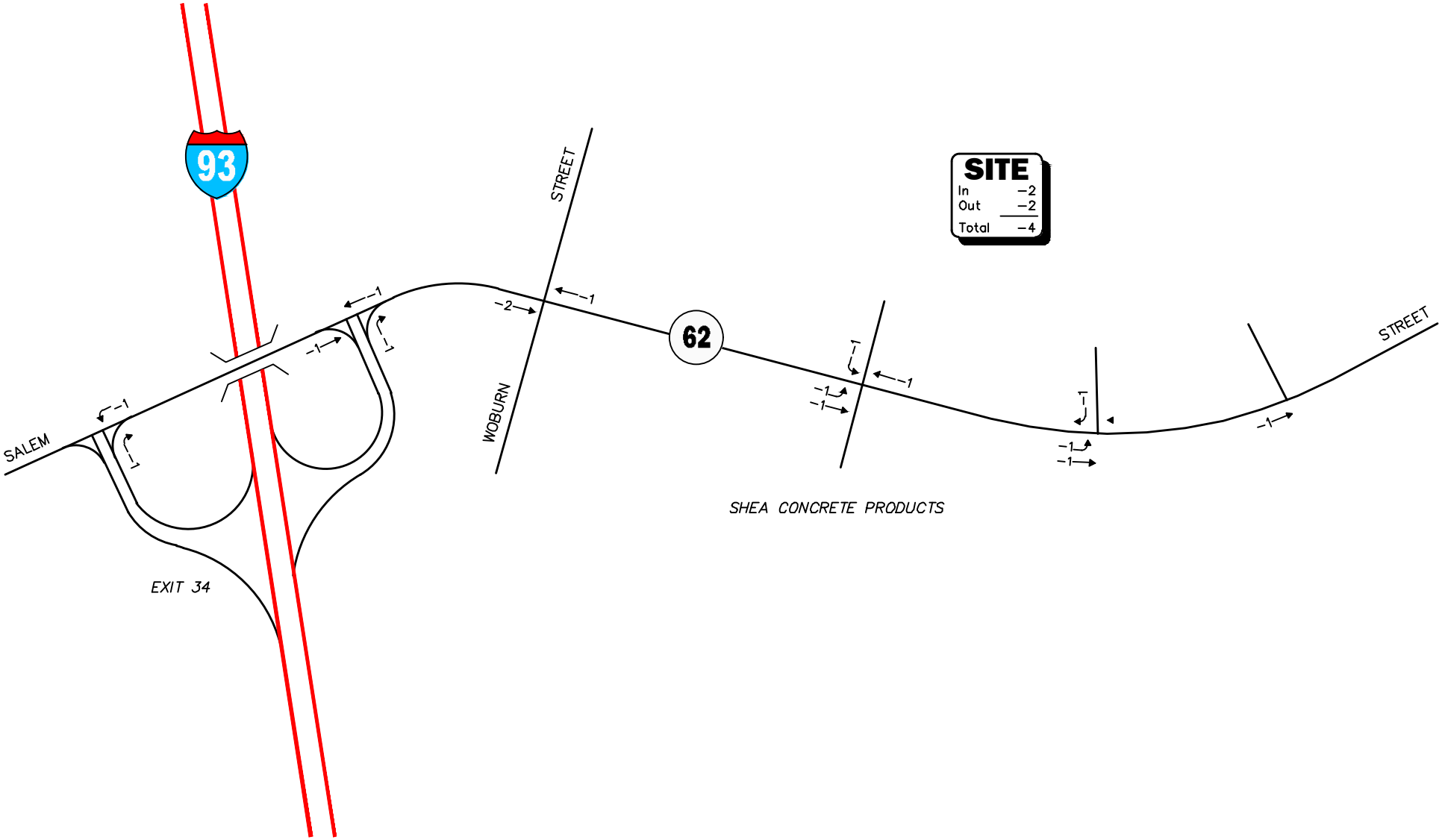
R:\19311\19311NT1.dwg, 7/26/2022 8:47:02 PM



Not To Scale

Figure A-6

Existing Site Trips Removed
Weekday Evening
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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R:\19311\19311NT1.dwg, 7/26/2022 8:51:39 PM

TRIP-GENERATION CALCULATIONS

Graph Look Up

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How to Use ITETripGen
TGM Desk Reference
TGM Appendices
Support Documents
Add Users
Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

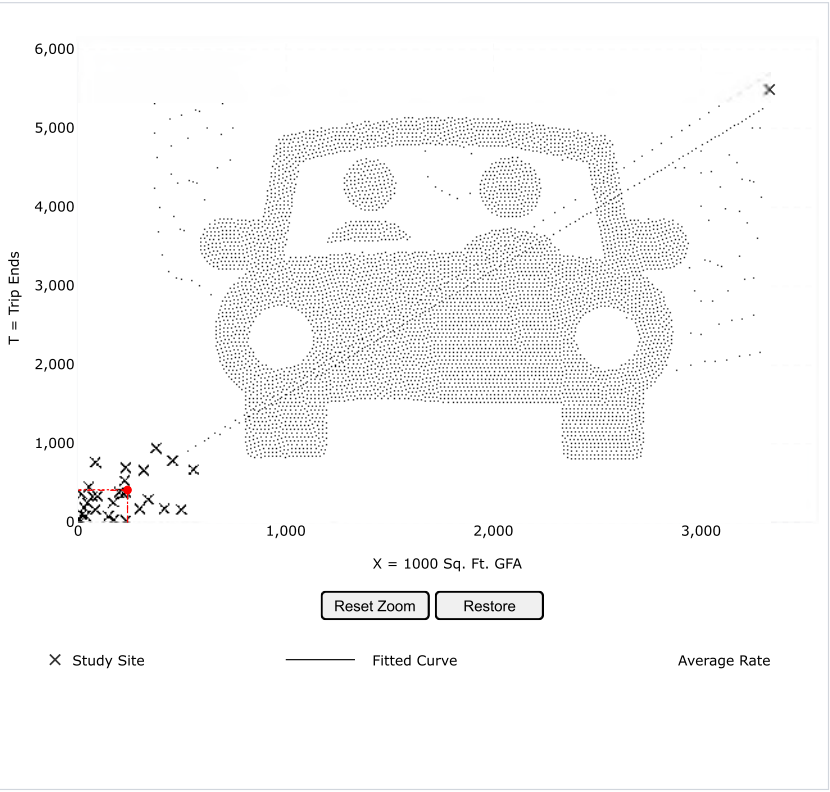
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
237.88 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
31

Avg. 1000 Sq. Ft. GFA:
292

Average Rate:
1.71

Range of Rates:
0.15 - 16.93

Standard Deviation:
1.48

Fitted Curve Equation:
T = 1.58(X) + 38.29

R^2:
0.92

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 407 (Total), 203 (Entry), 204 (Exit)
Fitted Curve: 414 (Total), 207 (Entry), 207 (Exit)

Add-ons to do more
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Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

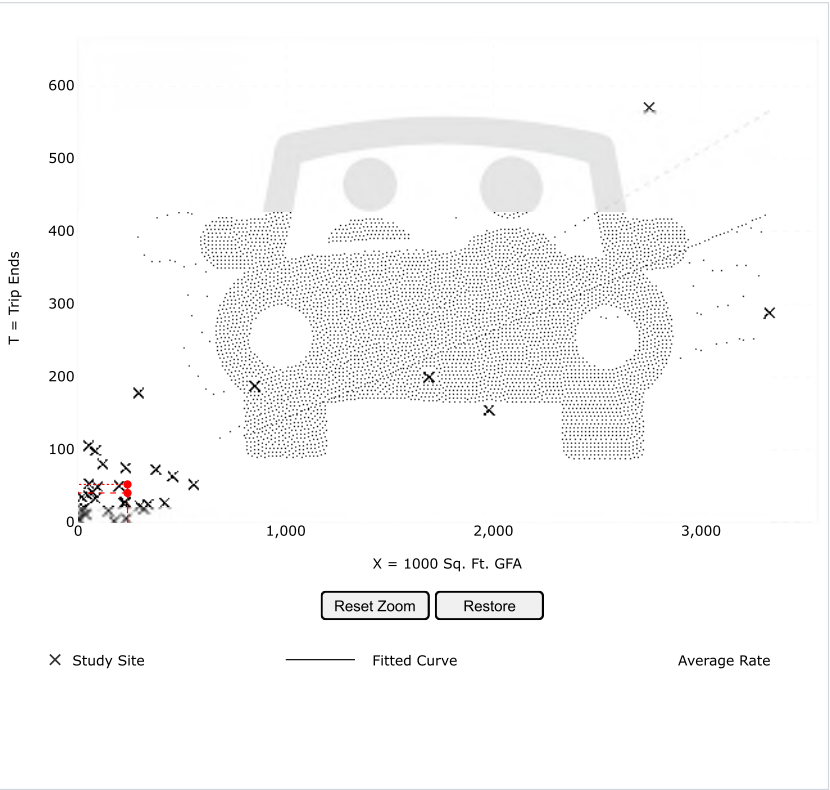
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
237.88
Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
36

Avg. 1000 Sq. Ft. GFA:
448

Average Rate:
0.17

Range of Rates:
0.02 - 1.93

Standard Deviation:
0.19

Fitted Curve Equation:
T = 0.12(X) + 23.62

R^2:
0.69

Directional Distribution:
77% entering, 23% exiting

Calculated Trip Ends:
Average Rate: 40 (Total), 31 (Entry), 9 (Exit)
Fitted Curve: 52 (Total), 40 (Entry), 12 (Exit)

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Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

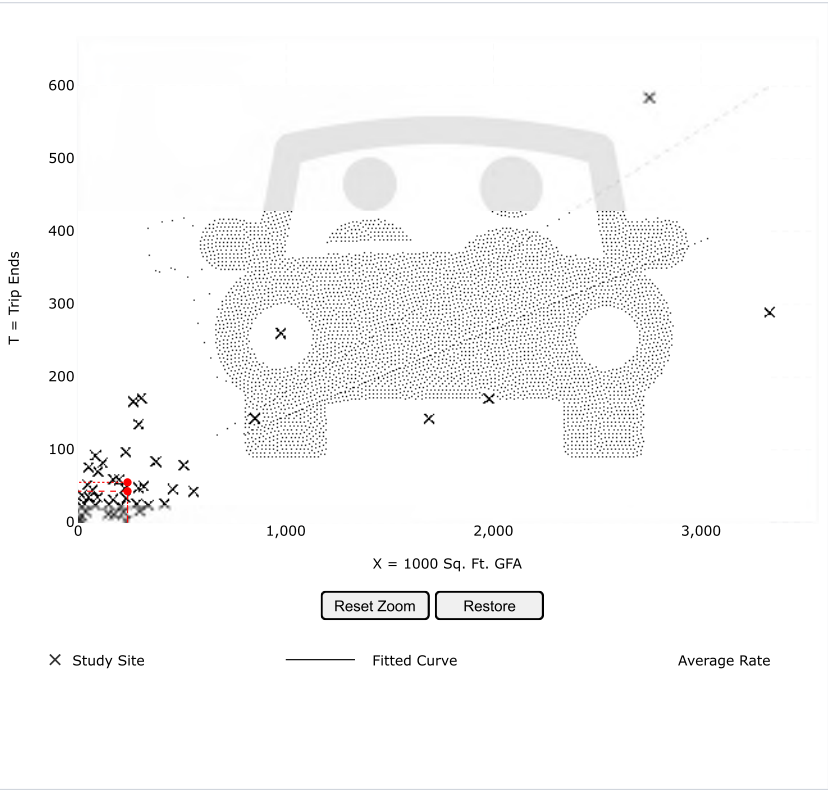
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
237.88
Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
49

Avg. 1000 Sq. Ft. GFA:
400

Average Rate:
0.18

Range of Rates:
0.01 - 1.80

Standard Deviation:
0.18

Fitted Curve Equation:
T = 0.12(X) + 26.48

R^2:
0.65

Directional Distribution:
28% entering, 72% exiting

Calculated Trip Ends:
Average Rate: 43 (Total), 12 (Entry), 31 (Exit)
Fitted Curve: 55 (Total), 15 (Entry), 40 (Exit)

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Support Documents
Add Users
Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

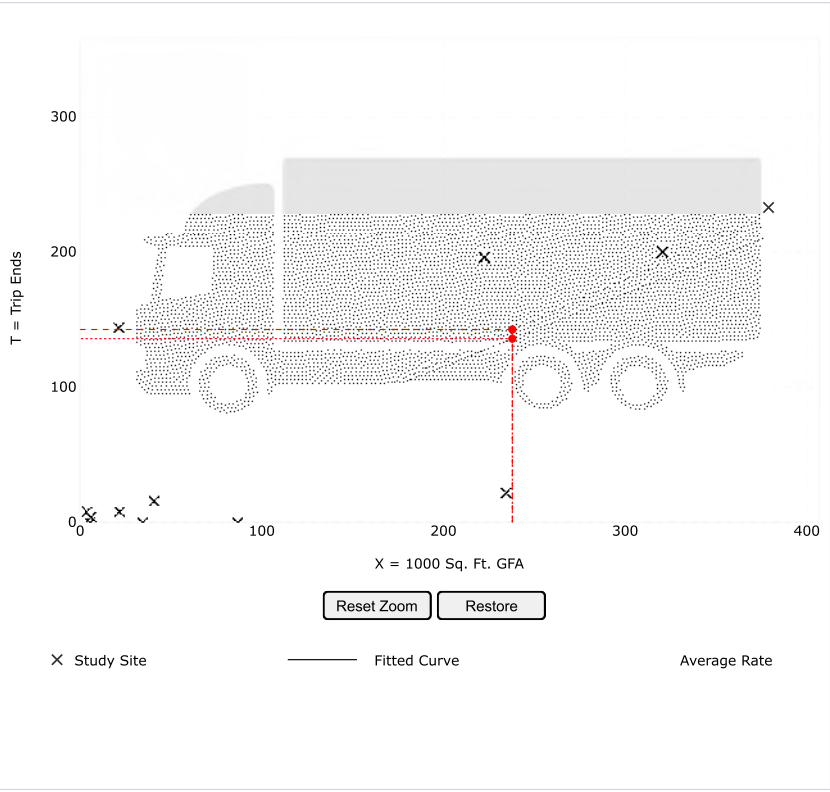
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday

TRIP TYPE:
Truck

ENTER IV VALUE TO CALCULATE TRIPS:
237.88 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Truck

Number of Studies:
12

Avg. 1000 Sq. Ft. GFA:
115

Average Rate:
0.60

Range of Rates:
0.00 - 6.66

Standard Deviation:
0.86

Fitted Curve Equation:
T = 0.54(X) + 7.47

R^2:
0.61

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 143 (Total), 71 (Entry), 72 (Exit)
Fitted Curve: 136 (Total), 68 (Entry), 68 (Exit)

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TGM Appendices
Support Documents
Add Users
Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

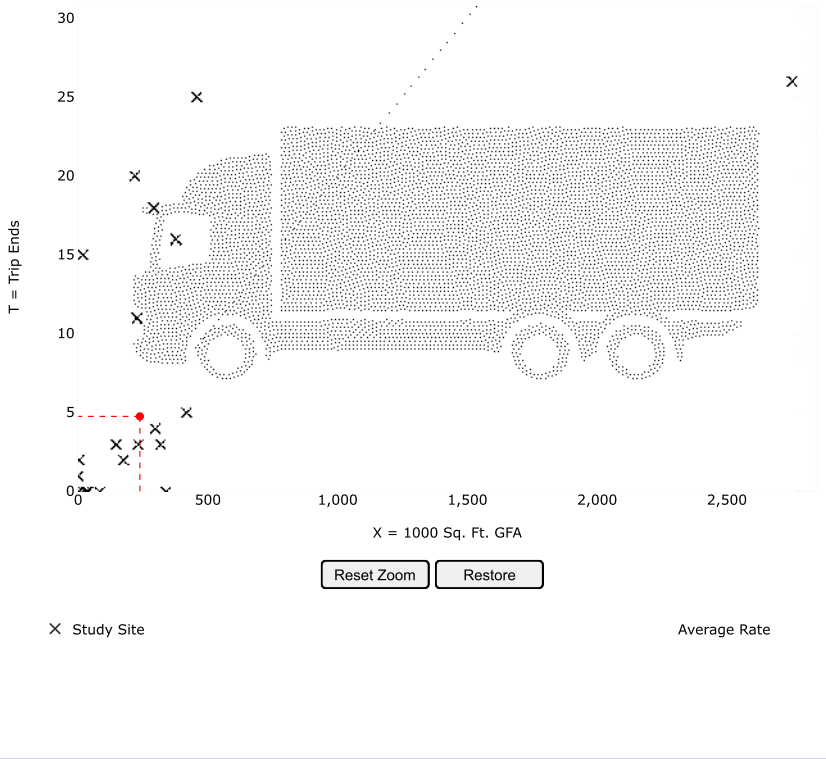
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Truck

ENTER IV VALUE TO CALCULATE TRIPS:
237.88
Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Truck

Number of Studies:
21

Avg. 1000 Sq. Ft. GFA:
309

Average Rate:
0.02

Range of Rates:
0.00 - 0.69

Standard Deviation:
0.05

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
52% entering, 48% exiting

Calculated Trip Ends:
Average Rate: 5 (Total), 2 (Entry), 3 (Exit)

Add-ons to do more
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ITETripGen Web-based App

- Graph Look Up
- How to Use ITETripGen
- TGM Desk Reference
- TGM Appendices
- Support Documents
- Add Users
- Comments

Add-ons to do more

Try OTISS Pro

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 150

LAND USE GROUP: (100-199) Industrial

LAND USE : 150 - Warehousing

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

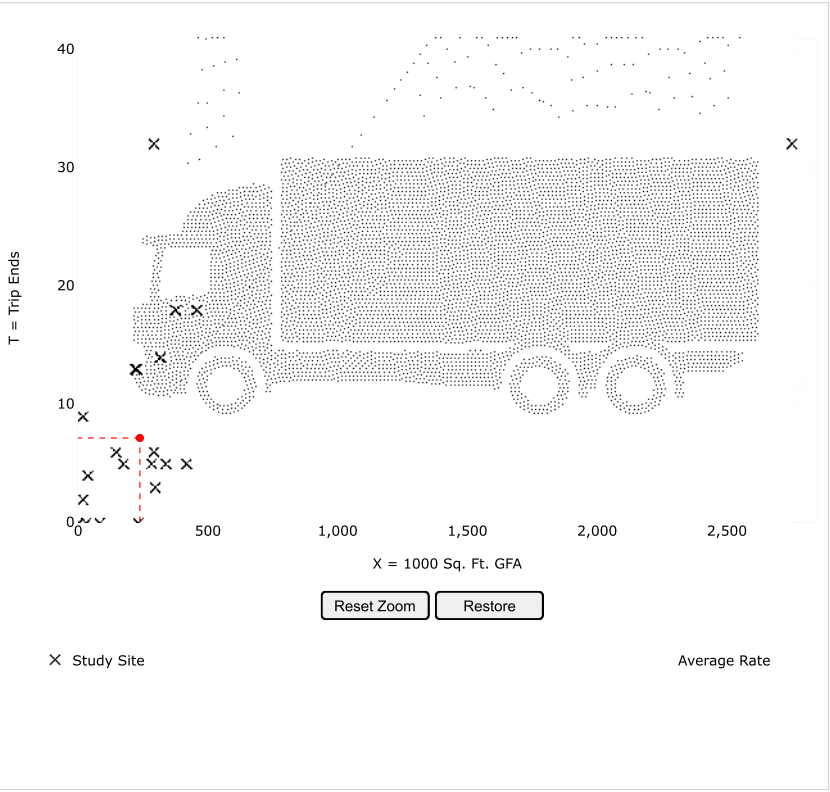
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Truck

ENTER IV VALUE TO CALCULATE TRIPS: 237.88 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Truck

Number of Studies:
23

Avg. 1000 Sq. Ft. GFA:
308

Average Rate:
0.03

Range of Rates:
0.00 - 0.42

Standard Deviation:
0.03

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
52% entering, 48% exiting

Calculated Trip Ends:
Average Rate: 7 (Total), 4 (Entry), 3 (Exit)

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JOURNEY-TO-WORK TRIP DISTRIBUTIONS

Proposed Warehouse
Wilmington, Massachusetts

Residence	Workplace	Number	Route 62 (West)		I-93 (South)		I-93 (North)		Woburn Street (South)		Woburn Street (North)		Route 62 (East)	
Wilmington town	Wilmington town	2,302	50%	1151	10%	230	10%	230	20%	460	10%	230		0
Lowell city	Wilmington town	1,286	25%	322		0	75%	965		0		0		0
Lawrence city	Wilmington town	835		0		0	100%	835		0		0		0
Haverhill city	Wilmington town	728		0		0	75%	546		0	25%	182		0
Tewksbury town	Wilmington town	716	50%	358		0	50%	358		0		0		0
Methuen Town city	Wilmington town	688		0		0	100%	688		0		0		0
Boston city	Wilmington town	616		0	100%	616		0		0		0		0
Woburn city	Wilmington town	591		0	100%	591		0		0		0		0
Billerica town	Wilmington town	534	100%	534		0		0		0		0		0
Andover town	Wilmington town	432		0		0		0		0	50%	216	50%	216
Reading town	Wilmington town	340		0	50%	170		0		0		0	50%	170
Somerville city	Wilmington town	309		0	100%	309		0		0		0		0
Waltham city	Wilmington town	292		0	100%	292		0		0		0		0
North Andover town	Wilmington town	270		0		0	75%	203		0	25%	68		0
Malden city	Wilmington town	266		0	100%	266		0		0		0		0
Lynn city	Wilmington town	257		0	50%	129		0		0		0	50%	129
Chelmsford town	Wilmington town	257		0		0	100%	257		0		0		0
Salem town	Wilmington town	254		0		0	100%	254		0		0		0
Dracut town	Wilmington town	248		0		0	100%	248		0		0		0
Framingham town	Wilmington town	245		0	100%	245		0		0		0		0
Wakefield town	Wilmington town	244		0	50%	122		0		0		0	50%	122
Medford city	Wilmington town	235		0	100%	235		0		0		0		0
Peabody city	Wilmington town	219		0	50%	110		0		0		0	50%	110
Nashua city	Wilmington town	218		0		0	100%	218		0		0		0
Salem city	Wilmington town	205		0	50%	103		0		0		0	50%	103
North Reading town	Wilmington town	202		0		0		0		0		0	100%	202
Melrose city	Wilmington town	194		0	100%	194		0		0		0		0
Marlborough city	Wilmington town	156		0	50%	78	50%	78		0		0		0
Westford town	Wilmington town	154		0		0	100%	154		0		0		0
Revere city	Wilmington town	153		0	100%	153		0		0		0		0
Newton city	Wilmington town	149		0	100%	149		0		0		0		0
Stoneham town	Wilmington town	143		0	100%	143		0		0		0		0
Derry town	Wilmington town	140		0		0	100%	140		0		0		0
Cambridge city	Wilmington town	133		0	100%	133		0		0		0		0
Burlington town	Wilmington town	129	100%	129		0		0		0		0		0
Maynard town	Wilmington town	125		0	75%	94	25%	31		0		0		0
Quincy city	Wilmington town	122		0	100%	122		0		0		0		0
Hampstead town	Wilmington town	122		0		0	100%	122		0		0		0
Lexington town	Wilmington town	121		0	75%	91		0	25%	30		0		0
		14,630		2,494		4,573		5,326		491		696		1,051
				17.0%		31.3%		36.4%		3.4%		4.8%		7.2%
		SAY		**17%**		**31%**		**37%**		**3%**		**5%**		**7%**

PRELIMINARY TRAFFIC SIGNAL WARRANTS ANALYSIS

Vehicle Volumes

		Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
No.	Period	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h
1	07 - 08	0	500	0	309	788	0	107	0	0	0	0	0
2	08 - 09	0	500	0	309	788	0	107	0	0	0	0	0
3	09 - 10	0	0	0	0	0	0	0	0	0	0	0	0
4	10 - 11	0	0	0	0	0	0	0	0	0	0	0	0
5	11 - 12	0	0	0	0	0	0	0	0	0	0	0	0
6	12 - 13	0	0	0	0	0	0	0	0	0	0	0	0
7	13 - 14	0	0	0	0	0	0	0	0	0	0	0	0
8	14 - 15	0	0	0	0	0	0	0	0	0	0	0	0
9	15 - 16	0	0	0	0	0	0	0	0	0	0	0	0
10	16 - 17	0	575	0	223	486	0	255	0	0	0	0	0
11	17 - 18	0	575	0	223	486	0	255	0	0	0	0	0
12	18 - 19	0	0	0	0	0	0	0	0	0	0	0	0

Back

Next

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10:26 AM
7/28/2022

HCS7 Warrants Report

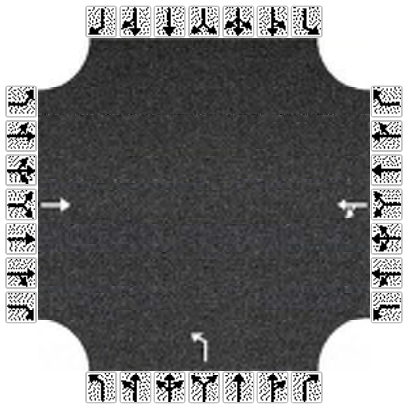
Project Information

Analyst	DCL	Date	7/21/2022
Agency	Vanasse & Associates	Analysis Year	2022
Jurisdiction		Time Period Analyzed	7-9 AM, 4-6 PM
Project Description	Warehouse Development		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	45	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	0	1	0	1	0	0	0	0	0
Lane Usage		T			LT		L					
Vehicle Volumes Averages (veh/h)	0	179	0	88	212	0	60	0	0	0	0	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

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HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
07 - 08	1597	107	1704	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
08 - 09	1597	107	1704	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
09 - 10	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10 - 11	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11 - 12	0	0	0	0	0	No	No	No	No	No	No	No	No	No
12 - 13	0	0	0	0	0	No	No	No	No	No	No	No	No	No
13 - 14	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14 - 15	0	0	0	0	0	No	No	No	No	No	No	No	No	No
15 - 16	0	0	0	0	0	No	No	No	No	No	No	No	No	No
16 - 17	1284	255	1539	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1284	255	1539	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	5762	724	6486	0	0	4	4	4	4	4	0	4	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✔
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
Warrant 3: Peak Hour	✔
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

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Vehicle Volumes

		Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
No.	Period	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h
1	07 - 08	0	427	0	538	357	0	77	0	0	0	0	0
2	08 - 09	0	427	0	538	357	0	77	0	0	0	0	0
3	09 - 10	0	0	0	0	0	0	0	0	0	0	0	0
4	10 - 11	0	0	0	0	0	0	0	0	0	0	0	0
5	11 - 12	0	0	0	0	0	0	0	0	0	0	0	0
6	12 - 13	0	0	0	0	0	0	0	0	0	0	0	0
7	13 - 14	0	0	0	0	0	0	0	0	0	0	0	0
8	14 - 15	0	0	0	0	0	0	0	0	0	0	0	0
9	15 - 16	0	0	0	0	0	0	0	0	0	0	0	0
10	16 - 17	0	493	0	208	533	0	82	0	0	0	0	0
11	17 - 18	0	493	0	208	533	0	82	0	0	0	0	0
12	18 - 19	0	0	0	0	0	0	0	0	0	0	0	0

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HCS7 Warrants Report

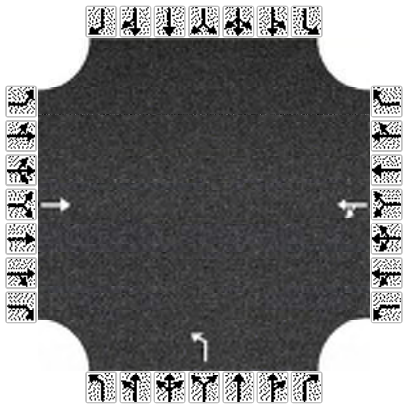
Project Information

Analyst	DCL	Date	7/21/2022
Agency	Vanasse & Associates	Analysis Year	2022
Jurisdiction		Time Period Analyzed	7-9 AM, 4-6 PM
Project Description	Warehouse Development		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	45	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	0	1	0	1	0	0	0	0	0
Lane Usage		T			LT		L					
Vehicle Volumes Averages (veh/h)	0	153	0	124	148	0	26	0	0	0	0	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

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HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
07 - 08	1322	77	1399	0	0	No	No	Yes	Yes	Yes	No	Yes	No	No
08 - 09	1322	77	1399	0	0	No	No	Yes	Yes	Yes	No	Yes	No	No
09 - 10	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10 - 11	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11 - 12	0	0	0	0	0	No	No	No	No	No	No	No	No	No
12 - 13	0	0	0	0	0	No	No	No	No	No	No	No	No	No
13 - 14	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14 - 15	0	0	0	0	0	No	No	No	No	No	No	No	No	No
15 - 16	0	0	0	0	0	No	No	No	No	No	No	No	No	No
16 - 17	1234	82	1316	0	0	No	No	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1234	82	1316	0	0	No	No	Yes	Yes	Yes	No	Yes	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	5112	318	5430	0	0	0	0	4	4	4	0	4	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✔
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
Warrant 3: Peak Hour	✔
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

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CAPACITY ANALYSIS WORKSHEETS

Route 62 at the I-93 Southbound Ramps
Route 62 at the I-93 Northbound Ramps
Route 62 at Woburn Street
Route 62 at the West Project Driveway and Shea Concrete Driveway
Route 62 at the Center Project Driveway
Route 62 at the East Project Driveway

Route 62 at the I-93 Southbound Ramps

Intersection	
Int Delay, s/veh	123.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	423	463	535	356	77	204
Future Vol, veh/h	423	463	535	356	77	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	89	89	94	94
Heavy Vehicles, %	2	0	6	3	7	7
Mvmt Flow	455	498	601	400	82	217

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	455	0	2306	704
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	1602	-
Critical Hdwy	-	-	4.16	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.254	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1085	-	~ 41	429
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	177	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1085	-	~ 12	429
Mov Cap-2 Maneuver	-	-	-	-	~ 12	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	~ 51	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.4	$ 903.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	12	429	-	-	1085	-
HCM Lane V/C Ratio	6.826	0.506	-	-	0.554	-
HCM Control Delay (s)	$ 3240.7	21.7	-	-	12.4	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	11.4	2.8	-	-	3.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	18.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	491	243	193	527	82	257
Future Vol, veh/h	491	243	193	527	82	257
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	0	1	2
Mvmt Flow	546	270	214	586	91	286

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	546	0	1695	681
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	1014	-
Critical Hdwy	-	-	4.1	-	6.41	6.22
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.318
Pot Cap-1 Maneuver	-	-	1033	-	103	450
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1033	-	~ 71	450
Mov Cap-2 Maneuver	-	-	-	-	~ 71	-
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	244	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	92.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	71	450	-	-	1033	-
HCM Lane V/C Ratio	1.283	0.635	-	-	0.208	-
HCM Control Delay (s)	$ 302	25.9	-	-	9.4	0
HCM Lane LOS	F	D	-	-	A	A
HCM 95th %tile Q(veh)	7.2	4.3	-	-	0.8	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	425.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	469	502	597	390	85	222
Future Vol, veh/h	469	502	597	390	85	222
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	89	89	94	94
Heavy Vehicles, %	2	0	6	3	7	7
Mvmt Flow	504	540	671	438	90	236

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	504	0	2554	774
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	1780	-
Critical Hdwy	-	-	4.16	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.254	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1040	-	~ 28	391
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	144	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1040	-	~ 4	391
Mov Cap-2 Maneuver	-	-	-	-	~ 4	-
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	~ 21	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8.8	$ 3201.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	4	391	-	-	1040	-
HCM Lane V/C Ratio	22.606	0.604	-	-	0.645	-
HCM Control Delay (s)	$ 11492.6	27.3	-	-	14.5	0
HCM Lane LOS	F	D	-	-	B	A
HCM 95th %tile Q(veh)	13.3	3.8	-	-	4.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	42.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	539	264	226	581	95	282
Future Vol, veh/h	539	264	226	581	95	282
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	0	1	2
Mvmt Flow	599	293	251	646	106	313

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	1894	746
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	1148	-
Critical Hdwy	-	-	4.1	-	6.41	6.22
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.318
Pot Cap-1 Maneuver	-	-	988	-	~ 77	413
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	304	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	988	-	~ 47	413
Mov Cap-2 Maneuver	-	-	-	-	~ 47	-
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	184	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	218
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	47	413	-	-	988	-
HCM Lane V/C Ratio	2.246	0.759	-	-	0.254	-
HCM Control Delay (s)	$ 756.9	36.4	-	-	9.9	0
HCM Lane LOS	F	E	-	-	A	A
HCM 95th %tile Q(veh)	10.9	6.3	-	-	1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	422.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	473	502	600	391	85	232
Future Vol, veh/h	473	502	600	391	85	232
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	89	89	94	94
Heavy Vehicles, %	2	0	6	3	7	7
Mvmt Flow	509	540	674	439	90	247

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	509	0	2566	779
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	1787	-
Critical Hdwy	-	-	4.16	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.254	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1036	-	~ 28	388
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	143	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1036	-	~ 4	388
Mov Cap-2 Maneuver	-	-	-	-	~ 4	-
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	~ 20	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8.9	$ 3102.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	4	388	-	-	1036	-
HCM Lane V/C Ratio	22.606	0.636	-	-	0.651	-
HCM Control Delay (s)	$ 11492.6	29.1	-	-	14.7	0
HCM Lane LOS	F	D	-	-	B	A
HCM 95th %tile Q(veh)	13.3	4.2	-	-	5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	48.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	541	264	241	587	95	286
Future Vol, veh/h	541	264	241	587	95	286
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	0	1	2
Mvmt Flow	601	293	268	652	106	318

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	601	0	1936	748
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	1188	-
Critical Hdwy	-	-	4.1	-	6.41	6.22
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.318
Pot Cap-1 Maneuver	-	-	986	-	~ 73	412
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	291	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	986	-	~ 42	412
Mov Cap-2 Maneuver	-	-	-	-	~ 42	-
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	167	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	250.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	42	412	-	-	986	-
HCM Lane V/C Ratio	2.513	0.771	-	-	0.272	-
HCM Control Delay (s)	$ 892.6	37.7	-	-	10	0
HCM Lane LOS	F	E	-	-	B	A
HCM 95th %tile Q(veh)	11.4	6.5	-	-	1.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Route 62 at the I-93 Northbound Ramps

Intersection	
Int Delay, s/veh	165.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	486	141	306	784	107	157
Future Vol, veh/h	486	141	306	784	107	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	89	89	92	92
Heavy Vehicles, %	5	8	9	8	3	19
Mvmt Flow	528	153	344	881	116	171

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	528	0	2174	605
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	1569	-
Critical Hdwy	-	-	4.19	-	6.43	6.39
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.281	-	3.527	3.471
Pot Cap-1 Maneuver	-	-	1004	-	~ 51	468
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	187	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1004	-	~ 17	468
Mov Cap-2 Maneuver	-	-	-	-	~ 17	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	~ 62	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	$ 1255.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	17	468	-	-	1004	-
HCM Lane V/C Ratio	6.841	0.365	-	-	0.342	-
HCM Control Delay (s)	$ 3073.6	17	-	-	10.4	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	15.3	1.6	-	-	1.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	183.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	569	179	211	465	255	322
Future Vol, veh/h	569	179	211	465	255	322
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	89	89	96	96
Heavy Vehicles, %	1	2	1	0	0	1
Mvmt Flow	605	190	237	522	266	335

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	605	0	1696	700
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	996	-
Critical Hdwy	-	-	4.11	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	978	-	~ 103	441
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	360	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	~ 68	441
Mov Cap-2 Maneuver	-	-	-	-	~ 68	-
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	~ 237	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	$ 652.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	68	441	-	-	978	-
HCM Lane V/C Ratio	3.906	0.761	-	-	0.242	-
HCM Control Delay (s)	$ 1433.4	34.8	-	-	9.9	0
HCM Lane LOS	F	D	-	-	A	A
HCM 95th %tile Q(veh)	28.2	6.4	-	-	0.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	654.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	535	156	335	870	117	180
Future Vol, veh/h	535	156	335	870	117	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	89	89	92	92
Heavy Vehicles, %	5	8	9	8	3	19
Mvmt Flow	582	170	376	978	127	196

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	582	0	2397	667
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	1730	-
Critical Hdwy	-	-	4.19	-	6.43	6.39
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.281	-	3.527	3.471
Pot Cap-1 Maneuver	-	-	959	-	~ 37	430
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	156	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	959	-	~ 5	430
Mov Cap-2 Maneuver	-	-	-	-	~ 5	-
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	~ 22	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	$ 4906.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	5	430	-	-	959	-
HCM Lane V/C Ratio	25.435	0.455	-	-	0.392	-
HCM Control Delay (s)	$ 12425	20.2	-	-	11.2	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	17.9	2.3	-	-	1.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	320.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	626	195	231	529	278	369
Future Vol, veh/h	626	195	231	529	278	369
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	89	89	96	96
Heavy Vehicles, %	1	2	1	0	0	1
Mvmt Flow	666	207	260	594	290	384

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	666	0	1884	770
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	1114	-
Critical Hdwy	-	-	4.11	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	928	-	~ 79	402
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	317	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	928	-	~ 46	402
Mov Cap-2 Maneuver	-	-	-	-	~ 46	-
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	~ 184	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	$ 1136.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	46	402	-	-	928	-
HCM Lane V/C Ratio	6.295	0.956	-	-	0.28	-
HCM Control Delay (s)	$ 2555.8	66.9	-	-	10.4	0
HCM Lane LOS	F	F	-	-	B	A
HCM 95th %tile Q(veh)	33.7	11	-	-	1.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	811

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	156	338	874	117	191
Future Vol, veh/h	549	156	338	874	117	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	89	89	92	92
Heavy Vehicles, %	5	8	9	8	3	19
Mvmt Flow	597	170	380	982	127	208

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	597	0	2424	682
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	1742	-
Critical Hdwy	-	-	4.19	-	6.43	6.39
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.281	-	3.527	3.471
Pot Cap-1 Maneuver	-	-	946	-	~ 35	422
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	154	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	946	-	~ 4	422
Mov Cap-2 Maneuver	-	-	-	-	~ 4	-
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	~ 18	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	$ 5953.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	4	422	-	-	946	-
HCM Lane V/C Ratio	31.793	0.492	-	-	0.401	-
HCM Control Delay (s)	$ 15636.2	21.5	-	-	11.3	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	18	2.6	-	-	2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	367.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	632	195	243	550	278	374
Future Vol, veh/h	632	195	243	550	278	374
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	89	89	96	96
Heavy Vehicles, %	1	2	1	0	0	1
Mvmt Flow	672	207	273	618	290	390

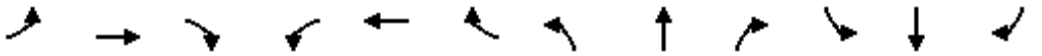
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	672	0	1940	776
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	1164	-
Critical Hdwy	-	-	4.11	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	923	-	~ 73	399
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	300	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	923	-	~ 40	399
Mov Cap-2 Maneuver	-	-	-	-	~ 40	-
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	~ 165	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	$ 1321.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	40	399	-	-	923	-
HCM Lane V/C Ratio	7.24	0.976	-	-	0.296	-
HCM Control Delay (s)	$ 3003.6	71.9	-	-	10.5	0
HCM Lane LOS	F	F	-	-	B	A
HCM 95th %tile Q(veh)	34.4	11.5	-	-	1.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Route 62 at Woburn Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	474	39	16	633	30	69	45	17	17	35	388
Future Volume (vph)	130	474	39	16	633	30	69	45	17	17	35	388
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.983			0.881	
Flt Protected	0.950				0.999			0.974			0.998	
Satd. Flow (prot)	1711	1761	0	0	1718	1561	0	2040	0	0	1707	0
Flt Permitted	0.950				0.982			0.220			0.985	
Satd. Flow (perm)	1711	1761	0	0	1688	1561	0	461	0	0	1685	0
Satd. Flow (RTOR)		6				88		5			260	
Adj. Flow (vph)	148	539	44	17	666	32	86	56	21	19	39	431
Lane Group Flow (vph)	148	583	0	0	683	32	0	163	0	0	489	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.60	0.48			0.80	0.04		1.54			0.85	
Control Delay	50.2	8.0			28.2	0.1		310.7			32.3	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	50.2	8.0			28.2	0.1		310.7			32.3	
Queue Length 50th (ft)	89	138			335	0		~149			149	
Queue Length 95th (ft)	150	194			496	0		#242			#335	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	273	1332			934	903		106			578	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.54	0.44			0.73	0.04		1.54			0.85	

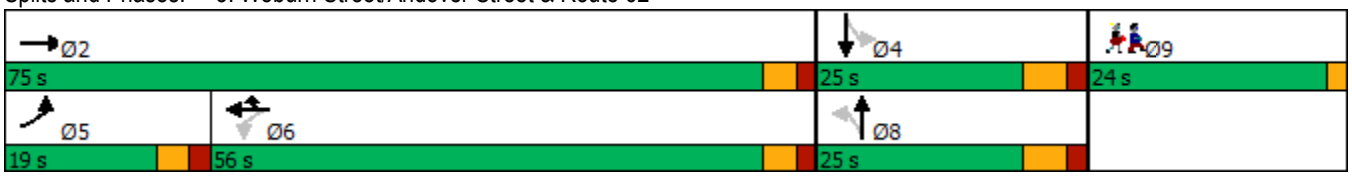
Intersection Summary
Cycle Length: 124

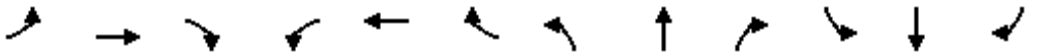
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 94.7
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

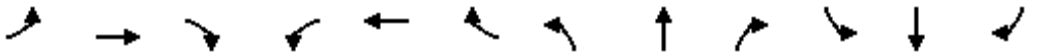




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	474	39	16	633	30	69	45	17	17	35	388
Future Volume (vph)	130	474	39	16	633	30	69	45	17	17	35	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		0.98			0.88	
Flt Protected	0.95	1.00			1.00	1.00		0.97			1.00	
Satd. Flow (prot)	1711	1761			1717	1561		2040			1707	
Flt Permitted	0.95	1.00			0.98	1.00		0.22			0.99	
Satd. Flow (perm)	1711	1761			1688	1561		461			1685	
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	148	539	44	17	666	32	86	56	21	19	39	431
RTOR Reduction (vph)	0	2	0	0	0	16	0	4	0	0	202	0
Lane Group Flow (vph)	148	581	0	0	683	16	0	159	0	0	287	0
Heavy Vehicles (%)	2%	7%	3%	0%	7%	0%	2%	0%	0%	6%	0%	1%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	12.6	64.4			46.8	46.8		19.1			19.1	
Effective Green, g (s)	13.6	65.4			47.8	47.8		21.1			21.1	
Actuated g/C Ratio	0.14	0.69			0.51	0.51		0.22			0.22	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	246	1218			853	789		102			376	
v/s Ratio Prot	c0.09	0.33				0.01						
v/s Ratio Perm					c0.40			c0.35			0.17	
v/c Ratio	0.60	0.48			0.80	0.02		1.56			0.76	
Uniform Delay, d1	37.9	6.7			19.4	11.7		36.7			34.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	4.1	0.3			5.4	0.0		294.1			8.9	
Delay (s)	42.0	7.0			24.8	11.7		330.8			43.3	
Level of Service	D	A			C	B		F			D	
Approach Delay (s)		14.1			24.2			330.8			43.3	
Approach LOS		B			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	94.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	659	81	11	530	29	52	71	27	47	63	94
Future Volume (vph)	151	659	81	11	530	29	52	71	27	47	63	94
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.976			0.938	
Flt Protected	0.950				0.999			0.983			0.989	
Satd. Flow (prot)	1745	1853	0	0	1817	1561	0	2066	0	0	1821	0
Flt Permitted	0.950				0.983			0.756			0.879	
Satd. Flow (perm)	1745	1853	0	0	1788	1561	0	1589	0	0	1619	0
Satd. Flow (RTOR)		8				88		8			30	
Adj. Flow (vph)	159	694	85	11	546	30	63	86	33	52	69	103
Lane Group Flow (vph)	159	779	0	0	557	30	0	182	0	0	224	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.53	0.68			0.79	0.04		0.48			0.55	
Control Delay	43.7	15.3			32.3	0.1		35.5			33.9	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	43.7	15.3			32.3	0.1		35.5			33.9	
Queue Length 50th (ft)	70	211			235	0		70			80	
Queue Length 95th (ft)	#231	595			514	0		194			#265	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	347	1605			1232	1103		448			472	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.46	0.49			0.45	0.03		0.41			0.47	

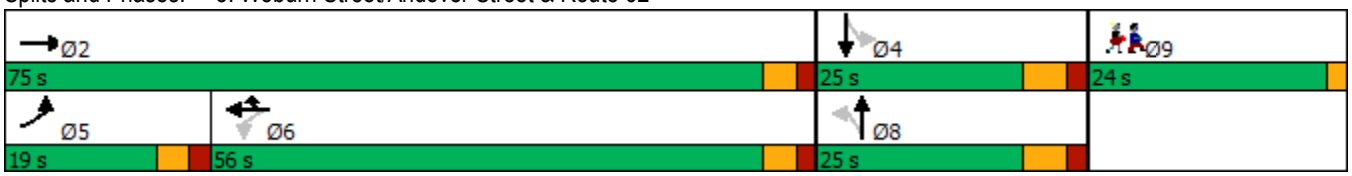
Intersection Summary
Cycle Length: 124

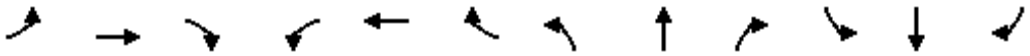
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 81.4
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

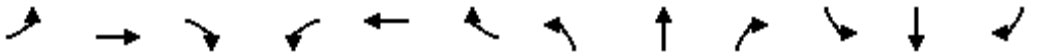




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	659	81	11	530	29	52	71	27	47	63	94
Future Volume (vph)	151	659	81	11	530	29	52	71	27	47	63	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.98			1.00	0.85		0.98			0.94	
Flt Protected	0.95	1.00			1.00	1.00		0.98			0.99	
Satd. Flow (prot)	1745	1852			1817	1561		2065			1820	
Flt Permitted	0.95	1.00			0.98	1.00		0.76			0.88	
Satd. Flow (perm)	1745	1852			1788	1561		1589			1620	
Peak-hour factor, PHF	0.95	0.95	0.95	0.97	0.97	0.97	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	159	694	85	11	546	30	63	86	33	52	69	103
RTOR Reduction (vph)	0	3	0	0	0	18	0	6	0	0	23	0
Lane Group Flow (vph)	159	776	0	0	557	12	0	176	0	0	201	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	12.9	49.2			31.3	31.3		17.1			17.1	
Effective Green, g (s)	13.9	50.2			32.3	32.3		19.1			19.1	
Actuated g/C Ratio	0.17	0.61			0.39	0.39		0.23			0.23	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	295	1131			702	613		369			376	
v/s Ratio Prot	0.09	c0.42				0.01						
v/s Ratio Perm					c0.31			0.11			c0.12	
v/c Ratio	0.54	0.69			0.79	0.02		0.48			0.53	
Uniform Delay, d1	31.2	10.7			22.0	15.3		27.2			27.7	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	1.9	1.7			6.2	0.0		1.0			1.5	
Delay (s)	33.1	12.5			28.2	15.3		28.2			29.1	
Level of Service	C	B			C	B		C			C	
Approach Delay (s)		16.0			27.5			28.2			29.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	531	42	20	714	35	74	48	20	40	126	417
Future Volume (vph)	142	531	42	20	714	35	74	48	20	40	126	417
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.981			0.903	
Flt Protected	0.950				0.999			0.975			0.997	
Satd. Flow (prot)	1711	1761	0	0	1718	1561	0	2038	0	0	1748	0
Flt Permitted	0.950				0.976			0.223			0.963	
Satd. Flow (perm)	1711	1761	0	0	1678	1561	0	466	0	0	1688	0
Satd. Flow (RTOR)		5				88		6			88	
Adj. Flow (vph)	161	603	48	21	752	37	93	60	25	44	140	463
Lane Group Flow (vph)	161	651	0	0	773	37	0	178	0	0	647	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.66	0.52			0.88	0.04		1.73			1.52	
Control Delay	54.2	8.5			34.4	0.1		392.2			270.9	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	54.2	8.5			34.4	0.1		392.2			270.9	
Queue Length 50th (ft)	98	163			418	0		~168			~538	
Queue Length 95th (ft)	162	230			#675	0		#263			#757	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	258	1262			880	860		103			427	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.62	0.52			0.88	0.04		1.73			1.52	

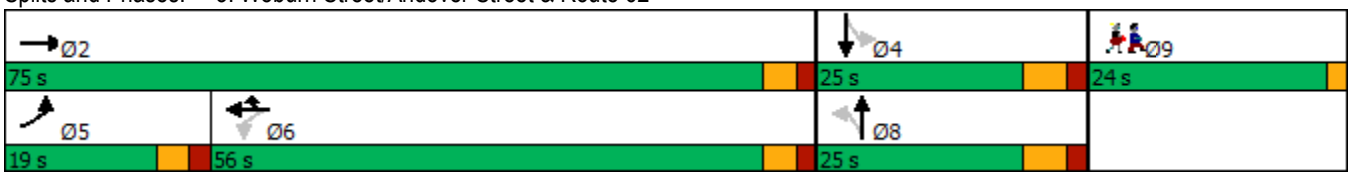
Intersection Summary
Cycle Length: 124

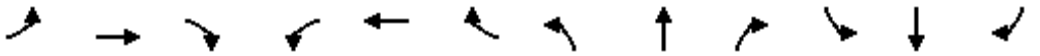
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 99.1
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

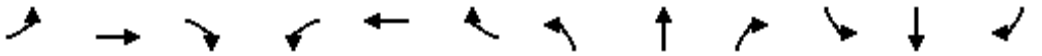




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	531	42	20	714	35	74	48	20	40	126	417
Future Volume (vph)	142	531	42	20	714	35	74	48	20	40	126	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		0.98			0.90	
Flt Protected	0.95	1.00			1.00	1.00		0.97			1.00	
Satd. Flow (prot)	1711	1761			1717	1561		2037			1748	
Flt Permitted	0.95	1.00			0.98	1.00		0.22			0.96	
Satd. Flow (perm)	1711	1761			1679	1561		467			1690	
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	161	603	48	21	752	37	92	60	25	44	140	463
RTOR Reduction (vph)	0	1	0	0	0	18	0	5	0	0	69	0
Lane Group Flow (vph)	161	650	0	0	773	19	0	173	0	0	578	0
Heavy Vehicles (%)	2%	7%	3%	0%	7%	0%	2%	0%	0%	6%	0%	1%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	13.1	69.1			51.0	51.0		19.0			19.0	
Effective Green, g (s)	14.1	70.1			52.0	52.0		21.0			21.0	
Actuated g/C Ratio	0.14	0.71			0.52	0.52		0.21			0.21	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	243	1245			881	819		98			358	
v/s Ratio Prot	c0.09	0.37				0.01						
v/s Ratio Perm					c0.46			c0.37			0.34	
v/c Ratio	0.66	0.52			0.88	0.02		1.77			1.61	
Uniform Delay, d1	40.2	6.7			20.7	11.3		39.0			39.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	6.6	0.4			9.8	0.0		383.7			288.7	
Delay (s)	46.9	7.1			30.6	11.3		422.8			327.8	
Level of Service	D	A			C	B		F			F	
Approach Delay (s)		15.0			29.7			422.8			327.8	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	132.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.973			0.938	
Flt Protected	0.950				0.999			0.983			0.988	
Satd. Flow (prot)	1745	1853	0	0	1817	1561	0	2060	0	0	1820	0
Flt Permitted	0.950				0.973			0.667			0.814	
Satd. Flow (perm)	1745	1853	0	0	1770	1561	0	1397	0	0	1499	0
Satd. Flow (RTOR)		8				88		9			29	
Adj. Flow (vph)	172	795	93	16	654	36	67	92	40	60	75	113
Lane Group Flow (vph)	172	888	0	0	670	36	0	199	0	0	248	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.70	0.71			0.77	0.04		0.68			0.75	
Control Delay	59.4	16.0			29.8	0.1		50.7			50.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	59.4	16.0			29.8	0.1		50.7			50.6	
Queue Length 50th (ft)	105	270			315	0		112			132	
Queue Length 95th (ft)	#256	762			#730	0		#239			#331	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	259	1308			914	848		298			335	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.66	0.68			0.73	0.04		0.67			0.74	

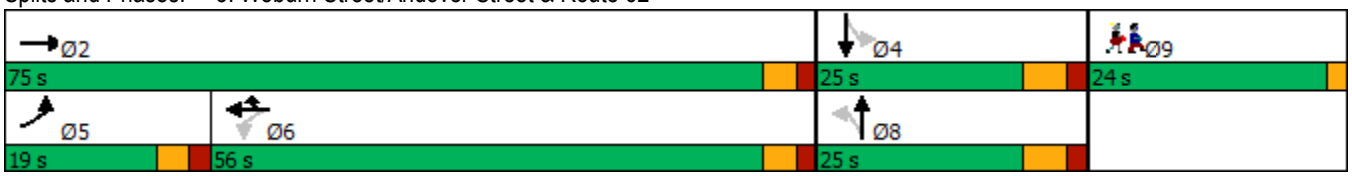
Intersection Summary
Cycle Length: 124

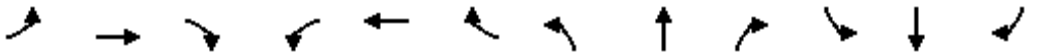
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 102
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

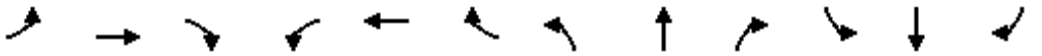




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.98			1.00	0.85		0.97			0.94	
Flt Protected	0.95	1.00			1.00	1.00		0.98			0.99	
Satd. Flow (prot)	1745	1854			1817	1561		2060			1821	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.81	
Satd. Flow (perm)	1745	1854			1770	1561		1397			1501	
Peak-hour factor, PHF	0.95	0.95	0.95	0.97	0.97	0.97	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	172	795	93	16	654	36	67	92	40	60	75	113
RTOR Reduction (vph)	0	3	0	0	0	18	0	7	0	0	23	0
Lane Group Flow (vph)	172	885	0	0	670	18	0	192	0	0	225	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	13.5	67.9			49.4	49.4		19.0			19.0	
Effective Green, g (s)	14.5	68.9			50.4	50.4		21.0			21.0	
Actuated g/C Ratio	0.14	0.67			0.49	0.49		0.20			0.20	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	244	1234			861	760		283			304	
v/s Ratio Prot	0.10	c0.48				0.01						
v/s Ratio Perm					c0.38			0.14			c0.15	
v/c Ratio	0.70	0.72			0.78	0.02		0.68			0.74	
Uniform Delay, d1	42.5	11.1			21.9	13.8		38.1			38.7	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	8.9	2.0			4.5	0.0		6.3			9.1	
Delay (s)	51.4	13.1			26.4	13.8		44.4			47.8	
Level of Service	D	B			C	B		D			D	
Approach Delay (s)		19.3			25.8			44.4			47.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Future Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.980			0.904	
Flt Protected	0.950				0.999			0.975			0.996	
Satd. Flow (prot)	1711	1761	0	0	1718	1561	0	2036	0	0	1748	0
Flt Permitted	0.950				0.976			0.227			0.961	
Satd. Flow (perm)	1711	1761	0	0	1678	1561	0	474	0	0	1686	0
Satd. Flow (RTOR)		5				88		6			87	
Adj. Flow (vph)	161	632	48	21	759	37	93	60	26	46	140	463
Lane Group Flow (vph)	161	680	0	0	780	37	0	179	0	0	649	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.66	0.55			0.89	0.04		1.70			1.53	
Control Delay	54.2	8.8			35.3	0.1		383.2			275.4	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	54.2	8.8			35.3	0.1		383.2			275.4	
Queue Length 50th (ft)	98	176			426	0		~168			~542	
Queue Length 95th (ft)	162	247			#685	0		#263			#762	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	258	1262			880	860		105			425	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.62	0.54			0.89	0.04		1.70			1.53	

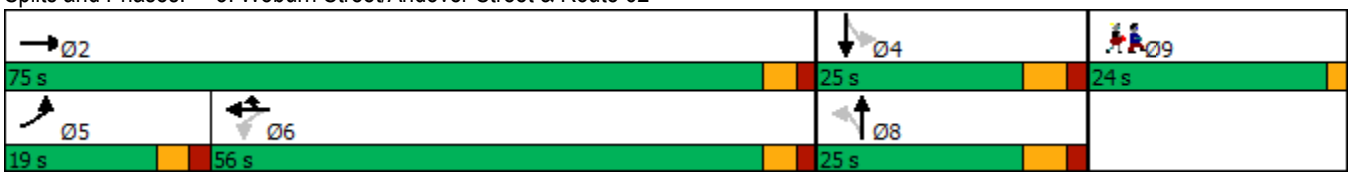
Intersection Summary
Cycle Length: 124

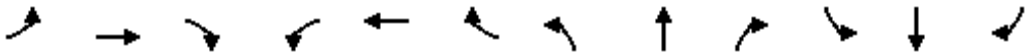
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 99.1
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

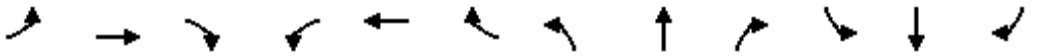




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Future Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		0.98			0.90	
Flt Protected	0.95	1.00			1.00	1.00		0.97			1.00	
Satd. Flow (prot)	1711	1762			1717	1561		2036			1748	
Flt Permitted	0.95	1.00			0.98	1.00		0.23			0.96	
Satd. Flow (perm)	1711	1762			1678	1561		474			1686	
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	161	632	48	21	759	37	92	60	26	46	140	463
RTOR Reduction (vph)	0	1	0	0	0	18	0	5	0	0	69	0
Lane Group Flow (vph)	161	679	0	0	780	19	0	174	0	0	580	0
Heavy Vehicles (%)	2%	7%	3%	0%	7%	0%	2%	0%	0%	6%	0%	1%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	13.1	69.1			51.0	51.0		19.0			19.0	
Effective Green, g (s)	14.1	70.1			52.0	52.0		21.0			21.0	
Actuated g/C Ratio	0.14	0.71			0.52	0.52		0.21			0.21	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	243	1246			880	819		100			357	
v/s Ratio Prot	c0.09	0.39				0.01						
v/s Ratio Perm					c0.46			c0.37			0.34	
v/c Ratio	0.66	0.54			0.89	0.02		1.74			1.63	
Uniform Delay, d1	40.2	6.9			20.9	11.3		39.0			39.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	6.6	0.5			10.7	0.0		372.2			294.2	
Delay (s)	46.9	7.4			31.6	11.3		411.2			333.2	
Level of Service	D	A			C	B		F			F	
Approach Delay (s)		15.0			30.7			411.2			333.2	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	131.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	115.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	36	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	36	56	76	33	55	68	103
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.973			0.938	
Flt Protected	0.950				0.999			0.983			0.988	
Satd. Flow (prot)	1745	1853	0	0	1817	1561	0	2060	0	0	1820	0
Flt Permitted	0.950				0.973			0.667			0.814	
Satd. Flow (perm)	1745	1853	0	0	1770	1561	0	1397	0	0	1499	0
Satd. Flow (RTOR)		8				88		9			29	
Adj. Flow (vph)	172	795	93	16	654	37	67	92	40	60	75	113
Lane Group Flow (vph)	172	888	0	0	670	37	0	199	0	0	248	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		56.0	56.0	56.0	22.5	22.5		22.5	22.5	
Total Split (s)	19.0	75.0		56.0	56.0	56.0	25.0	25.0		25.0	25.0	
Total Split (%)	15.3%	60.5%		45.2%	45.2%	45.2%	20.2%	20.2%		20.2%	20.2%	
Maximum Green (s)	14.0	70.0		51.0	51.0	51.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.70	0.71			0.77	0.05		0.68			0.75	
Control Delay	59.4	16.0			29.8	0.1		50.7			50.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	59.4	16.0			29.8	0.1		50.7			50.6	
Queue Length 50th (ft)	105	270			315	0		112			132	
Queue Length 95th (ft)	#256	762			#730	0		#239			#331	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	259	1308			914	848		298			335	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.66	0.68			0.73	0.04		0.67			0.74	

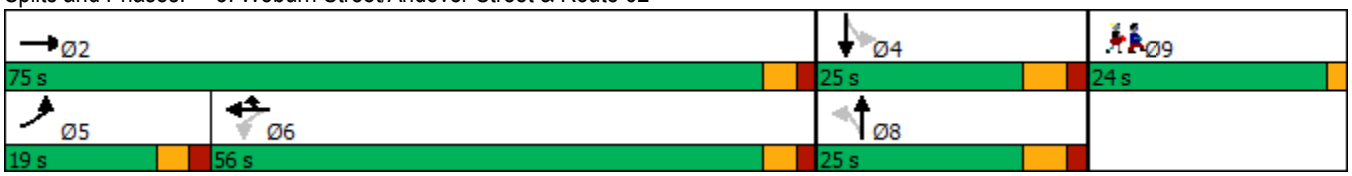
Intersection Summary
Cycle Length: 124

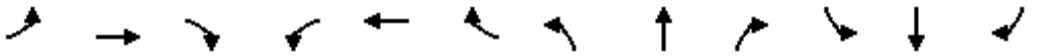
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 102
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

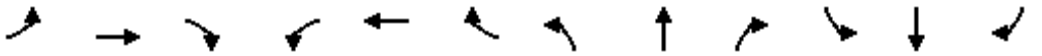




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	36	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	36	56	76	33	55	68	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.98			1.00	0.85		0.97			0.94	
Flt Protected	0.95	1.00			1.00	1.00		0.98			0.99	
Satd. Flow (prot)	1745	1854			1817	1561		2060			1821	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.81	
Satd. Flow (perm)	1745	1854			1770	1561		1397			1501	
Peak-hour factor, PHF	0.95	0.95	0.95	0.97	0.97	0.97	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	172	795	93	16	654	37	67	92	40	60	75	113
RTOR Reduction (vph)	0	3	0	0	0	19	0	7	0	0	23	0
Lane Group Flow (vph)	172	885	0	0	670	18	0	192	0	0	225	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	13.5	67.9			49.4	49.4		19.0			19.0	
Effective Green, g (s)	14.5	68.9			50.4	50.4		21.0			21.0	
Actuated g/C Ratio	0.14	0.67			0.49	0.49		0.20			0.20	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	244	1234			861	760		283			304	
v/s Ratio Prot	0.10	c0.48				0.01						
v/s Ratio Perm					c0.38			0.14			c0.15	
v/c Ratio	0.70	0.72			0.78	0.02		0.68			0.74	
Uniform Delay, d1	42.5	11.1			21.9	13.8		38.1			38.7	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	8.9	2.0			4.5	0.0		6.3			9.1	
Delay (s)	51.4	13.1			26.4	13.8		44.4			47.8	
Level of Service	D	B			C	B		D			D	
Approach Delay (s)		19.3			25.7			44.4			47.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Future Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.980			0.904	
Flt Protected	0.950				0.999			0.975			0.996	
Satd. Flow (prot)	1711	1761	0	0	1718	1561	0	2036	0	0	1748	0
Flt Permitted	0.087				0.975			0.360			0.965	
Satd. Flow (perm)	157	1761	0	0	1677	1561	0	752	0	0	1693	0
Satd. Flow (RTOR)		4				91		7			102	
Adj. Flow (vph)	161	632	48	21	759	37	93	60	26	46	140	463
Lane Group Flow (vph)	161	680	0	0	780	37	0	179	0	0	649	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	11.0	11.0		11.0	11.0	
Total Split (s)	10.0	60.0		50.0	50.0	50.0	36.0	36.0		36.0	36.0	
Total Split (%)	8.3%	50.0%		41.7%	41.7%	41.7%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	5.0	55.0		45.0	45.0	45.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.86	0.66			0.97	0.05		0.70			1.03	
Control Delay	54.2	17.4			51.4	0.1		43.8			71.1	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	54.2	17.4			51.4	0.1		43.8			71.1	
Queue Length 50th (ft)	44	260			446	0		91			~381	
Queue Length 95th (ft)	#151	369			#707	0		147			#597	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	188	1028			803	795		255			632	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.86	0.66			0.97	0.05		0.70			1.03	

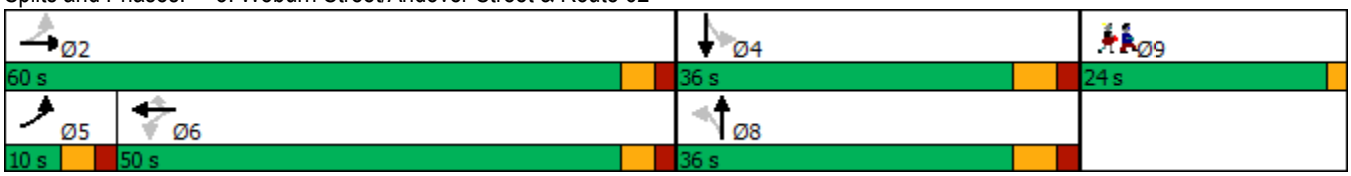
Intersection Summary
Cycle Length: 120

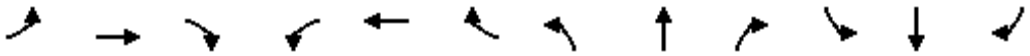
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 96
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62

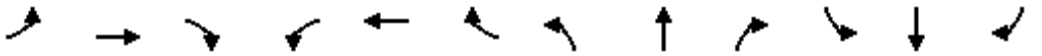




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Future Volume (vph)	142	556	42	20	721	35	74	48	21	41	126	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.99			1.00	0.85		0.98			0.90	
Flt Protected	0.95	1.00			1.00	1.00		0.97			1.00	
Satd. Flow (prot)	1711	1762			1717	1561		2036			1748	
Flt Permitted	0.09	1.00			0.98	1.00		0.36			0.97	
Satd. Flow (perm)	157	1762			1677	1561		753			1694	
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	161	632	48	21	759	37	92	60	26	46	140	463
RTOR Reduction (vph)	0	2	0	0	0	19	0	5	0	0	68	0
Lane Group Flow (vph)	161	678	0	0	780	18	0	174	0	0	581	0
Heavy Vehicles (%)	2%	7%	3%	0%	7%	0%	2%	0%	0%	6%	0%	1%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	55.0	55.0			45.0	45.0		30.0			30.0	
Effective Green, g (s)	56.0	56.0			46.0	46.0		32.0			32.0	
Actuated g/C Ratio	0.58	0.58			0.48	0.48		0.33			0.33	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	188	1027			803	747		251			564	
v/s Ratio Prot	c0.05	0.39										
v/s Ratio Perm	0.44				c0.47	0.01		0.23			c0.34	
v/c Ratio	0.86	0.66			0.97	0.02		0.69			1.03	
Uniform Delay, d1	19.8	13.6			24.4	13.2		27.8			32.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	29.7	1.6			24.8	0.0		8.1			45.8	
Delay (s)	49.5	15.2			49.1	13.2		35.8			77.8	
Level of Service	D	B			D	B		D			E	
Approach Delay (s)		21.7			47.5			35.8			77.8	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	115.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.973			0.938	
Flt Protected	0.950				0.999			0.983			0.988	
Satd. Flow (prot)	1745	1853	0	0	1817	1561	0	2060	0	0	1820	0
Flt Permitted	0.950				0.974			0.665			0.814	
Satd. Flow (perm)	1745	1853	0	0	1772	1561	0	1393	0	0	1499	0
Satd. Flow (RTOR)		8				95		9			31	
Adj. Flow (vph)	172	795	93	16	654	36	67	92	40	60	75	113
Lane Group Flow (vph)	172	888	0	0	670	36	0	199	0	0	248	0
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	22.5		10.0	10.0	10.0	11.0	11.0		11.0	11.0	
Total Split (s)	19.0	68.0		49.0	49.0	49.0	23.0	23.0		23.0	23.0	
Total Split (%)	16.5%	59.1%		42.6%	42.6%	42.6%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	14.0	63.0		44.0	44.0	44.0	17.0	17.0		17.0	17.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0			-1.0	-1.0		-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.67	0.71			0.79	0.05		0.69			0.76	
Control Delay	53.5	16.0			30.7	0.1		49.0			48.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	
Total Delay	53.5	16.0			30.7	0.1		49.0			48.6	
Queue Length 50th (ft)	93	247			299	0		101			118	
Queue Length 95th (ft)	#232	#766			#725	0		#233			#317	
Internal Link Dist (ft)		487			500			289			273	
Turn Bay Length (ft)	350					85						
Base Capacity (vph)	279	1267			850	798		289			328	
Starvation Cap Reductn	0	0			0	0		0			0	
Spillback Cap Reductn	0	0			0	0		0			0	
Storage Cap Reductn	0	0			0	0		0			0	
Reduced v/c Ratio	0.62	0.70			0.79	0.05		0.69			0.76	

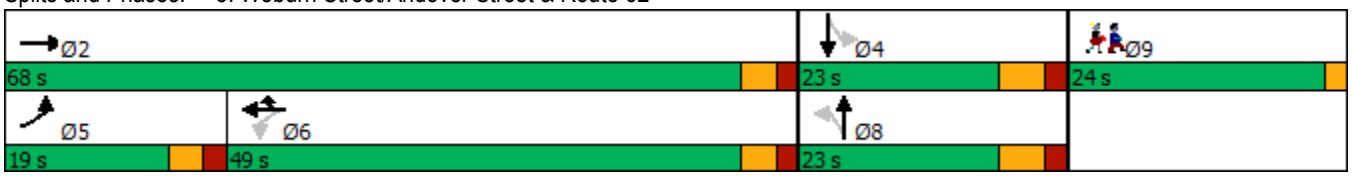
Intersection Summary
Cycle Length: 115

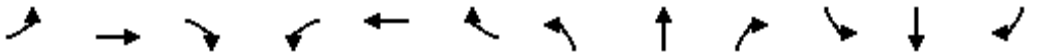
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	21%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 94.7
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Woburn Street/Andover Street & Route 62





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Future Volume (vph)	163	755	88	16	634	35	56	76	33	55	68	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	16	16	16	13	13	13
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.98			1.00	0.85		0.97			0.94	
Flt Protected	0.95	1.00			1.00	1.00		0.98			0.99	
Satd. Flow (prot)	1745	1854			1817	1561		2060			1821	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.81	
Satd. Flow (perm)	1745	1854			1771	1561		1393			1501	
Peak-hour factor, PHF	0.95	0.95	0.95	0.97	0.97	0.97	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	172	795	93	16	654	36	67	92	40	60	75	113
RTOR Reduction (vph)	0	3	0	0	0	19	0	7	0	0	25	0
Lane Group Flow (vph)	172	885	0	0	670	17	0	192	0	0	223	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA	Prot	Perm	NA		Perm	NA	
Protected Phases	5	2			6	6		8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)	13.0	62.5			44.5	44.5		17.2			17.2	
Effective Green, g (s)	14.0	63.5			45.5	45.5		19.2			19.2	
Actuated g/C Ratio	0.15	0.66			0.47	0.47		0.20			0.20	
Clearance Time (s)	5.0	5.0			5.0	5.0		6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	253	1222			836	737		277			299	
v/s Ratio Prot	0.10	c0.48				0.01						
v/s Ratio Perm					c0.38			0.14			c0.15	
v/c Ratio	0.68	0.72			0.80	0.02		0.69			0.75	
Uniform Delay, d1	39.0	10.7			21.6	13.5		35.8			36.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	7.1	2.2			5.6	0.0		7.3			9.7	
Delay (s)	46.1	12.9			27.1	13.6		43.1			46.0	
Level of Service	D	B			C	B		D			D	
Approach Delay (s)		18.3			26.4			43.1			46.0	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	96.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Route 62 at the West Project Driveway and Shea Concrete Driveway

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	9	467	4	2	640	0	2	0	4	0	0	1
Future Vol, veh/h	9	467	4	2	640	0	2	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	50	50	50	25	25	25
Heavy Vehicles, %	38	8	0	50	7	0	50	0	0	0	0	100
Mvmt Flow	10	525	4	2	681	0	4	0	8	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	681	0	0	529	0	0	1234	1232	527	1236	1234	681
Stage 1	-	-	-	-	-	-	547	547	-	685	685	-
Stage 2	-	-	-	-	-	-	687	685	-	551	549	-
Critical Hdwy	4.48	-	-	4.6	-	-	7.6	6.5	6.2	7.1	6.5	7.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.542	-	-	2.65	-	-	3.95	4	3.3	3.5	4	4.2
Pot Cap-1 Maneuver	764	-	-	834	-	-	123	179	555	154	178	318
Stage 1	-	-	-	-	-	-	445	521	-	441	451	-
Stage 2	-	-	-	-	-	-	368	451	-	522	520	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	764	-	-	834	-	-	119	175	555	149	174	318
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	175	-	149	174	-
Stage 1	-	-	-	-	-	-	437	511	-	433	449	-
Stage 2	-	-	-	-	-	-	362	449	-	505	510	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	20.1	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	250	764	-	-	834	-	-	318
HCM Lane V/C Ratio	0.048	0.013	-	-	0.003	-	-	0.013
HCM Control Delay (s)	20.1	9.8	0	-	9.3	0	-	16.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	725	0	0	534	0	0	0	0	1	0	0
Future Vol, veh/h	1	725	0	0	534	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	90	90	90	25	25	25	25	25	25
Heavy Vehicles, %	38	8	0	50	7	0	50	0	0	0	0	100
Mvmt Flow	1	763	0	0	593	0	0	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	593	0	0	763	0	0	1358	1358	763	1358	1358	593
Stage 1	-	-	-	-	-	-	765	765	-	593	593	-
Stage 2	-	-	-	-	-	-	593	593	-	765	765	-
Critical Hdwy	4.48	-	-	4.6	-	-	7.6	6.5	6.2	7.1	6.5	7.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.542	-	-	2.65	-	-	3.95	4	3.3	3.5	4	4.2
Pot Cap-1 Maneuver	829	-	-	670	-	-	100	150	408	127	150	363
Stage 1	-	-	-	-	-	-	331	415	-	496	497	-
Stage 2	-	-	-	-	-	-	418	497	-	399	415	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	829	-	-	670	-	-	100	150	408	127	150	363
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	150	-	127	150	-
Stage 1	-	-	-	-	-	-	330	414	-	495	497	-
Stage 2	-	-	-	-	-	-	418	497	-	398	414	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	34.3
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	829	-	-	670	-	-	127
HCM Lane V/C Ratio	-	0.001	-	-	-	-	-	0.031
HCM Control Delay (s)	0	9.3	0	-	0	-	-	34.3
HCM Lane LOS	A	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	9	527	4	2	727	0	2	0	4	0	0	1
Future Vol, veh/h	9	527	4	2	727	0	2	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	50	50	50	25	25	25
Heavy Vehicles, %	38	8	0	50	7	0	50	0	0	0	0	100
Mvmt Flow	10	592	4	2	773	0	4	0	8	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	596	0	0	1393	1391	594	1395	1393	773
Stage 1	-	-	-	-	-	-	614	614	-	777	777	-
Stage 2	-	-	-	-	-	-	779	777	-	618	616	-
Critical Hdwy	4.48	-	-	4.6	-	-	7.6	6.5	6.2	7.1	6.5	7.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.542	-	-	2.65	-	-	3.95	4	3.3	3.5	4	4.2
Pot Cap-1 Maneuver	702	-	-	784	-	-	94	143	509	120	143	277
Stage 1	-	-	-	-	-	-	406	486	-	393	410	-
Stage 2	-	-	-	-	-	-	325	410	-	480	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	702	-	-	784	-	-	91	139	509	116	139	277
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	139	-	116	139	-
Stage 1	-	-	-	-	-	-	397	476	-	385	408	-
Stage 2	-	-	-	-	-	-	319	408	-	463	475	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	24	18.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	201	702	-	-	784	-	-	277
HCM Lane V/C Ratio	0.06	0.014	-	-	0.003	-	-	0.014
HCM Control Delay (s)	24	10.2	0	-	9.6	0	-	18.2
HCM Lane LOS	C	B	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	821	0	0	611	0	0	0	0	1	0	0
Future Vol, veh/h	1	821	0	0	611	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	90	90	90	25	25	25	25	25	25
Heavy Vehicles, %	38	8	0	50	7	0	50	0	0	0	0	100
Mvmt Flow	1	864	0	0	679	0	0	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	679	0	0	864	0	0	1545	1545	864	1545	1545	679
Stage 1	-	-	-	-	-	-	866	866	-	679	679	-
Stage 2	-	-	-	-	-	-	679	679	-	866	866	-
Critical Hdwy	4.48	-	-	4.6	-	-	7.6	6.5	6.2	7.1	6.5	7.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.542	-	-	2.65	-	-	3.95	4	3.3	3.5	4	4.2
Pot Cap-1 Maneuver	766	-	-	609	-	-	73	116	357	94	116	319
Stage 1	-	-	-	-	-	-	289	373	-	445	454	-
Stage 2	-	-	-	-	-	-	372	454	-	351	373	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	766	-	-	609	-	-	73	116	357	94	116	319
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	116	-	94	116	-
Stage 1	-	-	-	-	-	-	288	372	-	444	454	-
Stage 2	-	-	-	-	-	-	372	454	-	350	372	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	45
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	766	-	-	609	-	-	94
HCM Lane V/C Ratio	-	0.001	-	-	-	-	-	0.043
HCM Control Delay (s)	0	9.7	0	-	0	-	-	45
HCM Lane LOS	A	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	538	4	2	727	1	2	0	4	0	0	8
Future Vol, veh/h	25	538	4	2	727	1	2	0	4	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	94	94	92	50	92	50	92	92	92
Heavy Vehicles, %	2	8	0	50	7	2	50	2	0	2	2	2
Mvmt Flow	27	604	4	2	773	1	4	0	8	0	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	774	0	0	608	0	0	1442	1438	606	1442	1440	774
Stage 1	-	-	-	-	-	-	660	660	-	778	778	-
Stage 2	-	-	-	-	-	-	782	778	-	664	662	-
Critical Hdwy	4.12	-	-	4.6	-	-	7.6	6.52	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.65	-	-	3.95	4.018	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	842	-	-	775	-	-	86	133	501	110	133	398
Stage 1	-	-	-	-	-	-	382	460	-	389	407	-
Stage 2	-	-	-	-	-	-	324	407	-	450	459	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	775	-	-	81	126	501	104	126	398
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	126	-	104	126	-
Stage 1	-	-	-	-	-	-	364	438	-	370	405	-
Stage 2	-	-	-	-	-	-	315	405	-	422	437	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	25.9	14.2
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	842	-	-	775	-	-	398
HCM Lane V/C Ratio	0.065	0.032	-	-	0.003	-	-	0.022
HCM Control Delay (s)	25.9	9.4	0	-	9.7	0	-	14.2
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	823	0	0	621	0	0	0	0	1	0	26
Future Vol, veh/h	11	823	0	0	621	0	0	0	0	1	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	90	90	92	25	92	25	92	92	92
Heavy Vehicles, %	2	8	0	50	7	2	50	2	0	0	0	2
Mvmt Flow	12	866	0	0	690	0	0	0	0	1	0	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	690	0	0	866	0	0	1594	1580	866	1580	1580	690
Stage 1	-	-	-	-	-	-	890	890	-	690	690	-
Stage 2	-	-	-	-	-	-	704	690	-	890	890	-
Critical Hdwy	4.12	-	-	4.6	-	-	7.6	6.52	6.2	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.65	-	-	3.95	4.018	3.3	3.5	4	3.318
Pot Cap-1 Maneuver	905	-	-	608	-	-	67	109	356	89	110	445
Stage 1	-	-	-	-	-	-	279	361	-	439	449	-
Stage 2	-	-	-	-	-	-	360	446	-	340	364	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	905	-	-	608	-	-	62	106	356	87	107	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	106	-	87	107	-
Stage 1	-	-	-	-	-	-	272	352	-	428	449	-
Stage 2	-	-	-	-	-	-	337	446	-	331	355	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	15.1
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	905	-	-	608	-	-	386
HCM Lane V/C Ratio	-	0.013	-	-	-	-	-	0.076
HCM Control Delay (s)	0	9	0	-	0	-	-	15.1
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Route 62 at the Center Project Driveway

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	470	640	0	5	2
Future Vol, veh/h	1	470	640	0	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	97	97	44	44
Heavy Vehicles, %	0	7	7	0	0	0
Mvmt Flow	1	516	660	0	11	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	660	0	-	0	1178	660
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	518	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	938	-	-	-	213	467
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	938	-	-	-	213	467
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	938	-	-	-	252
HCM Lane V/C Ratio	0.001	-	-	-	0.063
HCM Control Delay (s)	8.8	0	-	-	20.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	725	533	0	0	1
Future Vol, veh/h	1	725	533	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	95	95	25	25
Heavy Vehicles, %	0	7	7	0	0	0
Mvmt Flow	1	815	561	0	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	561	0	-	0	1378	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	817	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1020	-	-	-	161	531
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1020	-	-	-	161	531
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	438	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1020	-	-	-	531
HCM Lane V/C Ratio	0.001	-	-	-	0.008
HCM Control Delay (s)	8.5	0	-	-	11.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	530	727	0	5	2
Future Vol, veh/h	1	530	727	0	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	97	97	44	44
Heavy Vehicles, %	0	7	7	0	0	0
Mvmt Flow	1	582	749	0	11	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	749	0	-	0	1333	749
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	584	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	869	-	-	-	172	415
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	561	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	869	-	-	-	172	415
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	23.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	869	-	-	-	207
HCM Lane V/C Ratio	0.001	-	-	-	0.077
HCM Control Delay (s)	9.1	0	-	-	23.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	821	610	0	0	1
Future Vol, veh/h	1	821	610	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	95	95	25	25
Heavy Vehicles, %	0	7	7	0	0	0
Mvmt Flow	1	922	642	0	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	642	0	-	0	1566	642
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	924	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	952	-	-	-	124	478
Stage 1	-	-	-	-	528	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	952	-	-	-	124	478
Mov Cap-2 Maneuver	-	-	-	-	124	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	390	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	952	-	-	-	478
HCM Lane V/C Ratio	0.001	-	-	-	0.008
HCM Control Delay (s)	8.8	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Route 62 at the East Project Driveway

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	475	639	12	5	1
Future Vol, veh/h	0	475	639	12	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	97	97	38	38
Heavy Vehicles, %	0	7	7	45	60	0
Mvmt Flow	0	522	659	12	13	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	671	0	-	0	1187	665
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	4.1	-	-	-	7	6.2
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.2	-	-	-	4.04	3.3
Pot Cap-1 Maneuver	929	-	-	-	160	464
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	929	-	-	-	160	464
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	493	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	26.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	929	-	-	-	180
HCM Lane V/C Ratio	-	-	-	-	0.088
HCM Control Delay (s)	0	-	-	-	26.9
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	725	533	0	0	0
Future Vol, veh/h	0	725	533	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	95	95	25	25
Heavy Vehicles, %	0	7	7	45	60	0
Mvmt Flow	0	815	561	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	561	0	-	0	1376	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	815	-
Critical Hdwy	4.1	-	-	-	7	6.2
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.2	-	-	-	4.04	3.3
Pot Cap-1 Maneuver	1020	-	-	-	120	531
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1020	-	-	-	120	531
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	350	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1020	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	535	726	12	5	1
Future Vol, veh/h	0	535	726	12	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	97	97	38	38
Heavy Vehicles, %	0	7	7	45	60	0
Mvmt Flow	0	588	748	12	13	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	760	0	-	0	1342	754
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	588	-
Critical Hdwy	4.1	-	-	-	7	6.2
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.2	-	-	-	4.04	3.3
Pot Cap-1 Maneuver	861	-	-	-	127	412
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	457	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	861	-	-	-	127	412
Mov Cap-2 Maneuver	-	-	-	-	127	-
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	457	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	861	-	-	-	144
HCM Lane V/C Ratio	-	-	-	-	0.11
HCM Control Delay (s)	0	-	-	-	33.1
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	821	610	0	0	0
Future Vol, veh/h	0	821	610	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	95	95	25	25
Heavy Vehicles, %	0	7	7	45	60	0
Mvmt Flow	0	922	642	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	642	0	-	0	1564	642
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	922	-
Critical Hdwy	4.1	-	-	-	7	6.2
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.2	-	-	-	4.04	3.3
Pot Cap-1 Maneuver	952	-	-	-	90	478
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	308	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	952	-	-	-	90	478
Mov Cap-2 Maneuver	-	-	-	-	90	-
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	308	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	952	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	530	727	2	1	3
Future Vol, veh/h	12	530	727	2	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	91	97	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	13	582	749	2	1	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	751	0	-	0	1358	750
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	608	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	858	-	-	-	164	411
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	543	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	858	-	-	-	160	411
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	858	-	-	-	295
HCM Lane V/C Ratio	0.015	-	-	-	0.015
HCM Control Delay (s)	9.3	0	-	-	17.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	821	610	1	2	11
Future Vol, veh/h	3	821	610	1	2	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	95	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	3	922	642	1	2	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	643	0	-	0	1571	643
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	928	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	942	-	-	-	122	473
Stage 1	-	-	-	-	523	-
Stage 2	-	-	-	-	385	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	942	-	-	-	121	473
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	385	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	942	-	-	-	327
HCM Lane V/C Ratio	0.003	-	-	-	0.043
HCM Control Delay (s)	8.8	0	-	-	16.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

MEMORANDUM

TO: Ms. Andrea Lathrop
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Administrator
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FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
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Professional Engineer in CT, MA, ME, NH, RI and VA

DATE: May 4, 2020

RE: 8520

SUBJECT: Transportation Impact Assessment
Proposed Multifamily Residential Development – Jefferson Road
Wilmington, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development that is to be located off Middlesex Avenue (Route 62) and Jefferson Road in Wilmington, Massachusetts (hereafter referred to as the "Project"). This assessment provides an existing conditions context for the Project in relation to the transportation infrastructure and evaluates the following specific areas: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and qualitatively evaluates the potential impact of the Project along Middlesex Avenue and at major intersections located along this roadway through which Project-related traffic will travel.

This assessment was prepared in consultation with the Town of Wilmington and was performed in general accordance with the MassDOT *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Professions. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] and after applying appropriate adjustments to account for resident use of alternative modes of transportation, including commuter rail services available from North Wilmington Station which is immediately adjacent to the Project site, the Project is expected to generate approximately 490 vehicle trips on an average weekday (two-way, 24-hour volume), with 33 vehicle trips expected during the weekday morning peak-hour and 43 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with traffic volume increases outside of the immediate proximity of the Project site predicted to be less than one (1) added vehicle every 3-4 minutes during the peak hours. In fact, the Project represents an

[1] *Trip Generation*, 10th Edition; Institute of Transportation Engineers; Washington, DC; 2017.

increase in traffic of less than 5 percent along Middlesex Avenue, which is well within the normal fluctuation in traffic volumes that occurs between Monday and Friday over the course of a typical week;

3. No apparent safety deficiencies were noted with respect to the motor vehicle crash history along Middlesex Avenue in the vicinity of the Project site; and

4. Lines of sight at the Project site driveway intersections with Middlesex Avenue and Jefferson Road and at the Middlesex Avenue/Jefferson Road intersection were found to meet, exceed or could be made to meet or exceed the recommended minimum distances for safe operation based on the appropriate approach speeds.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

PROJECT DESCRIPTION

The Project will entail the construction of multifamily residential development that will be located off Jefferson Road and Middlesex Avenue in Wilmington, Massachusetts. As proposed, the Project will consist of the construction of 108 multifamily residential units to be located in two (2) buildings, with "Building A" to encompass 58 residential units and generally situated in the northeast corner of the Middlesex Avenue/Jefferson Road intersection and "Building B" to encompass 50 residential units and located at the north end of Jefferson Road. The Project site encompasses 25.29± acres of land that is generally bounded by areas of open and wooded space and low-lying wetland areas to the north; Middlesex Avenue, a commercial building (200 Jefferson Road), a gravel lot and a surface parking lot for North Wilmington Station on the Massachusetts Bay Transportation Authority (MBTA) Haverhill Line Commuter Rail system to the south; Lubbers Brook to the east; and Jefferson Road and the MBTA Commuter Rail tracks to the west. At present, the Project site is occupied by several commercial buildings with associated parking lots and appurtenances, Jefferson Road (a private way), and areas of open and wooded space. The existing commercial buildings and associated appurtenances located at 378-380 and 382 Middlesex Avenue will be removed to accommodate the Project; the commercial building located at 200 Jefferson Road will be retained.

©2020 Google Imagery.

Access to the Project site will be provided as follows: *Building A* – access to "Building A" will be provided by way of the existing driveway that serves 382 Middlesex Avenue and intersects the north side of Middlesex Avenue approximately 185 feet east of Jefferson Road and two (2) driveways that will intersect the east side of Jefferson Road approximately 40 feet and 325 feet north of Middlesex Avenue, respectively; *Building B* – access to "Building B" will be provided by way of a driveway that will intersect the north end of Jefferson Road.

On-site parking will be provided for each building consisting of both surface parking and garage parking configured as follows: *Building A* (58 units) – on-site parking will be provided for 96 vehicles, or a parking ratio of approximately 1.66 spaces per unit, including 55 surface parking spaces and 41 covered spaces beneath the residential building; *Building B* (50 units) - on-site parking will be provided for 80 vehicles, or a parking ratio of approximately 1.60 spaces per unit, including 56 surface parking spaces and 24 garage spaces. The proposed parking ratios (1.66/1.60 spaces per unit) are below the parking requirements for a residential use specified in Section 6.4, *Parking and Site Design Standards*, of the Wilmington Zoning Bylaw (2.0 spaces for each dwelling unit are required), but exceed the range of values documented by the Institute of Transportation Engineers (ITE) for comparable multifamily residential communities.[2]

EXISTING CONDITIONS CONTEXT

In order to establish the existing conditions context of the Project with respect to the transportation infrastructure, a review of existing conditions was completed in May 2020. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; traffic volumes (December 2018); and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Middlesex Avenue and Jefferson Road in the vicinity of the Project site. The following summarizes existing conditions within the study area.

Roadways

Middlesex Avenue (Route 62)

Middlesex Avenue (Route 62) is a two-lane urban minor arterial that is under local jurisdiction in the vicinity of the Project site; north of High Street, Route 62 is under MassDOT jurisdiction between High Street and Woburn Street, and provides a full access interchange with I-93 (Exit 40). In the vicinity of the Project site, Middlesex Avenue provides two 13 to 14-foot wide travel lanes separated by a double-yellow centerline with 3 to 6-foot wide marked shoulders. A railroad crossing with gates and flashing signals is located approximately 200 feet south west of Jefferson Road. The posted speed limit along Middlesex Avenue in the vicinity of the Project site is 25 miles per hour (mph), with prevailing travel speeds measured in December 2018 found to be between 35 and 37 mph.[3] Land use in the vicinity of the Project site consists of commercial properties, North Wilmington Station on the Haverhill Line of the MBTA Commuter Rail system, and areas of open and wooded space.

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[2] *Parking Generation Manual*, 5th Edition; Institute of Transportation Engineers; Washington, D.C.; 2019. Observed parking demand ratios for an affordable housing community were found to range from 0.32 to 1.66 spaces per dwelling unit, with an average parking demand of 0.99 spaces per dwelling unit and an 85th percentile peak parking demand of 1.33 spaces per dwelling unit. For a traditional multifamily residential community located within ½ mile of a rail transit station, the average parking demand was reported to be 1.12 spaces per dwelling unit and the 85th percentile peak parking demand was identified to be 1.27 spaces per dwelling unit.

[3] The prevailing travel speed is also known as the 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below during the observation period.

Traffic volume data collected as a part of this assessment in December 2018 indicates that Middlesex Avenue in the vicinity of the Project site accommodates approximately 14,105 vehicles per day on an average weekday and 12,090 vehicles on a Saturday, with approximately 1,105 vehicles per hour (vph) during the weekday morning peak-hour (7:15 to 8:15 AM), 1,125 vph during the weekday evening peak-hour (5:00 to 6:00 PM) and 1,010 vph during the Saturday peak-hour (11:45 AM to 12:45 PM).

Jefferson Road

Jefferson Road is a private way that traverses a general north-south alignment and terminates in a parking lot approximately 720 feet north of Middlesex Avenue. Jefferson Road consists of a 40 foot layout within which a 20± foot wide paved roadway is provided that accommodates two-way travel with no pavement markings. A sidewalk is provided along the west side of the roadway between Middlesex Avenue and the entrance to the commuter rail parking lot (a distance of approximately 250 linear feet). Land use consists of the Project site, the parking lot for the North Wilmington Commuter Rail Station, commercial properties and areas of open and wooded space.

Jefferson Road intersects Middlesex Avenue from the north to from a four-legged intersection with the exit driveway to Elia's Country Store slightly off-set to the west and both the Jefferson Road and the Elia's Country Store driveway approaches under STOP-sign control. Marked crosswalks are provided for crossing Jefferson Road and the Middlesex Avenue northeast leg of the intersection.

Pedestrian and Bicycle Accommodations

Sidewalks are currently provided along both sides of Middlesex Avenue within the study area and along the west side of Jefferson Road between Middlesex Avenue and the entrance to the commuter rail parking lot (a distance of approximately 250 linear feet), with marked crosswalks provided for crossing Jefferson Avenue and Middlesex Avenue at both Jefferson Avenue (northeast leg) and at the commuter rail crossing (northeast of crossing). Formal bicycle facilities were not identified within the immediate study area; however, Middlesex Avenue generally provides sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared travel-way configuration (i.e., motor vehicles and bicyclists sharing the roadway).[4]

Public Transportation

Regularly scheduled public transportation services are provided immediately adjacent to the Project site by way of North Wilmington Station on the Haverhill Line of the MBTA Commuter Rail system. Daily commuter rail service is provided between North Wilmington Station and North Station in Boston, with four (4) in-bound and four (4) out-bound trains provided during the weekday morning and evening peak commuter periods; flag stop service[5] is provided outside of the peak period service on a weekday and on Saturday and Sunday, with six (6) trains provided on Saturday and Sunday. In addition, the MBTA provides The RIDE paratransit services to eligible people who cannot use fixed-route transit all or some of the time due to a physical, cognitive or mental disability in compliance with the Americans with Disabilities Act (ADA), and the Wilmington Department of Elderly Services provides transportation services for Wilmington residents that are over age 60 for medical appointments and shopping within a 13-mile radius of the Town.

[4]A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

[5]Commuter rail trains will stop to pick-up a passenger that is visible on the platform to an approaching train; passengers that wish to disembark must inform the conductor prior to arrival at the station.

Motor Vehicle Crash Data

Motor vehicle crash information for Middlesex Avenue in the vicinity of the Project site and for the intersections of Middlesex Avenue at High Street, Middlesex Avenue at Jefferson Road and Middlesex Avenue at Federal Street was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2013 through 2017, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 1.

As can be seen in Table 1, the study intersections experienced an average of approximately five (5) or fewer reported motor vehicle crashes per year over the five-year review period, the majority of which were reported to have occurred on a weekday; during daylight; under clear weather conditions; and involved angle or rear-end type collisions that resulted in property damage only. The Middlesex Avenue/High Street intersection was reported to have experienced the largest number of reported crashes, with 24 crashes reported over the five-year review period. No fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

A review of the MassDOT statewide High Crash Location List indicated that there are no locations along Middlesex Avenue in the vicinity of the Project site that are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as high crash locations.

Table 1
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Middlesex Ave./ High St.	Middlesex Ave./ Jefferson Rd.	Middlesex Ave./ Federal St.
Traffic Control Type:[b]	TS	U	TS
Year:			
2013	6	2	2
2014	4	0	2
2015	3	0	2
2016	5	2	6
2017	6	0	2
Total	24	4	14
Average:	4.8	0.8	2.8
Type:			
Angle	7	0	7
Rear-End	17	4	3
Head-On	0	0	0
Sideswipe	0	0	2
Fixed Object	0	0	2
Pedestrian/Bicycle	0	0	0
Unknown/Other	0	0	0
Total	24	4	14
Conditions:			
Clear	15	1	9
Cloudy	6	2	3
Rain	3	1	1
Snow/Ice	0	0	1
Total	24	4	14
Lighting:			
Daylight	20	4	10
Dawn/Dusk	0	0	0
Dark (Road Lit)	4	0	4
Dark (Road Unlit)	0	0	0
Total	24	4	14
Day of Week:			
Monday through Friday	22	4	11
Saturday	2	0	1
Sunday	0	0	2
Total	24	4	14
Severity:			
Property Damage Only	18	4	11
Personal Injury	6	0	3
Fatality	0	0	0
Total	24	4	14

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2013 through 2017.
[b]Traffic Control Type: U = unsignalized; TS = traffic signal.

PROJECT-GENERATED TRAFFIC

In order to determine the traffic characteristics of the Project, trip-generation methodologies established by the Institute of Transportation Engineers (ITE)[6] were used. The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50 plus years, the most recent update of which was published in 2012. This data includes trip estimates for a similar land use as that proposed (multifamily housing). ITE Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise)*, was used to establish the base traffic characteristics of the Project.

Transit Use

Given the availability of public transportation services to the Project site (MBTA Commuter Rail service), it is expected that a portion of the residents of the Project will use public transportation services, thereby reducing the volume of traffic that may be associated with the Project. In order to determine the proportion of residents of the Project that may use public transportation, walk or bicycle as their primary mode of transportation, travel mode data obtained from the 2013-2017 American Community Survey (ACS) for the Town of Wilmington and a survey of commuting modes for residents of a similar suburban multifamily residential community located within walking distance of a commuter rail station were reviewed. Based on the ACS data, the following commuting modes were identified for workers age 16 or older that reside within the Town:

- *Single-Occupant Vehicle:* 83.7%
- *Car/Vanpool:* 6.7%
- *Taxi/Motorcycle/Other:* 1.0%
- *Public Transportation:* 4.3%
- *Walk:* 0.7%
- *Bicycle:* 0.1%
- *Worked at Home:* 3.5%

According to the ACS, approximately 16 percent of workers that reside in the Town reported that they used an alternative mode of transportation to single-occupancy vehicles, with approximately 7 percent participating in a car or vanpool, 4 percent using public transportation, 1 percent walking/bicycling and 4 percent reporting that they work from home.

A commuting survey of 253 respondents residing in The Mastlight, a multifamily residential community located at 10-50 Patriot Parkway in Weymouth at Union Point that is within an approximate 8-minute walking distance of the South Weymouth Commuter Rail Station, indicates that approximately 18.6 percent of residents use public transportation (MBTA Commuter Rail), with approximately 4 percent working from home and 1 percent participating in a car/vanpool.

In order to account for the use of alternative modes of transportation to single-occupancy vehicles, the base ITE trip-generation calculations were first converted to person trips using a vehicle occupancy ratio of 1.04 persons per vehicle, which was obtained from the 2013-2017 ACS, and were then disseminated to the modes of transportation that are accessible to the residents of the Project: public transportation (transit), pedestrian/bicycle and automobile.

[6] *Trip Generation*, 10th Edition; Institute of Transportation Engineers; Washington, DC; 2017.

In order to provide conservative (high) traffic volume projections from which to assess the potential impact of the Project on the transportation infrastructure, it was assumed that 90 percent of the trips generated by the Project would consist of automobile trips, with 10 percent of trips assumed to be made using public transportation or other alternative to SOV travel, including working from home. The public transportation rate is higher than the 4 percent utilization documented in the ACS and reflects the proximity of the Project site to the North Wilmington Commuter Rail station. The public transportation utilization data from The Mastlight is direct evidence of the increased inducement of transit usage that can occur when multifamily residential developments are located proximate to transit stations.

Table 2 summarizes the anticipated trip characteristics of the Project using the aforementioned methodology.

Table 2
TRIP GENERATION SUMMARY

Time Period/Direction	Proposed Residential Community (ITE Vehicle Trips)[a]	Person Trips			
		Person Trips[b]	Automobile Trips (90%)	Transit Trips (10%)	Vehicle Trips[c]
Average Weekday Daily					
Entering	294	293	255	28	245
Exiting	294	283	255	28	245
Total	588	566	510	56	490
Weekday Morning Peak Hour					
Entering	10	10	9	1	9
Exiting	27	28	25	3	24
Total	37	38	34	4	33
Weekday Evening Peak Hour					
Entering	29	30	27	3	26
Exiting	19	20	18	2	17
Total	48	50	45	5	43

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)*; 108 dwelling units.
[b]ITE vehicle trips x vehicle occupancy ratio (VOR) of 1.04.
[c]Automobile person trips divided by 1.04.

As can be seen in Table 2, after accounting for the use of alternative modes of transportation to SOVs, the Project is expected to generate approximately 490 vehicle trips on an average weekday (two-way, 24-hour volume, or 245 vehicles entering and 245 exiting), with 33 vehicle trips (9 vehicles entering and 24 exiting) expected during the weekday morning peak-hour and 43 vehicle trips (26 vehicles entering and 17 exiting) expected during the weekday evening peak-hour.

When dispersed to Middlesex Avenue and over the respective peak-hour, and with consideration of trips generated by the existing active uses that occupy the Project site and that will be removed, the traffic volume increases that are expected from the Project are anticipated to be less than one (1) additional vehicle every 3-4 minutes during the peak hours outside of the immediate proximity of the Project site,

an increase that would not result in an appreciable increase in motorist delays or vehicle queuing over existing conditions. In fact, the Project represents an increase in traffic of less than 5 percent along Middlesex Avenue, which is well within the normal fluctuation in traffic volumes that occurs between Monday and Friday over the course of a typical week.

SIGHT DISTANCE ASSESSMENT

Sight distance measurements were performed at the Project site driveway intersections with Middlesex Avenue and Jefferson Road, and for the Middlesex Avenue/Jefferson Road intersection, in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[7] requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 3 presents the measured sight lines to and from the subject intersections.

Note that the driveway to "Building B" is located at the end of Jefferson Road, essentially forming an extension thereof, and, as such, clear line of sight is provided along the roadway to/from the driveway. As such, sight distance measurements for the access to "Building B" are not provided in Table 3.

[7] *A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

Table 3
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Recommended Minimum (SSD)	Desirable (ISD)[b]	Measured
Middlesex Avenue at the "Building A" Driveway			
Stopping Sight Distance:			
Middlesex Avenue approaching from the northeast	305	--	325
Middlesex Avenue approaching from the southwest	305	--	450
Intersection Sight Distance:			
Looking to the northeast from the "Building A" Driveway	305	385	305
Looking to the southwest from the "Building A" Driveway	305	445	450
Jefferson Road at the "Building A" North Driveway			
Stopping Sight Distance:			
Jefferson Road approaching from the north	155	--	250
Jefferson Road approaching from the south	155	--	350+[c]
Intersection Sight Distance:			
Looking to the north from the "Building A" Driveway	155	280	350+[d]
Looking to the south from the "Building A" Driveway	155	240	350+[c,d]
Jefferson Road at the "Building A" South Driveway			
Stopping Sight Distance:			
Jefferson Road approaching from the north	80	--	500+
Jefferson Road approaching from the south	80	--	60+[c]
Intersection Sight Distance:			
Looking to the north from the "Building A" Driveway	80	170	500+
Looking to the south from the "Building A" Driveway	80	145	60+[c]
Middlesex Avenue at Jefferson Road			
Stopping Sight Distance:			
Middlesex Avenue approaching from the northeast	305	--	500+
Middlesex Avenue approaching from the southwest	305	--	305
Intersection Sight Distance:			
Looking to the northeast from Jefferson Road	305	385	500+
Looking to the southwest from Jefferson Road	305	445	375

[a]Recommended minimum values obtained from: *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on an approach speed of 40 mph along Middlesex Avenue and a 25 mph approach speed along Jefferson Road approaching the north driveway to "Building A" and a 15 mph speed approaching the south driveway.

[b]Value shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

[c]Clear line of sight is provided to/from Middlesex Avenue.

[d]With selective trimming/removal of trees and vegetation located within the sight triangle areas of the Project site driveway.

As can be seen in Table 3, lines of sight at the Project site driveway intersections and at the Middlesex Avenue/Jefferson Road intersection meet, exceed or could be made to meet or exceed the recommended minimum distances for safe operation based on the appropriate approach speeds. That being said, it is recommended that the south driveway to "Building A" be configured as a one-way, entrance only driveway given the proximity of the driveway to Middlesex Avenue (approximately 40 feet).

SUMMARY

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development that is to be located off Middlesex Avenue (Route 62) and Jefferson Road in Wilmington, Massachusetts. This assessment has defined the existing conditions context of the Project in relation to the transportation infrastructure and has evaluated the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE[8] and after applying appropriate adjustments to account for resident use of alternative modes of transportation, including commuter rail services available from North Wilmington Station which is immediately adjacent to the Project site, the Project is expected to generate approximately 490 vehicle trips on an average weekday (two-way, 24-hour volume), with 33 vehicle trips expected during the weekday morning peak-hour and 43 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with traffic volume increases outside of the immediate proximity of the Project site predicted to be less than one (1) added vehicle every 3-4 minutes during the peak hours. In fact, the Project represents an increase in traffic of less than 5 percent along Middlesex Avenue, which is well within the normal fluctuation in traffic volumes that occurs between Monday and Friday over the course of a typical week;

3. No apparent safety deficiencies were noted with respect to the motor vehicle crash history along Middlesex Avenue in the vicinity of the Project site; and

4. Lines of sight at the Project site driveway intersections with Middlesex Avenue and Jefferson Road and at the Middlesex Avenue/Jefferson Road intersection were found to meet, exceed or could be made to meet or exceed the recommended minimum distances for safe operation based on the appropriate approach speeds.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

[8]Ibid 1.

Project Access

Access to the Project site will be provided as follows: *Building A* – access to "Building A" will be provided by way of the existing driveway that serves 382 Middlesex Avenue and intersects the north side of Middlesex Avenue approximately 185 feet east of Jefferson Road and two (2) driveways that will intersect the east side of Jefferson Road approximately 40 feet and 325 feet north of Middlesex Avenue, respectively; *Building B* – access to "Building B" will be provided by way of a driveway that will intersect the north end of Jefferson Road. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The Project site driveways should be a minimum of 20 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

- Given the proximity of the south driveway to "Building A" to Middlesex Avenue (within 40 feet), this driveway should be configured to function as a one-way entrance drive with the requisite signs ("One Way" and "Do Not Enter") and pavement markings installed at Jefferson Road to regulate use of the driveway.

- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23-feet in order to facilitate parking maneuvers.

- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.

- "No Parking" signs should be installed along both sides of Jefferson Road.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[9]

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site roadway should be designed and maintained so as not to restrict lines of sight.

- Existing trees and vegetation located along the east side of Jefferson Road within the sight triangle areas of the "Building A" north driveway should be selectively trimmed or removed as may be necessary to afford the recommended sight distance from the driveway.

- Surface parking for "Building A" should not be located within the sight triangle area of the Middlesex Avenue/Jefferson Road intersection.

- Snow windrows within sight triangle areas of the Project site roadway should be promptly removed where such accumulations would impede sight lines.

- A sidewalk should be installed along at least one side of Jefferson Road between Middlesex Avenue and "Building B" and include Americans with Disabilities Act (ADA) compliant wheelchair ramps where pedestrian crossings will be provided.

- A school bus waiting area should be provided at an appropriate location defined in consultation with Wilmington School Department.

[9] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

Transportation Demand Management

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures should be implemented as a part of the townhouse component of the Project:

- Information regarding public transportation services, maps, schedules and fare information should be posted in a central location and/or otherwise made available to residents;
- A "welcome packet" should be provided to residents detailing available public transportation services, bicycle and walking alternatives, and commuter options available;
- Work-at-home workspaces should be provided to support telecommuting by residents of the Project;
- Pedestrian accommodations should be provided and consist of sidewalks and ADA compliant wheelchair ramps at all pedestrian crossings internal to the Project site that will link building entrances to the sidewalk infrastructure along Jefferson Road and Middlesex Avenue;
- Bicycle parking should be provided consisting of both exterior bicycle racks located proximate to building entrances and weather protected bicycle parking;
- A centralized mail kiosk should be provided to limit off-site trips; and
- Transit screens/displays should be provided in the building lobby to display real-time transportation information (similar to https://transitscreen.com/).

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

cc: File

ATTACHMENTS

AUTOMATIC TRAFFIC RECORDER COUNTS
PUBLIC TRANSPORTATION SCHEDULES
MASSDOT HIGH CRASH LOCATION MAPPING
TRIP-GENERATION CALCULATIONS

AUTOMATIC TRAFFIC RECORDER COUNTS

Accurate Counts
978-664-2565

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074VOL1

Start Time	12/13/201 Thu	EB Morning	EB Afternoon	Hour Totals Morning	Hour Totals Afternoon	WB Morning	WB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		6	137			4	147				
12:15		8	140			3	105				
12:30		12	134			4	93				
12:45		4	123	30	534	4	107	15	452	45	986
01:00		4	135			2	91				
01:15		0	106			2	112				
01:30		6	104			4	99				
01:45		3	115	13	460	1	92	9	394	22	854
02:00		4	131			4	123				
02:15		3	119			5	94				
02:30		3	149			1	124				
02:45		0	99	10	498	2	112	12	453	22	951
03:00		3	138			5	111				
03:15		5	136			2	104				
03:30		2	148			3	111				
03:45		2	128	12	550	3	108	13	434	25	984
04:00		9	137			6	141				
04:15		9	142			8	91				
04:30		15	153			11	118				
04:45		8	183	41	615	20	103	45	453	86	1068
05:00		14	155			25	130				
05:15		15	154			25	105				
05:30		28	142			46	138				
05:45		43	166	100	617	54	133	150	506	250	1123
06:00		53	154			96	124				
06:15		43	135			117	90				
06:30		59	111			97	104				
06:45		79	96	234	496	169	94	479	412	713	908
07:00		104	97			132	65				
07:15		127	69			161	68				
07:30		138	72			123	65				
07:45		123	65	492	303	140	56	556	254	1048	557
08:00		157	93			134	52				
08:15		104	78			155	42				
08:30		91	65			157	41				
08:45		82	46	434	282	135	41	581	176	1015	458
09:00		103	52			97	29				
09:15		122	38			115	15				
09:30		121	43			86	30				
09:45		88	32	434	165	110	26	408	100	842	265
10:00		94	24			97	16				
10:15		110	13			95	20				
10:30		95	15			97	13				
10:45		90	14	389	66	107	16	396	65	785	131
11:00		108	18			93	17				
11:15		100	8			115	12				
11:30		130	12			101	12				
11:45		101	4	439	42	128	8	437	49	876	91
Total		2628	4628			3101	3748			5729	8376
Percent		36.2%	63.8%			45.3%	54.7%			40.6%	59.4%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA
8074VOL1

Start Time	12/14/201 Fri	EB Morning	EB Afternoon	Hour Totals Morning	Hour Totals Afternoon	WB Morning	WB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		8	132			7	146				
12:15		6	132			2	120				
12:30		3	135			2	126				
12:45		3	120	20	519	1	128	12	520	32	1039
01:00		8	123			3	123				
01:15		5	128			2	106				
01:30		2	128			4	121				
01:45		5	117	20	496	5	132	14	482	34	978
02:00		3	132			0	110				
02:15		1	136			8	91				
02:30		6	154			1	139				
02:45		1	130	11	552	1	118	10	458	21	1010
03:00		5	130			3	93				
03:15		3	162			1	112				
03:30		2	165			2	134				
03:45		3	143	13	600	4	131	10	470	23	1070
04:00		2	159			6	115				
04:15		8	158			10	113				
04:30		14	169			13	111				
04:45		11	148	35	634	16	133	45	472	80	1106
05:00		10	169			21	107				
05:15		13	169			35	128				
05:30		32	142			41	102				
05:45		42	131	97	611	46	95	143	432	240	1043
06:00		59	122			61	110				
06:15		48	136			91	91				
06:30		55	127			107	91				
06:45		76	123	238	508	126	79	385	371	623	879
07:00		92	99			110	80				
07:15		83	91			134	72				
07:30		120	76			109	59				
07:45		122	66	417	332	102	56	455	267	872	599
08:00		138	47			101	56				
08:15		109	69			132	42				
08:30		100	60			131	34				
08:45		116	56	463	232	174	52	538	184	1001	416
09:00		136	63			115	44				
09:15		120	50			117	33				
09:30		119	35			95	40				
09:45		105	24	480	172	122	44	449	161	929	333
10:00		103	49			132	23				
10:15		106	36			135	27				
10:30		115	22			117	22				
10:45		119	18	443	125	121	26	505	98	948	223
11:00		119	23			88	24				
11:15		127	18			94	20				
11:30		128	17			113	19				
11:45		112	18	486	76	115	22	410	85	896	161
Total		2723	4857			2976	4000			5699	8857
Percent		35.9%	64.1%			42.7%	57.3%			39.2%	60.8%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074VOL1

Start	12/15/201	EB		Hour Totals		WB		Hour Totals		Combined Totals	
Time	Sat	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		20	115			18	145				
12:15		7	132			7	107				
12:30		11	156			14	124				
12:45		9	89	47	492	11	116	50	492	97	984
01:00		8	149			7	129				
01:15		5	112			4	118				
01:30		4	113			3	112				
01:45		5	108	22	482	7	95	21	454	43	936
02:00		3	133			4	102				
02:15		9	121			2	94				
02:30		3	124			2	94				
02:45		1	103	16	481	2	96	10	386	26	867
03:00		6	103			1	114				
03:15		5	115			2	108				
03:30		3	113			1	124				
03:45		2	98	16	429	3	103	7	449	23	878
04:00		8	113			4	98				
04:15		0	98			5	112				
04:30		6	112			3	110				
04:45		5	107	19	430	3	92	15	412	34	842
05:00		8	123			12	98				
05:15		7	119			10	84				
05:30		17	103			16	79				
05:45		16	78	48	423	18	84	56	345	104	768
06:00		15	93			21	81				
06:15		26	106			24	95				
06:30		21	116			30	75				
06:45		29	89	91	404	36	87	111	338	202	742
07:00		27	94			34	75				
07:15		42	62			39	65				
07:30		54	51			58	67				
07:45		51	71	174	278	63	68	194	275	368	553
08:00		60	56			56	59				
08:15		71	53			77	64				
08:30		69	64			77	42				
08:45		90	56	290	229	113	52	323	217	613	446
09:00		86	40			103	41				
09:15		94	63			90	38				
09:30		95	54			91	46				
09:45		101	41	376	198	130	41	414	166	790	364
10:00		108	42			141	36				
10:15		136	45			89	31				
10:30		121	30			134	43				
10:45		102	32	467	149	117	31	481	141	948	290
11:00		136	26			128	22				
11:15		125	25			121	24				
11:30		137	27			111	17				
11:45		124	20	522	98	108	19	468	82	990	180
Total		2088	4093			2150	3757			4238	7850
Percent		33.8%	66.2%			36.4%	63.6%			35.1%	64.9%
Grand Total		7439	13578			8227	11505			15666	25083
Percent		35.4%	64.6%			41.7%	58.3%			38.4%	61.6%

ADT ADT 13,583 AADT 13,583

Accurate Counts
978-664-2565

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074VOL1

Start	12/10/2018		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	*	*	30	15	20	12	47	50	*	*	32	26
01:00	*	*	*	*	*	*	13	9	20	14	22	21	*	*	18	15
02:00	*	*	*	*	*	*	10	12	11	10	16	10	*	*	12	11
03:00	*	*	*	*	*	*	12	13	13	10	16	7	*	*	14	10
04:00	*	*	*	*	*	*	41	45	35	45	19	15	*	*	32	35
05:00	*	*	*	*	*	*	100	150	97	143	48	56	*	*	82	116
06:00	*	*	*	*	*	*	234	479	238	385	91	111	*	*	188	325
07:00	*	*	*	*	*	*	**492**	556	417	455	174	194	*	*	361	402
08:00	*	*	*	*	*	*	434	**581**	463	**538**	290	323	*	*	396	**481**
09:00	*	*	*	*	*	*	434	408	480	449	376	414	*	*	430	424
10:00	*	*	*	*	*	*	389	396	443	505	467	**481**	*	*	433	461
11:00	*	*	*	*	*	*	439	437	**486**	410	**522**	468	*	*	**482**	438
12:00 PM	*	*	*	*	*	*	534	452	519	**520**	**492**	**492**	*	*	515	**488**
01:00	*	*	*	*	*	*	460	394	496	482	482	454	*	*	479	443
02:00	*	*	*	*	*	*	498	453	552	458	481	386	*	*	510	432
03:00	*	*	*	*	*	*	550	434	600	470	429	449	*	*	526	451
04:00	*	*	*	*	*	*	615	453	**634**	472	430	412	*	*	**560**	446
05:00	*	*	*	*	*	*	**617**	**506**	611	432	423	345	*	*	550	428
06:00	*	*	*	*	*	*	496	412	508	371	404	338	*	*	469	374
07:00	*	*	*	*	*	*	303	254	332	267	278	275	*	*	304	265
08:00	*	*	*	*	*	*	282	176	232	184	229	217	*	*	248	192
09:00	*	*	*	*	*	*	165	100	172	161	198	166	*	*	178	142
10:00	*	*	*	*	*	*	66	65	125	98	149	141	*	*	113	101
11:00	*	*	*	*	*	*	42	49	76	85	98	82	*	*	72	72
Lane	0	0	0	0	0	0	7256	6849	7580	6976	6181	5907	0	0	7004	6578
Day	0		0		0		14105		14556		12088		0		13582	
AM Peak	-	-	-	-	-	-	07:00	08:00	11:00	08:00	11:00	10:00	-	-	11:00	08:00
Vol.	-	-	-	-	-	-	492	581	486	538	522	481	-	-	482	481
PM Peak	-	-	-	-	-	-	17:00	17:00	16:00	12:00	12:00	12:00	-	-	16:00	12:00
Vol.	-	-	-	-	-	-	617	506	634	520	492	492	-	-	560	488

Comb. Total	0	0	0	14105	14556	12088	0	13582

ADT ADT 13,583 AADT 13,583

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/13/18	0	0	0	4	11	11	3	1	0	0	0	0	0	0	30
01:00	0	0	0	3	5	3	1	1	0	0	0	0	0	0	13
02:00	0	0	1	5	2	2	0	0	0	0	0	0	0	0	10
03:00	0	0	0	1	6	5	0	0	0	0	0	0	0	0	12
04:00	2	2	1	9	17	7	3	0	0	0	0	0	0	0	41
05:00	3	0	0	12	52	26	7	0	0	0	0	0	0	0	100
06:00	11	1	10	49	109	49	5	0	0	0	0	0	0	0	234
07:00	36	3	16	98	239	90	10	0	0	0	0	0	0	0	492
08:00	26	7	16	72	224	76	10	2	1	0	0	0	0	0	434
09:00	34	5	22	126	168	77	2	0	0	0	0	0	0	0	434
10:00	21	4	24	101	171	66	2	0	0	0	0	0	0	0	389
11:00	24	4	21	153	179	53	5	0	0	0	0	0	0	0	439
12 PM	37	1	25	157	233	68	12	0	1	0	0	0	0	0	534
13:00	21	5	18	140	208	60	6	2	0	0	0	0	0	0	460
14:00	47	4	52	158	189	44	3	1	0	0	0	0	0	0	498
15:00	45	3	27	181	215	72	7	0	0	0	0	0	0	0	550
16:00	39	9	39	195	246	85	2	0	0	0	0	0	0	0	615
17:00	46	7	49	197	252	64	1	0	1	0	0	0	0	0	617
18:00	19	2	15	153	243	60	3	1	0	0	0	0	0	0	496
19:00	20	0	16	76	135	52	4	0	0	0	0	0	0	0	303
20:00	7	1	9	71	131	58	4	1	0	0	0	0	0	0	282
21:00	6	1	5	34	76	40	3	0	0	0	0	0	0	0	165
22:00	0	2	2	13	28	19	2	0	0	0	0	0	0	0	66
23:00	0	0	0	3	19	16	4	0	0	0	0	0	0	0	42
Total	444	61	368	2011	3158	1103	99	9	3	0	0	0	0	0	7256

Daily

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	5169
Percent in Pace :	71.2%
Number of Vehicles > 30 MPH :	4372
Percent of Vehicles > 30 MPH :	60.3%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/14/18	0	0	1	2	7	8	2	0	0	0	0	0	0	0	20
01:00	0	0	0	5	6	8	1	0	0	0	0	0	0	0	20
02:00	0	0	0	3	6	1	1	0	0	0	0	0	0	0	11
03:00	0	0	0	5	3	5	0	0	0	0	0	0	0	0	13
04:00	3	0	1	5	9	15	2	0	0	0	0	0	0	0	35
05:00	2	0	0	14	54	24	3	0	0	0	0	0	0	0	97
06:00	19	1	2	55	111	40	10	0	0	0	0	0	0	0	238
07:00	32	1	8	76	197	90	11	2	0	0	0	0	0	0	417
08:00	34	4	27	115	202	77	4	0	0	0	0	0	0	0	463
09:00	29	3	14	122	241	69	2	0	0	0	0	0	0	0	480
10:00	23	2	20	138	193	61	6	0	0	0	0	0	0	0	443
11:00	36	7	27	161	192	57	6	0	0	0	0	0	0	0	486
12 PM	29	5	10	170	230	72	3	0	0	0	0	0	0	0	519
13:00	30	2	18	108	245	85	7	1	0	0	0	0	0	0	496
14:00	45	6	32	181	216	68	4	0	0	0	0	0	0	0	552
15:00	64	6	43	175	234	74	4	0	0	0	0	0	0	0	600
16:00	32	13	48	197	254	83	6	1	0	0	0	0	0	0	634
17:00	45	13	35	188	259	65	5	0	0	0	0	0	0	1	611
18:00	15	3	44	144	239	61	1	1	0	0	0	0	0	0	508
19:00	9	4	12	91	163	44	8	1	0	0	0	0	0	0	332
20:00	5	0	5	50	121	44	6	1	0	0	0	0	0	0	232
21:00	1	0	6	30	93	37	5	0	0	0	0	0	0	0	172
22:00	0	0	4	25	59	31	6	0	0	0	0	0	0	0	125
23:00	1	0	3	15	32	23	2	0	0	0	0	0	0	0	76
Total	454	70	360	2075	3366	1142	105	7	0	0	0	0	0	1	7580

Daily

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	5441
Percent in Pace :	71.8%
Number of Vehicles > 30 MPH :	4621
Percent of Vehicles > 30 MPH :	61.0%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/15/18	1	0	0	5	26	12	3	0	0	0	0	0	0	0	47
01:00	0	0	0	2	9	10	1	0	0	0	0	0	0	0	22
02:00	0	0	1	1	10	4	0	0	0	0	0	0	0	0	16
03:00	0	0	0	8	4	2	2	0	0	0	0	0	0	0	16
04:00	0	0	0	4	7	5	3	0	0	0	0	0	0	0	19
05:00	1	0	0	7	17	20	3	0	0	0	0	0	0	0	48
06:00	3	0	5	18	32	30	3	0	0	0	0	0	0	0	91
07:00	5	2	9	27	81	43	7	0	0	0	0	0	0	0	174
08:00	14	2	14	70	132	51	7	0	0	0	0	0	0	0	290
09:00	18	6	19	81	160	85	7	0	0	0	0	0	0	0	376
10:00	33	5	29	137	183	71	9	0	0	0	0	0	0	0	467
11:00	26	5	26	130	247	80	6	1	0	0	0	0	0	1	522
12 PM	40	3	14	136	238	57	4	0	0	0	0	0	0	0	492
13:00	34	1	19	146	210	69	3	0	0	0	0	0	0	0	482
14:00	25	1	7	127	217	101	3	0	0	0	0	0	0	0	481
15:00	26	1	14	145	178	60	5	0	0	0	0	0	0	0	429
16:00	25	0	17	123	214	47	4	0	0	0	0	0	0	0	430
17:00	8	0	15	131	211	50	8	0	0	0	0	0	0	0	423
18:00	19	2	14	114	203	49	3	0	0	0	0	0	0	0	404
19:00	12	2	11	79	130	42	2	0	0	0	0	0	0	0	278
20:00	1	0	14	41	117	54	2	0	0	0	0	0	0	0	229
21:00	5	0	1	39	97	51	5	0	0	0	0	0	0	0	198
22:00	1	0	3	25	80	33	5	2	0	0	0	0	0	0	149
23:00	2	0	1	12	50	32	1	0	0	0	0	0	0	0	98
Total	299	30	233	1608	2853	1058	96	3	0	0	0	0	0	1	6181

Daily

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	4461
Percent in Pace :	72.2%
Number of Vehicles > 30 MPH :	4011
Percent of Vehicles > 30 MPH :	64.9%

Grand Total	1197	161	961	5694	9377	3303	300	19	3	0	0	0	0	2	21017

Overall

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	15071
Percent in Pace :	71.7%
Number of Vehicles > 30 MPH :	13004
Percent of Vehicles > 30 MPH :	61.9%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/13/18	0	0	0	1	6	1	6	0	1	0	0	0	0	0	15
01:00	0	0	2	1	2	4	0	0	0	0	0	0	0	0	9
02:00	0	0	2	3	1	4	1	1	0	0	0	0	0	0	12
03:00	0	0	0	2	6	3	2	0	0	0	0	0	0	0	13
04:00	0	0	1	6	17	16	5	0	0	0	0	0	0	0	45
05:00	6	1	2	27	65	41	8	0	0	0	0	0	0	0	150
06:00	42	23	29	120	182	73	6	4	0	0	0	0	0	0	479
07:00	39	13	28	135	205	119	16	1	0	0	0	0	0	0	556
08:00	46	20	45	139	219	93	18	1	0	0	0	0	0	0	581
09:00	62	18	38	78	135	66	10	1	0	0	0	0	0	0	408
10:00	20	6	35	117	134	74	9	1	0	0	0	0	0	0	396
11:00	43	18	34	119	144	65	14	0	0	0	0	0	0	0	437
12 PM	63	15	32	93	144	97	8	0	0	0	0	0	0	0	452
13:00	27	7	27	109	150	63	11	0	0	0	0	0	0	0	394
14:00	76	21	26	119	145	59	6	1	0	0	0	0	0	0	453
15:00	68	18	36	85	136	79	11	1	0	0	0	0	0	0	434
16:00	50	34	47	98	127	77	19	1	0	0	0	0	0	0	453
17:00	65	8	51	151	167	60	4	0	0	0	0	0	0	0	506
18:00	31	2	18	96	162	90	12	1	0	0	0	0	0	0	412
19:00	16	1	11	53	105	55	13	0	0	0	0	0	0	0	254
20:00	5	2	1	22	80	55	10	0	1	0	0	0	0	0	176
21:00	1	0	1	21	43	30	4	0	0	0	0	0	0	0	100
22:00	1	0	1	13	19	25	5	1	0	0	0	0	0	0	65
23:00	0	1	2	6	17	14	7	2	0	0	0	0	0	0	49
Total	661	208	469	1614	2411	1263	205	16	2	0	0	0	0	0	6849

Daily

15th Percentile :	21 MPH
50th Percentile :	30 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	4025
Percent in Pace :	58.8%
Number of Vehicles > 30 MPH :	3897
Percent of Vehicles > 30 MPH :	56.9%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/14/18	0	0	0	0	6	5	1	0	0	0	0	0	0	0	12
01:00	0	0	0	3	5	5	1	0	0	0	0	0	0	0	14
02:00	0	0	0	2	5	3	0	0	0	0	0	0	0	0	10
03:00	0	0	1	1	3	3	2	0	0	0	0	0	0	0	10
04:00	1	0	0	7	25	7	5	0	0	0	0	0	0	0	45
05:00	2	1	6	23	53	48	7	2	0	1	0	0	0	0	143
06:00	21	8	15	91	159	77	14	0	0	0	0	0	0	0	385
07:00	34	6	24	118	162	95	16	0	0	0	0	0	0	0	455
08:00	48	16	36	114	210	94	18	1	1	0	0	0	0	0	538
09:00	39	14	43	93	153	81	24	2	0	0	0	0	0	0	449
10:00	37	13	35	139	154	100	25	2	0	0	0	0	0	0	505
11:00	40	20	21	97	127	91	12	2	0	0	0	0	0	0	410
12 PM	63	34	35	87	183	103	14	1	0	0	0	0	0	0	520
13:00	36	5	33	95	182	107	22	2	0	0	0	0	0	0	482
14:00	90	30	50	98	125	55	10	0	0	0	0	0	0	0	458
15:00	74	20	54	108	143	58	11	2	0	0	0	0	0	0	470
16:00	55	16	37	97	180	78	7	2	0	0	0	0	0	0	472
17:00	60	17	35	80	168	62	9	1	0	0	0	0	0	0	432
18:00	20	8	15	106	145	73	4	0	0	0	0	0	0	0	371
19:00	12	2	14	64	116	52	7	0	0	0	0	0	0	0	267
20:00	7	0	2	24	91	51	8	1	0	0	0	0	0	0	184
21:00	1	5	3	30	70	41	10	1	0	0	0	0	0	0	161
22:00	1	0	3	11	47	30	5	1	0	0	0	0	0	0	98
23:00	1	0	0	18	33	26	6	1	0	0	0	0	0	0	85
Total	642	215	462	1506	2545	1345	238	21	1	1	0	0	0	0	6976

Daily

15th Percentile :	22 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	4051
Percent in Pace :	58.1%
Number of Vehicles > 30 MPH :	4151
Percent of Vehicles > 30 MPH :	59.5%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/15/18	1	0	0	5	18	18	8	0	0	0	0	0	0	0	50
01:00	0	0	0	4	11	6	0	0	0	0	0	0	0	0	21
02:00	0	0	1	2	2	4	0	0	0	1	0	0	0	0	10
03:00	0	0	1	2	2	2	0	0	0	0	0	0	0	0	7
04:00	0	0	0	3	5	3	3	1	0	0	0	0	0	0	15
05:00	0	0	0	9	18	22	7	0	0	0	0	0	0	0	56
06:00	2	1	3	22	45	31	6	1	0	0	0	0	0	0	111
07:00	7	1	8	38	88	38	14	0	0	0	0	0	0	0	194
08:00	16	3	25	79	116	70	13	1	0	0	0	0	0	0	323
09:00	19	14	38	97	139	87	17	3	0	0	0	0	0	0	414
10:00	46	11	25	135	151	96	16	1	0	0	0	0	0	0	481
11:00	38	6	29	98	169	106	19	2	1	0	0	0	0	0	468
12 PM	74	12	32	89	168	95	20	2	0	0	0	0	0	0	492
13:00	45	15	28	81	166	102	15	2	0	0	0	0	0	0	454
14:00	21	4	21	92	152	80	13	3	0	0	0	0	0	0	386
15:00	26	5	21	121	166	94	14	1	1	0	0	0	0	0	449
16:00	36	4	26	108	149	71	18	0	0	0	0	0	0	0	412
17:00	15	1	20	63	158	77	10	1	0	0	0	0	0	0	345
18:00	21	8	9	99	114	75	9	3	0	0	0	0	0	0	338
19:00	18	2	8	57	128	53	9	0	0	0	0	0	0	0	275
20:00	4	5	5	34	95	59	13	1	0	1	0	0	0	0	217
21:00	5	1	7	25	72	40	14	2	0	0	0	0	0	0	166
22:00	3	1	1	30	52	45	6	2	1	0	0	0	0	0	141
23:00	2	0	0	7	23	42	7	1	0	0	0	0	0	0	82
Total	399	94	308	1300	2207	1316	251	27	3	2	0	0	0	0	5907

Daily

15th Percentile : 25 MPH
50th Percentile : 31 MPH
85th Percentile : 37 MPH
95th Percentile : 39 MPH

Mean Speed(Average) : 31 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 3523
Percent in Pace : 59.6%
Number of Vehicles > 30 MPH : 3806
Percent of Vehicles > 30 MPH : 64.4%

Grand Total	1702	517	1239	4420	7163	3924	694	64	6	3	0	0	0	0	19732

Overall

15th Percentile : 22 MPH
50th Percentile : 31 MPH
85th Percentile : 37 MPH
95th Percentile : 39 MPH

Mean Speed(Average) : 30 MPH
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 11583
Percent in Pace : 58.7%
Number of Vehicles > 30 MPH : 11854
Percent of Vehicles > 30 MPH : 60.1%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB, WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/13/18	0	0	0	5	17	12	9	1	1	0	0	0	0	0	45
01:00	0	0	2	4	7	7	1	1	0	0	0	0	0	0	22
02:00	0	0	3	8	3	6	1	1	0	0	0	0	0	0	22
03:00	0	0	0	3	12	8	2	0	0	0	0	0	0	0	25
04:00	2	2	2	15	34	23	8	0	0	0	0	0	0	0	86
05:00	9	1	2	39	117	67	15	0	0	0	0	0	0	0	250
06:00	53	24	39	169	291	122	11	4	0	0	0	0	0	0	713
07:00	75	16	44	233	444	209	26	1	0	0	0	0	0	0	1048
08:00	72	27	61	211	443	169	28	3	1	0	0	0	0	0	1015
09:00	96	23	60	204	303	143	12	1	0	0	0	0	0	0	842
10:00	41	10	59	218	305	140	11	1	0	0	0	0	0	0	785
11:00	67	22	55	272	323	118	19	0	0	0	0	0	0	0	876
12 PM	100	16	57	250	377	165	20	0	1	0	0	0	0	0	986
13:00	48	12	45	249	358	123	17	2	0	0	0	0	0	0	854
14:00	123	25	78	277	334	103	9	2	0	0	0	0	0	0	951
15:00	113	21	63	266	351	151	18	1	0	0	0	0	0	0	984
16:00	89	43	86	293	373	162	21	1	0	0	0	0	0	0	1068
17:00	111	15	100	348	419	124	5	0	1	0	0	0	0	0	1123
18:00	50	4	33	249	405	150	15	2	0	0	0	0	0	0	908
19:00	36	1	27	129	240	107	17	0	0	0	0	0	0	0	557
20:00	12	3	10	93	211	113	14	1	1	0	0	0	0	0	458
21:00	7	1	6	55	119	70	7	0	0	0	0	0	0	0	265
22:00	1	2	3	26	47	44	7	1	0	0	0	0	0	0	131
23:00	0	1	2	9	36	30	11	2	0	0	0	0	0	0	91
Total	1105	269	837	3625	5569	2366	304	25	5	0	0	0	0	0	14105

Daily

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	9194
Percent in Pace :	65.2%
Number of Vehicles > 30 MPH :	8269
Percent of Vehicles > 30 MPH :	58.6%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB, WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/14/18	0	0	1	2	13	13	3	0	0	0	0	0	0	0	32
01:00	0	0	0	8	11	13	2	0	0	0	0	0	0	0	34
02:00	0	0	0	5	11	4	1	0	0	0	0	0	0	0	21
03:00	0	0	1	6	6	8	2	0	0	0	0	0	0	0	23
04:00	4	0	1	12	34	22	7	0	0	0	0	0	0	0	80
05:00	4	1	6	37	107	72	10	2	0	1	0	0	0	0	240
06:00	40	9	17	146	270	117	24	0	0	0	0	0	0	0	623
07:00	66	7	32	194	359	185	27	2	0	0	0	0	0	0	872
08:00	82	20	63	229	412	171	22	1	1	0	0	0	0	0	1001
09:00	68	17	57	215	394	150	26	2	0	0	0	0	0	0	929
10:00	60	15	55	277	347	161	31	2	0	0	0	0	0	0	948
11:00	76	27	48	258	319	148	18	2	0	0	0	0	0	0	896
12 PM	92	39	45	257	413	175	17	1	0	0	0	0	0	0	1039
13:00	66	7	51	203	427	192	29	3	0	0	0	0	0	0	978
14:00	135	36	82	279	341	123	14	0	0	0	0	0	0	0	1010
15:00	138	26	97	283	377	132	15	2	0	0	0	0	0	0	1070
16:00	87	29	85	294	434	161	13	3	0	0	0	0	0	0	1106
17:00	105	30	70	268	427	127	14	1	0	0	0	0	0	1	1043
18:00	35	11	59	250	384	134	5	1	0	0	0	0	0	0	879
19:00	21	6	26	155	279	96	15	1	0	0	0	0	0	0	599
20:00	12	0	7	74	212	95	14	2	0	0	0	0	0	0	416
21:00	2	5	9	60	163	78	15	1	0	0	0	0	0	0	333
22:00	1	0	7	36	106	61	11	1	0	0	0	0	0	0	223
23:00	2	0	3	33	65	49	8	1	0	0	0	0	0	0	161
Total	1096	285	822	3581	5911	2487	343	28	1	1	0	0	0	1	14556

Daily

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	9492
Percent in Pace :	65.2%
Number of Vehicles > 30 MPH :	8772
Percent of Vehicles > 30 MPH :	60.3%

Location : Middlesex Avenue (Route 62)
Location : East of Jefferson Avenue
City/State: Wilmington, MA

8074SPD1

EB, WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
12/15/18	2	0	0	10	44	30	11	0	0	0	0	0	0	0	97
01:00	0	0	0	6	20	16	1	0	0	0	0	0	0	0	43
02:00	0	0	2	3	12	8	0	0	0	1	0	0	0	0	26
03:00	0	0	1	10	6	4	2	0	0	0	0	0	0	0	23
04:00	0	0	0	7	12	8	6	1	0	0	0	0	0	0	34
05:00	1	0	0	16	35	42	10	0	0	0	0	0	0	0	104
06:00	5	1	8	40	77	61	9	1	0	0	0	0	0	0	202
07:00	12	3	17	65	169	81	21	0	0	0	0	0	0	0	368
08:00	30	5	39	149	248	121	20	1	0	0	0	0	0	0	613
09:00	37	20	57	178	299	172	24	3	0	0	0	0	0	0	790
10:00	79	16	54	272	334	167	25	1	0	0	0	0	0	0	948
11:00	64	11	55	228	416	186	25	3	1	0	0	0	0	1	990
12 PM	114	15	46	225	406	152	24	2	0	0	0	0	0	0	984
13:00	79	16	47	227	376	171	18	2	0	0	0	0	0	0	936
14:00	46	5	28	219	369	181	16	3	0	0	0	0	0	0	867
15:00	52	6	35	266	344	154	19	1	1	0	0	0	0	0	878
16:00	61	4	43	231	363	118	22	0	0	0	0	0	0	0	842
17:00	23	1	35	194	369	127	18	1	0	0	0	0	0	0	768
18:00	40	10	23	213	317	124	12	3	0	0	0	0	0	0	742
19:00	30	4	19	136	258	95	11	0	0	0	0	0	0	0	553
20:00	5	5	19	75	212	113	15	1	0	1	0	0	0	0	446
21:00	10	1	8	64	169	91	19	2	0	0	0	0	0	0	364
22:00	4	1	4	55	132	78	11	4	1	0	0	0	0	0	290
23:00	4	0	1	19	73	74	8	1	0	0	0	0	0	0	180
Total	698	124	541	2908	5060	2374	347	30	3	2	0	0	0	1	12088

Daily

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	7968
Percent in Pace :	65.9%
Number of Vehicles > 30 MPH :	7817
Percent of Vehicles > 30 MPH :	64.7%

Grand Total	2899	678	2200	10114	16540	7227	994	83	9	3	0	0	0	2	40749

Overall

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	26654
Percent in Pace :	65.4%
Number of Vehicles > 30 MPH :	24858
Percent of Vehicles > 30 MPH :	61.0%

PUBLIC TRANSPORTATION SCHEDULES

HAVERHILL LINE

Effective October 21, 2019

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM								PM												
	Bikes Allowed		200	202	204	206	286	288	208	290	210	212	214	216	218	292	220	294	296	222	224	226	228
7	Haverhill	♿	5:05	5:40	6:10	6:38	-	-	7:35	-	9:05	10:49	12:05	2:00	3:25	-	4:47	-	-	6:25	7:45	9:10	10:50
7	Bradford	♿	5:07	5:42	6:12	6:40	-	-	7:37	-	f 9:07	f 10:52	f 12:07	f 2:02	f 3:27	-	f 4:49	-	-	f 6:28	f 7:47	f 9:12	f 10:52
6	Lawrence	♿	5:16	5:51	6:21	6:50	-	-	7:46	-	9:15	10:59	12:15	2:10	3:35	-	4:57	-	-	6:39	7:55	9:20	11:00
5	Andover	♿	5:23	5:58	6:28	6:57	-	-	7:53	-	f 9:22	f 11:06	f 12:22	f 2:17	f 3:42	-	f 5:04	-	-	f 6:46	f 8:02	f 9:27	f 11:07
4	Ballardvale	♿	5:29	6:04	6:34	7:02	-	-	7:59	-	f 9:27	f 11:11	f 12:27	f 2:22	f 3:47	-	f 5:09	-	-	f 6:51	f 8:07	f 9:32	f 11:12
3	North Wilmington		5:36	6:11	6:41	-	-	-	-	-	f 9:34	f 11:18	f 12:34	f 2:29	-	-	-	-	-	-	-	f 9:39	f 11:19
2	Reading	♿	5:43	6:18	6:48	-	7:30	8:00	-	8:30	9:41	11:25	12:41	2:36	-	4:50	-	5:37	6:55	-	8:21	9:46	11:26
2	Wakefield		5:49	6:24	6:54	-	7:36	8:06	VIA	8:36	f 9:46	f 11:30	f 12:46	f 2:41	-	f 4:55	-	f 5:42	f 7:00	-	f 8:27	f 9:51	f 11:31
2	Greenwood		5:52	6:27	6:57	-	7:39	8:09	LOWELL	8:39	f 9:49	f 11:33	f 12:49	f 2:44	-	f 4:58	-	f 5:45	f 7:03	-	f 8:30	f 9:54	f 11:34
1	Melrose Highlands	♿	5:54	6:29	6:59	-	7:41	8:11	LINE	8:41	f 9:51	f 11:35	f 12:51	f 2:46	-	f 5:00	-	f 5:47	f 7:05	-	f 8:32	f 9:56	f 11:36
1	Melrose/Cedar Park		5:56	6:31	7:01	-	7:43	8:13	-	8:43	f 9:53	f 11:37	f 12:53	f 2:48	-	f 5:01	-	f 5:48	f 7:06	-	f 8:34	f 9:58	f 11:38
1	Wyoming Hill		5:58	6:33	7:03	-	7:45	8:15	-	8:45	f 9:55	f 11:39	f 12:55	f 2:50	-	f 5:03	-	f 5:51	f 7:08	-	f 8:36	f 10:00	f 11:40
1A	Malden Center	♿	L 6:03	L 6:38	L 7:08	-	L 7:51	L 8:19	-	L 8:49	L 9:58	L 11:43	L 12:58	L 2:54	-	L 5:06	-	L 5:54	L 7:11	-	L 8:39	L 10:03	L 11:43
1A	North Station	♿	6:16	6:51	7:21	7:36	8:02	8:30	8:38	9:00	10:10	11:55	1:10	3:06	4:23	5:17	5:45	6:05	7:22	7:25	8:50	10:15	11:55

Trains in purple box indicate peak period trains.

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM									PM									AM			
	Bikes Allowed		285	287	201	289	203	205	207	209	211	291	213	293	215	217	295	219	221	223	225	227	229
1A	North Station	♿	6:43	7:10	7:35	7:55	9:20	10:30	12:20	1:44	3:15	3:50	4:30	4:48	5:15	5:35	6:05	6:25	6:55	7:30	9:20	11:00	12:10
1A	Malden Center	♿	f 6:54	f 7:21	f 7:45	-	f 9:31	f 10:41	f 12:31	f 1:55	3:26	4:01	4:41	4:59	5:26	5:46	6:16	6:36	-	f 7:41	f 9:31	f 11:11	f 12:21
1	Wyoming Hill		f 6:57	f 7:24	f 7:48	-	f 9:34	f 10:44	f 12:34	f 1:58	3:30	4:05	4:45	5:03	-	5:50	6:20	6:40	-	f 7:44	f 9:34	f 11:14	f 12:24
1	Melrose/Cedar Park		f 6:59	f 7:26	f 7:50	-	f 9:36	f 10:46	f 12:36	f 2:00	3:32	4:07	4:47	5:05	-	5:52	6:22	6:42	-	f 7:46	f 9:36	f 11:16	f 12:26
1	Melrose Highlands	♿	f 7:02	f 7:29	f 7:53	-	f 9:39	f 10:49	f 12:39	f 2:03	3:36	4:11	4:51	5:09	-	5:56	6:26	6:46	VIA	f 7:49	f 9:39	f 11:19	f 12:29
2	Greenwood		f 7:05	f 7:32	f 7:56	-	f 9:42	f 10:52	f 12:42	f 2:06	3:39	4:14	4:54	5:12	-	5:59	6:29	6:49	LOWELL	f 7:52	f 9:42	f 11:22	f 12:32
2	Wakefield		f 7:09	f 7:36	f 8:00	-	f 9:46	f 10:56	f 12:46	f 2:10	3:43	4:18	4:58	5:16	5:36	6:03	6:33	6:53	LINE	f 7:56	f 9:46	f 11:26	f 12:36
2	Reading	♿	7:15	7:42	8:06	8:17	9:52	11:02	12:52	2:16	3:49	4:24	5:04	5:22	5:42	6:09	6:39	6:59	-	8:02	9:52	11:32	12:42
3	North Wilmington		-	-	8:12	-	f 9:58	f 11:08	f 12:58	f 2:22	3:56	-	5:11	-	5:49	6:16	-	7:06	-	f 8:08	f 9:58	f 11:38	f 12:48
4	Ballardvale	♿	-	-	8:19	-	f 10:05	f 11:16	f 1:05	f 2:30	4:03	-	5:18	-	5:56	6:23	-	7:13	7:35	f 8:15	f 10:05	f 11:45	f 12:55
5	Andover	♿	-	-	8:24	-	f 10:10	f 11:21	f 1:10	f 2:35	4:09	-	5:24	-	6:02	6:29	-	7:19	7:41	f 8:20	f 10:10	f 11:50	f 1:00
6	Lawrence	♿	-	-	8:31	-	10:17	11:28	1:17	2:42	4:16	-	5:31	-	6:09	6:36	-	7:26	7:48	8:28	10:17	11:57	1:07
7	Bradford	♿	-	-	L 8:40	-	L 10:26	L 11:38	L 1:27	L 2:54	L 4:26	-	L 5:42	-	L 6:20	L 6:47	-	L 7:37	L 7:59	L 8:39	L 10:26	L 12:06	L 1:16
7	Haverhill	♿	-	-	8:43	-	10:29	11:41	1:30	2:57	4:29	-	5:45	-	6:23	6:50	-	7:40	8:02	8:42	10:29	12:09	1:19

Trains in purple box indicate peak period trains.

Saturday & Sunday

Inbound to Boston

ZONE	STATION		AM		PM			
		SATURDAY TRAIN #	1200	1202	1204	1206	1208	1210
		SUNDAY TRAIN #	2200	2202	2204	2206	2208	2210
	Bikes Allowed							
7	Haverhill	♿	7:15	10:20	1:15	4:20	7:15	10:00
7	Bradford	♿	7:18	10:23	1:18	4:23	7:18	10:03
6	Lawrence	♿	7:27	10:32	1:27	4:32	7:27	10:12
5	Andover	♿	7:32	10:37	1:33	4:37	7:33	10:18
4	Ballardvale	♿	f 7:37	f 10:42	f 1:37	f 4:42	f 7:37	f 10:22
3	North Wilmington		f 7:44	f 10:49	f 1:44	f 4:49	f 7:44	f 10:29
2	Reading	♿	7:50	10:56	1:50	4:55	7:50	10:35
2	Wakefield		7:55	11:01	1:55	5:00	7:55	10:40
2	Greenwood		f 7:59	f 11:05	f 1:59	f 5:04	f 7:59	f 10:44
1	Melrose Highlands	♿	8:02	11:08	2:02	5:07	8:02	10:47
1	Melrose/Cedar Park		f 8:04	f 11:10	f 2:04	f 5:09	f 8:04	f 10:49
1	Wyoming Hill		f 8:06	f 11:12	f 2:06	f 5:11	f 8:06	f 10:51
1A	Malden Center	♿	L 8:10	L 11:16	L 2:10	L 5:15	L 8:10	L 10:55
1A	North Station	♿	8:21	11:27	2:21	5:26	8:21	11:06

Saturday & Sunday

Outbound from Boston

ZONE	STATION		AM		PM			
		SATURDAY TRAIN #	1201	1203	1205	1207	1209	1211
		SUNDAY TRAIN #	2201	2203	2205	2207	2209	2211
	Bikes Allowed							
1A	North Station	♿	8:40	11:40	2:50	5:20	8:20	11:30
1A	Malden Center	♿	8:50	11:50	3:00	5:30	8:30	11:40
1	Wyoming Hill		f 8:54	f 11:54	f 3:04	f 5:34	f 8:34	f 11:44
1	Melrose/Cedar Park		f 8:56	f 11:56	f 3:06	f 5:36	f 8:36	f 11:46
1	Melrose Highlands	♿	8:59	11:59	3:09	5:39	8:39	11:49
2	Greenwood		f 9:02	f 12:02	f 3:12	f 5:42	f 8:42	f 11:52
2	Wakefield		9:05	12:05	3:15	5:45	8:45	11:55
2	Reading	♿	9:11	12:11	3:21	5:51	8:51	12:01
3	North Wilmington		f 9:17	f 12:17	f 3:27	f 5:57	f 8:57	f 12:07
4	Ballardvale	♿	f 9:23	f 12:23	f 3:33	f 6:03	f 9:03	f 12:13
5	Andover	♿	9:28	12:28	3:38	6:08	9:08	12:18
6	Lawrence	♿	9:35	12:35	3:45	6:15	9:15	12:25
7	Bradford	♿	L 9:45	L 12:45	L 3:55	L 6:25	L 9:25	L 12:35
7	Haverhill	♿	9:48	12:48	3:58	6:28	9:28	12:38

Keep in Mind:

This schedule will be effective from October 21, 2019 and will replace the schedule of May 20, 2019

Presidents' Day and 4th of July operate on a **Saturday service schedule.**

New Year's Day, Memorial Day, Labor Day, Thanksgiving Day, and Christmas Day operate on a **Sunday service schedule**.

For all other holiday schedules, please check MBTA.com or call 617-222-3200.

Via Lowell Line: Operates via the Lowell Line between Wilmington and North Station. See the Lowell Line schedule for all stops.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Times in blue indicate an early departure (L stop): The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

High level platform and bridge plate available. Visit mbta.com/accessibility for more information.

Schedules may change in the event of severe weather

The MBTA and Keolis closely monitor weather forecasts to determine if conditions necessitate changes to the Commuter Rail schedule.

During weather events, the symbols below will communicate service level and impact on passengers. Service level for the following day will be announced mid-afternoon on the prior day.

REGULAR SCHEDULE
Trains will operate on a normal schedule.

STORM SCHEDULE
Major changes to the regular schedule. Schedules will be available on mbta.com, and in Boston stations.

NO SERVICE
No passenger service on Commuter Rail.

2020 REDUCED SERVICE SCHEDULE

Reduced service schedule in effect when declared in advance by the MBTA. In most cases, announcement made late in the afternoon on the prior day. Should an event occur requiring a more immediate service change, please check departure times prior to travel, and stay connected to MBTA.com for up-to-the minute information.

HAVERHILL LINE

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	7280	1200	1202	1204	1206	1208	1210
			AM	AM	AM	PM	PM	PM	PM
7	Haverhill	♿	-	7:15	10:20	1:15	4:20	7:15	10:00
7	Bradford	♿	-	7:18	10:23	1:18	4:23	7:18	10:03
6	Lawrence	♿	-	7:27	10:32	1:27	4:32	7:27	10:12
5	Andover	♿	-	7:32	10:37	1:33	4:37	7:33	10:18
4	Ballardvale	♿	-	7:37	10:42	1:37	4:42	7:37	10:22
3	North Wilmington		-	7:44	10:49	1:44	4:49	7:44	10:29
2	Reading	♿	5:50	7:50	10:56	1:50	4:55	7:50	10:35
2	Wakefield		5:56	7:55	11:01	1:55	5:00	7:55	10:40
2	Greenwood		5:59	7:59	11:05	1:59	5:04	7:59	10:44
1	Melrose Highlands	♿	6:01	8:02	11:08	2:02	5:07	8:02	10:47
1	Melrose/Cedar Park		6:03	8:04	11:10	2:04	5:09	8:04	10:49
1	Wyoming Hill		6:05	8:06	11:12	2:06	5:11	8:06	10:51
1A	Malden Center	♿	6:10	8:10	11:16	2:10	5:15	8:10	10:55
1A	NORTH STATION	♿	6:23	8:21	11:27	2:21	5:26	8:21	11:06

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	1201	1203	1205	1207	1209	1211
			AM	AM	PM	PM	PM	PM
1A	NORTH STATION	♿	8:40	11:40	2:50	5:20	8:20	11:30
1A	Malden Center	♿	8:50	11:50	3:00	5:30	8:30	11:40
1	Wyoming Hill		8:54	11:54	3:04	5:34	8:34	11:44
1	Melrose/Cedar Park		8:56	11:56	3:06	5:36	8:36	11:46
1	Melrose Highlands	♿	8:59	11:59	3:09	5:39	8:39	11:49
2	Greenwood		9:02	12:02	3:12	5:42	8:42	11:52
2	Wakefield		9:05	12:05	3:15	5:45	8:45	11:55
2	Reading	♿	9:11	12:11	3:21	5:51	8:51	12:01
3	North Wilmington		9:17	12:17	3:27	5:57	8:57	12:07
4	Ballardvale	♿	9:23	12:23	3:33	6:03	9:03	12:13
5	Andover	♿	9:28	12:28	3:38	6:08	9:08	12:18
6	Lawrence	♿	9:35	12:35	3:45	6:15	9:15	12:25
7	Bradford	♿	9:45	12:45	3:55	6:25	9:25	12:35
7	Haverhill	♿	9:48	12:48	3:58	6:28	9:28	12:38

Reduced schedule advisory system

The MBTA and Keolis closely monitor events to determine if changes to the Commuter Rail schedule are needed. During these times, the symbols to the right will communicate service level and impact on passengers.

REGULAR SCHEDULE
Trains will operate on a normal schedule.

REDUCED SCHEDULE
Major changes to the regular schedule. Schedules also available on MBTA.com and in Boston stations.

NO SERVICE
No passenger service on Commuter Rail.

Service Change ONGOING

All MBTA services are running on a reduced schedule until further notice in the interest of the health and safety of our riders and employees. Effective May 6, all riders must use a face covering when on the MBTA. Full details: MBTA.com/coronavirus

Commuter Rail Fares

One-Way Fares

Each Commuter Rail station is located in a fare zone, from 1A – 10. Your Commuter Rail fare depends on which zones your boarding and exiting stations are located in.

Commuter Rail One-Way

$2.40 – $13.25

with CharlieTicket or mTicket App

Price based on distance traveled

Learn about Commuter Rail zones

Commuter Rail Weekend Pass

$10.00

with CharlieTicket, Cash, or mTicket App

Learn about $10 weekends

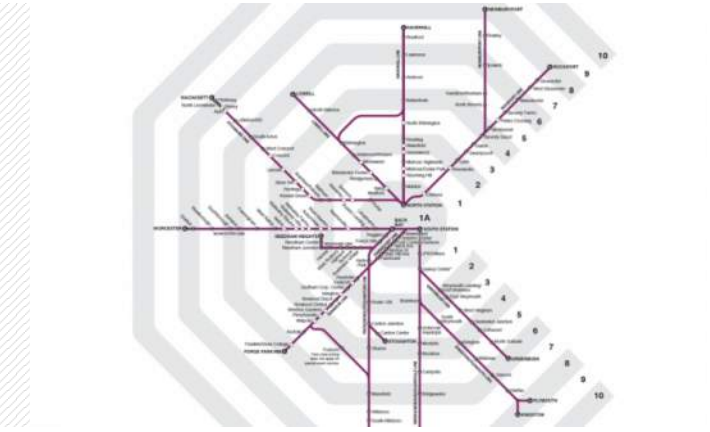
Commuter Rail Fare Zones

Download our map to see which zone your station is in.

Find my fare zone

Find the cost of your trip with our fare finder.

Find your fare



Passes

The price of your monthly Commuter Rail pass depends on which zones your boarding and exiting stations are located in.

Tip! Reduced monthly Commuter Rail passes are not available, but reduced 10-ride passes are available at fare vending machines, at ticket windows, and from mTicket.

Monthly Commuter Rail Pass CharlieTicket

$90.00 – $426.00

Unlimited travel for 1 calendar month

Valid on:

- Commuter Rail, up to designated pass zone
- Subway
- Bus
- Charlestown Ferry
- Hingham/Hull Ferry with Zone 6 passes and up

Please note:

- Zone 1A passes not valid on Express Bus
- Interzone passes not valid on subway, Express Bus, and ferry

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Monthly Commuter Rail Pass mTicket

$80.00 – $416.00

Unlimited travel for 1 calendar month

Valid on:

- Commuter Rail, up to designated pass zone

No transfers to other modes

Weekend Pass

$10.00

- Unlimited travel to all zones on all lines
- Valid Saturdays and Sundays
- Available onboard trains, at ticket windows, and from mTicket

Valid only on:
Commuter Rail

$10 Commuter Rail Weekends

Take unlimited Commuter Rail trips on Saturdays and Sundays for just $10.

Learn more about weekend passes

Auto-pay

Get a monthly Commuter Rail pass that renews automatically.

Sign up for Auto-pay

Perq

Get monthly passes—at pre-tax rates—through your employer.

Learn more about Perq

How to Pay Your Commuter Rail Fare

First, choose how you'll pay your fare

Conductors will check your ticket or pass after you board the train.

Tip! During Fare Is Fair events, your ticket may be checked at any point during your trip, including before you board or after you get off the train.

CharlieTicket

★ Best for frequent Commuter Rail riders who also take the subway or bus
✔ Monthly passes available
⊘ No online card management
⊘ No discounts

One-way and round trip tickets valid on:
Commuter Rail, up to designated zone

Monthly passes valid on:
Commuter Rail, up to designated zone
Subway
Bus
Charlestown Ferry
Hingham/Hull Ferry with Zone 6 passes and up

Note: Interzone passes not valid on subway, Express Bus, and ferry

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mTicket

★ Best for infrequent Commuter Rail riders or pass holders who don't often take subway or bus
✔ $10 discount on monthly passes
✔ Convenient smartphone app for ticket purchase and validation
✔ 10-ride passes available
⊘ No transfers

	Valid on: Commuter Rail, up to designated zone
Cash Onboard	★ Best for infrequent Commuter Rail riders at stations where tickets can't be purchased at fare vending machines or ticket windows ✔ May include a $3 fee if you board at a station where tickets can be purchased ✔ Only available for one-way and round trip tickets ⊘ Not available during Fare is Fair events

Then, choose where to buy your ticket or pass

- mTicket app
- Ticket booths
- Fare vending machines
- Online
- Retail stores

When you're ready to board the train

The conductor will verify your fare payment after you board the train. The conductor may tuck a small piece of paper on the seat back in front of you to indicate that you paid your fare.

The only exception to this is during Fare Is Fair events, when your ticket may be checked at any point during your trip, including before you board or after you get off the train.

- Pay with a prepaid ticket or pass
- Pay with mTicket

Pay with cash or credit on board

Reduced Fares

Some customers are eligible for reduced fares or can ride the T for free.

Learn more about reduced fares

Have a Question?

Fares FAQ

Visit our fares FAQ for detailed answers about the MBTA's ticketing system

Other MBTA Fares

Subway Fares

See all MBTA subway fares

Bus Fares

See all MBTA bus fares

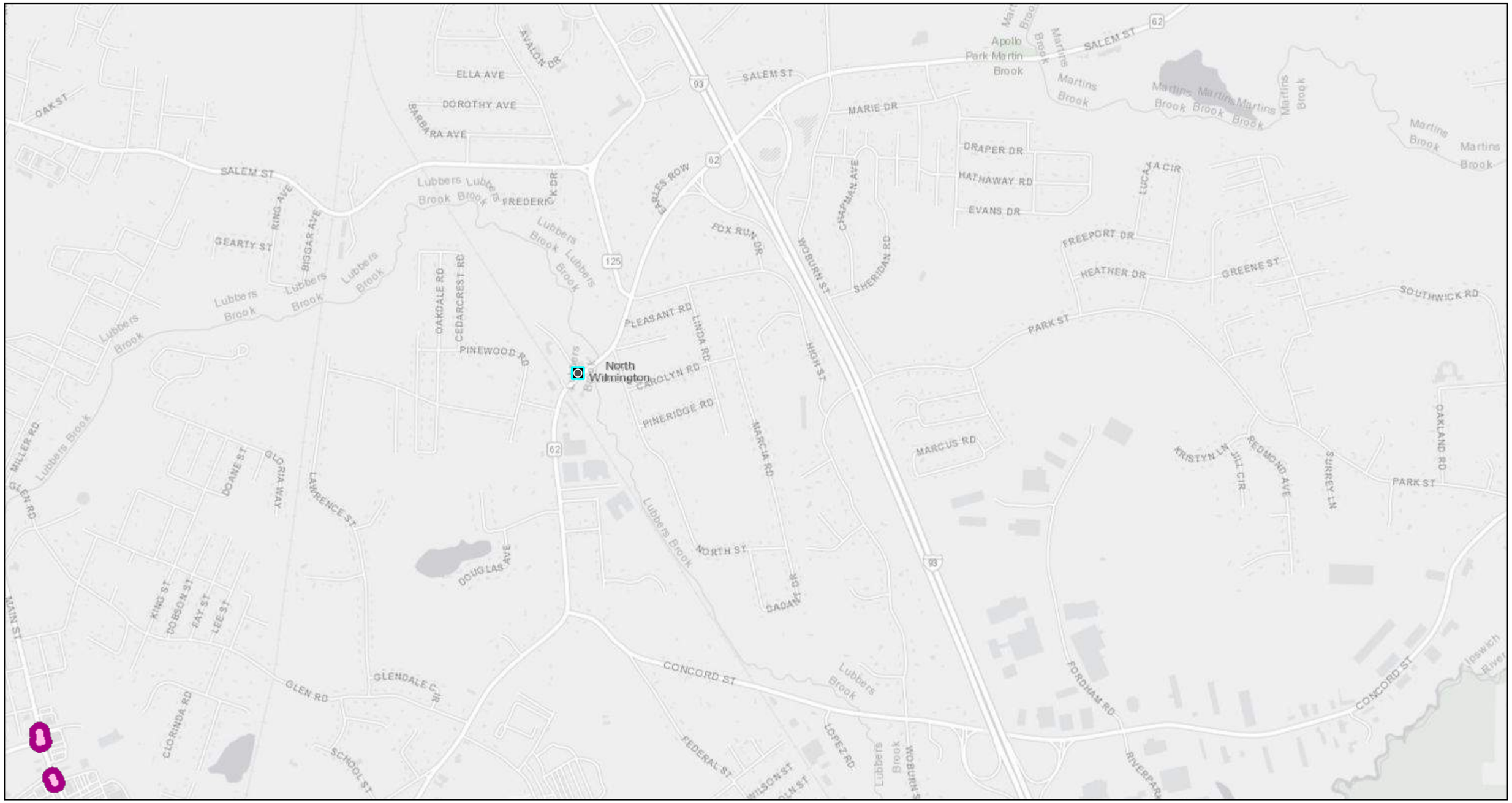
Ferry Fares

See all MBTA ferry fares

Common Fares

See common fares across all MBTA modes

MASSDOT HIGH CRASH LOCATION MAPPING



$)

6,3%HGHWUL DQ&OXWHU

6,3%LFFOH&OXWHUV

6,3&OXWHU

P

NP

\UL 5DUPQ F 2HQWUHHWDS FRQWUL EXWRUV DQG WKH,6 XHU FRPQLW\

DWZ

\UL 5_ \UL 5_

TRIP-GENERATION CALCULATIONS

Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (Land Use 225), and mid-rise residential with 1st-floor commercial (Land Use 231) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.46 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 95.7 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 4:45 and 5:45 p.m., respectively.

For the four dense multi-use urban sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:15 and 5:15 p.m., respectively. For the three center city core sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 6:45 and 7:45 a.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.46 residents per occupied dwelling unit.

For the five sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 95.7 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the five center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 1.84 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.94 during Weekday, AM Peak Hour of Generator
- 2.07 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.59 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 32 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.90 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.90 during Weekday, AM Peak Hour of Generator
- 2.00 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.08 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 13 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.56 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.88 during Weekday, AM Peak Hour of Generator
- 1.70 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.07 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, Ontario, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.

Source Numbers

168, 188, 204, 305, 306, 321, 357, 390, 436, 525, 530, 579, 638, 818, 857, 866, 901, 904, 910, 912, 918, 934, 936, 939, 944, 947, 948, 949, 959, 963, 964, 966, 967, 969, 970

Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- Technical Support
- Add Users
- Comments

ADD-ONS

Try OTISS Pro

Query | Filter

DATA SOURCE: Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

LAND USE : 221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY: All Sites

INDEPENDENT VARIABLE (IV): Dwelling Units

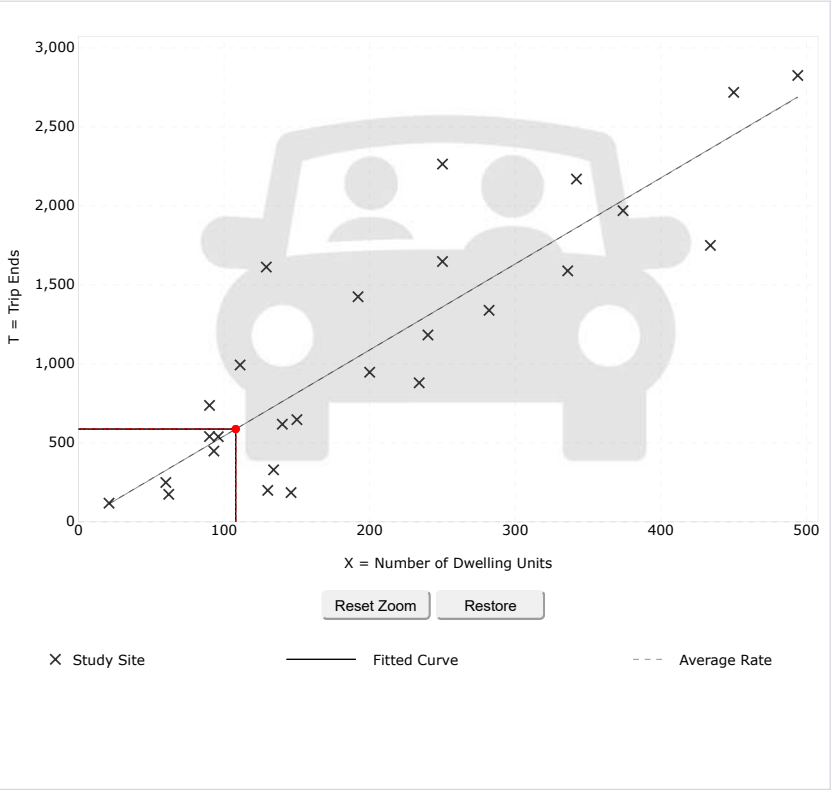
TIME PERIOD: Weekday

SETTING/LOCATION: General Urban/Suburban

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 108 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
27

Avg. Num. of Dwelling Units:
205

Average Rate:
5.44

Range of Rates:
1.27 - 12.50

Standard Deviation:
2.03

Fitted Curve Equation:
T = 5.45(X) - 1.75

R^2:
0.77

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 588 (Total), 294 (Entry), 294 (Exit)
Fitted Curve: 587 (Total), 293 (Entry), 294 (Exit)

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Graph Look Up

ITETripGen Web-based App

Graph Look Up

Technical Support

Add Users

Comments

ADD-ONS

Try OTISS Pro

Query | Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

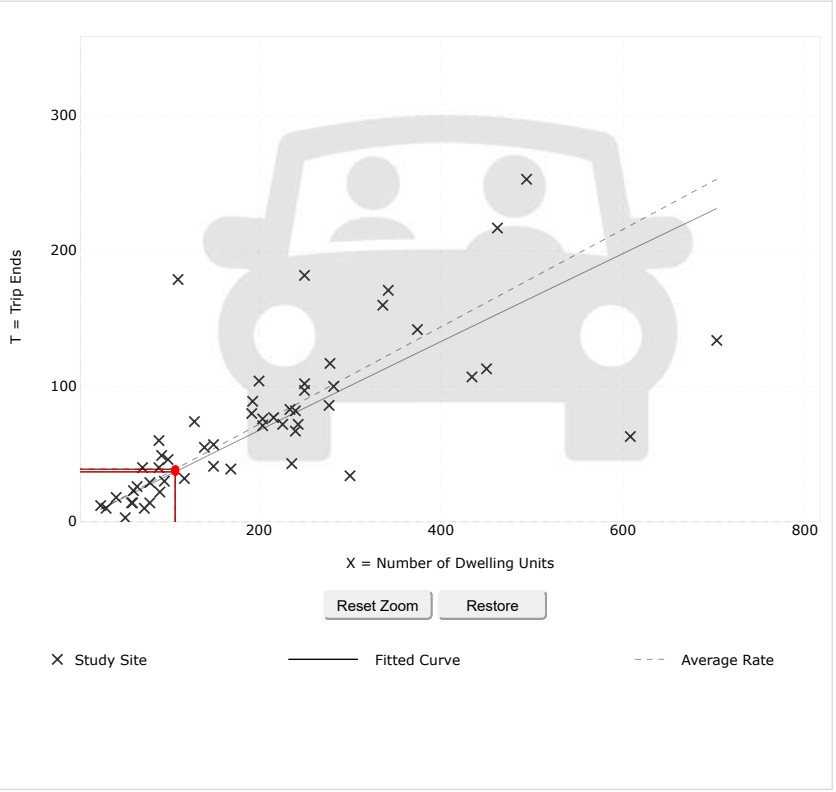
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
108 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
53

Avg. Num. of Dwelling Units:
207

Average Rate:
0.36

Range of Rates:
0.06 - 1.61

Standard Deviation:
0.19

Fitted Curve Equation:
Ln(T) = 0.98 Ln(X) - 0.98

R^2:
0.67

Directional Distribution:
26% entering, 74% exiting

Calculated Trip Ends:
Average Rate: 39 (Total), 10 (Entry), 29 (Exit)
Fitted Curve: 37 (Total), 10 (Entry), 27 (Exit)

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Graph Look Up

Query | Filter

DATA SOURCE: Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

LAND USE : 221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY: All Sites

INDEPENDENT VARIABLE (IV): Dwelling Units

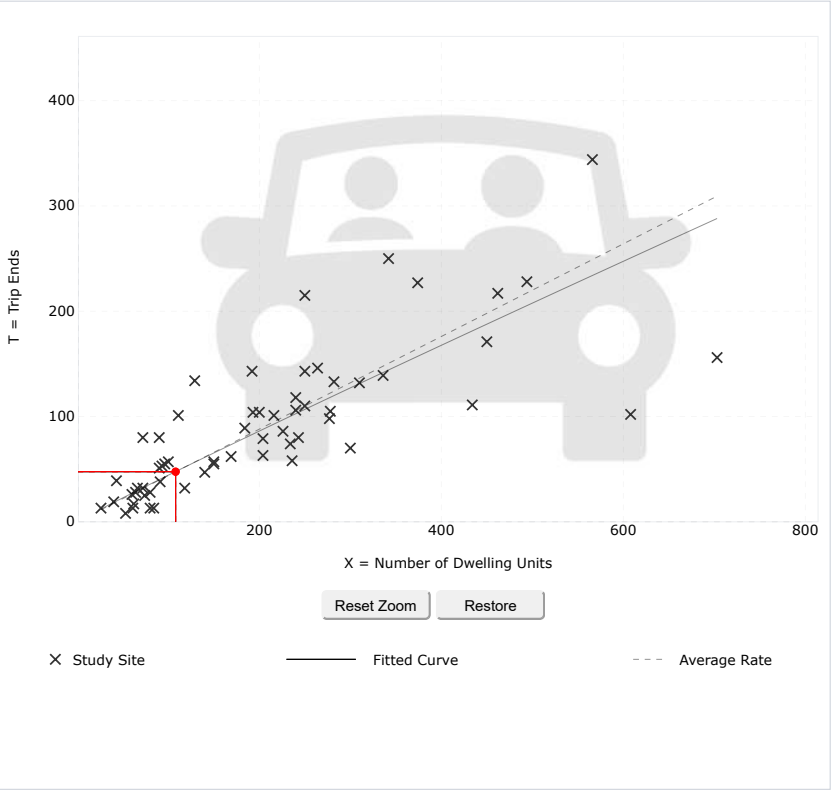
TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION: General Urban/Suburban

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 108 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
60

Avg. Num. of Dwelling Units:
208

Average Rate:
0.44

Range of Rates:
0.15 - 1.11

Standard Deviation:
0.19

Fitted Curve Equation:
Ln(T) = 0.96 Ln(X) - 0.63

R^2:
0.72

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 48 (Total), 29 (Entry), 19 (Exit)
Fitted Curve: 48 (Total), 29 (Entry), 19 (Exit)

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TECHNICAL MEMORANDUM

REF: MAX-2018119.02

DATE: September 14, 2022

TO: Mr. Matthew Costa, P.E.
Beals Associates, Inc.
22 Park Plaza, Suite 200
Boston, MA 02116

FROM: Ms. Rebecca L. Brown, P.E., Senior Project Manager
Ms. Susannah E. Theriault, P.E., Project Engineer

RE: Updated Traffic Impact Assessment
Upton Park Mixed Commercial Development
36 & 38 Upton Drive, Massachusetts

EXECUTIVE SUMMARY

Greenman-Pedersen, Inc. (GPI) previously prepared a *Traffic Impact and Access Study*[1] (TIAS) for a proposed warehouse/office development referred to as Upton Park to be located at #36 & #38 Upton Drive in Wilmington, Massachusetts. The site is currently a vacant vegetated lot with a gravel driveway which spurs off the southwesterly corner of Upton Drive. The site was recently approved for the construction of an approximately ±263,900 square feet (SF) warehouse distribution development within three buildings with access/egress proposed via five driveways along Upton Drive. To attract a wider range of potential tenants to the site, the developer is seeking approval for a mixed commercial development that would allow a potential light industrial, manufacturing, or research and development (R&D) use to occupy a portion of the previously permitted buildings. Access and egress will continue to be provided via the five previously proposed site driveways.

To allow flexibility in the marketing of the overall development, the various uses may be separated between each building and could include up to 19,800 SF of R&D space, up to 39,000 SF of light industrial space, and up to 78,500 SF of manufacturing space with the remainder of the buildings being occupied by warehousing space. This *Updated Traffic Impact Assessment* (Updated TIA) is intended to evaluate the traffic impacts associated with the proposed change in use in comparison to the originally approved development and assess the need for any additional mitigation measures to offset the project's impacts on the study area roadways. The Applicant acknowledges that if the overall development's traffic generation exceeds the amount depicted in this report, than additional studies will be provided to the approving authority.

The study area for this Updated TIA is consistent with the study area contained in the original TIAS and is graphically depicted in Figure 1. The Updated TIA utilizes the traffic volumes and analysis contained in the original 2018 TIAS to evaluate 2022 Existing and 2029 No-Build traffic operations at the study area intersections. The potential traffic to be generated by the proposed mix of light industrial, manufacturing, warehousing, and R&D space has been estimated based on Institute of Transportation Engineers (ITE) trip

[1] *Traffic Impact and Access Study, Upton Park, Wilmington, Massachusetts*; Greenman-Pedersen, Inc.; September 14, 2018.

generation rates and distributed to the roadway network to estimate 2029 Build conditions. The currently proposed development is anticipated to generate an additional 84 vehicle trips (68 entering and 16 exiting) during the weekday AM peak hour and an additional 85 vehicle trips (21 entering and 64 exiting) during the weekday PM peak hour as compared to the previously approved warehouse distribution center.

Capacity and queue analyses were completed at all of the study area intersections for the 2029 Build condition with the currently proposed development and compared to the 2029 No-Build condition and 2029 Build condition with the previously proposed development. The results of the analysis indicate that all movements at the signalized intersections of Route 125 (Ballardvale Street) with the I-93 Northbound (NB) and Southbound (SB) ramps are anticipated to operate at LOS D or better under all analysis conditions. The additional traffic generated by the proposed mixed commercial development is not expected to increase delay on any movement through these intersections by more than four seconds per vehicle or increase queues by more than two vehicles.

Although some movements at the Route 125 / Ballardvale Street intersection will operate at LOS F under 2029 No-Build and Build conditions, the additional traffic generated by the proposed warehouse / office development is not anticipated to increase delay on any movement through the intersection by more than seven seconds per vehicle or increase queues by more than two vehicles.

Similarly, although some side street movements at the unsignalized intersections of Andover Street with Upon Drive and Jonspin Road are expected to operate at LOS F under 2029 No-Build and/or Build conditions, the volume-to-capacity (V/C) ratios will be well below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. Improvements are also proposed by the Applicant at the intersection of Andover Street / Upton Drive, which include installation of DO NOT BLOCK INTERSECTION signage and pavement markings, and reconstruction of the median island on Upton Drive to better accommodate truck turns. These improvements will help to facilitate turning movements into and exiting Upton Drive.

Several movements at the intersection of Route 125 / Andover Street are anticipated to operate at LOS E or F during the weekday AM and PM peak hours under 2029 No-Build and Build conditions. However, the additional traffic generated by the proposed mixed commercial development is not expected to increase overall delay through the intersection by more than 13 seconds per vehicle or increase queues by more than five vehicles. Although MassDOT recently installed a new traffic signal controller at this intersection, it operates with a single timing plan 24 hours per day that is designed to accommodate traffic volumes during the weekday AM peak hour. By implementing a separate timing plan for the weekday PM peak hour, all movements through the intersection can operate under capacity (V/C <1.0) and at LOS D or better during the weekday PM peak hour. The Applicant for the development at #30 Upton Drive has committed to contacting MassDOT to implement the recommended signal timing modifications as mitigation for the proposed development.

Based on the findings above, the proposed mixed commercial development can be safely and efficiently accommodated along the existing roadway network. No additional project-specific mitigation is warranted based on the incremental impacts of the development.

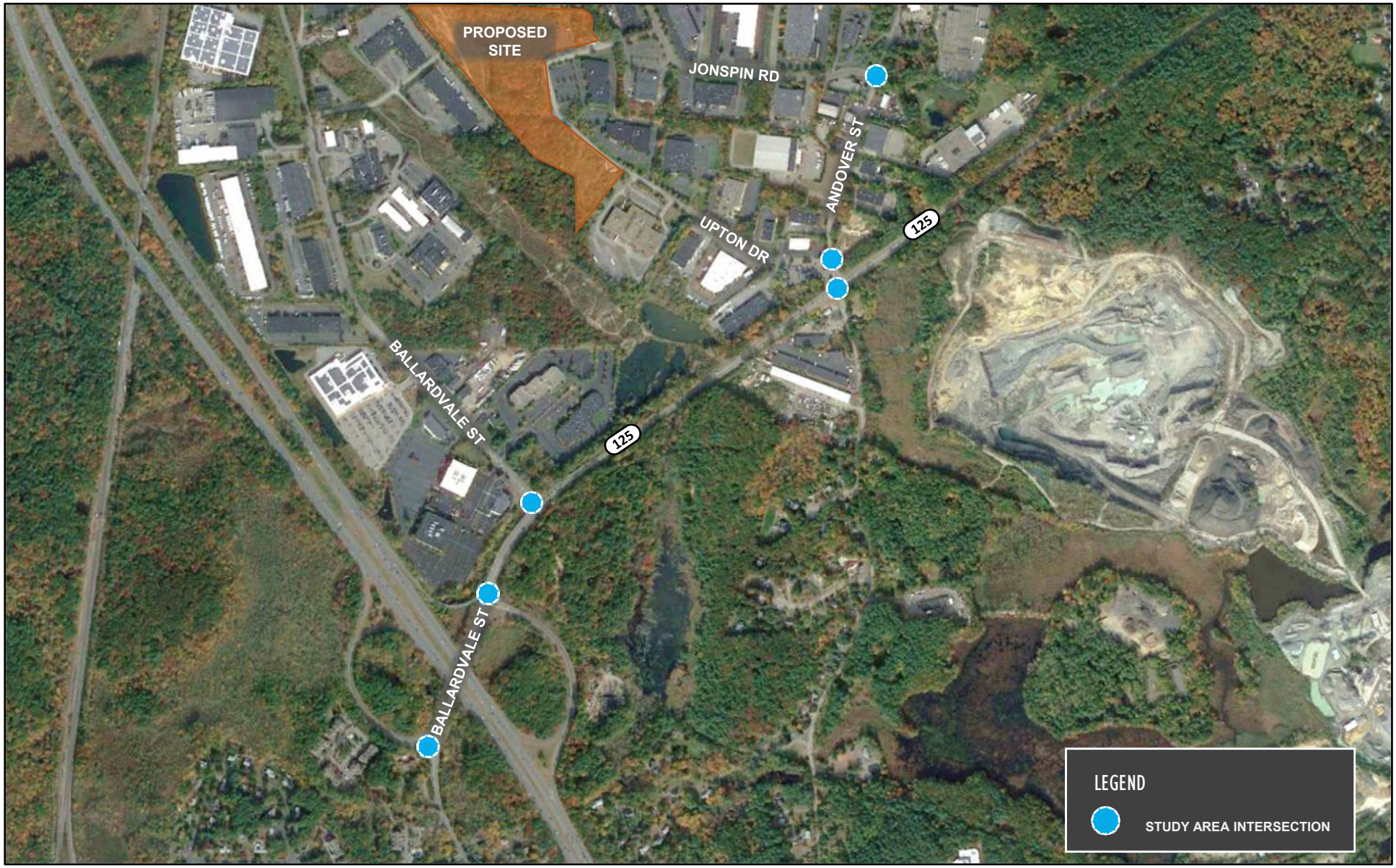


FIGURE 1 – SITE LOCATION MAP

EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and nearby intersections. To be consistent with the original *Traffic Impact and Access Study*[2] (TIAS) prepared as part of the permitting for the Upton Park development, the following key intersections have been evaluated in the completion of this study:

- Route 125 (Ballardvale Street) / Route 93 SB Ramps (Signalized)
- Route 125 (Ballardvale Street) / Route 93 NB Ramps (Signalized)
- Route 125 (Ballardvale Street) / Ballardvale Street (Signalized)
- Route 125 / Andover Street (Signalized)
- Andover Street / Upton Drive (Unsignalized)
- Andover Street / Jonspin Road (Unsignalized)

Traffic Volumes

Existing conditions traffic volumes during the weekday AM (7:30 AM – 8:30 AM) and weekday PM (4:30 PM – 5:30 PM) peak hours at the study area intersections were obtained from the original 2018 TIAS[3] prepared for the Upton Park development. Manual turning movement counts (TMCs) and vehicle classification counts were collected in June and August 2018 as part of the Upton Park 2018 TIAS. The TMCs were collected during the weekday AM (7:00 AM – 9:00 AM) and weekday PM (4:00 PM – 6:00 PM) peak periods on Thursday, August 16, 2018 at each of the following intersections:

- Route 125 / Andover Street
- Andover Street / Upton Drive
- Andover Street / Jonspin Road

In addition, GPI previously collected manual turning movement counts along Route 125 and Ballardvale Street in June 2018, while school was in session, as part of a signal timing modification project with the Massachusetts Department of Transportation (MassDOT) during the same weekday AM and PM peak periods at the following intersections:

- Route 125 / Ballardvale Street
- Ballardvale Street / Route 93 NB Ramps
- Ballardvale Street / Route 93 SB Ramps

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the June and August traffic-volume data needed to be adjusted to account for this

[2] *Traffic Impact and Access Study, Upton Park, Wilmington, MA;* Prepared by Greenman-Pedersen, Inc.; September 14, 2018.

[3] *Traffic Impact and Access Study, Upton Park, Wilmington, MA;* Prepared by Greenman-Pedersen, Inc.; September 14, 2018.

fluctuation, traffic-volume data from Massachusetts Department of Transportation (MassDOT) Permanent Count Stations in the area were researched[4]. Based on the MassDOT traffic-volume data, traffic during the months of June and August is 5.3 and 3.1 percent higher than average-month conditions, respectively. Therefore, the June traffic volumes were unadjusted to represent a conservative (worse case) scenario of average-month conditions. The MassDOT seasonal adjustment data are provided in the Appendix.

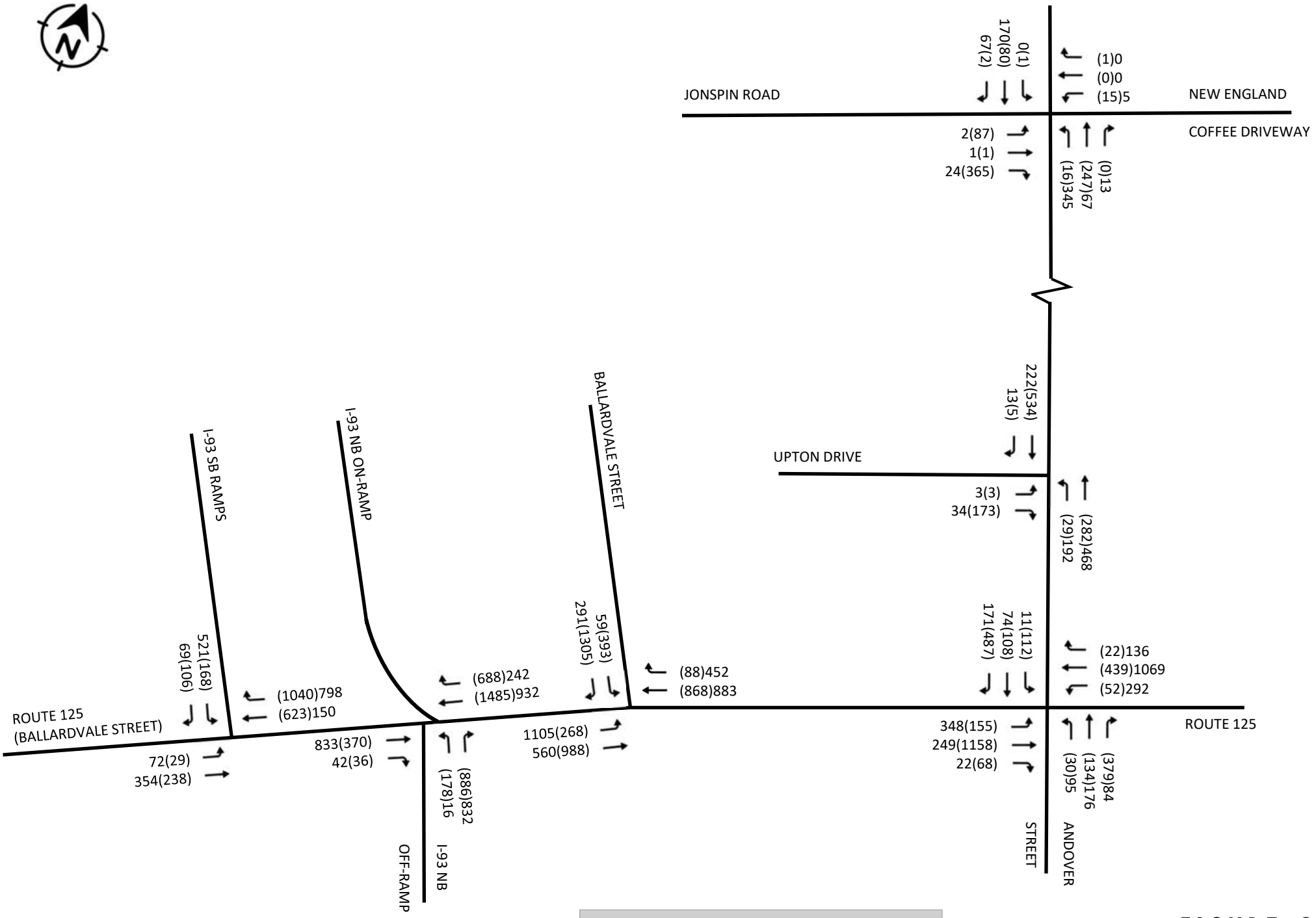
While the historic traffic count data indicates that traffic volumes in August are typically higher than average month conditions, GPI compared the volumes collected in August to those collected in June for the section of Route 125 between Ballardvale Street and Andover Street, and discovered that the traffic volumes collected in August were 10.5 and 5.2 percent lower than traffic volumes collected in June during the weekday AM and PM peak hours, respectively, in the westbound direction. This difference is likely due to school traffic and summer vacations. To account for this difference, the August traffic volumes were increased accordingly to balance with the June traffic volumes in the westbound direction. In the eastbound direction, however, the August traffic volumes were 17.9 to 2.3 percent higher than the June traffic volumes during the AM and PM peak hours, respectively. Therefore, the June traffic volumes were increased accordingly to balance with the August traffic volumes in the eastbound direction. Overall, two-way traffic volumes along Route 125 between Ballardvale Street and Andover Street were 0.7 to 0.8 percent higher in June than in August. Therefore, all other volumes collected in August were increased by 0.7 to 0.8 percent to account for this seasonal variation in traffic.

Annual Adjustment

The MassDOT directive, "Guidance of Traffic Count Data" dated April 2020 provides growth rates to be applied to traffic volumes on various roadway types to adjust traffic volumes collected prior to March 2020 to 2021 Existing conditions. According to MassDOT's Yearly Growth Rates for data from 2014 to 2018, an adjustment of -0.004 should be applied to traffic volumes collected on Group U4-7 (urban arterials and collectors) to grow volumes from 2018 to 2019 conditions. However, to provide a conservative (worse case) analysis condition, no adjustment was applied to the 2018 traffic volumes to adjust to 2019 conditions. MassDOT's directive also notes the significant decrease in traffic volumes that occurred on nearly all roadways across the Commonwealth due to the COVID-19 pandemic in 2020 and 2021. Therefore, MassDOT recommends that no annual growth adjustment be applied to 2019 traffic volumes to grow them to 2022 conditions. As a result, the 2018 seasonally adjusted traffic volumes were assumed to represent a 2022 Existing condition.

The resulting 2022 Existing traffic-flow networks for the weekday AM and weekday PM peak hours are shown graphically on Figure 2.

[4] *MassDOT Traffic Volumes*; Permanent Count Stations 5022 – Route I-93 north of Ramp Route 62 to I-93 (Wilmington), 5127 – Route 125 south of Route 28 (Wilmington).



XX (XX) = AM(PM) PEAK HOUR

FIGURE 2

2022 EXISTING CONDITIONS WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the year 2029. This represents a seven-year design horizon in accordance with the EOEEA/EOT traffic impact assessment guidelines. The proposed development is expected to be occupied within this time period. Traffic volumes on the roadway network at that time will include existing traffic, new traffic due to normal traffic growth, and traffic related to any significant development by others expected to be completed within the area by 2029. Consideration of these factors resulted in the development of 2029 No-Build traffic volumes, which assume that the proposed project is not built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

Traffic Growth

To develop the 2029 No-Build (seven-year) forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined. Based on historic traffic-volume counts provided by MassDOT and recent traffic studies completed for other projects in the area, traffic volumes in the area had been increasing at a rate of approximately 1.1 percent per year prior to COVID-19.[5] Therefore a 1.1 percent compounded annual growth was assumed for the project area. The MassDOT adjustment data are provided in the Appendix.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next seven years were considered. At the time that the project was originally permitted, the following additional projects were identified:

- *58 Jonspin Road (Heilind Electronics Inc.)* – Commercial Development proposes a 60,000 square feet (SF) office building addition and the re-purposing of the existing 41,131 SF manufacturing building located at 58 Jonspin Road. As a result of the project, approximately 50 employees from 30 Upton Drive will be relocated to the new office building. Access is proposed via two full access/egress driveways with one east and one west of the project site. A Traffic Impact and Access Study (TIAS) prepared by Vanasse & Associates Inc. (VAI) dated May 2018 identifies the impacts on surrounding roads resulting from the proposed site-generated traffic.

- *401 Andover Street (Spruce Farm)* – The project consists of 27 age-restricted (age 55+) residential units located at 401 Andover Street. Access is proposed via a full access/egress driveway onto Andover Street. A Traffic Impact Assessment (TIA) prepared by GPI dated April 2017 identifies the impacts on surrounding roads resulting from the proposed site-generated traffic.

- *228 Andover Street (Arrow Paper Corporation)* – The project consists of 34,450 SF building addition located at 228 Andover Street. A Traffic Impact Assessment (TIA) prepared by Dana D. Perkins Inc. dated February 2020 identifies the impacts on surrounding roads resulting from the proposed site-generated traffic. The impact of site-generated traffic volumes on the roadway network is considered minimal, therefore, the trips are accounted for in the conservative background growth rate.

- *225 Andover Street (Self-Storage Facility)* – The project consists of 30,500 SF building addition located at 225 Andover Street. A Traffic Impact Assessment has not yet been received but it is assumed that the vehicle trips resulting from this proposal will be very minimal. Therefore, the impact

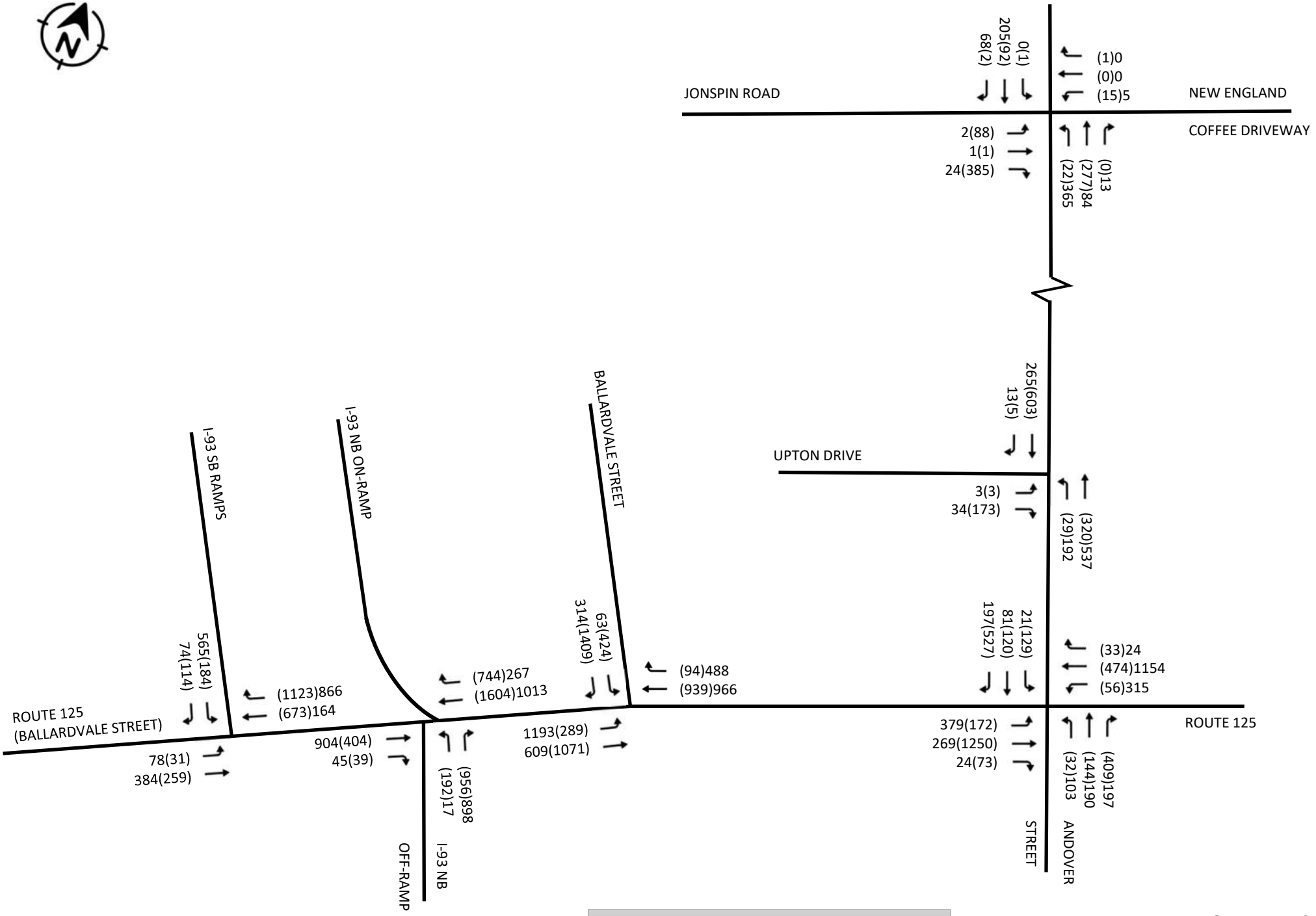
[5] *MassDOT Transportation Data Management System;* Tewksbury and Wilmington, MA.

of site-generated traffic volumes on the roadway network are accounted for in the conservative background growth rate.

Although additional development projects have recently been approved or proposed in the surrounding area, those developments entered the permitting process after the approved development at Upton Park and were required to include the traffic generated by Upton Park within their No-Build traffic-volume projections. Therefore, the traffic generated by these additional projects was not included in the 2029 No-Build projections to assess the impacts of the proposed change in use of Upton Park.

No-Build Conditions

The 2029 No-Build networks were accordingly developed by applying a compounded 1.1 percent annual traffic growth rate (8.0 percent over seven years) to the 2022 Existing traffic volumes and adding the traffic to be generated by the four (4) other planned development. The 2029 No-Build peak-hour traffic-flow networks are shown graphically on Figure 3 for the weekday AM and weekday PM peak hours.



XX (XX) = AM(PM) PEAK HOUR

FIGURE 3

2029 NO-BUILD CONDITIONS
WEEKDAY PEAK HOUR TRAFFIC VOLUMES

Trip Generation

The project consists of constructing three buildings to contain a total of up to ±125,300 SF of warehouse space, ±39,000 SF of light industrial space, ±78,500 SF of manufacturing space, and ±19,800 SF of research and development space. To estimate the volume of traffic to be generated by the proposed development, trip generation rates published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[6] were used for Land Use Code (LUC) 150 (Warehouse), LUC 110 (Light Industrial), LUC 140 (Manufacturing), and LUC 760 (Research & Development Center), respectively. Table 1 summarizes the result of trip generation estimates. All trip-generation calculations are provided in the Appendix.

It should be noted that the site was previously approved for the development of three warehouse buildings totaling ±293,600 SF. Table 1 also provides a comparison of the trips generated by the currently proposed development in comparison to the previously approved development on the site.

As shown in Table 1, the currently proposed development is anticipated to generate an additional 84 vehicle trips (68 entering and 16 exiting) during the weekday AM peak hour and an additional 85 vehicle trips (21 entering and 64 exiting) during the weekday PM peak hour.

6 *Trip Generation Manual, 11th Edition*; Institute of Transportation Engineers; Washington, DC; 2021.

TABLE 1
PROPOSED TRIP-GENERATION SUMMARY

Time Period / Direction	Previously Approved Development [a]	Currently Proposed Development					Net Change in Trips [g]
		Warehouse (LUC 150) [b]	Manufacturing (LUC 140) [c]	Light Industrial (LUC 110) [d]	R&D (LUC 760) [e]	Total Trips [f]	
Weekday Daily	**462**	236	372	190	220	**1,018**	**556**
Weekday AM Peak Hour							
Enter	**44**	30	40	26	16	**112**	**68**
Exit	**13**	9	13	3	4	**29**	**16**
Total	**57**	39	53	29	20	**141**	**84**
Weekday PM Peak Hour							
Enter	**16**	12	18	4	3	**37**	**21**
Exit	**43**	30	40	21	16	**107**	**64**
Total	**59**	42	58	25	19	**144**	**85**

[a] Obtained from Table 1 of *Upton Parking, Wilmington, Massachusetts – Trip Generation Comparison*; prepared by Greenman-Pedersen, Inc.; dated October 1, 2021.
[b] Based on ITE trip rates for LUC 150 for ±125,300 SF.
[c] Based on ITE trip rates for LUC 140 for ±78,500 SF.
[d] Based on ITE trip rates for LUC 110 for ±39,000 SF.
[e] Based on ITE trip rates for LUC 760 for ±19,800 SF.
[f] Sum of Proposed Warehouse, Manufacturing, Light Industrial, and R&D Trips.
[g] Currently Proposed Development Trips minus Previously Approved Development Trips.

Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. The directional distribution of site traffic was based on the trip distribution patterns contained in the *Response to Comments on the TIAS*[7] prepared for the previously permitted Upton Park development, which was reviewed and approved by the Town's peer review consultant. Table 2 summarizes the results of the trip distribution estimates. All trip distribution data are provided in the Appendix.

TABLE 2
Trip Distribution Summary

Roadway	Direction To/From	Percentage Trips to/from
Route 125	West	15%
Route 125	East	10%
I-93	North	30%
I-93	South	30%
Andover Street	North	5%
Andover Street	South	10%
TOTAL	**--**	**100%**

Build Traffic Volumes

Based on the traffic generation and distribution estimates for this project, the traffic volumes associated with the proposed development were assigned to the roadway network. The site-generated traffic networks are shown on Figures 4A and 4B for the weekday AM and weekday PM peak hours, respectively. The site-generated traffic volumes were then combined with the 2029 No-Build traffic volumes to develop the 2029 Build peak-hour traffic-volume networks. The 2029 Build weekday AM and weekday PM peak hour traffic volumes are illustrated on Figure 5.

[7] *Response to Comments from TEC, Inc., 36 and 38 Upton Drive, Wilmington, MA;* Prepared by Greenman-Pedersen, Inc.; July 22, 2019.

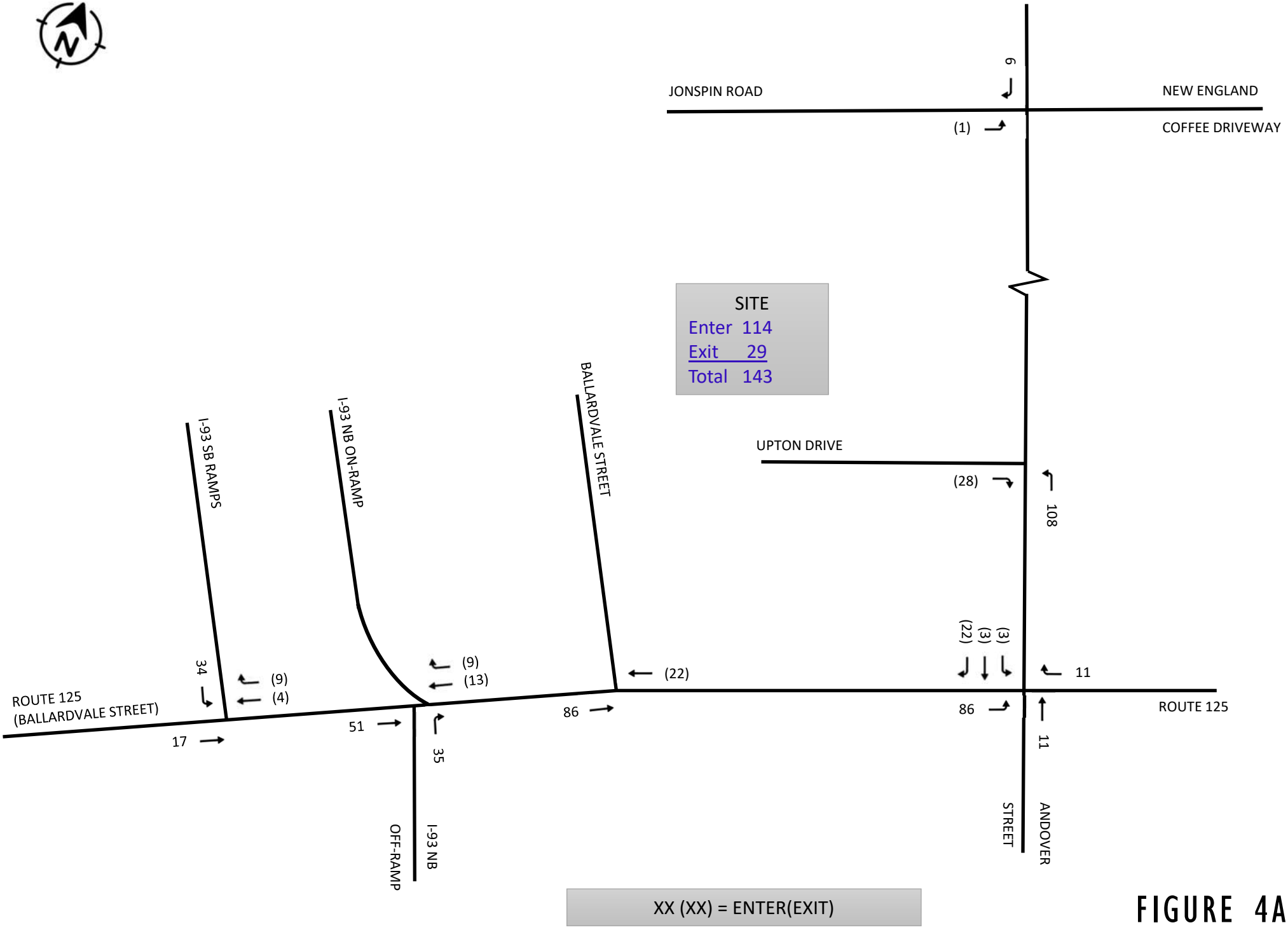


FIGURE 4A

AM SITE-GENERATED WEEKDAY PEAK HOUR TRAFFIC VOLUMES

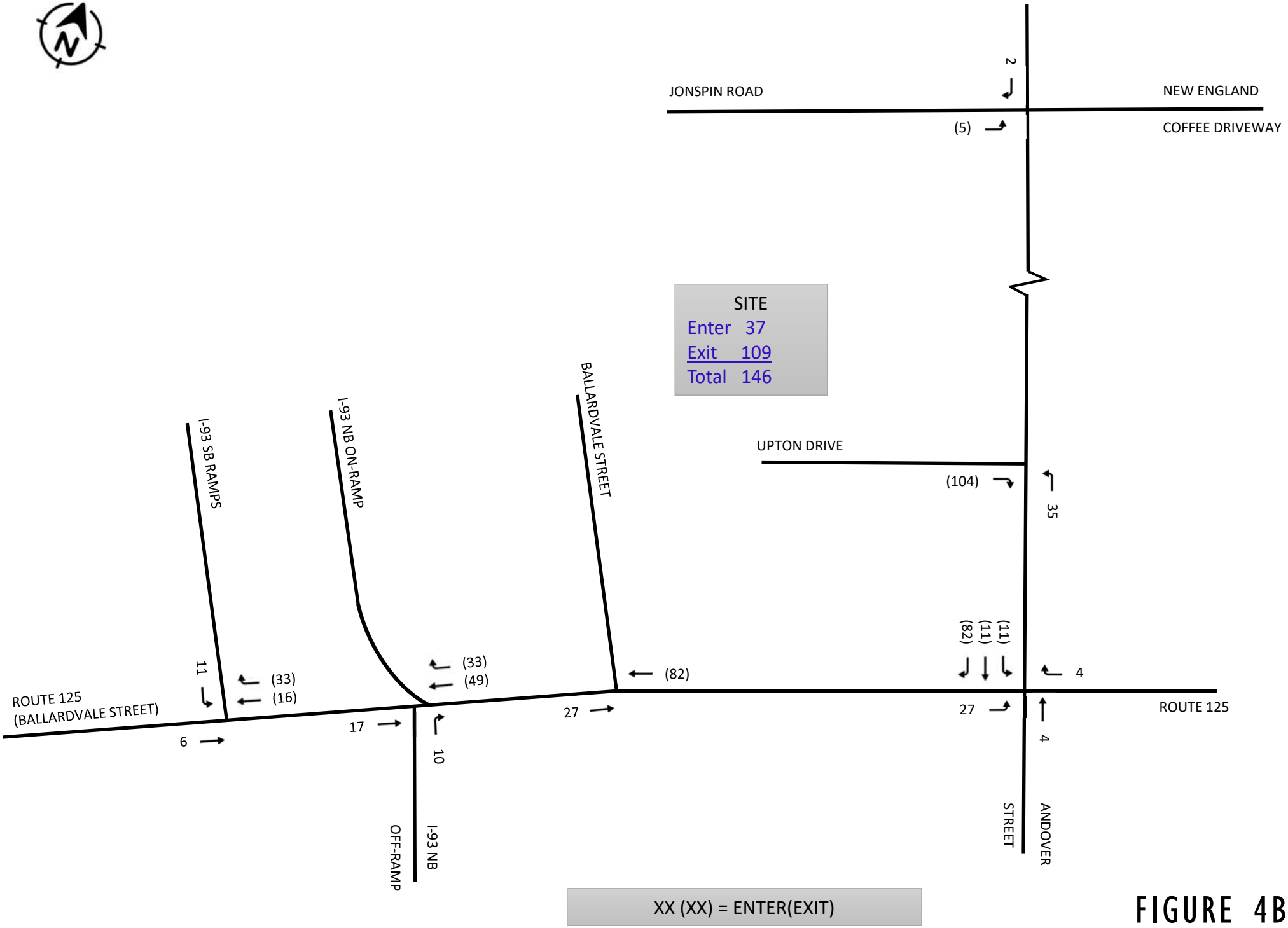
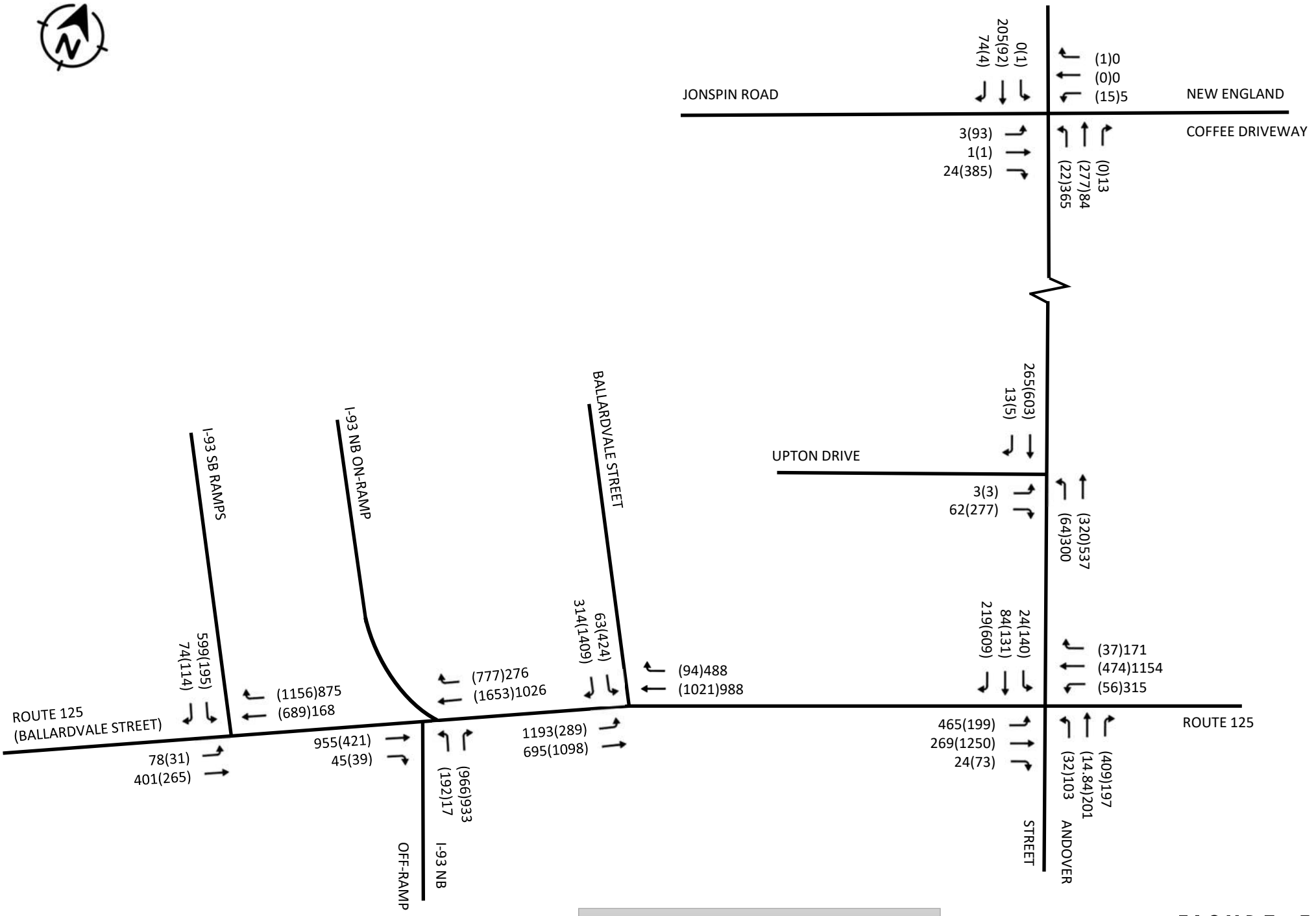


FIGURE 4B

PM SITE-GENERATED WEEKDAY PEAK HOUR TRAFFIC VOLUMES



XX (XX) = AM(PM) PEAK HOUR

FIGURE 5

2029 BUILD CONDITIONS
WEEKDAY PEAK HOUR TRAFFIC VOLUMES

CAPACITY AND QUEUE ANALYSIS

Capacity and queue analyses were conducted at all study area locations under 2022 Existing, 2029 No-Build, and 2029 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing 2029 No-Build conditions to 2029 Build conditions.

Methodology

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)[8] and is described in the Appendix. The TIAS utilizes the HCM 2000 methodology at the signalized intersection due to the fact that *HCM* methodology does not support non-NEMA signal phasing provided at the signalized study rea intersections. MassDOT has recognized such inefficiencies in the HCM 6 method and still accepts the HCM 2000 results as the most recently previously approved method for this scenario. However, the HCM 6 methodology was used for all unsignalized intersections within the study area to utilize the most recent analysis methodology.

For signalized intersections, the maximum back of queue during a typical (average) signal cycle and a 95th percentile signal cycle were calculated for each lane group during the peak periods studied. The back of queue is the length of a backup of vehicles from the stop line of a signalized intersection to the last vehicle in the queue that is required to stop, regardless of the signal indication. The length of this queue depends on a number of factors including signal timing, vehicle arrival patterns, and the saturation flow rate. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

Analysis Results

The results of the level-of-service (LOS) and queue analyses are shown in Table 3 and are discussed below. Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software.[9] The capacity and queue analysis worksheets for all conditions are provided in the Appendix.

Route 125 (Ballardvale Street) at Route 93 SB Ramps

All movements at this intersection are anticipated to operate at acceptable levels of service (LOS D or better) under 2029 No-Build and Build conditions during the weekday AM and PM peak hours. The additional traffic generated by the proposed mixed commercial development is not anticipated to increase delay on any given movement by more than one second per vehicle and not increase queues on any approach by more than one vehicle as compared to the 2029 No-Build condition.

Route 125 (Ballardvale Street) at Route 93 NB Ramps

All movements at this intersection are anticipated to operate at acceptable levels of service (LOS D or better) under all analysis conditions. The additional traffic generated by the proposed mixed commercial development is not anticipated to increase delay on any given movement by more than four seconds per

[8] *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

[9] *Synchro plus SimTraffic 10*; Trafficware LLC.; Sugar Land, TX; 2017.

vehicle or increase queues on any approach by more than two vehicles as compared to the 2029 No-Build condition.

Route 125 (Ballardvale Street) at Ballardvale Street

The Route 125 southbound through / right-turn movement currently operates at level-of-service (LOS) E during the weekday AM peak hour and is anticipated to operate at LOS F under 2029 No-Build conditions. However, the additional traffic generated by the proposed mixed commercial development is not anticipated to increase delay on this movement by more than eight (8) seconds per vehicle or increase queues by more than one vehicle. All other movements through the intersection are anticipated to operate at LOS E or better during all analysis time periods. The additional traffic generated by the proposed mixed commercial development will not increase delays on any other movements by more than seven (7) seconds per vehicle or increase queues by more than two vehicles as compared to the 2029 No-Build condition.

Route 125 at Andover Street

Several movements at this intersection are anticipated to operate at LOS E or F during the weekday AM and PM peak hours under 2029 No-Build and Build conditions, particularly the Andover Street northbound and southbound left-turn/through movements and Route 125 eastbound left and westbound right-turn/through movements. However, the additional traffic generated by the proposed warehouse / office development is not expected to increase overall intersection delay by more 13 seconds per vehicle during the weekday AM peak hour or by more than four (4) seconds per vehicle during the weekday PM peak hour. Queues on all approaches are not anticipated to increase by more than five vehicles.

Although MassDOT recently installed a new traffic signal controller at this intersection, it is currently running the same timing plan all day long, resulting in inefficient traffic operations during the weekday PM peak hour. By implementing separate time-of-day plans at the intersection, green time can be better allocated to each phase throughout the day and the signal timings can be optimized for the traffic volumes in each peak time period. As shown in Table 3, with implementation of the separate time-of-day plans, all movements through the intersection are anticipated to operate under capacity (V/C <1.0) and at LOS D or better during the weekday PM peak hour. Therefore, independent of the proposed development, GPI recommends that MassDOT implement time-of-day plans within the new traffic signal controller to optimize operations at this intersection. The developer for the proposed commercial development at 30 Upton Drive has committed to contacting MassDOT to implement the recommended signal timing modifications as a condition of approval.

Andover Street at Upton Drive

Although traffic exiting left from Upton Drive onto Andover Street is expected to experience LOS F during the weekday AM peak hour under 2029 Build conditions, the volume-to-capacity (V/C) ratio will be well below 1.00, indicating there will be more than adequate capacity to accommodate the anticipated traffic volumes. In addition, queues are not expected to exceed seven vehicles exiting Upton Drive

The intersection of Andover Street / Upton Drive is located in close proximity to the signalized intersection of Route 125 / Andover Street. During the weekday AM and PM peak hours, queues from the signal extend along Andover Street beyond Upton Drive. As part of the approval of the previously permitted warehouse / office development at #36 & #38 Upton Drive, the Applicant was required to install DO NOT BLOCK INTERSECTION pavement markings and signage on Andover Street southbound at the intersection with Upton Drive to ensure vehicles stopped at the signal do not block vehicles from exiting or entering Upton Drive. In addition, large trucks occasionally drive over the center median island or curb when turning on and off Upton Drive. To improve turning maneuverability for large trucks, the Applicant was required to remove a portion of the raised landscaped island at the intersection with Andover Street and replace this with a striped or scored concrete island that is mountable by trucks. The Applicant continues to be committed to implementing these modifications at this intersection as mitigation for the proposed mixed

commercial development. A conceptual improvement plan depicting these modifications is provided within the Appendix

Andover Street at Jonspin Road

Although traffic exiting the New England Coffee Driveway onto Andover Street is expected to experience LOS F during the weekday AM peak hour under 2029 No-Build and Build conditions, the proposed mixed commercial development is not anticipated to increase traffic volumes on the New England Coffee Driveway. In addition, the volume-to-capacity (V/C) ratio will be well below 1.00, indicating there will be more than adequate capacity to accommodate the anticipated traffic volumes. Queues on this approach are not expected to exceed one vehicle. All other movements at this intersection are anticipated to operate at acceptable levels of service (LOS D or better) under all analysis conditions.

TABLE 3
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2022 Existing				2029 No-Build				2029 Build – Previously Approved Development				2029 Build – Currently Proposed Development			
	V/C [a]	Del. [b]	LOS [c]	V/C	V/C	V/C	V/C	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Route 125 (Ballardvale Street) / Route 93 SB Ramps																
Weekday AM:																
Route 93 SB Ramps EBL	0.79	53.4	D	210/256	0.79	52.5	D	227/273	0.80	52.2	D	232/278	0.80	51.9	D	240/286
Route 93 SB Ramps EBR	0.04	0.0	A	<25/<25	0.04	0.0	A	<25/<25	0.04	0.0	A	<25/<25	0.04	0.0	A	<25/<25
Route 125 NBL	0.09	5.7	A	<25/36	0.10	6.2	A	<25/40	0.10	6.4	A	<25/41	0.10	6.7	A	<25/42
Route 125 NBT	0.28	7.1	A	94/163	0.31	8.1	A	110/189	0.31	8.3	A	115/195	0.33	8.7	B	121/206
Route 125 SBT	0.14	10.0	B	49/94	0.16	11.0	B	56/107	0.16	11.2	B	58/109	0.17	11.6	B	60/113
Route 125 SBR	0.54	1.4	A	<25/<25	0.59	1.7	A	<25/<25	0.59	1.8	A	<25/<25	0.60	1.8	A	<25/<25
Overall Intersection	**0.65**	**17.0**	**B**	**--/--**	**0.70**	**17.1**	**B**	**--/--**	**0.70**	**17.3**	**B**	**--/--**	**0.71**	**17.6**	**B**	**--/--**
Weekday PM:																
Route 93 SB Ramps EBL	0.50	33.3	C	73/673	0.53	33.5	C	49/78	0.53	33.4	C	50/79	0.55	33.5	C	52/81
Route 93 SB Ramps EBR	0.06	0.1	A	<25/<25	0.07	0.1	A	<25/<25	0.07	0.1	A	<25/<25	0.07	0.1	A	<25/<25
Route 125 NBL	0.08	4.9	A	<25/<25	0.09	5.9	A	<25/<25	0.10	6.0	A	<25/<25	0.10	6.3	A	<25/<25
Route 125 NBT	0.19	3.7	A	32/64	0.21	3.9	A	36/72	0.21	4.0	A	37/73	0.22	4.1	A	38/75
Route 125 SBT	0.57	10.3	B	122/225	0.64	11.8	B	188/226	0.65	12.0	B	192/225	0.66	12.1	B	199/225
Route 125 SBR	0.71	1.6	A	35//518	0.77	1.8	A	433/518	0.78	1.8	A	462/519	0.79	1.8	A	478/519
Overall Intersection	**0.91**	**6.7**	**A**	**--/--**	**0.98**	**7.3**	**A**	**--/--**	**0.99**	**7.3**	**A**	**--/--**	**1.01**	**7.5**	**A**	**--/--**
Route 125 (Ballardvale Street) / Route 93 NB Ramps																
Weekday AM:																
Route 93 NB Ramps WBL	0.03	23.4	C	<25/28	0.04	27.1	C	<25/36	0.04	28.1	C	<25/37	0.04	29.6	C	<25/37
Route 93 NB Ramps WBR	0.63	15.3	B	172/343	0.69	19.0	B	239/422	0.70	19.9	B	253/439	0.73	21.7	C	274/469
Route 125 NBT	0.79	30.0	C	221/351	0.79	32.1	C	253/442	0.80	33.2	C	267/468	0.81	33.5	C	292/488
Route 125 NBR	0.02	0.0	A	<25/<25	0.03	0.0	A	<25/<25	0.03	0.0	A	<25/<25	0.03	0.0	A	<25/<25
Route 125 SBT	0.48	10.2	B	160/201	0.50	10.5	B	182/220	0.50	10.6	B	183/221	0.49	10.4	B	185/222
Route 125 SBR	0.19	0.3	A	<25/<25	0.21	0.4	A	<25/<25	0.21	0.4	A	<25/<25	0.22	0.4	A	<25/<25
Overall Intersection	**0.75**	**16.4**	**B**	**--/--**	**0.79**	**18.3**	**B**	**--/--**	**0.80**	**18.9**	**B**	**--/--**	**0.81**	**19.5**	**B**	**--/--**
Weekday PM:																
Route 93 NB Ramps WBL	0.32	20.2	C	72/125	0.36	20.9	C	79/136	0.36	20.9	C	79/136	0.36	20.9	C	79/136
Route 93 NB Ramps WBR	0.66	13.4	B	201/201	0.70	13.6	B	218/218	0.70	13.7	B	219/219	0.70	13.6	B	220/220
Route 125 NBT	0.39	22.6	C	95/151	0.45	24.4	C	106/166	0.46	24.5	C	109/168	0.48	25.0	C	112/173
Route 125 NBR	0.02	0.0	A	<25/<25	0.02	0.0	A	<25/<25	0.02	0.0	A	<25/<25	0.02	0.0	A	<25/<25
Route 125 SBT	0.87	23.2	C	344/449	0.93	27.6	C	398/581	0.94	29.1	C	407/593	0.96	31.5	C	422/611
Route 125 SBR	0.48	1.1	A	<25/<25	0.52	1.3	A	<25/<25	0.53	1.3	A	<25/<25	0.55	1.4	A	<25/<25
Overall Intersection	**0.88**	**16.2**	**B**	**--/--**	**0.94**	**18.3**	**B**	**--/--**	**0.95**	**18.9**	**B**	**--/--**	**0.96**	**20.0**	**B**	**--/--**

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 50th/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 3 (CONTINUED)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2022 Existing				2029 No-Build				2029 Build – Previously Approved Development				2029 Build – Currently Proposed Development				2029 Build with Improvements Currently Proposed Development			
	V/C [a]	Del. [b]	LOS [c]	V/C	V/C	V/C	V/C	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Route 125 (Ballardvale Street) / Route 125 / Ballardvale Street																				
Weekday AM:																				
Ballardvale Street EBL	0.43	50.1	D	44/94	0.46	52.1	D	51/100	0.46	52.1	D	51/100	0.46	52.1	D	51/100				
Ballardvale Street EBR	0.23	15.2	B	53/81	0.25	14.8	B	63/93	0.25	14.8	B	64/94	0.25	14.8	B	64/94				
Route 125 NBL	0.91	43.6	D	412/510	0.94	46.4	D	471/573	0.94	46.4	D	471/573	0.94	46.4	D	471/573	N/A – Same as Build			
Route 125 NBT	0.41	3.1	A	98/142	0.44	3.3	A	117/162	0.47	3.4	A	128/177	0.50	3.6	A	145/200				
Route 125 SB T/R	1.06	76.5	E	594/816	1.20	137.2	F	783/927	1.21	141.3	F	794/939	1.22	145.5	F	805/951				
Overall Intersection	**0.93**	**47.6**	**D**	**--/--**	**1.00**	**72.9**	**E**	**--/--**	**1.00**	**74.0**	**E**	**--/--**	**1.01**	**75.0**	**E**	**--/--**				
Weekday PM:																				
Ballardvale Street EBL	0.84	41.5	D	232/398	0.94	57.8	E	256/442	0.94	57.8	E	256/442	0.94	57.8	E	256/442				
Ballardvale Street EBR	0.96	35.7	D	419/611	1.08	71.7	E	549/697	1.08	72.6	E	552/700	1.08	73.7	E	555/703				
Route 125 NBL	0.59	34.9	C	80/122	066	38.1	C	87/131	0.66	38.1	D	87/131	0.66	38.1	D	87/131	N/A – Same as Build			
Route 125 NBT	0.96	35.9	D	515/842	1.02	51.1	D	668/955	1.03	53.9	D	725/968	1.05	58.9	E	747/991				
Route 125 SB T/R	0.80	28.6	C	262/339	0.82	29.0	C	293/378	0.84	30.3	C	306/395	0.88	33.0	C	328/457				
Overall Intersection	**1.06**	**34.5**	**C**	**--/--**	**1.16**	**52.3**	**D**	**--/--**	**1.17**	**53.5**	**D**	**--/--**	**1.18**	**55.6**	**E**	**--/--**				
Route 125 / Andover Street																				
Weekday AM:																				
Route 125 EBL	0.89	59.0	E	234/390	0.94	66.6	E	261/442	1.00	83.4	F	294/498	1.12	120.8	F	379/580				
Route 125 EB T/R	0.20	19.1	B	60/96	0.22	19.9	B	67/103	0.22	19.8	B	67/103	0.22	19.8	B	67/103				
Route 125 WBL	0.80	49.5	D	195/280	0.83	51.8	D	211/306	0.83	52.3	D	211/306	0.83	52.3	D	211/306				
Route 125 WB T/R	0.94	43.0	D	431/582	1.04	67.8	E	533/669	1.05	72.0	E	537/673	1.06	74.1	E	542/679				
Andover Street NB L/T	0.94	76.0	E	191/355	1.05	107.6	F	227/397	1.08	117.0	F	234/405	1.11	130.1	F	247/420	N/A – Same as Build			
Andover Street NBR	0.12	16.3	B	32/57	0.13	16.1	B	35/61	0.13	16.4	B	35/61	0.13	16.4	B	35/61				
Andover Street SB L/T	0.32	36.4	D	53/101	0.54	40.7	D	65/124	0.58	42.9	D	67/128	0.65	47.4	D	71/150				
Andover Street SBR	0.26	15.9	B	86/111	0.30	16.0	B	78/128	0.31	16.1	B	82/135	0.33	16.3	B	88/143				
Overall Intersection	**0.93**	**43.9**	**D**	**--/--**	**1.01**	**59.3**	**E**	**--/--**	**1.04**	**64.4**	**E**	**--/--**	**1.09**	**72.5**	**E**	**--/--**				
Weekday PM:																				
Route 125 EBL	0.58	36.3	D	85/140	0.62	37.7	D	92/156	0.63	37.7	D	99/166	0.62	36.1	D	108/179	0.69	40.8	D	111/179
Route 125 EB T/R	0.83	25.3	C	302/489	0.87	28.2	C	335/599	0.87	28.2	C	335/599	0.87	28.1	C	335/599	0.91	32.1	C	375/523
Route 125 WBL	0.25	35.4	D	28/62	0.27	36.0	D	31/66	0.27	36.0	D	31/66	0.27	36.1	D	31/66	0.37	39.8	D	32/71
Route 125 WB T/R	0.36	18.9	B	94/165	0.39	19.6	B	108/185	0.40	20.1	C	109/185	0.42	21.3	C	110/186	0.46	23.7	C	126/183
Andover Street NB L/T	0.45	29.7	C	82/162	0.56	32.9	C	89/182	0.58	33.6	C	90/184	0.62	34.9	C	92/203	0.42	27.0	C	88/151
Andover Street NBR	0.61	21.8	C	170/260	0.66	24.2	C	188/286	0.66	24.2	C	188/286	0.67	24.2	C	188/286	0.64	22.4	C	185/286
Andover Street SB L/T	0.83	49.9	D	121/286	1.02	95.9	F	142/347	1.06	107.2	F	154/363	1.12	128.0	F	175/385	0.86	49.5	D	153/296
Andover Street SBR	0.71	22.0	C	218/309	0.76	24.9	C	232/354	0.80	26.1	C	254/388	0.83	27.7	C	288/445	0.78	22.3	C	264/383
Overall Intersection	**0.87**	**26.1**	**C**	**--/--**	**0.96**	**31.7**	**C**	**--/--**	**0.98**	**33.0**	**C**	**--/--**	**1.01**	**35.1**	**D**	**--/--**	**0.94**	**29.8**	**C**	**--**

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 50th/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 3 (CONTINUED)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2022 Existing				2029 No-Build				2029 Build – Previously Approved Development				2029 Build – Currently Proposed Development			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Andover Street / Upton Drive																
Weekday AM:																
Andover Street NB Approach	0.19	8.5	A	<25	0.20	8.7	A	<25	0.24	8.9	A	<25	0.30	9.2	A	33
Upton Drive EBL	0.03	34.9	D	<25	0.04	43.6	E	<25	0.05	54.8	F	<25	0.07	81.0	F	<25
Upton Drive EBR	0.06	10.2	B	<25	0.06	10.6	B	<25	0.08	10.7	B	<25	0.11	10.9	B	<25
Weekday PM:																
Andover Street NB Approach	0.04	9.1	A	<25	0.04	9.5	A	<25	0.06	9.6	A	<25	0.09	9.7	A	<25
Upton Drive EBL	0.02	20.5	C	<25	0.02	23.7	C	<25	0.02	25.4	D	<25	0.02	27.7	D	<25
Upton Drive EBR	0.45	18.9	C	58	0.50	21.9	C	68	0.62	26.6	D	103	0.80	39.9	E	178
Andover Street / Jonspin Road / New England Coffee Driveway																
Weekday AM:																
Andover Street NB Approach	0.36	9.5	A	40	0.39	9.9	A	48	0.39	9.9	A	48	0.40	10.0	A	48
Jonspin Road EB Approach	0.09	14.8	B	<25	0.11	16.1	C	<25	0.13	17.6	C	<25	0.13	17.6	C	<25
N.E. Coffee Driveway WB Approach	0.07	49.1	E	<25	0.10	64.4	F	<25	0.10	64.4	F	<25	0.10	64.4	F	<25
Andover Street SB Approach	0.00	0.0	A	<25	0.00	0.0	A	<25	0.00	0.0	A	<25	0.00	0.0	A	<25
Weekday PM:																
Andover Street NB Approach	0.01	7.6	A	<25	0.02	7.7	A	<25	0.02	7.7	A	<25	0.02	7.7	A	<25
Jonspin Road EB Approach	0.64	16.7	A	120	0.70	19.1	C	128	0.71	19.5	C	148	0.71	19.9	C	153
N.E. Coffee Driveway WB Approach	0.09	23.1	C	<25	0.10	27.0	D	<25	0.10	27.2	D	<25	0.10	27.2	D	<25
Andover Street SB Approach	0.00	7.8	A	<25	0.00	7.9	A	<25	0.00	7.9	A	<25	0.00	7.9	A	<25

[a] Volume-to-capacity ratio. [b] Average control delay in seconds per vehicle.
[c] Level of service. [d] 95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

CONCLUSIONS

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed redevelopment. Conclusions of this effort are presented below.

- The site is currently a vacant vegetated lot with a gravel driveway which spurs off the southwesterly corner of Upton Drive. The site was recently approved for the construction of an approximately ±263,900 square feet (SF) warehouse distribution development within three buildings with access/egress proposed via five driveways along Upton Drive. To attract a wider range of potential tenants to the site, the developer is seeking approval for a mixed commercial development that would allow up to 19,800 SF of research and development space, 39,000 SF of light industrial space, 78,500 SF of manufacturing space, and 125,300 SF of warehousing space. Access and egress will continue to be provided via the five previously proposed site driveways.

- The currently proposed development is anticipated to generate an additional 84 vehicle trips (68 entering and 16 exiting) during the weekday AM peak hour and an additional 85 vehicle trips (21 entering and 64 exiting) during the weekday PM peak hour as compared to the previously approved warehouse distribution center.

- All movements at the signalized intersections of Route 125 (Ballardvale Street) with the I-93 Northbound (NB) and Southbound (SB) ramps are anticipated to operate at LOS D or better under all analysis conditions. The additional traffic generated by the proposed mixed commercial development is not expected to increase delay on any movement through these intersections by more than four seconds per vehicle or increase queues by more than two vehicles.

- Although some movements at the Route 125 / Ballardvale Street intersection will operate at LOS F under 2029 No-Build and Build conditions, the additional traffic generated by the proposed warehouse / office development is not anticipated to increase delay on any movement through the intersection by more than seven seconds per vehicle or increase queues by more than two vehicles.

- Similarly, although some side street movements at the unsignalized intersections of Andover Street with Upon Drive and Jonspin Road are expected to operate at LOS F under 2029 No-Build and/or Build conditions, the volume-to-capacity (V/C) ratios will be well below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. Improvements are also proposed by the Applicant at the intersection of Andover Street / Upton Drive, which include installation of DO NOT BLOCK INTERSECTION signage and pavement markings, and reconstruction of the median island on Upton Drive to better accommodate truck turns. These improvements will help to facilitate turning movements into and exiting Upton Drive.

- Several movements at the intersection of Route 125 / Andover Street are anticipated to operate at LOS E or F during the weekday AM and PM peak hours under 2029 No-Build and Build conditions. However, the additional traffic generated by the proposed mixed commercial development is not expected to increase overall delay through the intersection by more than 13 seconds per vehicle or increase queues by more than five vehicles. Although MassDOT recently installed a new traffic signal controller at this intersection, it operates with a single timing plan 24 hours per day that is designed to accommodate traffic volumes during the weekday AM peak hour. By implementing a separate timing plan for the weekday PM peak hour, all movements through the intersection can operate under capacity (V/C <1.0) and at LOS D or better during the weekday PM peak hour. The Applicant for the development at #30 Upton Drive has committed to contacting MassDOT to

implement the recommended signal timing modifications as mitigation for the proposed development.

Based on the findings above, the proposed mixed commercial development can be safely and efficiently accommodated along the existing roadway network. No additional project-specific mitigation is warranted based on the incremental impacts of the development.

- APPENDIX

- ***Conceptual Improvement Plan***
- ***Traffic Volume Adjustment Data***
- ***Trip Generation Calculations***
- ***Capacity Analysis Methodology***
- ***Capacity and Queue Analysis Worksheets***

CONCEPTUAL IMPROVEMENT PLAN

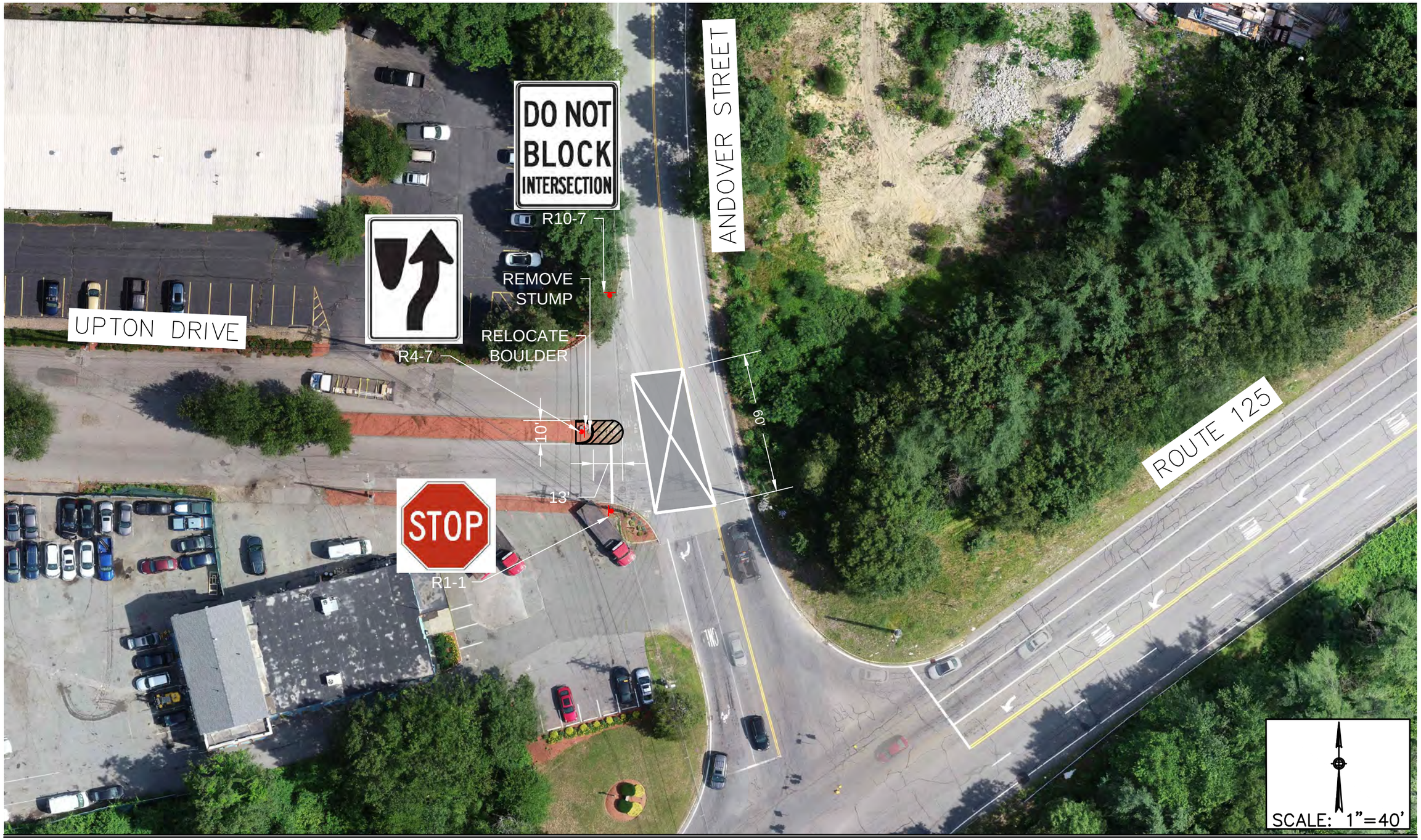
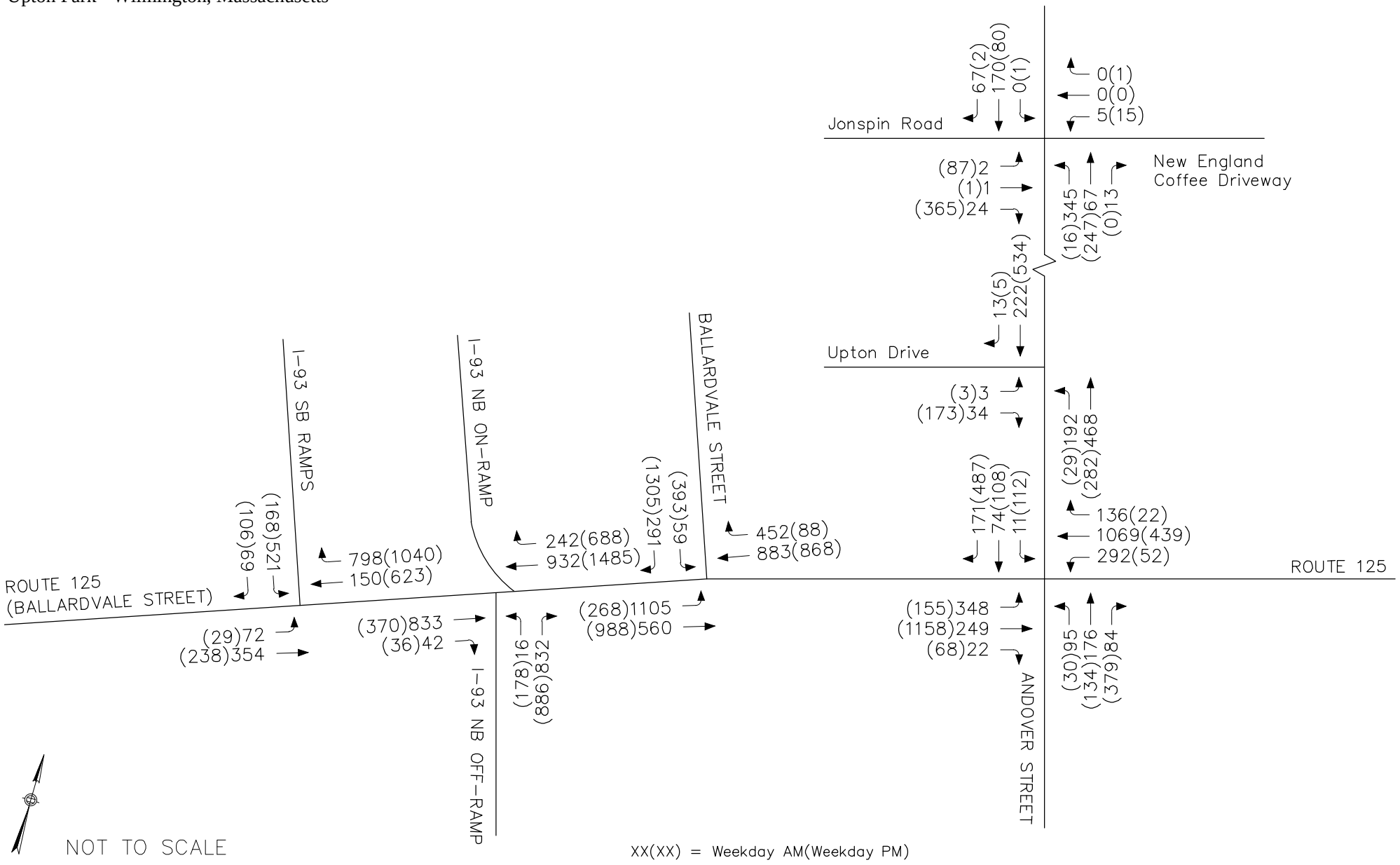


Figure 7
Conceptual Improvements

Figure 8
Entering Upton Drive

Figure 9
Exiting Upton Drive

TRAFFIC VOLUME ADJUSTMENT DATA

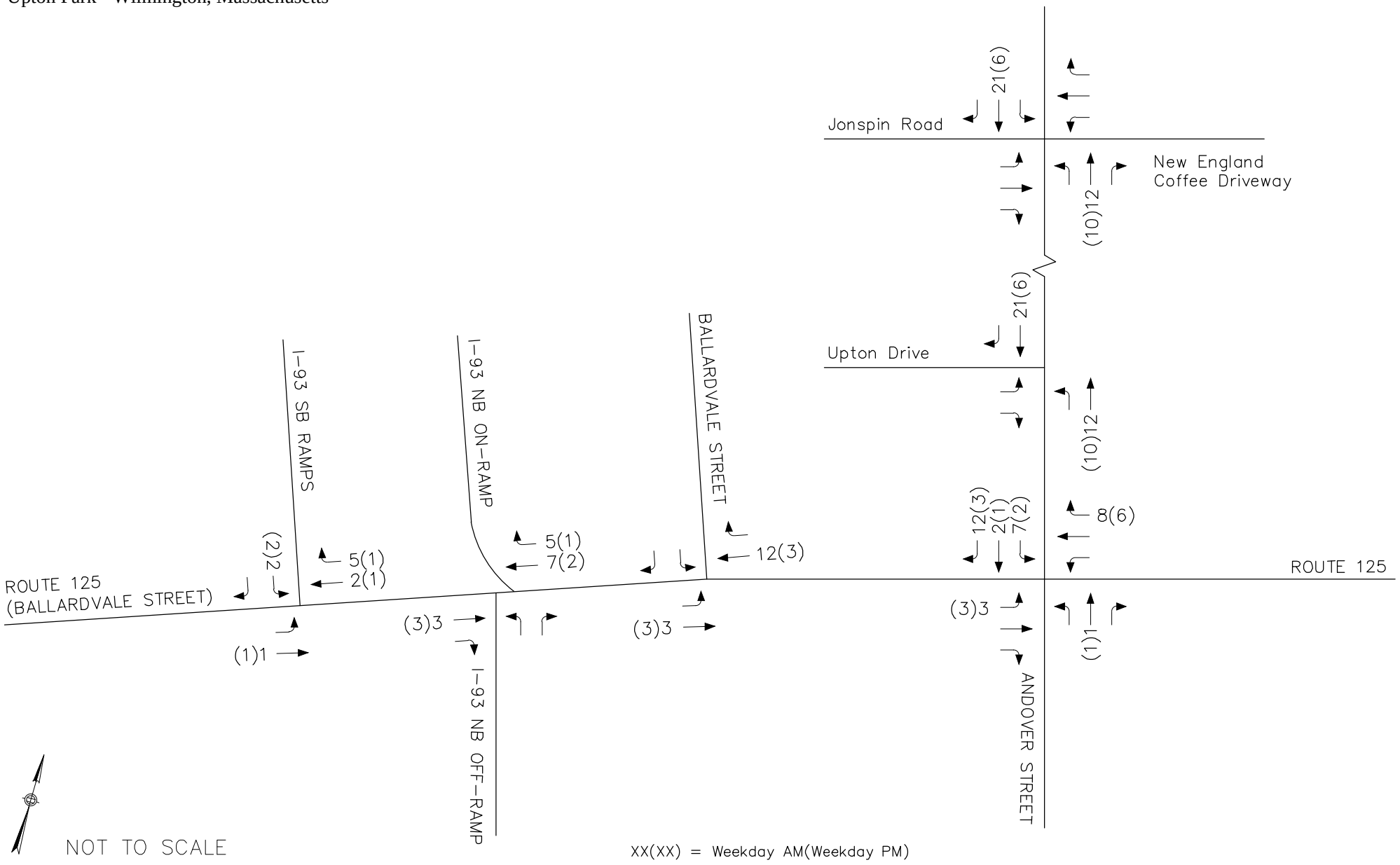


Greenman-Pedersen, Inc.

Engineering and Construction Services

Figure 2

2018 Existing
Peak Hour Traffic Volumes

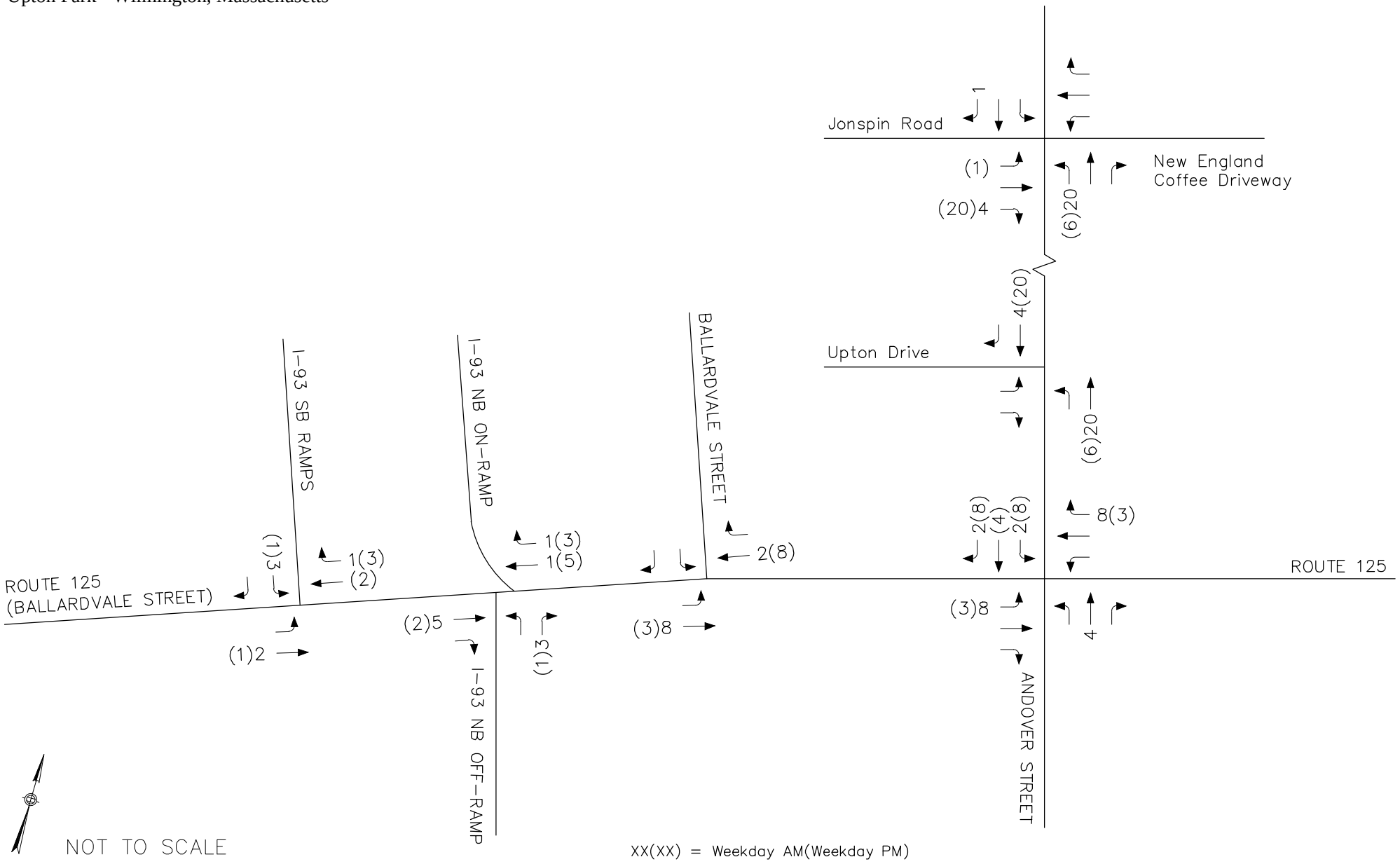


GPI Greenman-Pedersen, Inc.

Engineering and Construction Services

Figure 3A

401 Andover Street
Peak Hour Traffic Volumes

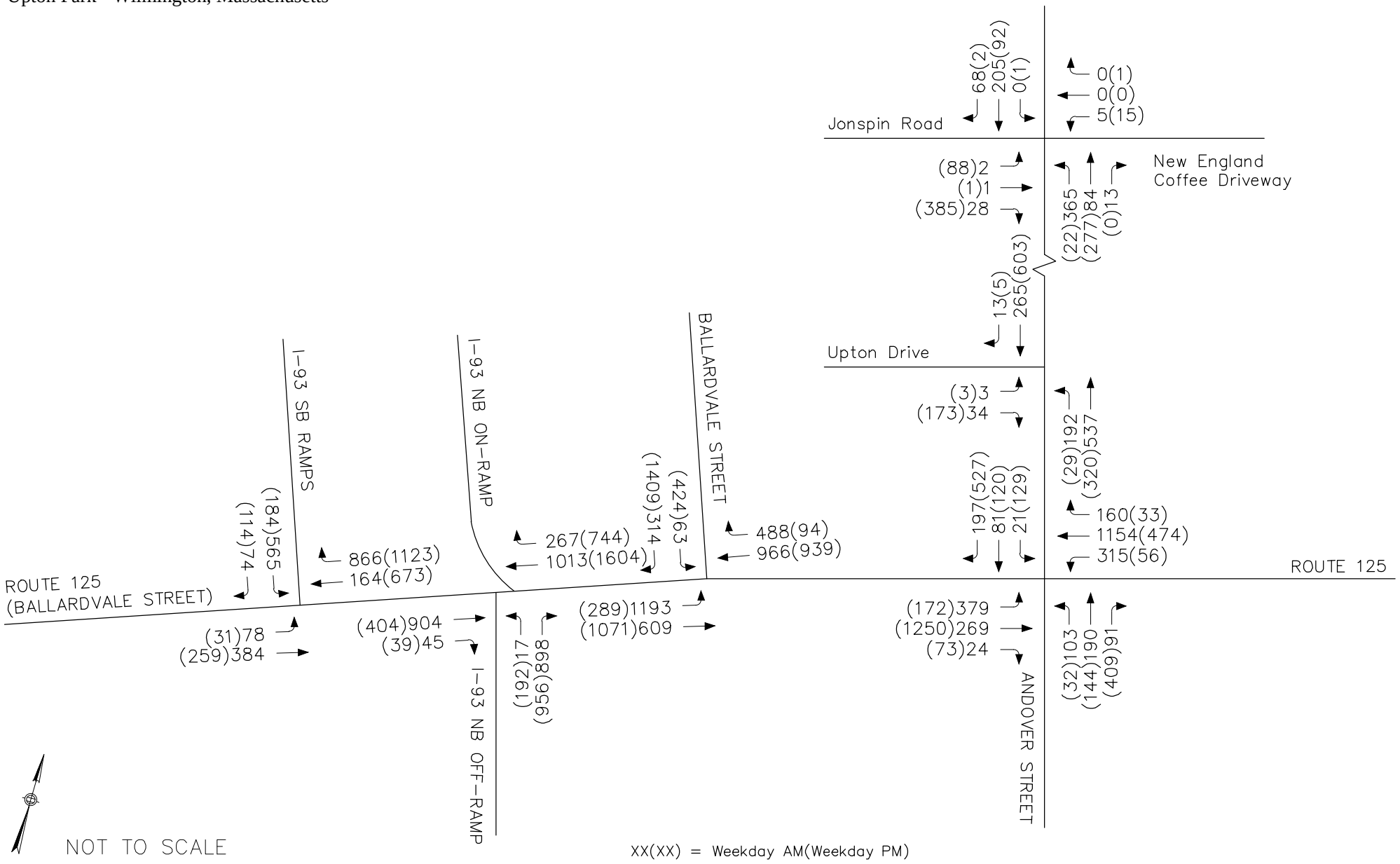


GPI Greenman-Pedersen, Inc.

Engineering and Construction Services

Figure 3B

58 Jonspin Road
Peak Hour Traffic Volumes



Greenman-Pedersen, Inc.

Engineering and Construction Services

Figure 4

2025 No-Build
Peak Hour Traffic Volumes

MassDOT Traffic Volumes

Permanent Count Station 5022 [a]
Wilmington - Route I-93 - North of Ramp Route 62 to I-93 NB

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	AADT[b]
2015	125,444	126,309	140,654	143,059	144,180	150,259	146,755	150,695	145,957	148,892	141,259	138,759	141,852
Seasonal Adj. [c]	**13.1%**	**12.3%**	**0.9%**	**-0.8%**	**-1.6%**	**-5.6%**	**-3.3%**	**-5.9%**	**-2.8%**	**-4.7%**	**0.4%**	**2.2%**	**0.0%**

Permanent Count Station 5127 [a]
Andover - Route 125 - South of Route 28

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	AADT[b]
2014	13,612	13,831	14,899	15,465	15,677	16,135	14,733	15,427	16,369	16,918	14,392	N/A	15,089
2017	N/A	15,720	16,229	17,373	17,358	17,833	16,908	16,949	17,918	18,264	17,151	17,471	17,198
Seasonal Adj. [c]		**9.3%**	**3.7%**	**-1.7%**	**-2.3%**	**-4.9%**	**2.0%**	**-0.3%**	**-5.8%**	**-8.2%**	**2.4%**	**-1.6%**	**0.0%**
Seasonal Adj. Avg		**10.8%**	**2.3%**	**-1.3%**	**-1.9%**	**-5.3%**	**-0.6%**	**-3.1%**	**-4.3%**	**-6.5%**	**1.4%**	**0.3%**	**0.0%**

[a] Based upon historical data. Source: MassDOT Traffic Volumes.

[b] Average Annual Daily Traffic.

[c] Seasonal adjustment to yearly average.

Traffic Growth Factor Worksheet

Count Stations

(Source: MassDOT Transportation Data Management System)

STA.	CITY/TOWN	ROUTE/STREET	LOCATION	2010	2011	2012	2013	2014	2015	2016	2017	Average % Growth
H8460	WILMINGTON	I-93	NORTH OF ROUTE 62	130,262	126,719	128,434	128,582	131,929	129,528	145,814	144,492	1.6%
5127	WILMINGTON	ANDOVER BYPASS	RAMP - RTE 28 SB TO TRE 125	15,210	15,173	15,312	15,008	15,292	15,659			0.6%
4105	TEWKSBURY	SALEM RD	EAST OF MAIN ST	5,375	5,965	5,884	5,938	5,679				1.5%
4112	TEWKSBURY	CHANDLER STREET	NORTH OF WHIPPLE ROAD	2,091	1,820	1,827	1,846	2,172			2,069	0.2%
5022	WILMINGTON	I-93	NORTH OF ROUTE 125	137,116		135,921	136,213	136,495	142,104	145,189	151,255	1.4%

Average Growth: 1.1%

Say **1.1%**

TRIP-GENERATION CALCULATIONS

Size	Units	Land Use
19.8	SF	LUC 760
39.0	SF	LUC 110
78.5	SF	LUC 140
125.3	SF	LUC 150

		Total Trips					Previously Approved Trips	Net Change in Trips
		LUC 760	LUC 110	LUC 140	LUC 150	TOTAL		
Weekday Daily	Entering	110	95	186	118	509	231	278
	Exiting	110	95	186	118	509	231	278
	Total	220	190	372	236	1,018	462	556
Weekday AM Peak Hour	Entering	16	26	40	30	112	44	68
	Exiting	4	3	13	9	29	13	16
	Total	20	29	53	39	141	57	84
Weekday PM Peak Hour	Entering	3	4	18	12	37	16	21
	Exiting	16	21	40	30	107	43	64
	Total	19	25	58	42	144	59	85
Saturday Daily	Entering	19	13	58	9	99	--	--
	Exiting	19	13	58	9	99	--	--
	Total	38	26	116	18	198	--	--
Saturday Midday Peak Hour	Entering	3	2	7	4	16	--	--
	Exiting	2	2	7	2	13	--	--
	Total	5	4	14	6	29	--	--

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 760 - Research and Development Center

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 19.800

AVERAGE WEEKDAY DAILY

T = 11.08 * (X)
T = 11.08 * 19.800
T = 219.38
T = 220 vehicle trips
with 50% (110 vpd) entering and 50% (110 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 1.03 * (X)
T = 1.03 * 19.800
T = 20.39
T = 20 vehicle trips
with 82% (16 vph) entering and 18% (4 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.98 * (X)
T = 0.98 * 19.800
T = 19.40
T = 19 vehicle trips
with 16% (3 vph) entering and 84% (16 vph) exiting.

SATURDAY DAILY

T = 1.91 * (X)
T = 1.91 * 19.800
T = 37.82
T = 38 vehicle trips
with 50% (19 vpd) entering and 50% (19 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 0.24 * (X)
T = 0.24 * 19.800
T = 4.75
T = 5 vehicle trips
with 54% (3 vph) entering and 46% (2 vph) exiting.

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 110 - General Light Industrial

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 39.000

AVERAGE WEEKDAY DAILY

T = 4.87 * (X)
T = 4.87 * 39
T = 189.93
T = 190 vehicle trips
with 50% (95 vpd) entering and 50% (95 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.74 * (X)
T = 0.74 * 39.000
T = 28.86
T = 29 vehicle trips
with 88% (26 vph) entering and 12% (3 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.65 * (X)
T = 0.65 * 39.000
T = 25.35
T = 25 vehicle trips
with 14% (4 vph) entering and 86% (21 vph) exiting.

SATURDAY DAILY

T = 0.69 * (X)
T = 0.69 * 39.000
T = 26.91
T = 26 vehicle trips
with 50% (13 vpd) entering and 50% (13 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\frac{\text{ITE LUC 110 Sunday Midday Trip Rate}}{\text{ITE LUC 110 Sunday Daily Trip Rate}} = \frac{\text{ITE LUC 110 Saturday Midday Trip Rate}}{\text{ITE LUC 110 Saturday Daily Trip Rate}}$$

$$\frac{0.69}{5.00} = \frac{(Y)}{0.69} \qquad Y = 0.10$$

T = Y * 39.000
T = 3.71
T = 4 vehicle trips
with 48% (2 vpd) entering and 52% (2 vpd) exiting.

(same distribution split as ITE LUC 110 during the Sunday midday traffic)

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 140 - Manufacturing

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 78.500

AVERAGE WEEKDAY DAILY

T = 4.75 * (X)
T = 4.75 * 79
T = 372.88
T = 372 vehicle trips
with 50% (186 vpd) entering and 50% (186 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.68 * (X)
T = 0.68 * 78.500
T = 53.38
T = 53 vehicle trips
with 76% (40 vph) entering and 24% (13 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.74 * (X)
T = 0.74 * 78.500
T = 58.09
T = 58 vehicle trips
with 31% (18 vph) entering and 69% (40 vph) exiting.

SATURDAY DAILY

T = 1.49 * (X)
T = 1.49 * 78.500
T = 116.97
T = 116 vehicle trips
with 50% (58 vpd) entering and 50% (58 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 0.18 * (X)
T = 0.18 * 78.500
T = 14.13
T = 14 vehicle trips
with 52% (7 vph) entering and 48% (7 vph) exiting.

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 150 - Warehousing

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 125.300

AVERAGE WEEKDAY DAILY

T = 1.58 * (X) + 38.29
T = 1.58 * 125.300 + 38.29
T = 236.26
T = 236 vehicle trips
with 50% (118 vpd) entering and 50% (118 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.12* (X) + 23.62
T = 0.12 * 125.300 + 23.62
T = 38.66
T = 39 vehicle trips
with 77% (30 vph) entering and 23% (9 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.12* (X) + 26.48
T = 0.12 * 125.300 + 26.48
T = 41.52
T = 42 vehicle trips
with 28% (12 vph) entering and 72% (30 vph) exiting.

SATURDAY DAILY

T = 0.15 * (X)
T = 0.150 * 125.300
T = 18.80
T = 18 vehicle trips
with 50% (9 vpd) entering and 50% (9 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 0.05 * (X)
T = 0.05 * 125.300
T = 6.27
T = 6 vehicle trips
with 64% (4 vph) entering and 36% (2 vph) exiting.

CAPACITY ANALYSIS METHODOLOGY

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[10] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table A-1 summarizes the relationship between level of service and average control delay.

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[10] *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	Unsignalized Intersection Criteria Average Control Delay (Seconds per Vehicle)	Signalized Intersection Criteria Average Control Delay (Seconds per Vehicle)
A	≤10	≤10
B	>10 and ≤15	>10 and ≤20
C	>15 and ≤25	>20 and ≤35
D	>25 and ≤35	>35 and ≤55
E	>35 and ≤50	>55 and ≤80
F	>50	>80

Source *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000. Pages 10-16 and 17-2.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups or to individual intersection approaches.

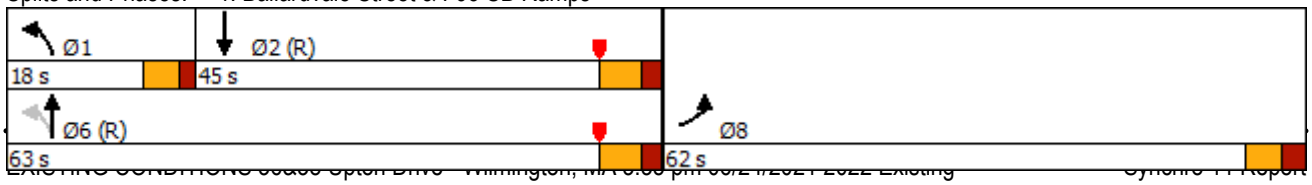
CAPACITY AND QUEUE ANALYSIS WORKSHEETS

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	521	69	72	354	150	798
Future Volume (vph)	521	69	72	354	150	798
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.950		0.621			
Satd. Flow (perm)	3433	1760	1141	1818	1727	1482
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		45				806
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Adj. Flow (vph)	526	70	73	358	152	806
Shared Lane Traffic (%)						
Lane Group Flow (vph)	526	70	73	358	152	806
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	62.0		18.0	63.0	45.0	
Total Split (%)	49.6%		14.4%	50.4%	36.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 12 (10%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	526	70	73	358	152	806
v/c Ratio	0.79	0.04	0.09	0.28	0.14	0.54
Control Delay	56.3	0.0	6.3	7.8	11.4	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	0.0	6.3	7.8	11.4	1.4
Queue Length 50th (ft)	210	0	16	94	49	0
Queue Length 95th (ft)	256	0	36	163	94	0
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1537	1760	880	1288	1088	1482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.04	0.08	0.28	0.14	0.54

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	521	69	72	354	150	798
Future Volume (vph)	521	69	72	354	150	798
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.95	1.00	0.62	1.00	1.00	1.00
Satd. Flow (perm)	3433	1760	1140	1818	1727	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	526	70	73	358	152	806
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	526	70	73	358	152	806
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	24.4	125.0	88.6	88.6	77.8	125.0
Effective Green, g (s)	24.4	125.0	88.6	88.6	77.8	125.0
Actuated g/C Ratio	0.20	1.00	0.71	0.71	0.62	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	670	1760	836	1288	1074	1482
v/s Ratio Prot	c0.15		0.00	0.20	0.09	
v/s Ratio Perm		0.04	0.06			c0.54
v/c Ratio	0.79	0.04	0.09	0.28	0.14	0.54
Uniform Delay, d1	47.8	0.0	5.6	6.6	9.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.0	0.0	0.5	0.3	1.4
Delay (s)	53.4	0.0	5.7	7.1	10.0	1.4
Level of Service	D	A	A	A	B	A
Approach Delay (s)	47.1			6.9	2.8	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

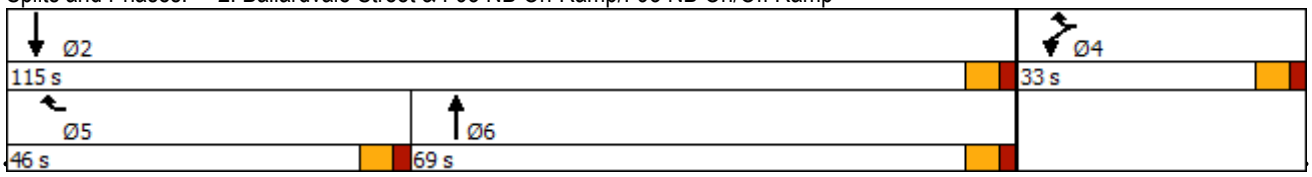
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	16	0	832	0	833	42	0	932	242
Future Volume (vph)	0	0	0	16	0	832	0	833	42	0	932	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									111			213
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Adj. Flow (vph)	0	0	0	16	0	858	0	859	43	0	961	249
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	16	0	858	0	859	43	0	961	249
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				33.0				69.0			115.0	
Total Split (%)				22.3%				46.6%			77.7%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				Min			Min	

Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 87.5
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	14.0
Total Split (s)	46.0
Total Split (%)	31%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	858	859	43	961	249
v/c Ratio	0.03	0.63	0.80	0.02	0.48	0.19
Control Delay	29.7	18.6	33.3	0.0	11.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	18.6	33.3	0.0	11.2	0.3
Queue Length 50th (ft)	6	172	221	0	160	0
Queue Length 95th (ft)	28	343	351	0	201	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	549	2048	2499	1830	3355	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.42	0.34	0.02	0.29	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	16	0	832	0	833	42	0	932	242
Future Volume (vph)	0	0	0	16	0	832	0	833	42	0	932	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1703		2544		3323	1830		3406	1301
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1703		2544		3323	1830		3406	1301
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	16	0	858	0	859	43	0	961	249
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	16	0	858	0	859	43	0	961	249
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				23.6		46.4		28.6	87.0		51.4	87.0
Effective Green, g (s)				23.6		46.4		28.6	87.0		51.4	87.0
Actuated g/C Ratio				0.27		0.53		0.33	1.00		0.59	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				461		1356		1092	1830		2012	1301
v/s Ratio Prot				0.01		c0.34		c0.26			0.28	
v/s Ratio Perm									0.02			0.19
v/c Ratio				0.03		0.63		0.79	0.02		0.48	0.19
Uniform Delay, d1				23.3		14.3		26.4	0.0		10.1	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.0		1.0		3.5	0.0		0.1	0.3
Delay (s)				23.4		15.3		30.0	0.0		10.2	0.3
Level of Service				C		B		C	A		B	A
Approach Delay (s)		0.0			15.4			28.5			8.2	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

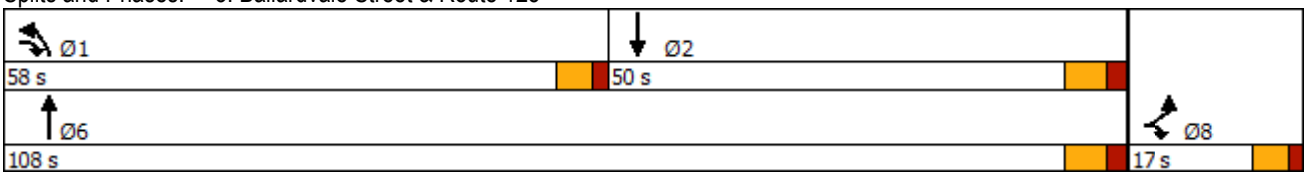
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	291	1105	560	883	452
Future Volume (vph)	59	291	1105	560	883	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.949	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1543	2311	3303	1759	3284	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1543	2311	3303	1759	3284	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		56			80	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Adj. Flow (vph)	61	303	1151	583	920	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	303	1151	583	1391	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	17.0		58.0	108.0	50.0	
Total Split (%)	13.6%		46.4%	86.4%	40.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 114.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	61	303	1151	583	1391
v/c Ratio	0.44	0.25	0.91	0.41	1.06
Control Delay	61.9	12.4	45.0	4.0	74.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	12.4	45.0	4.0	74.5
Queue Length 50th (ft)	44	53	412	98	~594
Queue Length 95th (ft)	94	81	510	142	#816
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	162	1379	1536	1567	1317
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.75	0.37	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	291	1105	560	883	452
Future Volume (vph)	59	291	1105	560	883	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1543	2311	3303	1759	3285	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1543	2311	3303	1759	3285	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	61	303	1151	583	920	471
RTOR Reduction (vph)	0	27	0	0	49	0
Lane Group Flow (vph)	61	276	1151	583	1342	0
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Actuated Green, G (s)	10.5	59.3	43.8	93.2	44.4	
Effective Green, g (s)	10.5	59.3	43.8	93.2	44.4	
Actuated g/C Ratio	0.09	0.52	0.38	0.81	0.39	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	141	1194	1261	1429	1271	
v/s Ratio Prot	c0.04	0.12	c0.35	0.33	c0.41	
v/s Ratio Perm						
v/c Ratio	0.43	0.23	0.91	0.41	1.06	
Uniform Delay, d1	49.3	15.2	33.6	3.0	35.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.0	10.0	0.1	41.4	
Delay (s)	50.1	15.2	43.6	3.1	76.5	
Level of Service	D	B	D	A	E	
Approach Delay (s)	21.1			30.0	76.5	
Approach LOS	C			C	E	

Intersection Summary

HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	114.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

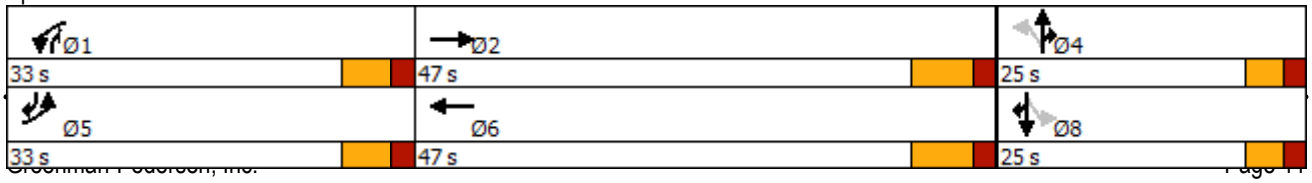
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	249	22	292	1069	136	95	176	84	11	74	171
Future Volume (vph)	348	249	22	292	1069	136	95	176	84	11	74	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.988			0.983				0.850			0.850
Flt Protected	0.950			0.950				0.983			0.993	
Satd. Flow (prot)	1687	3334	0	1805	3474	0	0	1824	1583	0	1757	1404
Flt Permitted	0.950			0.950				0.847			0.813	
Satd. Flow (perm)	1687	3334	0	1805	3474	0	0	1572	1583	0	1439	1404
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		10										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			229	
Travel Time (s)		18.9			8.3			12.1			5.2	
Confl. Bikes (#/hr)						4						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Adj. Flow (vph)	366	262	23	307	1125	143	100	185	88	12	78	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	285	0	307	1268	0	0	285	88	0	90	180
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	22.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 103
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	366	285	307	1268	285	88	90	180
v/c Ratio	0.89	0.20	0.80	0.94	0.94	0.12	0.32	0.26
Control Delay	63.1	19.7	54.2	45.1	80.9	15.4	40.3	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	19.7	54.2	45.1	80.9	15.4	40.3	16.2
Queue Length 50th (ft)	234	60	195	431	191	32	53	66
Queue Length 95th (ft)	#390	96	280	#582	#355	57	101	111
Internal Link Dist (ft)		890		526	540		149	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	442	1401	473	1350	305	799	280	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.20	0.65	0.94	0.93	0.11	0.32	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	249	22	292	1069	136	95	176	84	11	74	171
Future Volume (vph)	348	249	22	292	1069	136	95	176	84	11	74	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	1.00
Satd. Flow (prot)	1687	3334		1805	3474			1823	1583		1758	1404
Flt Permitted	0.95	1.00		0.95	1.00			0.85	1.00		0.81	1.00
Satd. Flow (perm)	1687	3334		1805	3474			1572	1583		1438	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	366	262	23	307	1125	143	100	185	88	12	78	180
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	366	279	0	307	1268	0	0	285	88	0	90	180
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	25.0	43.1		21.9	40.0			19.9	46.8		19.9	49.9
Effective Green, g (s)	25.0	43.1		21.9	40.0			19.9	46.8		19.9	49.9
Actuated g/C Ratio	0.24	0.42		0.21	0.39			0.19	0.45		0.19	0.48
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	409	1396		384	1350			304	719		278	680
v/s Ratio Prot	c0.22	c0.08		0.17	c0.37				0.06			0.13
v/s Ratio Perm								c0.18			0.06	
v/c Ratio	0.89	0.20		0.80	0.94			0.94	0.12		0.32	0.26
Uniform Delay, d1	37.7	19.0		38.4	30.3			40.9	16.2		35.7	15.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	21.3	0.1		11.1	12.7			35.1	0.1		0.7	0.2
Delay (s)	59.0	19.1		49.5	43.0			76.0	16.3		36.4	15.9
Level of Service	E	B		D	D			E	B		D	B
Approach Delay (s)		41.5			44.3			61.9			22.7	
Approach LOS		D			D			E			C	

Intersection Summary

HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	34	192	468	222	13
Future Volume (vph)	3	34	192	468	222	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.993	
Flt Protected	0.950			0.986		
Satd. Flow (prot)	1925	1538	0	2039	1929	0
Flt Permitted	0.950			0.986		
Satd. Flow (perm)	1925	1538	0	2039	1929	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1258			229	1411	
Travel Time (s)	34.3			4.5	32.1	
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	12%	2%	5%	11%	8%
Adj. Flow (vph)	4	42	237	578	274	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	42	0	815	290	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	34	192	468	222	13
Future Vol, veh/h	3	34	192	468	222	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	12	2	5	11	8
Mvmt Flow	4	42	237	578	274	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1334	282	290	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	1052	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.218	-	-	-
Pot Cap-1 Maneuver	171	734	1272	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	124	734	1272	-	-	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1272	-	124	734	-	-
HCM Lane V/C Ratio	0.186	-	0.03	0.057	-	-
HCM Control Delay (s)	8.5	0	34.9	10.2	-	-
HCM Lane LOS	A	A	D	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	24	5	0	0	345	67	13	0	170	67
Future Volume (vph)	2	1	24	5	0	0	345	67	13	0	170	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.880						0.996			0.962	
Flt Protected		0.996			0.950			0.961				
Satd. Flow (prot)	0	1468	0	0	1705	0	0	1994	0	0	2057	0
Flt Permitted		0.996			0.950			0.961				
Satd. Flow (perm)	0	1468	0	0	1705	0	0	1994	0	0	2057	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		518			544			1411			503	
Travel Time (s)		14.1			14.8			27.5			11.4	
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	0%	100%	29%	20%	0%	0%	2%	8%	15%	0%	1%	0%
Adj. Flow (vph)	3	1	31	6	0	0	448	87	17	0	221	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	0	0	6	0	0	552	0	0	308	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	24	5	0	0	345	67	13	0	170	67
Future Vol, veh/h	2	1	24	5	0	0	345	67	13	0	170	67
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	100	29	20	0	0	2	8	15	0	1	0
Mvmt Flow	3	1	31	6	0	0	448	87	17	0	221	87

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1257	1265	265	1273	1300	96	308	0	0	104	0	0
Stage 1	265	265	-	992	992	-	-	-	-	-	-	-
Stage 2	992	1000	-	281	308	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.49	7.3	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.561	3.68	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	149	110	713	132	163	966	1253	-	-	1500	-	-
Stage 1	745	542	-	274	326	-	-	-	-	-	-	-
Stage 2	299	221	-	688	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	68	713	88	101	966	1253	-	-	1500	-	-
Mov Cap-2 Maneuver	105	68	-	88	101	-	-	-	-	-	-	-
Stage 1	462	542	-	170	202	-	-	-	-	-	-	-
Stage 2	185	137	-	656	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	49.1	7.7	0
HCM LOS	B	E		

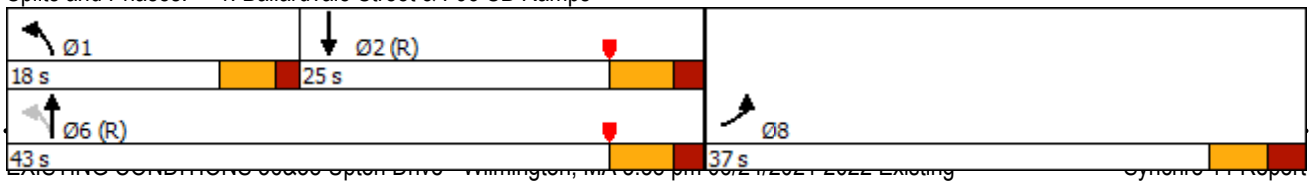
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1253	-	-	401	88	1500	-	-
HCM Lane V/C Ratio	0.358	-	-	0.087	0.074	-	-	-
HCM Control Delay (s)	9.5	0	-	14.8	49.1	0	-	-
HCM Lane LOS	A	A	-	B	E	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	0.3	0.2	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	106	29	238	623	1040
Future Volume (vph)	168	106	29	238	623	1040
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.950		0.284			
Satd. Flow (perm)	3019	1830	487	1837	1881	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		115				826
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Adj. Flow (vph)	183	115	32	259	677	1130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	115	32	259	677	1130
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	37.0		18.0	43.0	25.0	
Total Split (%)	46.3%		22.5%	53.8%	31.3%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 2 (3%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	183	115	32	259	677	1130
v/c Ratio	0.50	0.06	0.07	0.19	0.54	0.71
Control Delay	37.5	0.1	3.4	4.1	10.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	0.1	3.4	4.1	10.7	8.9
Queue Length 50th (ft)	45	0	3	32	122	358
Queue Length 95th (ft)	73	0	11	64	m225	m518
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1169	1830	547	1339	1258	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.06	0.19	0.54	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	106	29	238	623	1040
Future Volume (vph)	168	106	29	238	623	1040
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.95	1.00	0.28	1.00	1.00	1.00
Satd. Flow (perm)	3019	1830	488	1837	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	115	32	259	677	1130
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	183	115	32	259	677	1130
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	9.7	80.0	58.3	58.3	50.5	80.0
Effective Green, g (s)	9.7	80.0	58.3	58.3	50.5	80.0
Actuated g/C Ratio	0.12	1.00	0.73	0.73	0.63	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	366	1830	395	1338	1187	1583
v/s Ratio Prot	0.06		0.00	0.14	0.36	
v/s Ratio Perm		0.06	0.06			c0.71
v/c Ratio	0.50	0.06	0.08	0.19	0.57	0.71
Uniform Delay, d1	32.9	0.0	4.8	3.4	8.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.07	1.00
Incremental Delay, d2	0.4	0.1	0.0	0.3	1.2	1.6
Delay (s)	33.3	0.1	4.9	3.7	10.3	1.6
Level of Service	C	A	A	A	B	A
Approach Delay (s)	20.5			3.9	4.9	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

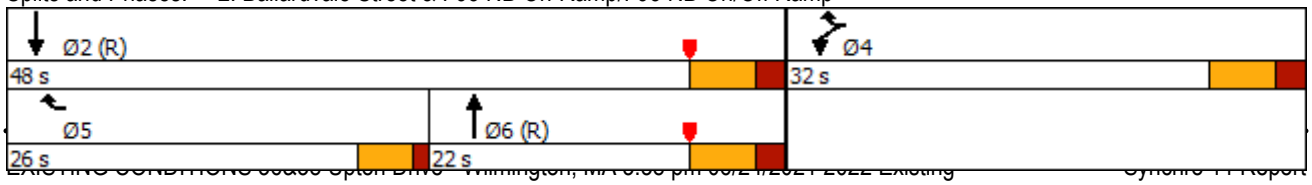
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	178	0	886	0	370	36	0	1485	688
Future Volume (vph)	0	0	0	178	0	886	0	370	36	0	1485	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1787	0	2617	0	3292	1830	0	3574	1546
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1787	0	2617	0	3292	1830	0	3574	1546
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									184			706
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	6%	0%	0%	1%	1%
Adj. Flow (vph)	0	0	0	193	0	963	0	402	39	0	1614	748
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	193	0	963	0	402	39	0	1614	748
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				32.0				22.0			48.0	
Total Split (%)				40.0%				27.5%			60.0%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				C-Min			C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	9.5
Total Split (s)	26.0
Total Split (%)	33%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	193	963	402	39	1614	748
v/c Ratio	0.32	0.68	0.39	0.02	0.87	0.48
Control Delay	21.9	15.9	24.0	0.0	23.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	15.9	24.0	0.0	23.9	1.1
Queue Length 50th (ft)	72	201	95	0	344	0
Queue Length 95th (ft)	125	195	151	0	449	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	601	1692	1022	1830	1886	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.57	0.39	0.02	0.86	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	178	0	886	0	370	36	0	1485	688
Future Volume (vph)	0	0	0	178	0	886	0	370	36	0	1485	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1787		2617		3292	1830		3574	1546
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1787		2617		3292	1830		3574	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	193	0	963	0	402	39	0	1614	748
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	193	0	963	0	402	39	0	1614	748
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	6%	0%	0%	1%	1%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.7		44.7		24.8	80.0		41.3	80.0
Effective Green, g (s)				26.7		44.7		24.8	80.0		41.3	80.0
Actuated g/C Ratio				0.33		0.56		0.31	1.00		0.52	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				596		1462		1020	1830		1845	1546
v/s Ratio Prot				0.11		c0.37		0.12			c0.45	
v/s Ratio Perm									0.02			0.48
v/c Ratio				0.32		0.66		0.39	0.02		0.87	0.48
Uniform Delay, d1				19.9		12.3		21.7	0.0		17.1	0.0
Progression Factor				1.00		1.00		0.99	1.00		1.00	1.00
Incremental Delay, d2				0.3		1.1		1.1	0.0		6.1	1.1
Delay (s)				20.2		13.4		22.6	0.0		23.2	1.1
Level of Service				C		B		C	A		C	A
Approach Delay (s)		0.0			14.5			20.6			16.2	
Approach LOS		A			B			C			B	

Intersection Summary

HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

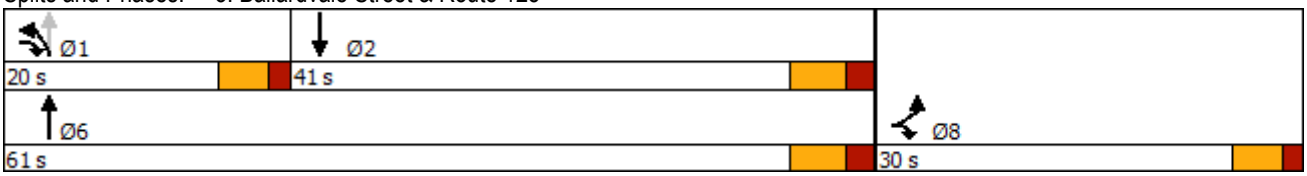
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	393	1305	268	988	868	88
Future Volume (vph)	393	1305	268	988	868	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	2787	2870	1863	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	2787	2870	1863	3502	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		73			14	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Adj. Flow (vph)	423	1403	288	1062	933	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	423	1403	288	1062	1028	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	30.0		20.0	61.0	41.0	
Total Split (%)	33.0%		22.0%	67.0%	45.1%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 88.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	423	1403	288	1062	1028
v/c Ratio	0.84	0.96	0.59	0.96	0.80
Control Delay	47.8	37.8	40.2	38.3	30.2
Queue Delay	0.0	0.0	0.0	0.3	0.0
Total Delay	47.8	37.8	40.2	38.6	30.2
Queue Length 50th (ft)	232	419	80	515	262
Queue Length 95th (ft)	#398	#611	122	#842	339
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	502	1459	489	1162	1399
Starvation Cap Reductn	0	0	0	7	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.96	0.59	0.92	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	393	1305	268	988	868	88
Future Volume (vph)	393	1305	268	988	868	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	2787	2870	1863	3502	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	2787	2870	1863	3502	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	423	1403	288	1062	933	95
RTOR Reduction (vph)	0	36	0	0	9	0
Lane Group Flow (vph)	423	1367	288	1062	1019	0
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Actuated Green, G (s)	25.1	45.2	15.1	52.3	32.2	
Effective Green, g (s)	25.1	45.2	15.1	52.3	32.2	
Actuated g/C Ratio	0.28	0.51	0.17	0.59	0.36	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	502	1425	490	1102	1275	
v/s Ratio Prot	0.24	c0.49	0.10	c0.57	0.29	
v/s Ratio Perm						
v/c Ratio	0.84	0.96	0.59	0.96	0.80	
Uniform Delay, d1	29.8	20.7	33.8	17.1	25.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.7	15.0	1.2	18.7	3.4	
Delay (s)	41.5	35.7	34.9	35.9	28.6	
Level of Service	D	D	C	D	C	
Approach Delay (s)	37.0			35.7	28.6	
Approach LOS	D			D	C	

Intersection Summary

HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

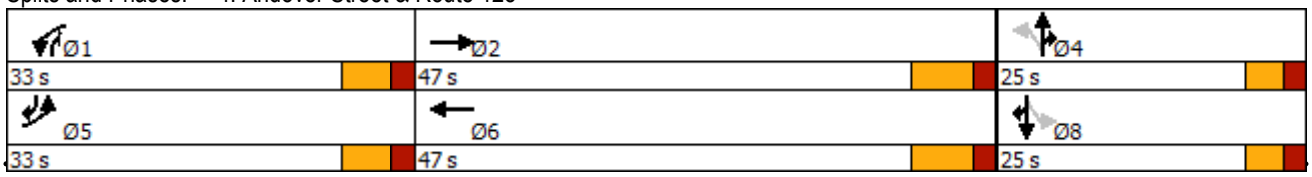
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1158	68	52	439	22	30	134	379	112	108	487
Future Volume (vph)	155	1158	68	52	439	22	30	134	379	112	108	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.993				0.850			0.850
Flt Protected	0.950			0.950				0.991			0.975	
Satd. Flow (prot)	1641	3544	0	1770	3477	0	0	1857	1599	0	1773	1583
Flt Permitted	0.950			0.950				0.893			0.671	
Satd. Flow (perm)	1641	3544	0	1770	3477	0	0	1674	1599	0	1220	1583
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		7										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			192	
Travel Time (s)		18.9			8.3			12.1			4.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Adj. Flow (vph)	163	1219	72	55	462	23	32	141	399	118	114	513
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	1291	0	55	485	0	0	173	399	0	232	513
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	25.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 87.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	163	1291	55	485	173	399	232	513
v/c Ratio	0.58	0.83	0.25	0.36	0.45	0.59	0.83	0.69
Control Delay	41.1	27.7	37.6	20.8	34.9	23.9	59.1	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	27.7	37.6	20.8	34.9	23.9	59.1	23.4
Queue Length 50th (ft)	85	302	28	94	82	170	121	218
Queue Length 95th (ft)	140	#489	62	165	162	260	#286	309
Internal Link Dist (ft)		890		526	540		112	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	509	1634	549	1599	384	974	280	965
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.79	0.10	0.30	0.45	0.41	0.83	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1158	68	52	439	22	30	134	379	112	108	487
Future Volume (vph)	155	1158	68	52	439	22	30	134	379	112	108	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)	1641	3542		1770	3477			1857	1599		1773	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.89	1.00		0.67	1.00
Satd. Flow (perm)	1641	3542		1770	3477			1674	1599		1220	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	1219	72	55	462	23	32	141	399	118	114	513
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	163	1287	0	55	485	0	0	173	399	0	232	513
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	15.0	38.4		10.8	34.2			20.1	35.9		20.1	40.1
Effective Green, g (s)	15.0	38.4		10.8	34.2			20.1	35.9		20.1	40.1
Actuated g/C Ratio	0.17	0.44		0.12	0.39			0.23	0.41		0.23	0.46
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		4.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	281	1557		218	1362			385	657		280	727
v/s Ratio Prot	0.10	c0.36		0.03	0.14				0.25			c0.32
v/s Ratio Perm								0.10			c0.19	
v/c Ratio	0.58	0.83		0.25	0.36			0.45	0.61		0.83	0.71
Uniform Delay, d1	33.3	21.5		34.6	18.8			28.8	20.2		32.0	18.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.0	3.7		0.8	0.2			0.8	1.6		17.9	3.1
Delay (s)	36.3	25.3		35.4	18.9			29.7	21.8		49.9	22.0
Level of Service	D	C		D	B			C	C		D	C
Approach Delay (s)		26.5			20.6			24.2			30.7	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	173	29	282	534	5
Future Volume (vph)	3	173	29	282	534	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950			0.995		
Satd. Flow (prot)	1925	1706	0	2037	2122	0
Flt Permitted	0.950			0.995		
Satd. Flow (perm)	1925	1706	0	2037	2122	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1277			192	1421	
Travel Time (s)	34.8			3.7	32.3	
Confl. Bikes (#/hr)		1				
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	1%	7%	5%	1%	40%
Adj. Flow (vph)	4	211	35	344	651	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	211	0	379	657	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	173	29	282	534	5
Future Vol, veh/h	3	173	29	282	534	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	1	7	5	1	40
Mvmt Flow	4	211	35	344	651	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1068	654	657	0	-	0
Stage 1	654	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	248	468	907	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	236	468	907	-	-	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	496	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.9	0.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	907	-	236	468	-	-
HCM Lane V/C Ratio	0.039	-	0.016	0.451	-	-
HCM Control Delay (s)	9.1	0	20.5	18.9	-	-
HCM Lane LOS	A	A	C	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0	2.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1	365	15	0	1	16	247	0	1	80	2
Future Volume (vph)	87	1	365	15	0	1	16	247	0	1	80	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.891			0.993						0.997	
Flt Protected		0.991			0.955			0.997			0.999	
Satd. Flow (prot)	0	1871	0	0	1915	0	0	2122	0	0	2063	0
Flt Permitted		0.991			0.955			0.997			0.999	
Satd. Flow (perm)	0	1871	0	0	1915	0	0	2122	0	0	2063	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		511			525			1421			503	
Travel Time (s)		13.9			14.3			27.7			11.4	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	7%	0%	0%	19%	0%	0%	0%	3%	50%
Adj. Flow (vph)	102	1	429	18	0	1	19	291	0	1	94	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	532	0	0	19	0	0	310	0	0	97	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	87	1	365	15	0	1	16	247	0	1	80	2
Future Vol, veh/h	87	1	365	15	0	1	16	247	0	1	80	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	7	0	0	19	0	0	0	3	50
Mvmt Flow	102	1	429	18	0	1	19	291	0	1	94	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	427	426	95	641	427	291	96	0	0	291	0	0
Stage 1	97	97	-	329	329	-	-	-	-	-	-	-
Stage 2	330	329	-	312	98	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.22	7.17	6.5	6.2	4.29	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.318	3.563	4	3.3	2.371	-	-	2.2	-	-
Pot Cap-1 Maneuver	541	520	962	381	523	753	1397	-	-	1282	-	-
Stage 1	914	815	-	674	650	-	-	-	-	-	-	-
Stage 2	687	646	-	688	818	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	533	511	962	208	514	753	1397	-	-	1282	-	-
Mov Cap-2 Maneuver	533	511	-	208	514	-	-	-	-	-	-	-
Stage 1	899	814	-	663	640	-	-	-	-	-	-	-
Stage 2	675	636	-	380	817	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	23.1	0.5	0.1
HCM LOS	C	C		

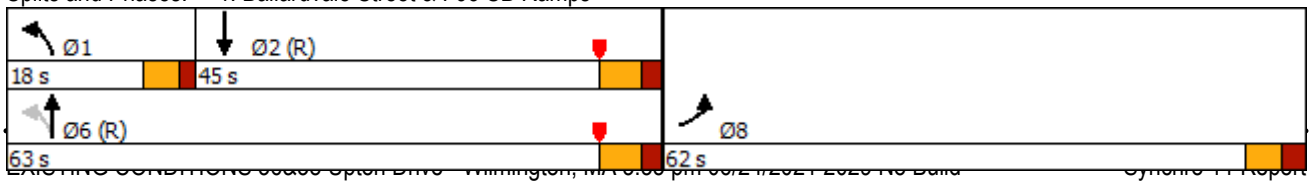
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1397	-	-	832	218	1282	-	-
HCM Lane V/C Ratio	0.013	-	-	0.641	0.086	0.001	-	-
HCM Control Delay (s)	7.6	0	-	16.7	23.1	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4.7	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	565	74	78	384	164	866
Future Volume (vph)	565	74	78	384	164	866
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.950		0.612			
Satd. Flow (perm)	3433	1760	1124	1818	1727	1482
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		44				875
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Adj. Flow (vph)	571	75	79	388	166	875
Shared Lane Traffic (%)						
Lane Group Flow (vph)	571	75	79	388	166	875
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	62.0		18.0	63.0	45.0	
Total Split (%)	49.6%		14.4%	50.4%	36.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 12 (10%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	571	75	79	388	166	875
v/c Ratio	0.79	0.04	0.10	0.31	0.16	0.59
Control Delay	55.2	0.0	6.9	8.8	12.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	0.0	6.9	8.8	12.4	1.7
Queue Length 50th (ft)	227	0	18	110	56	0
Queue Length 95th (ft)	273	0	40	189	107	0
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1537	1760	854	1262	1063	1482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.04	0.09	0.31	0.16	0.59

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	565	74	78	384	164	866
Future Volume (vph)	565	74	78	384	164	866
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.95	1.00	0.61	1.00	1.00	1.00
Satd. Flow (perm)	3433	1760	1124	1818	1727	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	571	75	79	388	166	875
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	571	75	79	388	166	875
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	26.2	125.0	86.8	86.8	75.9	125.0
Effective Green, g (s)	26.2	125.0	86.8	86.8	75.9	125.0
Actuated g/C Ratio	0.21	1.00	0.69	0.69	0.61	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	719	1760	809	1262	1048	1482
v/s Ratio Prot	c0.17		0.00	0.21	0.10	
v/s Ratio Perm		0.04	0.06			c0.59
v/c Ratio	0.79	0.04	0.10	0.31	0.16	0.59
Uniform Delay, d1	46.8	0.0	6.2	7.4	10.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.0	0.0	0.6	0.3	1.7
Delay (s)	52.5	0.0	6.2	8.1	11.0	1.7
Level of Service	D	A	A	A	B	A
Approach Delay (s)	46.4			7.7	3.2	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

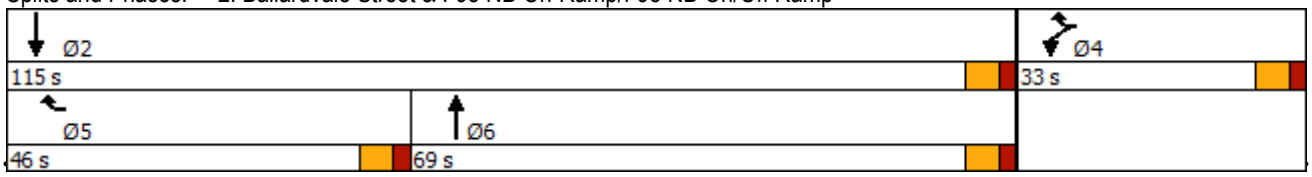
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	898	0	904	45	0	1013	267
Future Volume (vph)	0	0	0	17	0	898	0	904	45	0	1013	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									111			217
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Adj. Flow (vph)	0	0	0	18	0	926	0	932	46	0	1044	275
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	18	0	926	0	932	46	0	1044	275
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				33.0				69.0			115.0	
Total Split (%)				22.3%				46.6%			77.7%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				Min			Min	

Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 98.9
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	14.0
Total Split (s)	46.0
Total Split (%)	31%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	18	926	932	46	1044	275
v/c Ratio	0.04	0.69	0.81	0.03	0.50	0.21
Control Delay	36.2	22.3	35.7	0.0	11.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	22.3	35.7	0.0	11.1	0.4
Queue Length 50th (ft)	8	239	253	0	182	0
Queue Length 95th (ft)	36	422	442	0	220	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	488	1878	2224	1830	3267	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.49	0.42	0.03	0.32	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	898	0	904	45	0	1013	267
Future Volume (vph)	0	0	0	17	0	898	0	904	45	0	1013	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1703		2544		3323	1830		3406	1301
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1703		2544		3323	1830		3406	1301
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	18	0	926	0	932	46	0	1044	275
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	18	0	926	0	932	46	0	1044	275
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				25.8		51.6		34.7	98.3		60.5	98.3
Effective Green, g (s)				25.8		51.6		34.7	98.3		60.5	98.3
Actuated g/C Ratio				0.26		0.52		0.35	1.00		0.62	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				446		1335		1173	1830		2096	1301
v/s Ratio Prot				0.01		c0.36		c0.28			0.31	
v/s Ratio Perm									0.03			0.21
v/c Ratio				0.04		0.69		0.79	0.03		0.50	0.21
Uniform Delay, d1				27.0		17.4		28.6	0.0		10.5	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.0		1.6		3.5	0.0		0.1	0.4
Delay (s)				27.1		19.0		32.1	0.0		10.5	0.4
Level of Service				C		B		C	A		B	A
Approach Delay (s)		0.0			19.2			30.6			8.4	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	98.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

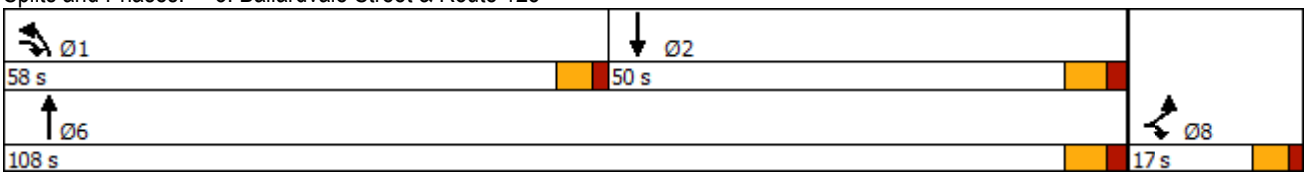
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	609	966	488
Future Volume (vph)	63	314	1193	609	966	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.950	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1543	2311	3303	1759	3287	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1543	2311	3303	1759	3287	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		40			78	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Adj. Flow (vph)	66	327	1243	634	1006	508
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	327	1243	634	1514	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	17.0		58.0	108.0	50.0	
Total Split (%)	13.6%		46.4%	86.4%	40.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 119.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	66	327	1243	634	1514
v/c Ratio	0.46	0.26	0.94	0.44	1.20
Control Delay	64.1	13.2	47.9	4.3	128.9
Queue Delay	0.0	0.0	0.0	0.4	0.0
Total Delay	64.1	13.2	47.9	4.7	128.9
Queue Length 50th (ft)	51	63	471	117	~783
Queue Length 95th (ft)	100	93	573	162	#927
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	156	1337	1473	1510	1266
Starvation Cap Reductn	0	0	0	381	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.24	0.84	0.56	1.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	609	966	488
Future Volume (vph)	63	314	1193	609	966	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1543	2311	3303	1759	3286	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1543	2311	3303	1759	3286	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	66	327	1243	634	1006	508
RTOR Reduction (vph)	0	19	0	0	49	0
Lane Group Flow (vph)	66	308	1243	634	1465	0
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Actuated Green, G (s)	11.1	64.1	48.0	97.2	44.2	
Effective Green, g (s)	11.1	64.1	48.0	97.2	44.2	
Actuated g/C Ratio	0.09	0.54	0.40	0.81	0.37	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1241	1328	1433	1217	
v/s Ratio Prot	c0.04	0.13	c0.38	0.36	c0.45	
v/s Ratio Perm						
v/c Ratio	0.46	0.25	0.94	0.44	1.20	
Uniform Delay, d1	51.3	14.7	34.2	3.2	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.0	12.2	0.1	99.7	
Delay (s)	52.1	14.8	46.4	3.3	137.2	
Level of Service	D	B	D	A	F	
Approach Delay (s)	21.1			31.8	137.2	
Approach LOS	C			C	F	

Intersection Summary

HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

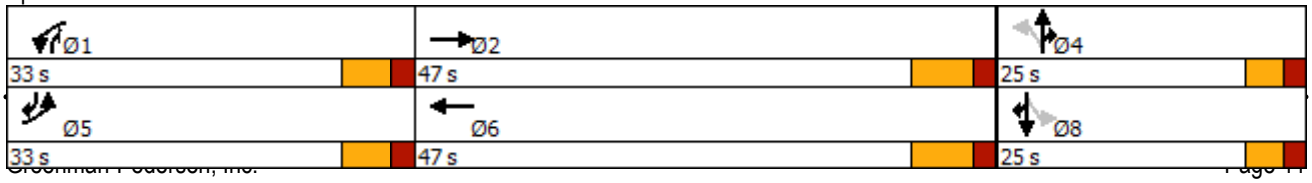
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	269	24	315	1154	160	103	190	91	21	81	197
Future Volume (vph)	379	269	24	315	1154	160	103	190	91	21	81	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.988			0.982				0.850			0.850
Flt Protected	0.950			0.950				0.983			0.990	
Satd. Flow (prot)	1687	3334	0	1805	3470	0	0	1824	1583	0	1744	1404
Flt Permitted	0.950			0.950				0.827			0.594	
Satd. Flow (perm)	1687	3334	0	1805	3470	0	0	1534	1583	0	1047	1404
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		10										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			229	
Travel Time (s)		18.9			8.3			12.1			5.2	
Confl. Bikes (#/hr)						4						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Adj. Flow (vph)	399	283	25	332	1215	168	108	200	96	22	85	207
Shared Lane Traffic (%)												
Lane Group Flow (vph)	399	308	0	332	1383	0	0	308	96	0	107	207
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	22.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 104.3
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	399	308	332	1383	308	96	107	207
v/c Ratio	0.94	0.22	0.83	1.04	1.05	0.13	0.54	0.29
Control Delay	70.4	20.4	56.2	68.1	107.8	15.2	49.3	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	20.4	56.2	68.1	107.8	15.2	49.3	16.6
Queue Length 50th (ft)	261	67	211	~533	~227	35	65	78
Queue Length 95th (ft)	#442	103	306	#669	#397	61	124	128
Internal Link Dist (ft)		890		526	540		149	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	436	1384	467	1330	294	805	200	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.22	0.71	1.04	1.05	0.12	0.54	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	269	24	315	1154	160	103	190	91	21	81	197
Future Volume (vph)	379	269	24	315	1154	160	103	190	91	21	81	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	1.00
Satd. Flow (prot)	1687	3334		1805	3469			1823	1583		1744	1404
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.59	1.00
Satd. Flow (perm)	1687	3334		1805	3469			1534	1583		1046	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	399	283	25	332	1215	168	108	200	96	22	85	207
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	399	302	0	332	1383	0	0	308	96	0	107	207
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	26.3	43.1		23.2	40.0			20.0	48.2		20.0	51.3
Effective Green, g (s)	26.3	43.1		23.2	40.0			20.0	48.2		20.0	51.3
Actuated g/C Ratio	0.25	0.41		0.22	0.38			0.19	0.46		0.19	0.49
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	425	1377		401	1330			294	731		200	690
v/s Ratio Prot	c0.24	c0.09		0.18	c0.40				0.06			0.15
v/s Ratio Perm								c0.20			0.10	
v/c Ratio	0.94	0.22		0.83	1.04			1.05	0.13		0.54	0.30
Uniform Delay, d1	38.2	19.7		38.6	32.1			42.1	16.1		38.0	15.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	28.4	0.1		13.1	35.7			65.5	0.1		2.7	0.2
Delay (s)	66.6	19.9		51.8	67.8			107.6	16.1		40.7	16.0
Level of Service	E	B		D	E			F	B		D	B
Approach Delay (s)		46.2			64.7			85.9			24.4	
Approach LOS		D			E			F			C	

Intersection Summary

HCM 2000 Control Delay	59.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	104.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	34	192	537	265	13
Future Volume (vph)	3	34	192	537	265	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.994	
Flt Protected	0.950			0.987		
Satd. Flow (prot)	1925	1538	0	2039	1931	0
Flt Permitted	0.950			0.987		
Satd. Flow (perm)	1925	1538	0	2039	1931	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1258			229	1411	
Travel Time (s)	34.3			4.5	32.1	
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	12%	2%	5%	11%	8%
Adj. Flow (vph)	4	42	237	663	327	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	42	0	900	343	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	34	192	537	265	13
Future Vol, veh/h	3	34	192	537	265	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	12	2	5	11	8
Mvmt Flow	4	42	237	663	327	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1472	335	343	0	-	0
Stage 1	335	-	-	-	-	-
Stage 2	1137	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.218	-	-	-
Pot Cap-1 Maneuver	141	685	1216	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	97	685	1216	-	-	-
Mov Cap-2 Maneuver	97	-	-	-	-	-
Stage 1	504	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1216	-	97	685	-	-
HCM Lane V/C Ratio	0.195	-	0.038	0.061	-	-
HCM Control Delay (s)	8.7	0	43.6	10.6	-	-
HCM Lane LOS	A	A	E	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	28	5	0	0	365	84	13	0	205	68
Future Volume (vph)	2	1	28	5	0	0	365	84	13	0	205	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.878						0.996			0.966	
Flt Protected		0.996			0.950			0.962				
Satd. Flow (prot)	0	1464	0	0	1705	0	0	1994	0	0	2065	0
Flt Permitted		0.996			0.950			0.962				
Satd. Flow (perm)	0	1464	0	0	1705	0	0	1994	0	0	2065	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		518			544			1411			503	
Travel Time (s)		14.1			14.8			27.5			11.4	
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	0%	100%	29%	20%	0%	0%	2%	8%	15%	0%	1%	0%
Adj. Flow (vph)	3	1	36	6	0	0	474	109	17	0	266	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	6	0	0	600	0	0	354	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	28	5	0	0	365	84	13	0	205	68
Future Vol, veh/h	2	1	28	5	0	0	365	84	13	0	205	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	100	29	20	0	0	2	8	15	0	1	0
Mvmt Flow	3	1	36	6	0	0	474	109	17	0	266	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1376	1384	310	1395	1420	118	354	0	0	126	0	0
Stage 1	310	310	-	1066	1066	-	-	-	-	-	-	-
Stage 2	1066	1074	-	329	354	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.49	7.3	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.561	3.68	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	124	91	671	108	138	939	1205	-	-	1473	-	-
Stage 1	705	515	-	249	301	-	-	-	-	-	-	-
Stage 2	271	201	-	648	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	83	52	671	67	79	939	1205	-	-	1473	-	-
Mov Cap-2 Maneuver	83	52	-	67	79	-	-	-	-	-	-	-
Stage 1	406	515	-	143	173	-	-	-	-	-	-	-
Stage 2	156	116	-	611	634	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	64.4	7.8	0
HCM LOS	C	F		

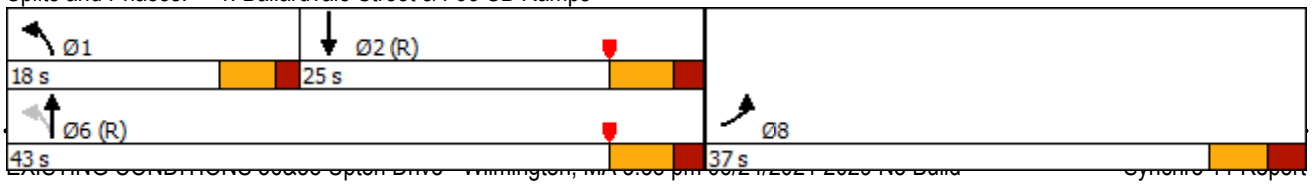
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1205	-	-	364	67	1473	-	-
HCM Lane V/C Ratio	0.393	-	-	0.111	0.097	-	-	-
HCM Control Delay (s)	9.9	0	-	16.1	64.4	0	-	-
HCM Lane LOS	A	A	-	C	F	A	-	-
HCM 95th %tile Q(veh)	1.9	-	-	0.4	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	184	114	31	259	673	1123
Future Volume (vph)	184	114	31	259	673	1123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.950		0.241			
Satd. Flow (perm)	3019	1830	414	1837	1881	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		124				826
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Adj. Flow (vph)	200	124	34	282	732	1221
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	124	34	282	732	1221
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	37.0		18.0	43.0	25.0	
Total Split (%)	46.3%		22.5%	53.8%	31.3%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 2 (3%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	200	124	34	282	732	1221
v/c Ratio	0.53	0.07	0.08	0.21	0.61	0.77
Control Delay	37.7	0.1	3.7	4.3	12.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	0.1	3.7	4.3	12.9	10.4
Queue Length 50th (ft)	49	0	4	36	188	433
Queue Length 95th (ft)	78	0	12	72	m226	m518
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1169	1830	502	1331	1193	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.07	0.07	0.21	0.61	0.77

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	184	114	31	259	673	1123
Future Volume (vph)	184	114	31	259	673	1123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.95	1.00	0.24	1.00	1.00	1.00
Satd. Flow (perm)	3019	1830	413	1837	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	124	34	282	732	1221
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	200	124	34	282	732	1221
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	10.0	80.0	58.0	58.0	48.8	80.0
Effective Green, g (s)	10.0	80.0	58.0	58.0	48.8	80.0
Actuated g/C Ratio	0.12	1.00	0.72	0.72	0.61	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	377	1830	363	1331	1147	1583
v/s Ratio Prot	0.07		0.00	0.15	0.39	
v/s Ratio Perm		0.07	0.06			c0.77
v/c Ratio	0.53	0.07	0.09	0.21	0.64	0.77
Uniform Delay, d1	32.8	0.0	5.8	3.6	10.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.05	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.4	1.3	1.8
Delay (s)	33.5	0.1	5.9	3.9	11.8	1.8
Level of Service	C	A	A	A	B	A
Approach Delay (s)	20.7			4.1	5.5	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

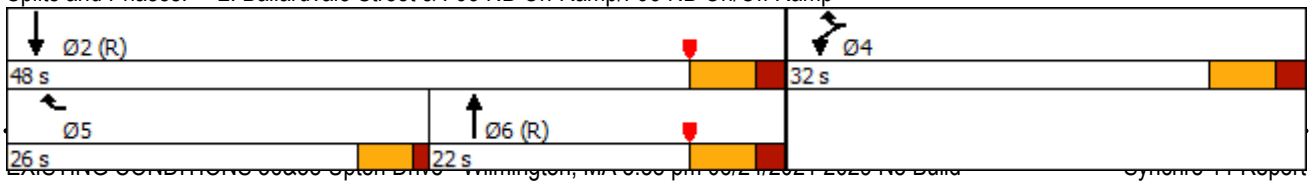
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	956	0	404	39	0	1604	744
Future Volume (vph)	0	0	0	192	0	956	0	404	39	0	1604	744
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									184			707
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Adj. Flow (vph)	0	0	0	209	0	1039	0	439	42	0	1743	809
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	209	0	1039	0	439	42	0	1743	809
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				32.0				22.0			48.0	
Total Split (%)				40.0%				27.5%			60.0%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				C-Min			C-Min	

Intersection Summary

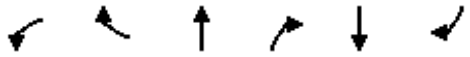
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	9.5
Total Split (s)	26.0
Total Split (%)	33%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	209	1039	439	42	1743	809
v/c Ratio	0.36	0.72	0.45	0.02	0.93	0.52
Control Delay	22.8	16.1	26.0	0.0	28.7	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	16.1	26.0	0.0	28.7	1.3
Queue Length 50th (ft)	79	218	106	0	398	0
Queue Length 95th (ft)	136	209	166	0	#581	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	583	1705	971	1830	1876	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.61	0.45	0.02	0.93	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	956	0	404	39	0	1604	744
Future Volume (vph)	0	0	0	192	0	956	0	404	39	0	1604	744
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1787		2617		3261	1830		3574	1546
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1787		2617		3261	1830		3574	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	209	0	1039	0	439	42	0	1743	809
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	209	0	1039	0	439	42	0	1743	809
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.1		45.7		23.8	80.0		41.9	80.0
Effective Green, g (s)				26.1		45.7		23.8	80.0		41.9	80.0
Actuated g/C Ratio				0.33		0.57		0.30	1.00		0.52	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				583		1494		970	1830		1871	1546
v/s Ratio Prot				0.12		c0.40		0.13			c0.49	
v/s Ratio Perm									0.02			0.52
v/c Ratio				0.36		0.70		0.45	0.02		0.93	0.52
Uniform Delay, d1				20.6		12.2		22.8	0.0		17.7	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.4		1.4		1.5	0.0		9.9	1.3
Delay (s)				20.9		13.6		24.4	0.0		27.6	1.3
Level of Service				C		B		C	A		C	A
Approach Delay (s)		0.0			14.9			22.3			19.3	
Approach LOS		A			B			C			B	

Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

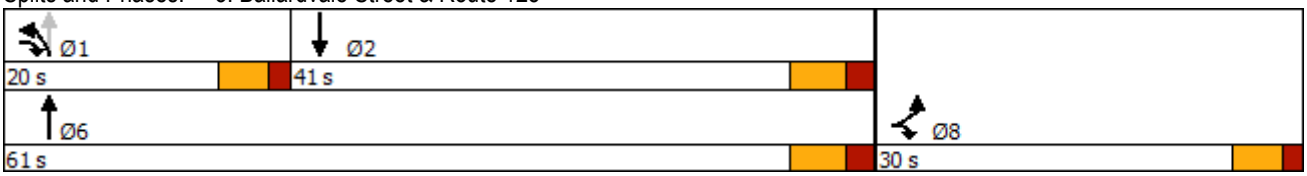
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1071	939	94
Future Volume (vph)	424	1409	289	1071	939	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	2787	2870	1863	3502	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	2787	2870	1863	3502	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55			13	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Adj. Flow (vph)	456	1515	311	1152	1010	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	456	1515	311	1152	1111	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	30.0		20.0	61.0	41.0	
Total Split (%)	33.0%		22.0%	67.0%	45.1%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 91
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	456	1515	311	1152	1111
v/c Ratio	0.94	1.08	0.66	1.02	0.82
Control Delay	62.1	71.7	43.0	53.0	31.1
Queue Delay	0.0	0.0	0.0	1.8	0.0
Total Delay	62.1	71.7	43.0	54.7	31.1
Queue Length 50th (ft)	256	~549	87	~668	293
Queue Length 95th (ft)	#442	#697	131	#955	378
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	486	1405	473	1125	1354
Starvation Cap Reductn	0	0	0	6	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	1.08	0.66	1.03	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1071	939	94
Future Volume (vph)	424	1409	289	1071	939	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	2787	2870	1863	3503	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	2787	2870	1863	3503	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	456	1515	311	1152	1010	101
RTOR Reduction (vph)	0	28	0	0	8	0
Lane Group Flow (vph)	456	1487	311	1152	1103	0
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Actuated Green, G (s)	25.0	45.0	15.0	55.0	35.0	
Effective Green, g (s)	25.0	45.0	15.0	55.0	35.0	
Actuated g/C Ratio	0.27	0.49	0.16	0.60	0.38	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	486	1378	473	1125	1347	
v/s Ratio Prot	0.26	c0.53	0.11	c0.62	0.31	
v/s Ratio Perm						
v/c Ratio	0.94	1.08	0.66	1.02	0.82	
Uniform Delay, d1	32.2	23.0	35.6	18.0	25.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.6	48.7	2.5	33.1	3.8	
Delay (s)	57.8	71.7	38.1	51.1	29.0	
Level of Service	E	E	D	D	C	
Approach Delay (s)	68.5			48.3	29.0	
Approach LOS	E			D	C	

Intersection Summary

HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

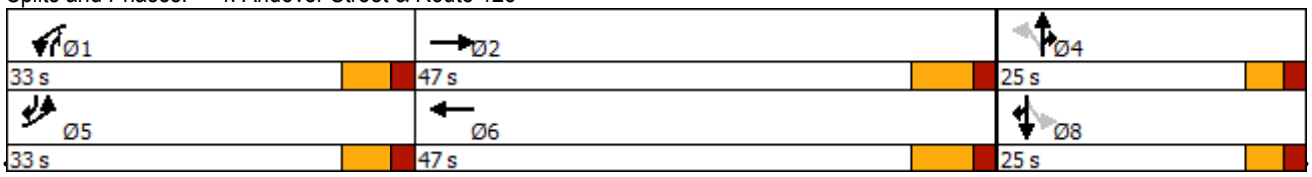
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	1250	73	56	474	33	32	144	409	129	120	527
Future Volume (vph)	172	1250	73	56	474	33	32	144	409	129	120	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.990				0.850			0.850
Flt Protected	0.950			0.950				0.991			0.975	
Satd. Flow (prot)	1641	3544	0	1770	3465	0	0	1858	1599	0	1772	1583
Flt Permitted	0.950			0.950				0.789			0.631	
Satd. Flow (perm)	1641	3544	0	1770	3465	0	0	1479	1599	0	1147	1583
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		7										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			192	
Travel Time (s)		18.9			8.3			12.1			4.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Adj. Flow (vph)	181	1316	77	59	499	35	34	152	431	136	126	555
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	1393	0	59	534	0	0	186	431	0	262	555
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	25.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 89.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	181	1393	59	534	186	431	262	555
v/c Ratio	0.62	0.87	0.27	0.39	0.56	0.65	1.02	0.75
Control Delay	42.5	30.7	37.6	21.5	39.5	25.9	99.2	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	30.7	37.6	21.5	39.5	25.9	99.2	26.0
Queue Length 50th (ft)	92	335	31	108	89	188	142	232
Queue Length 95th (ft)	156	#599	66	185	182	286	#347	354
Internal Link Dist (ft)		890		526	540		112	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	496	1593	535	1553	331	950	257	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.87	0.11	0.34	0.56	0.45	1.02	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	1250	73	56	474	33	32	144	409	129	120	527
Future Volume (vph)	172	1250	73	56	474	33	32	144	409	129	120	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.97	1.00
Satd. Flow (prot)	1641	3543		1770	3466			1857	1599		1772	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.63	1.00
Satd. Flow (perm)	1641	3543		1770	3466			1479	1599		1147	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	1316	77	59	499	35	34	152	431	136	126	555
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	181	1389	0	59	534	0	0	186	431	0	262	555
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	16.0	40.1		11.2	35.3			20.1	36.3		20.1	41.1
Effective Green, g (s)	16.0	40.1		11.2	35.3			20.1	36.3		20.1	41.1
Actuated g/C Ratio	0.18	0.45		0.13	0.39			0.22	0.41		0.22	0.46
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	293	1589		221	1368			332	649		257	727
v/s Ratio Prot	0.11	c0.39		0.03	0.15				0.27			c0.35
v/s Ratio Perm								0.13			c0.23	
v/c Ratio	0.62	0.87		0.27	0.39			0.56	0.66		1.02	0.76
Uniform Delay, d1	33.9	22.4		35.4	19.4			30.7	21.6		34.7	20.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.8	5.8		0.7	0.3			2.2	2.6		61.2	4.8
Delay (s)	37.7	28.2		36.0	19.6			32.9	24.2		95.9	24.9
Level of Service	D	C		D	B			C	C		F	C
Approach Delay (s)		29.3			21.2			26.8			47.6	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	173	29	320	603	5
Future Volume (vph)	3	173	29	320	603	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950			0.996		
Satd. Flow (prot)	1925	1706	0	2039	2123	0
Flt Permitted	0.950			0.996		
Satd. Flow (perm)	1925	1706	0	2039	2123	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1277			192	1421	
Travel Time (s)	34.8			3.7	32.3	
Confl. Bikes (#/hr)		1				
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	1%	7%	5%	1%	40%
Adj. Flow (vph)	4	211	35	390	735	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	211	0	425	741	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	173	29	320	603	5
Future Vol, veh/h	3	173	29	320	603	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	1	7	5	1	40
Mvmt Flow	4	211	35	390	735	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1198	738	741	0	-	0
Stage 1	738	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	207	420	843	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	196	420	843	-	-	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	640	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.9	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	843	-	196	420	-	-
HCM Lane V/C Ratio	0.042	-	0.019	0.502	-	-
HCM Control Delay (s)	9.5	0	23.7	21.9	-	-
HCM Lane LOS	A	A	C	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	2.7	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	1	385	15	0	1	22	277	0	1	92	2
Future Volume (vph)	88	1	385	15	0	1	22	277	0	1	92	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.890			0.993						0.998	
Flt Protected		0.991			0.955			0.996				
Satd. Flow (prot)	0	1869	0	0	1915	0	0	2115	0	0	2070	0
Flt Permitted		0.991			0.955			0.996				
Satd. Flow (perm)	0	1869	0	0	1915	0	0	2115	0	0	2070	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		511			525			1421			503	
Travel Time (s)		13.9			14.3			27.7			11.4	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	7%	0%	0%	19%	0%	0%	0%	3%	50%
Adj. Flow (vph)	104	1	453	18	0	1	26	326	0	1	108	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	558	0	0	19	0	0	352	0	0	111	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	10.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	88	1	385	15	0	1	22	277	0	1	92	2
Future Vol, veh/h	88	1	385	15	0	1	22	277	0	1	92	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	7	0	0	19	0	0	0	3	50
Mvmt Flow	104	1	453	18	0	1	26	326	0	1	108	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	490	489	109	716	490	326	110	0	0	326	0	0
Stage 1	111	111	-	378	378	-	-	-	-	-	-	-
Stage 2	379	378	-	338	112	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.22	7.17	6.5	6.2	4.29	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.318	3.563	4	3.3	2.371	-	-	2.2	-	-
Pot Cap-1 Maneuver	492	480	945	339	482	720	1381	-	-	1245	-	-
Stage 1	899	804	-	634	619	-	-	-	-	-	-	-
Stage 2	647	615	-	666	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	482	468	945	173	470	720	1381	-	-	1245	-	-
Mov Cap-2 Maneuver	482	468	-	173	470	-	-	-	-	-	-	-
Stage 1	878	803	-	619	605	-	-	-	-	-	-	-
Stage 2	631	601	-	346	806	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.1	27	0.6	0.1
HCM LOS	C	D		

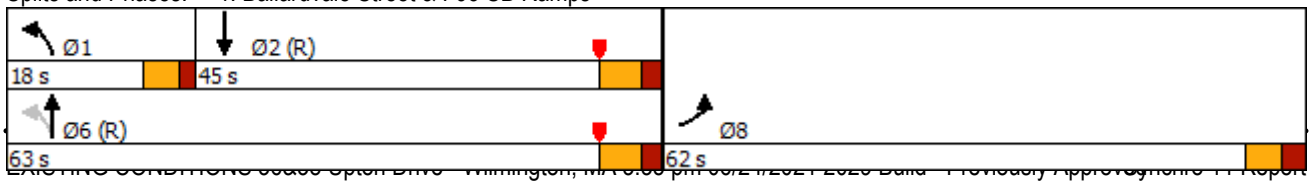
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1381	-	-	801	182	1245	-	-
HCM Lane V/C Ratio	0.019	-	-	0.696	0.103	0.001	-	-
HCM Control Delay (s)	7.7	0	-	19.1	27	7.9	0	-
HCM Lane LOS	A	A	-	C	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	5.8	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	578	74	78	391	166	870
Future Volume (vph)	578	74	78	391	166	870
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.950		0.610			
Satd. Flow (perm)	3433	1760	1120	1818	1727	1482
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		43				879
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Adj. Flow (vph)	584	75	79	395	168	879
Shared Lane Traffic (%)						
Lane Group Flow (vph)	584	75	79	395	168	879
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	62.0		18.0	63.0	45.0	
Total Split (%)	49.6%		14.4%	50.4%	36.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 12 (10%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	584	75	79	395	168	879
v/c Ratio	0.80	0.04	0.10	0.31	0.16	0.59
Control Delay	54.9	0.0	7.1	9.1	12.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	0.0	7.1	9.1	12.6	1.8
Queue Length 50th (ft)	232	0	18	115	58	0
Queue Length 95th (ft)	278	0	41	195	109	0
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1537	1760	847	1255	1056	1482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.04	0.09	0.31	0.16	0.59

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	578	74	78	391	166	870
Future Volume (vph)	578	74	78	391	166	870
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.95	1.00	0.61	1.00	1.00	1.00
Satd. Flow (perm)	3433	1760	1121	1818	1727	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	584	75	79	395	168	879
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	584	75	79	395	168	879
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	26.7	125.0	86.3	86.3	75.4	125.0
Effective Green, g (s)	26.7	125.0	86.3	86.3	75.4	125.0
Actuated g/C Ratio	0.21	1.00	0.69	0.69	0.60	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	733	1760	803	1255	1041	1482
v/s Ratio Prot	c0.17		0.00	0.22	0.10	
v/s Ratio Perm		0.04	0.06			c0.59
v/c Ratio	0.80	0.04	0.10	0.31	0.16	0.59
Uniform Delay, d1	46.6	0.0	6.4	7.7	10.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.0	0.0	0.7	0.3	1.8
Delay (s)	52.2	0.0	6.4	8.3	11.2	1.8
Level of Service	D	A	A	A	B	A
Approach Delay (s)	46.3			8.0	3.3	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

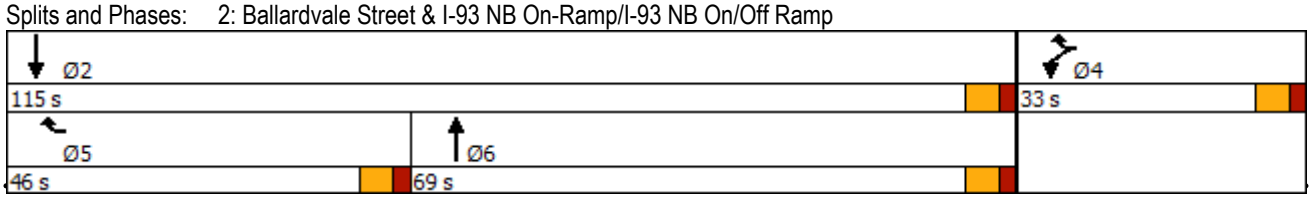
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	912	0	924	45	0	1019	271
Future Volume (vph)	0	0	0	17	0	912	0	924	45	0	1019	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									111			218
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Adj. Flow (vph)	0	0	0	18	0	940	0	953	46	0	1051	279
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	18	0	940	0	953	46	0	1051	279
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				33.0				69.0			115.0	
Total Split (%)				22.3%				46.6%			77.7%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				Min			Min	

Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 101.8
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	14.0
Total Split (s)	46.0
Total Split (%)	31%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	18	940	953	46	1051	279
v/c Ratio	0.04	0.70	0.82	0.03	0.50	0.21
Control Delay	37.8	23.2	36.8	0.0	11.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	23.2	36.8	0.0	11.0	0.4
Queue Length 50th (ft)	8	253	267	0	183	0
Queue Length 95th (ft)	37	439	468	0	221	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	475	1866	2163	1830	3230	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.50	0.44	0.03	0.33	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	912	0	924	45	0	1019	271
Future Volume (vph)	0	0	0	17	0	912	0	924	45	0	1019	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1703		2544		3323	1830		3406	1301
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1703		2544		3323	1830		3406	1301
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	18	0	940	0	953	46	0	1051	279
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	18	0	940	0	953	46	0	1051	279
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.3		53.1		36.1	101.2		62.9	101.2
Effective Green, g (s)				26.3		53.1		36.1	101.2		62.9	101.2
Actuated g/C Ratio				0.26		0.52		0.36	1.00		0.62	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				442		1334		1185	1830		2116	1301
v/s Ratio Prot				0.01		c0.37		c0.29			0.31	
v/s Ratio Perm									0.03			0.21
v/c Ratio				0.04		0.70		0.80	0.03		0.50	0.21
Uniform Delay, d1				28.0		18.1		29.4	0.0		10.5	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.0		1.7		3.8	0.0		0.1	0.4
Delay (s)				28.1		19.9		33.2	0.0		10.6	0.4
Level of Service				C		B		C	A		B	A
Approach Delay (s)		0.0			20.0			31.7			8.4	
Approach LOS		A			C			C			A	

Intersection Summary

HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	101.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

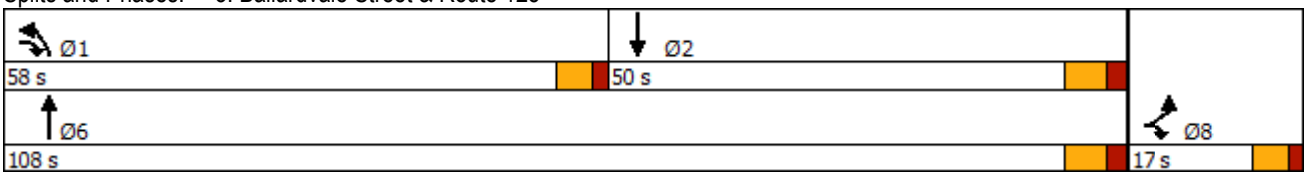
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	643	976	488
Future Volume (vph)	63	314	1193	643	976	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.950	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1543	2311	3303	1759	3287	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1543	2311	3303	1759	3287	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		38			77	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Adj. Flow (vph)	66	327	1243	670	1017	508
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	327	1243	670	1525	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	17.0		58.0	108.0	50.0	
Total Split (%)	13.6%		46.4%	86.4%	40.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 119.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	66	327	1243	670	1525
v/c Ratio	0.46	0.26	0.94	0.47	1.21
Control Delay	64.0	13.3	47.9	4.6	133.1
Queue Delay	0.0	0.0	0.0	0.4	0.0
Total Delay	64.0	13.3	47.9	4.9	133.1
Queue Length 50th (ft)	51	64	471	128	~794
Queue Length 95th (ft)	100	94	573	177	#939
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	155	1335	1473	1509	1265
Starvation Cap Reductn	0	0	0	367	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.24	0.84	0.59	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	643	976	488
Future Volume (vph)	63	314	1193	643	976	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1543	2311	3303	1759	3287	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1543	2311	3303	1759	3287	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	66	327	1243	670	1017	508
RTOR Reduction (vph)	0	18	0	0	48	0
Lane Group Flow (vph)	66	309	1243	670	1477	0
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Actuated Green, G (s)	11.1	64.1	48.0	97.2	44.2	
Effective Green, g (s)	11.1	64.1	48.0	97.2	44.2	
Actuated g/C Ratio	0.09	0.54	0.40	0.81	0.37	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1241	1328	1433	1217	
v/s Ratio Prot	c0.04	0.13	c0.38	0.38	c0.45	
v/s Ratio Perm						
v/c Ratio	0.46	0.25	0.94	0.47	1.21	
Uniform Delay, d1	51.3	14.7	34.2	3.3	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.0	12.2	0.1	103.7	
Delay (s)	52.1	14.8	46.4	3.4	141.3	
Level of Service	D	B	D	A	F	
Approach Delay (s)	21.1			31.3	141.3	
Approach LOS	C			C	F	

Intersection Summary

HCM 2000 Control Delay	74.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

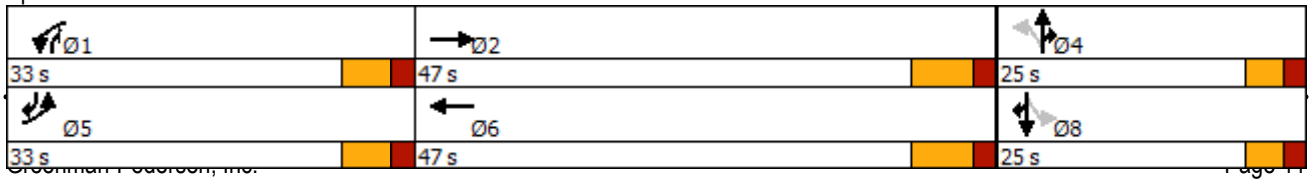
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	413	269	24	315	1154	164	103	194	91	22	82	207
Future Volume (vph)	413	269	24	315	1154	164	103	194	91	22	82	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.988			0.981				0.850			0.850
Flt Protected	0.950			0.950				0.983			0.990	
Satd. Flow (prot)	1687	3334	0	1805	3466	0	0	1824	1583	0	1744	1404
Flt Permitted	0.950			0.950				0.821			0.564	
Satd. Flow (perm)	1687	3334	0	1805	3466	0	0	1524	1583	0	993	1404
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		10										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			229	
Travel Time (s)		18.9			8.3			12.1			5.2	
Confl. Bikes (#/hr)						4						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Adj. Flow (vph)	435	283	25	332	1215	173	108	204	96	23	86	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	435	308	0	332	1388	0	0	312	96	0	109	218
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	22.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 105
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	435	308	332	1388	312	96	109	218
v/c Ratio	1.00	0.22	0.83	1.05	1.08	0.13	0.58	0.31
Control Delay	84.5	20.4	56.5	72.1	116.1	15.3	52.1	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.5	20.4	56.5	72.1	116.1	15.3	52.1	16.8
Queue Length 50th (ft)	~294	67	211	~537	~234	35	67	82
Queue Length 95th (ft)	#498	103	306	#673	#405	61	128	135
Internal Link Dist (ft)		890		526	540		149	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	433	1394	464	1320	290	799	189	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.22	0.72	1.05	1.08	0.12	0.58	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	413	269	24	315	1154	164	103	194	91	22	82	207
Future Volume (vph)	413	269	24	315	1154	164	103	194	91	22	82	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	1.00
Satd. Flow (prot)	1687	3334		1805	3467			1824	1583		1743	1404
Flt Permitted	0.95	1.00		0.95	1.00			0.82	1.00		0.56	1.00
Satd. Flow (perm)	1687	3334		1805	3467			1524	1583		993	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	435	283	25	332	1215	173	108	204	96	23	86	218
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	435	302	0	332	1388	0	0	312	96	0	109	218
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	27.0	43.7		23.3	40.0			20.0	48.3		20.0	52.0
Effective Green, g (s)	27.0	43.7		23.3	40.0			20.0	48.3		20.0	52.0
Actuated g/C Ratio	0.26	0.42		0.22	0.38			0.19	0.46		0.19	0.50
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	433	1387		400	1320			290	728		189	695
v/s Ratio Prot	c0.26	c0.09		0.18	c0.40				0.06			0.16
v/s Ratio Perm								c0.20			0.11	
v/c Ratio	1.00	0.22		0.83	1.05			1.08	0.13		0.58	0.31
Uniform Delay, d1	39.0	19.7		39.0	32.5			42.5	16.3		38.7	15.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	44.4	0.1		13.3	39.5			74.5	0.1		4.2	0.3
Delay (s)	83.4	19.8		52.3	72.0			117.0	16.4		42.9	16.1
Level of Service	F	B		D	E			F	B		D	B
Approach Delay (s)		57.0			68.2			93.3			25.0	
Approach LOS		E			E			F			C	

Intersection Summary

HCM 2000 Control Delay	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	46	234	537	265	13
Future Volume (vph)	3	46	234	537	265	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.994	
Flt Protected	0.950			0.985		
Satd. Flow (prot)	1925	1538	0	2038	1931	0
Flt Permitted	0.950			0.985		
Satd. Flow (perm)	1925	1538	0	2038	1931	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1258			229	1411	
Travel Time (s)	34.3			4.5	32.1	
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	12%	2%	5%	11%	8%
Adj. Flow (vph)	4	57	289	663	327	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	57	0	952	343	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	46	234	537	265	13
Future Vol, veh/h	3	46	234	537	265	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	12	2	5	11	8
Mvmt Flow	4	57	289	663	327	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1576	335	343	0	-	0
Stage 1	335	-	-	-	-	-
Stage 2	1241	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.218	-	-	-
Pot Cap-1 Maneuver	122	685	1216	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	76	685	1216	-	-	-
Mov Cap-2 Maneuver	76	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	2.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1216	-	76	685	-	-
HCM Lane V/C Ratio	0.238	-	0.049	0.083	-	-
HCM Control Delay (s)	8.9	0	54.8	10.7	-	-
HCM Lane LOS	A	A	F	B	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	0.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	28	5	0	0	365	84	13	0	205	70
Future Volume (vph)	3	1	28	5	0	0	365	84	13	0	205	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.881						0.996			0.966	
Flt Protected		0.995			0.950			0.962				
Satd. Flow (prot)	0	1476	0	0	1705	0	0	1994	0	0	2065	0
Flt Permitted		0.995			0.950			0.962				
Satd. Flow (perm)	0	1476	0	0	1705	0	0	1994	0	0	2065	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		518			544			1411			503	
Travel Time (s)		14.1			14.8			27.5			11.4	
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	0%	100%	29%	20%	0%	0%	2%	8%	15%	0%	1%	0%
Adj. Flow (vph)	4	1	36	6	0	0	474	109	17	0	266	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	6	0	0	600	0	0	357	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	1	28	5	0	0	365	84	13	0	205	70
Future Vol, veh/h	3	1	28	5	0	0	365	84	13	0	205	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	100	29	20	0	0	2	8	15	0	1	0
Mvmt Flow	4	1	36	6	0	0	474	109	17	0	266	91

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1378	1386	312	1396	1423	118	357	0	0	126	0	0
Stage 1	312	312	-	1066	1066	-	-	-	-	-	-	-
Stage 2	1066	1074	-	330	357	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.49	7.3	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.561	3.68	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	123	91	669	108	137	939	1202	-	-	1473	-	-
Stage 1	703	513	-	249	301	-	-	-	-	-	-	-
Stage 2	271	201	-	647	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	82	52	669	67	79	939	1202	-	-	1473	-	-
Mov Cap-2 Maneuver	82	52	-	67	79	-	-	-	-	-	-	-
Stage 1	404	513	-	143	173	-	-	-	-	-	-	-
Stage 2	156	116	-	610	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	64.4	7.8	0
HCM LOS	C	F		

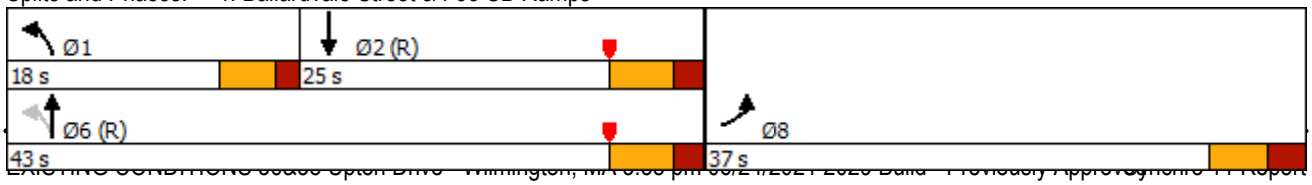
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	328	67	1473	-	-
HCM Lane V/C Ratio	0.394	-	-	0.127	0.097	-	-	-
HCM Control Delay (s)	9.9	0	-	17.6	64.4	0	-	-
HCM Lane LOS	A	A	-	C	F	A	-	-
HCM 95th %tile Q(veh)	1.9	-	-	0.4	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	189	114	31	261	679	1137
Future Volume (vph)	189	114	31	261	679	1137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.950		0.235			
Satd. Flow (perm)	3019	1830	403	1837	1881	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		124				829
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Adj. Flow (vph)	205	124	34	284	738	1236
Shared Lane Traffic (%)						
Lane Group Flow (vph)	205	124	34	284	738	1236
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	37.0		18.0	43.0	25.0	
Total Split (%)	46.3%		22.5%	53.8%	31.3%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 2 (3%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	205	124	34	284	738	1236
v/c Ratio	0.54	0.07	0.08	0.21	0.62	0.78
Control Delay	37.7	0.1	3.8	4.4	13.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	0.1	3.8	4.4	13.1	10.7
Queue Length 50th (ft)	50	0	4	37	192	462
Queue Length 95th (ft)	79	0	12	73	m225	m519
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1169	1830	495	1328	1190	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.07	0.07	0.21	0.62	0.78

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	189	114	31	261	679	1137
Future Volume (vph)	189	114	31	261	679	1137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.95	1.00	0.24	1.00	1.00	1.00
Satd. Flow (perm)	3019	1830	404	1837	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	205	124	34	284	738	1236
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	205	124	34	284	738	1236
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	10.2	80.0	57.8	57.8	48.6	80.0
Effective Green, g (s)	10.2	80.0	57.8	57.8	48.6	80.0
Actuated g/C Ratio	0.13	1.00	0.72	0.72	0.61	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	384	1830	356	1327	1142	1583
v/s Ratio Prot	0.07		0.01	0.15	0.39	
v/s Ratio Perm		0.07	0.06			c0.78
v/c Ratio	0.53	0.07	0.10	0.21	0.65	0.78
Uniform Delay, d1	32.7	0.0	6.0	3.6	10.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.05	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.4	1.3	1.8
Delay (s)	33.4	0.1	6.0	4.0	12.0	1.8
Level of Service	C	A	A	A	B	A
Approach Delay (s)	20.8			4.2	5.6	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

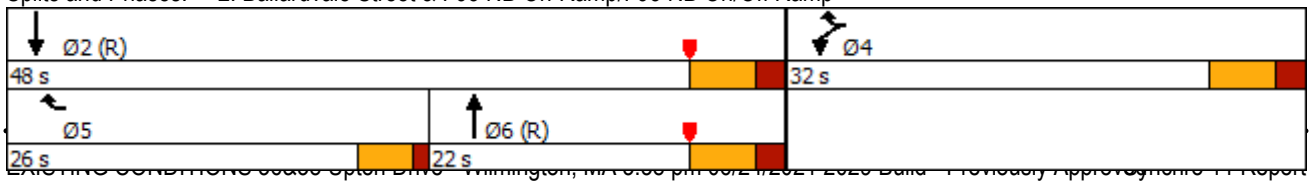
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	960	0	411	39	0	1624	757
Future Volume (vph)	0	0	0	192	0	960	0	411	39	0	1624	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									184			710
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Adj. Flow (vph)	0	0	0	209	0	1043	0	447	42	0	1765	823
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	209	0	1043	0	447	42	0	1765	823
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				32.0				22.0			48.0	
Total Split (%)				40.0%				27.5%			60.0%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				C-Min			C-Min	

Intersection Summary

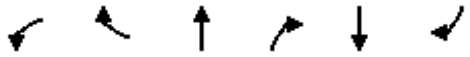
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	9.5
Total Split (s)	26.0
Total Split (%)	33%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	209	1043	447	42	1765	823
v/c Ratio	0.36	0.72	0.46	0.02	0.94	0.53
Control Delay	22.8	16.1	26.2	0.0	30.1	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	16.1	26.2	0.0	30.1	1.3
Queue Length 50th (ft)	79	219	109	0	407	0
Queue Length 95th (ft)	136	210	168	0	#593	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	582	1704	968	1830	1876	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.61	0.46	0.02	0.94	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	960	0	411	39	0	1624	757
Future Volume (vph)	0	0	0	192	0	960	0	411	39	0	1624	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1787		2617		3261	1830		3574	1546
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1787		2617		3261	1830		3574	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	209	0	1043	0	447	42	0	1765	823
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	209	0	1043	0	447	42	0	1765	823
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.1		45.7		23.8	80.0		41.9	80.0
Effective Green, g (s)				26.1		45.7		23.8	80.0		41.9	80.0
Actuated g/C Ratio				0.33		0.57		0.30	1.00		0.52	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				583		1494		970	1830		1871	1546
v/s Ratio Prot				0.12		c0.40		0.14			c0.49	
v/s Ratio Perm									0.02			0.53
v/c Ratio				0.36		0.70		0.46	0.02		0.94	0.53
Uniform Delay, d1				20.6		12.2		22.9	0.0		17.9	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.4		1.4		1.6	0.0		11.1	1.3
Delay (s)				20.9		13.7		24.5	0.0		29.1	1.3
Level of Service				C		B		C	A		C	A
Approach Delay (s)		0.0			14.9			22.4			20.3	
Approach LOS		A			B			C			C	

Intersection Summary

HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

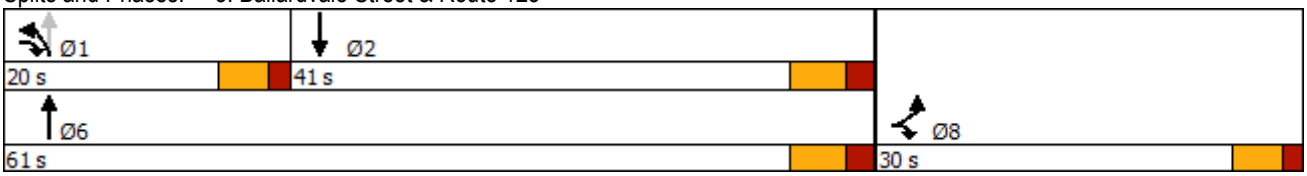
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1082	972	94
Future Volume (vph)	424	1409	289	1082	972	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.987	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	2787	2870	1863	3506	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	2787	2870	1863	3506	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		48			13	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Adj. Flow (vph)	456	1515	311	1163	1045	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	456	1515	311	1163	1146	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	30.0		20.0	61.0	41.0	
Total Split (%)	33.0%		22.0%	67.0%	45.1%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 91
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	456	1515	311	1163	1146
v/c Ratio	0.94	1.08	0.66	1.03	0.85
Control Delay	62.1	72.7	43.0	55.9	32.4
Queue Delay	0.0	0.0	0.0	1.9	0.0
Total Delay	62.1	72.7	43.0	57.8	32.4
Queue Length 50th (ft)	256	~552	87	~725	306
Queue Length 95th (ft)	#442	#700	131	#968	395
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	486	1402	473	1125	1356
Starvation Cap Reductn	0	0	0	6	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	1.08	0.66	1.04	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1082	972	94
Future Volume (vph)	424	1409	289	1082	972	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	2787	2870	1863	3506	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	2787	2870	1863	3506	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	456	1515	311	1163	1045	101
RTOR Reduction (vph)	0	24	0	0	8	0
Lane Group Flow (vph)	456	1491	311	1163	1138	0
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Actuated Green, G (s)	25.0	45.0	15.0	55.0	35.0	
Effective Green, g (s)	25.0	45.0	15.0	55.0	35.0	
Actuated g/C Ratio	0.27	0.49	0.16	0.60	0.38	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	486	1378	473	1125	1348	
v/s Ratio Prot	0.26	c0.53	0.11	c0.62	0.32	
v/s Ratio Perm						
v/c Ratio	0.94	1.08	0.66	1.03	0.84	
Uniform Delay, d1	32.2	23.0	35.6	18.0	25.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.6	49.6	2.5	35.9	4.8	
Delay (s)	57.8	72.6	38.1	53.9	30.3	
Level of Service	E	E	D	D	C	
Approach Delay (s)	69.2			50.6	30.3	
Approach LOS	E			D	C	

Intersection Summary

HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

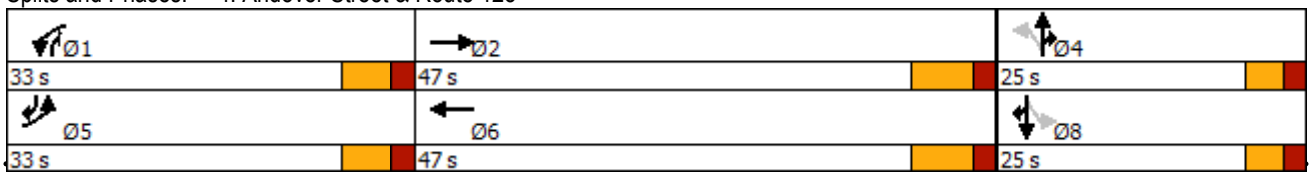
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	1250	73	56	474	35	32	146	409	133	124	560
Future Volume (vph)	183	1250	73	56	474	35	32	146	409	133	124	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.990				0.850			0.850
Flt Protected	0.950			0.950				0.991			0.975	
Satd. Flow (prot)	1641	3544	0	1770	3465	0	0	1858	1599	0	1772	1583
Flt Permitted	0.950			0.950				0.768			0.627	
Satd. Flow (perm)	1641	3544	0	1770	3465	0	0	1440	1599	0	1140	1583
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		7										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			192	
Travel Time (s)		18.9			8.3			12.1			4.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Adj. Flow (vph)	193	1316	77	59	499	37	34	154	431	140	131	589
Shared Lane Traffic (%)												
Lane Group Flow (vph)	193	1393	0	59	536	0	0	188	431	0	271	589
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	25.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 89.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	193	1393	59	536	188	431	271	589
v/c Ratio	0.63	0.87	0.27	0.40	0.58	0.65	1.06	0.78
Control Delay	42.3	30.7	37.6	22.1	40.5	25.9	110.2	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	30.7	37.6	22.1	40.5	25.9	110.2	27.2
Queue Length 50th (ft)	99	335	31	109	90	188	~154	254
Queue Length 95th (ft)	166	#599	66	185	184	286	#363	388
Internal Link Dist (ft)		890		526	540		112	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	496	1593	535	1553	322	950	255	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.87	0.11	0.35	0.58	0.45	1.06	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	1250	73	56	474	35	32	146	409	133	124	560
Future Volume (vph)	183	1250	73	56	474	35	32	146	409	133	124	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.97	1.00
Satd. Flow (prot)	1641	3543		1770	3464			1858	1599		1772	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00		0.63	1.00
Satd. Flow (perm)	1641	3543		1770	3464			1439	1599		1140	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	193	1316	77	59	499	37	34	154	431	140	131	589
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	193	1389	0	59	536	0	0	188	431	0	271	589
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	16.7	40.1		11.2	34.6			20.1	36.3		20.1	41.8
Effective Green, g (s)	16.7	40.1		11.2	34.6			20.1	36.3		20.1	41.8
Actuated g/C Ratio	0.19	0.45		0.13	0.39			0.22	0.41		0.22	0.47
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	306	1589		221	1340			323	649		256	740
v/s Ratio Prot	0.12	c0.39		0.03	0.15				0.27			c0.37
v/s Ratio Perm								0.13			c0.24	
v/c Ratio	0.63	0.87		0.27	0.40			0.58	0.66		1.06	0.80
Uniform Delay, d1	33.5	22.4		35.4	19.9			30.9	21.6		34.7	20.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.2	5.8		0.7	0.3			2.7	2.6		72.5	5.9
Delay (s)	37.7	28.2		36.0	20.1			33.6	24.2		107.2	26.1
Level of Service	D	C		D	C			C	C		F	C
Approach Delay (s)		29.4			21.7			27.0			51.7	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	214	44	320	603	5
Future Volume (vph)	3	214	44	320	603	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950			0.994		
Satd. Flow (prot)	1925	1706	0	2034	2123	0
Flt Permitted	0.950			0.994		
Satd. Flow (perm)	1925	1706	0	2034	2123	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1277			192	1421	
Travel Time (s)	34.8			3.7	32.3	
Confl. Bikes (#/hr)		1				
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	1%	7%	5%	1%	40%
Adj. Flow (vph)	4	261	54	390	735	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	261	0	444	741	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	214	44	320	603	5
Future Vol, veh/h	3	214	44	320	603	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	1	7	5	1	40
Mvmt Flow	4	261	54	390	735	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1236	738	741	0	-	0
Stage 1	738	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	196	420	843	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	180	420	843	-	-	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	615	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.6	1.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	843	-	180	420	-	-
HCM Lane V/C Ratio	0.064	-	0.02	0.621	-	-
HCM Control Delay (s)	9.6	0	25.4	26.6	-	-
HCM Lane LOS	A	A	D	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	4.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	1	385	15	0	1	22	277	0	1	92	3
Future Volume (vph)	90	1	385	15	0	1	22	277	0	1	92	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.891			0.993						0.995	
Flt Protected		0.991			0.955			0.996				
Satd. Flow (prot)	0	1871	0	0	1915	0	0	2115	0	0	2048	0
Flt Permitted		0.991			0.955			0.996				
Satd. Flow (perm)	0	1871	0	0	1915	0	0	2115	0	0	2048	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		511			525			1421			503	
Travel Time (s)		13.9			14.3			27.7			11.4	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	7%	0%	0%	19%	0%	0%	0%	3%	50%
Adj. Flow (vph)	106	1	453	18	0	1	26	326	0	1	108	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	560	0	0	19	0	0	352	0	0	113	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	11.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	90	1	385	15	0	1	22	277	0	1	92	3
Future Vol, veh/h	90	1	385	15	0	1	22	277	0	1	92	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	7	0	0	19	0	0	0	3	50
Mvmt Flow	106	1	453	18	0	1	26	326	0	1	108	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	491	490	110	717	492	326	112	0	0	326	0	0
Stage 1	112	112	-	378	378	-	-	-	-	-	-	-
Stage 2	379	378	-	339	114	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.22	7.17	6.5	6.2	4.29	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.318	3.563	4	3.3	2.371	-	-	2.2	-	-
Pot Cap-1 Maneuver	491	479	943	338	481	720	1378	-	-	1245	-	-
Stage 1	898	803	-	634	619	-	-	-	-	-	-	-
Stage 2	647	615	-	665	805	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	481	468	943	172	469	720	1378	-	-	1245	-	-
Mov Cap-2 Maneuver	481	468	-	172	469	-	-	-	-	-	-	-
Stage 1	877	802	-	619	605	-	-	-	-	-	-	-
Stage 2	631	601	-	345	804	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.5	27.2	0.6	0.1
HCM LOS	C	D		

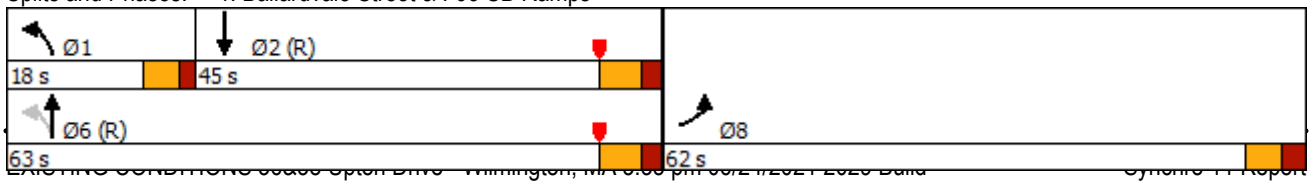
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1378	-	-	797	181	1245	-	-
HCM Lane V/C Ratio	0.019	-	-	0.703	0.104	0.001	-	-
HCM Control Delay (s)	7.7	0	-	19.5	27.2	7.9	0	-
HCM Lane LOS	A	A	-	C	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	5.9	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	599	74	78	401	168	875
Future Volume (vph)	599	74	78	401	168	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.950		0.609			
Satd. Flow (perm)	3433	1760	1119	1818	1727	1482
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		42				884
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Adj. Flow (vph)	605	75	79	405	170	884
Shared Lane Traffic (%)						
Lane Group Flow (vph)	605	75	79	405	170	884
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	62.0		18.0	63.0	45.0	
Total Split (%)	49.6%		14.4%	50.4%	36.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 12 (10%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	605	75	79	405	170	884
v/c Ratio	0.80	0.04	0.10	0.33	0.16	0.60
Control Delay	54.4	0.0	7.4	9.6	13.1	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	0.0	7.4	9.6	13.1	1.8
Queue Length 50th (ft)	240	0	19	121	60	0
Queue Length 95th (ft)	286	0	42	206	113	0
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1537	1760	839	1243	1044	1482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.04	0.09	0.33	0.16	0.60

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	599	74	78	401	168	875
Future Volume (vph)	599	74	78	401	168	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1760	1745	1818	1727	1482
Flt Permitted	0.95	1.00	0.61	1.00	1.00	1.00
Satd. Flow (perm)	3433	1760	1118	1818	1727	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	605	75	79	405	170	884
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	605	75	79	405	170	884
Heavy Vehicles (%)	2%	4%	0%	1%	10%	9%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	27.5	125.0	85.5	85.5	74.6	125.0
Effective Green, g (s)	27.5	125.0	85.5	85.5	74.6	125.0
Actuated g/C Ratio	0.22	1.00	0.68	0.68	0.60	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	755	1760	794	1243	1030	1482
v/s Ratio Prot	c0.18		0.00	0.22	0.10	
v/s Ratio Perm		0.04	0.06			c0.60
v/c Ratio	0.80	0.04	0.10	0.33	0.17	0.60
Uniform Delay, d1	46.2	0.0	6.6	8.0	11.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	0.0	0.0	0.7	0.3	1.8
Delay (s)	51.9	0.0	6.7	8.7	11.6	1.8
Level of Service	D	A	A	A	B	A
Approach Delay (s)	46.2			8.4	3.4	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

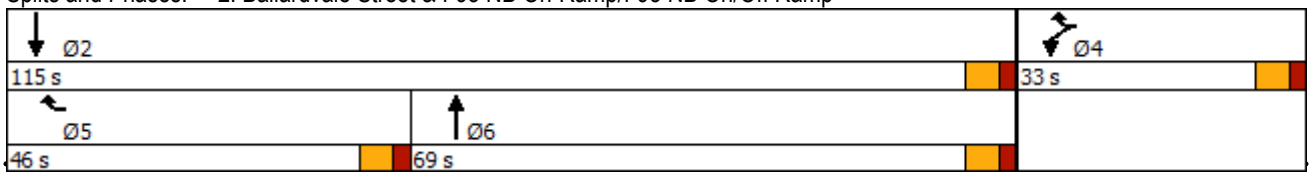
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	931	0	955	45	0	1026	276
Future Volume (vph)	0	0	0	17	0	931	0	955	45	0	1026	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1703	0	2544	0	3323	1830	0	3406	1301
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									111			222
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Adj. Flow (vph)	0	0	0	18	0	960	0	985	46	0	1058	285
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	18	0	960	0	985	46	0	1058	285
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				33.0				69.0			115.0	
Total Split (%)				22.3%				46.6%			77.7%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				Min			Min	

Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 105.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	14.0
Total Split (s)	46.0
Total Split (%)	31%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	18	960	985	46	1058	285
v/c Ratio	0.04	0.73	0.82	0.03	0.49	0.22
Control Delay	39.6	25.1	37.1	0.0	10.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	25.1	37.1	0.0	10.7	0.4
Queue Length 50th (ft)	9	274	292	0	185	0
Queue Length 95th (ft)	37	469	488	0	222	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	457	1806	2085	1830	3192	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.53	0.47	0.03	0.33	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	0	931	0	955	45	0	1026	276
Future Volume (vph)	0	0	0	17	0	931	0	955	45	0	1026	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1703		2544		3323	1830		3406	1301
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1703		2544		3323	1830		3406	1301
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	18	0	960	0	985	46	0	1058	285
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	18	0	960	0	985	46	0	1058	285
Heavy Vehicles (%)	0%	0%	0%	6%	0%	8%	0%	5%	0%	0%	6%	20%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.6		54.3		38.6	104.9		66.3	104.9
Effective Green, g (s)				26.6		54.3		38.6	104.9		66.3	104.9
Actuated g/C Ratio				0.25		0.52		0.37	1.00		0.63	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				431		1316		1222	1830		2152	1301
v/s Ratio Prot				0.01		c0.38		c0.30			0.31	
v/s Ratio Perm									0.03			0.22
v/c Ratio				0.04		0.73		0.81	0.03		0.49	0.22
Uniform Delay, d1				29.5		19.6		29.8	0.0		10.3	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.0		2.1		3.8	0.0		0.1	0.4
Delay (s)				29.6		21.7		33.5	0.0		10.4	0.4
Level of Service				C		C		C	A		B	A
Approach Delay (s)		0.0			21.8			32.0			8.3	
Approach LOS		A			C			C			A	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

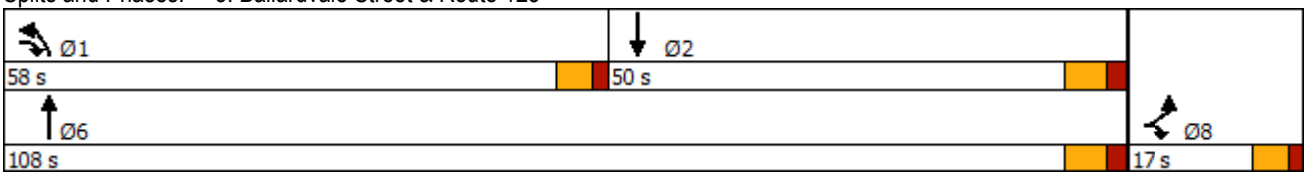
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	693	988	488
Future Volume (vph)	63	314	1193	693	988	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.950	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1543	2311	3303	1759	3287	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1543	2311	3303	1759	3287	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		36			75	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Adj. Flow (vph)	66	327	1243	722	1029	508
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	327	1243	722	1537	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	17.0		58.0	108.0	50.0	
Total Split (%)	13.6%		46.4%	86.4%	40.0%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 119.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	66	327	1243	722	1537
v/c Ratio	0.46	0.26	0.94	0.50	1.22
Control Delay	64.0	13.4	47.9	4.9	137.4
Queue Delay	0.0	0.0	0.0	0.4	0.0
Total Delay	64.0	13.4	47.9	5.3	137.4
Queue Length 50th (ft)	51	64	471	145	~805
Queue Length 95th (ft)	100	94	573	200	#951
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	155	1335	1473	1509	1264
Starvation Cap Reductn	0	0	0	347	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.24	0.84	0.62	1.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	314	1193	693	988	488
Future Volume (vph)	63	314	1193	693	988	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1543	2311	3303	1759	3288	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1543	2311	3303	1759	3288	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	66	327	1243	722	1029	508
RTOR Reduction (vph)	0	17	0	0	47	0
Lane Group Flow (vph)	66	310	1243	722	1490	0
Heavy Vehicles (%)	17%	23%	6%	8%	5%	3%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases						
Actuated Green, G (s)	11.1	64.1	48.0	97.2	44.2	
Effective Green, g (s)	11.1	64.1	48.0	97.2	44.2	
Actuated g/C Ratio	0.09	0.54	0.40	0.81	0.37	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1241	1328	1433	1218	
v/s Ratio Prot	c0.04	0.13	c0.38	0.41	c0.45	
v/s Ratio Perm						
v/c Ratio	0.46	0.25	0.94	0.50	1.22	
Uniform Delay, d1	51.3	14.8	34.2	3.5	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.0	12.2	0.1	107.9	
Delay (s)	52.1	14.8	46.4	3.6	145.5	
Level of Service	D	B	D	A	F	
Approach Delay (s)	21.1			30.6	145.5	
Approach LOS	C			C	F	

Intersection Summary

HCM 2000 Control Delay	75.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

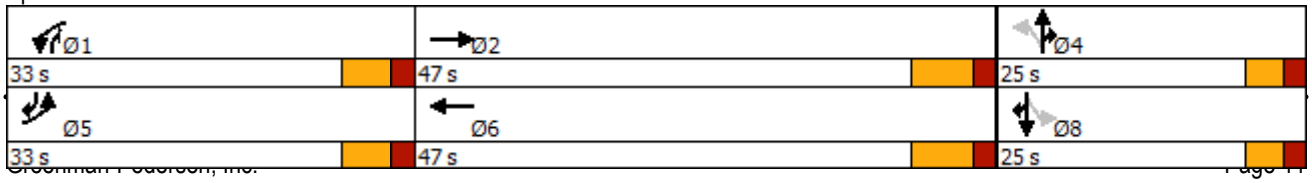
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	463	269	24	315	1154	171	103	201	91	24	84	219
Future Volume (vph)	463	269	24	315	1154	171	103	201	91	24	84	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.988			0.981				0.850			0.850
Flt Protected	0.950			0.950				0.983			0.989	
Satd. Flow (prot)	1687	3334	0	1805	3466	0	0	1825	1583	0	1741	1404
Flt Permitted	0.950			0.950				0.814			0.519	
Satd. Flow (perm)	1687	3334	0	1805	3466	0	0	1511	1583	0	914	1404
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		10										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			229	
Travel Time (s)		18.9			8.3			12.1			5.2	
Confl. Bikes (#/hr)						4						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Adj. Flow (vph)	487	283	25	332	1215	180	108	212	96	25	88	231
Shared Lane Traffic (%)												
Lane Group Flow (vph)	487	308	0	332	1395	0	0	320	96	0	113	231
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	22.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 105
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	487	308	332	1395	320	96	113	231
v/c Ratio	1.12	0.22	0.83	1.06	1.11	0.13	0.65	0.33
Control Delay	119.1	20.4	56.5	73.8	128.1	15.3	58.2	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.1	20.4	56.5	73.8	128.1	15.3	58.2	17.0
Queue Length 50th (ft)	~379	67	211	~542	~247	35	71	88
Queue Length 95th (ft)	#580	103	306	#679	#420	61	#150	143
Internal Link Dist (ft)		890		526	540		149	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	433	1394	464	1320	287	799	174	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.22	0.72	1.06	1.11	0.12	0.65	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	463	269	24	315	1154	171	103	201	91	24	84	219
Future Volume (vph)	463	269	24	315	1154	171	103	201	91	24	84	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	1.00
Satd. Flow (prot)	1687	3334		1805	3464			1826	1583		1741	1404
Flt Permitted	0.95	1.00		0.95	1.00			0.81	1.00		0.52	1.00
Satd. Flow (perm)	1687	3334		1805	3464			1511	1583		914	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	487	283	25	332	1215	180	108	212	96	25	88	231
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	487	302	0	332	1395	0	0	320	96	0	113	231
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	7%	6%	18%	0%	2%	1%	5%	1%	2%	9%	3%	15%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	27.0	43.7		23.3	40.0			20.0	48.3		20.0	52.0
Effective Green, g (s)	27.0	43.7		23.3	40.0			20.0	48.3		20.0	52.0
Actuated g/C Ratio	0.26	0.42		0.22	0.38			0.19	0.46		0.19	0.50
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	433	1387		400	1319			287	728		174	695
v/s Ratio Prot	c0.29	c0.09		0.18	c0.40				0.06			0.16
v/s Ratio Perm								c0.21			0.12	
v/c Ratio	1.12	0.22		0.83	1.06			1.11	0.13		0.65	0.33
Uniform Delay, d1	39.0	19.7		39.0	32.5			42.5	16.3		39.3	16.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	81.8	0.1		13.3	41.6			87.6	0.1		8.1	0.3
Delay (s)	120.8	19.8		52.3	74.1			130.1	16.4		47.4	16.3
Level of Service	F	B		D	E			F	B		D	B
Approach Delay (s)		81.7			69.9			103.9			26.5	
Approach LOS		F			E			F			C	

Intersection Summary

HCM 2000 Control Delay	72.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	62	298	537	265	13
Future Volume (vph)	3	62	298	537	265	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.994	
Flt Protected	0.950			0.982		
Satd. Flow (prot)	1925	1538	0	2035	1931	0
Flt Permitted	0.950			0.982		
Satd. Flow (perm)	1925	1538	0	2035	1931	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1258			229	1411	
Travel Time (s)	34.3			4.5	32.1	
Confl. Bikes (#/hr)						1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	12%	2%	5%	11%	8%
Adj. Flow (vph)	4	77	368	663	327	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	77	0	1031	343	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	62	298	537	265	13
Future Vol, veh/h	3	62	298	537	265	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	12	2	5	11	8
Mvmt Flow	4	77	368	663	327	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1734	335	343	0	-	0
Stage 1	335	-	-	-	-	-
Stage 2	1399	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.218	-	-	-
Pot Cap-1 Maneuver	98	685	1216	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	685	1216	-	-	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	380	-	-	-	-	-
Stage 2	231	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	3.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1216	-	51	685	-	-
HCM Lane V/C Ratio	0.303	-	0.073	0.112	-	-
HCM Control Delay (s)	9.2	0	81	10.9	-	-
HCM Lane LOS	A	A	F	B	-	-
HCM 95th %tile Q(veh)	1.3	-	0.2	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	28	5	0	0	365	84	13	0	205	74
Future Volume (vph)	3	1	28	5	0	0	365	84	13	0	205	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.881						0.996			0.964	
Flt Protected		0.995			0.950			0.962				
Satd. Flow (prot)	0	1476	0	0	1705	0	0	1994	0	0	2061	0
Flt Permitted		0.995			0.950			0.962				
Satd. Flow (perm)	0	1476	0	0	1705	0	0	1994	0	0	2061	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		518			544			1411			503	
Travel Time (s)		14.1			14.8			27.5			11.4	
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	0%	100%	29%	20%	0%	0%	2%	8%	15%	0%	1%	0%
Adj. Flow (vph)	4	1	36	6	0	0	474	109	17	0	266	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	6	0	0	600	0	0	362	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	1	28	5	0	0	365	84	13	0	205	74
Future Vol, veh/h	3	1	28	5	0	0	365	84	13	0	205	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	100	29	20	0	0	2	8	15	0	1	0
Mvmt Flow	4	1	36	6	0	0	474	109	17	0	266	96

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1380	1388	314	1399	1428	118	362	0	0	126	0	0
Stage 1	314	314	-	1066	1066	-	-	-	-	-	-	-
Stage 2	1066	1074	-	333	362	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.49	7.3	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.3	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.561	3.68	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	123	91	668	108	136	939	1197	-	-	1473	-	-
Stage 1	701	512	-	249	301	-	-	-	-	-	-	-
Stage 2	271	201	-	644	629	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	82	52	668	67	78	939	1197	-	-	1473	-	-
Mov Cap-2 Maneuver	82	52	-	67	78	-	-	-	-	-	-	-
Stage 1	402	512	-	143	172	-	-	-	-	-	-	-
Stage 2	155	115	-	607	629	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	64.4	7.9	0
HCM LOS	C	F		

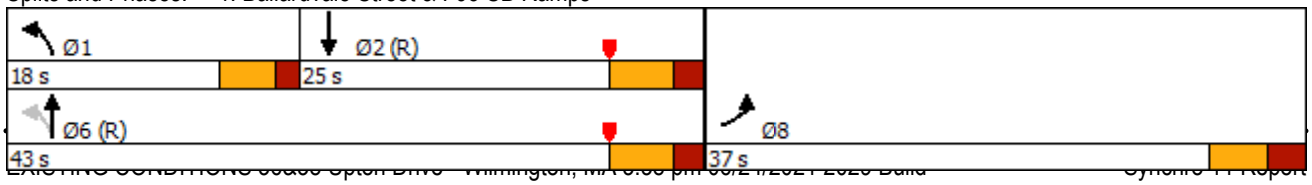
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	327	67	1473	-	-
HCM Lane V/C Ratio	0.396	-	-	0.127	0.097	-	-	-
HCM Control Delay (s)	10	0	-	17.6	64.4	0	-	-
HCM Lane LOS	A	A	-	C	F	A	-	-
HCM 95th %tile Q(veh)	1.9	-	-	0.4	0.3	0	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	114	31	265	689	1155
Future Volume (vph)	195	114	31	265	689	1155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	11	11	12	12
Storage Length (ft)	0	125	170			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25		75			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.950		0.228			
Satd. Flow (perm)	3019	1830	391	1837	1881	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		124				829
Link Speed (mph)	30			35	35	
Link Distance (ft)	753			772	351	
Travel Time (s)	17.1			15.0	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Adj. Flow (vph)	212	124	34	288	749	1255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	124	34	288	749	1255
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	8.0		7.0	10.0	10.0	
Minimum Split (s)	15.0		12.0	16.0	16.0	
Total Split (s)	37.0		18.0	43.0	25.0	
Total Split (%)	46.3%		22.5%	53.8%	31.3%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	C-Min	C-Min	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 2 (3%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Ballardvale Street & I-93 SB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	212	124	34	288	749	1255
v/c Ratio	0.55	0.07	0.09	0.22	0.63	0.79
Control Delay	37.7	0.1	3.8	4.5	13.3	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	0.1	3.8	4.5	13.3	11.1
Queue Length 50th (ft)	52	0	4	38	199	478
Queue Length 95th (ft)	81	0	12	75	m225	m519
Internal Link Dist (ft)	673			692	271	
Turn Bay Length (ft)		125	170			
Base Capacity (vph)	1169	1830	488	1324	1187	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.07	0.07	0.22	0.63	0.79

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	114	31	265	689	1155
Future Volume (vph)	195	114	31	265	689	1155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	11	11	12	12
Total Lost time (s)	6.0	4.0	5.0	6.0	6.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3019	1830	1631	1837	1881	1583
Flt Permitted	0.95	1.00	0.23	1.00	1.00	1.00
Satd. Flow (perm)	3019	1830	392	1837	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	124	34	288	749	1255
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	212	124	34	288	749	1255
Heavy Vehicles (%)	16%	0%	7%	0%	1%	2%
Turn Type	Prot	Free	pm+pt	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free	6			Free
Actuated Green, G (s)	10.3	80.0	57.7	57.7	48.5	80.0
Effective Green, g (s)	10.3	80.0	57.7	57.7	48.5	80.0
Actuated g/C Ratio	0.13	1.00	0.72	0.72	0.61	1.00
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	388	1830	347	1324	1140	1583
v/s Ratio Prot	0.07		0.01	0.16	0.40	
v/s Ratio Perm		0.07	0.07			c0.79
v/c Ratio	0.55	0.07	0.10	0.22	0.66	0.79
Uniform Delay, d1	32.7	0.0	6.2	3.7	10.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.05	1.00
Incremental Delay, d2	0.8	0.1	0.0	0.4	1.3	1.8
Delay (s)	33.5	0.1	6.3	4.1	12.1	1.8
Level of Service	C	A	A	A	B	A
Approach Delay (s)	21.2			4.3	5.7	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

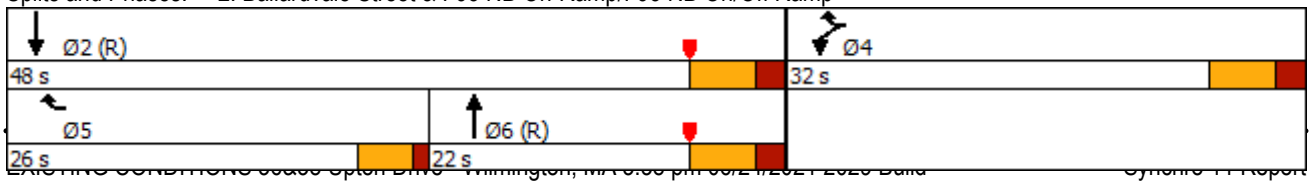
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	966	0	421	39	0	1652	776
Future Volume (vph)	0	0	0	192	0	966	0	421	39	0	1652	776
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	11	11	16	12	12	11
Storage Length (ft)	0		0	150		0	0		0	0		420
Storage Lanes	0		0	1		2	0		1	0		1
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1787	0	2617	0	3261	1830	0	3574	1546
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)									184			715
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		499			1438			373			803	
Travel Time (s)		11.3			32.7			7.3			15.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Adj. Flow (vph)	0	0	0	209	0	1050	0	458	42	0	1796	843
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	209	0	1050	0	458	42	0	1796	843
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Detector Phase				4		4 5		6			2	
Switch Phase												
Minimum Initial (s)				6.0				8.0			15.0	
Minimum Split (s)				12.0				14.0			21.0	
Total Split (s)				32.0				22.0			48.0	
Total Split (%)				40.0%				27.5%			60.0%	
Yellow Time (s)				4.0				4.0			4.0	
All-Red Time (s)				2.0				2.0			2.0	
Lost Time Adjust (s)				0.0				0.0			0.0	
Total Lost Time (s)				6.0				6.0			6.0	
Lead/Lag								Lag				
Lead-Lag Optimize?								Yes				
Recall Mode				None				C-Min			C-Min	

Intersection Summary

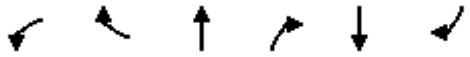
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 2: Ballardvale Street & I-93 NB On-Ramp/I-93 NB On/Off Ramp



Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	9.5
Total Split (s)	26.0
Total Split (%)	33%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	209	1050	458	42	1796	843
v/c Ratio	0.36	0.72	0.47	0.02	0.96	0.55
Control Delay	22.8	16.2	26.6	0.0	32.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	16.2	26.6	0.0	32.5	1.4
Queue Length 50th (ft)	79	220	112	0	422	0
Queue Length 95th (ft)	136	213	173	0	#611	0
Internal Link Dist (ft)			293		723	
Turn Bay Length (ft)	150					420
Base Capacity (vph)	581	1703	965	1830	1876	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.62	0.47	0.02	0.96	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	192	0	966	0	421	39	0	1652	776
Future Volume (vph)	0	0	0	192	0	966	0	421	39	0	1652	776
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	11	11	16	12	12	11
Total Lost time (s)				6.0		6.0		6.0	4.0		6.0	4.0
Lane Util. Factor				1.00		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				1787		2617		3261	1830		3574	1546
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				1787		2617		3261	1830		3574	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	209	0	1050	0	458	42	0	1796	843
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	209	0	1050	0	458	42	0	1796	843
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	7%	0%	0%	1%	1%
Turn Type				Prot		custom		NA	Free		NA	Free
Protected Phases				4		4 5		6			2	
Permitted Phases									Free			Free
Actuated Green, G (s)				26.1		45.9		23.6	80.0		41.9	80.0
Effective Green, g (s)				26.1		45.9		23.6	80.0		41.9	80.0
Actuated g/C Ratio				0.33		0.57		0.30	1.00		0.52	1.00
Clearance Time (s)				6.0				6.0			6.0	
Vehicle Extension (s)				3.0				2.0			2.0	
Lane Grp Cap (vph)				583		1501		961	1830		1871	1546
v/s Ratio Prot				0.12		c0.40		0.14			c0.50	
v/s Ratio Perm									0.02			0.55
v/c Ratio				0.36		0.70		0.48	0.02		0.96	0.55
Uniform Delay, d1				20.6		12.1		23.1	0.0		18.2	0.0
Progression Factor				1.00		1.00		1.01	1.00		1.00	1.00
Incremental Delay, d2				0.4		1.4		1.7	0.0		13.3	1.4
Delay (s)				20.9		13.6		25.0	0.0		31.5	1.4
Level of Service				C		B		C	A		C	A
Approach Delay (s)		0.0			14.8			22.9			21.9	
Approach LOS		A			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

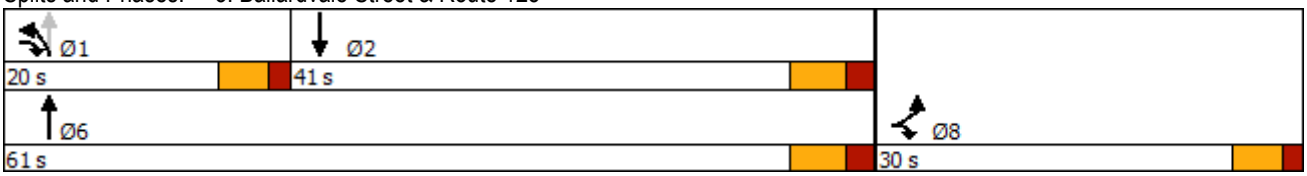
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1098	1019	94
Future Volume (vph)	424	1409	289	1098	1019	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	300			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		75			
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	0.95
Frt		0.850			0.987	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	2787	2870	1863	3507	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	2787	2870	1863	3507	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		40			12	
Link Speed (mph)	25			35	35	
Link Distance (ft)	1279			803	920	
Travel Time (s)	34.9			15.6	17.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Adj. Flow (vph)	456	1515	311	1181	1096	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	456	1515	311	1181	1197	0
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Detector Phase	8	8 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		8.0	10.0	10.0	
Minimum Split (s)	12.0		13.0	16.0	16.0	
Total Split (s)	30.0		20.0	61.0	41.0	
Total Split (%)	33.0%		22.0%	67.0%	45.1%	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	1.5		1.5	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 91
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ballardvale Street & Route 125



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	456	1515	311	1181	1197
v/c Ratio	0.94	1.08	0.66	1.05	0.88
Control Delay	62.1	74.0	43.0	61.0	35.1
Queue Delay	0.0	0.0	0.0	2.1	0.0
Total Delay	62.1	74.0	43.0	63.1	35.1
Queue Length 50th (ft)	256	~555	87	~747	328
Queue Length 95th (ft)	#442	#703	131	#991	#457
Internal Link Dist (ft)	1199			723	840
Turn Bay Length (ft)		150	300		
Base Capacity (vph)	486	1398	473	1125	1356
Starvation Cap Reductn	0	0	0	6	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	1.08	0.66	1.06	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	1409	289	1098	1019	94
Future Volume (vph)	424	1409	289	1098	1019	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	6.0	6.0	
Lane Util. Factor	1.00	0.88	0.97	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	2787	2870	1863	3509	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	2787	2870	1863	3509	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	456	1515	311	1181	1096	101
RTOR Reduction (vph)	0	20	0	0	7	0
Lane Group Flow (vph)	456	1495	311	1181	1190	0
Heavy Vehicles (%)	2%	2%	22%	2%	1%	8%
Turn Type	Prot	pt+ov	Prot	NA	NA	
Protected Phases	8	8 1	1	6	2	
Permitted Phases				1		
Actuated Green, G (s)	25.0	45.0	15.0	55.0	35.0	
Effective Green, g (s)	25.0	45.0	15.0	55.0	35.0	
Actuated g/C Ratio	0.27	0.49	0.16	0.60	0.38	
Clearance Time (s)	5.0		5.0	6.0	6.0	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	486	1378	473	1125	1349	
v/s Ratio Prot	0.26	c0.54	0.11	c0.63	0.34	
v/s Ratio Perm						
v/c Ratio	0.94	1.08	0.66	1.05	0.88	
Uniform Delay, d1	32.2	23.0	35.6	18.0	26.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.6	50.7	2.5	40.9	6.9	
Delay (s)	57.8	73.7	38.1	58.9	33.0	
Level of Service	E	E	D	E	C	
Approach Delay (s)	70.0			54.6	33.0	
Approach LOS	E			D	C	

Intersection Summary

HCM 2000 Control Delay	55.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

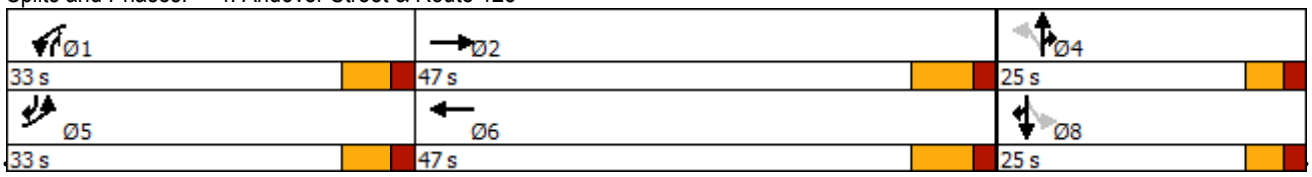
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Future Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.989				0.850			0.850
Flt Protected	0.950			0.950				0.991			0.975	
Satd. Flow (prot)	1641	3544	0	1770	3461	0	0	1858	1599	0	1772	1583
Flt Permitted	0.950			0.950				0.732			0.623	
Satd. Flow (perm)	1641	3544	0	1770	3461	0	0	1372	1599	0	1133	1583
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		7										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			192	
Travel Time (s)		18.9			8.3			12.1			4.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Adj. Flow (vph)	209	1316	77	59	499	39	34	156	431	147	138	639
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	1393	0	59	538	0	0	190	431	0	285	639
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	25.0		13.0	13.0		13.0	13.0	
Total Split (s)	33.0	47.0		33.0	47.0		25.0	25.0		25.0	25.0	
Total Split (%)	31.4%	44.8%		31.4%	44.8%		23.8%	23.8%		23.8%	23.8%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 89.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	209	1393	59	538	190	431	285	639
v/c Ratio	0.62	0.87	0.27	0.42	0.62	0.65	1.12	0.82
Control Delay	40.2	30.7	37.6	23.5	42.5	25.9	129.1	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.7	37.6	23.5	42.5	25.9	129.1	28.3
Queue Length 50th (ft)	108	335	31	110	92	188	~175	288
Queue Length 95th (ft)	179	#599	66	186	#203	286	#385	445
Internal Link Dist (ft)		890		526	540		112	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	496	1593	535	1551	307	950	254	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.87	0.11	0.35	0.62	0.45	1.12	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Future Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.97	1.00
Satd. Flow (prot)	1641	3543		1770	3462			1858	1599		1772	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.62	1.00
Satd. Flow (perm)	1641	3543		1770	3462			1373	1599		1132	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	209	1316	77	59	499	39	34	156	431	147	138	639
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	209	1389	0	59	538	0	0	190	431	0	285	639
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	18.3	40.2		11.2	33.1			20.1	36.3		20.1	43.4
Effective Green, g (s)	18.3	40.2		11.2	33.1			20.1	36.3		20.1	43.4
Actuated g/C Ratio	0.20	0.45		0.13	0.37			0.22	0.41		0.22	0.48
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	335	1591		221	1280			308	648		254	767
v/s Ratio Prot	0.13	c0.39		0.03	0.16				0.27			c0.40
v/s Ratio Perm								0.14			c0.25	
v/c Ratio	0.62	0.87		0.27	0.42			0.62	0.67		1.12	0.83
Uniform Delay, d1	32.5	22.3		35.4	21.0			31.2	21.7		34.7	19.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	5.8		0.7	0.3			3.6	2.6		93.3	7.7
Delay (s)	36.1	28.1		36.1	21.3			34.9	24.2		128.0	27.7
Level of Service	D	C		D	C			C	C		F	C
Approach Delay (s)		29.2			22.8			27.5			58.6	
Approach LOS		C			C			C			E	

Intersection Summary

HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	89.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	275	64	320	603	5
Future Volume (vph)	3	275	64	320	603	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	16	16	16	16
Storage Length (ft)	0	300	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.999	
Flt Protected	0.950			0.992		
Satd. Flow (prot)	1925	1706	0	2028	2123	0
Flt Permitted	0.950			0.992		
Satd. Flow (perm)	1925	1706	0	2028	2123	0
Link Speed (mph)	25			35	30	
Link Distance (ft)	1277			192	1421	
Travel Time (s)	34.8			3.7	32.3	
Confl. Bikes (#/hr)		1				
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	1%	7%	5%	1%	40%
Adj. Flow (vph)	4	335	78	390	735	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	335	0	468	741	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	275	64	320	603	5
Future Vol, veh/h	3	275	64	320	603	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	300	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	1	7	5	1	40
Mvmt Flow	4	335	78	390	735	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1284	738	741	0	-	0
Stage 1	738	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	184	420	843	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	162	420	843	-	-	-
Mov Cap-2 Maneuver	162	-	-	-	-	-
Stage 1	420	-	-	-	-	-
Stage 2	584	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	39.8	1.6	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	843	-	162	420	-	-
HCM Lane V/C Ratio	0.093	-	0.023	0.798	-	-
HCM Control Delay (s)	9.7	0	27.7	39.9	-	-
HCM Lane LOS	A	A	D	E	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	7.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	385	15	0	1	22	277	0	1	92	4
Future Volume (vph)	93	1	385	15	0	1	22	277	0	1	92	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	16	16	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.891			0.993						0.994	
Flt Protected		0.990			0.955			0.996				
Satd. Flow (prot)	0	1869	0	0	1915	0	0	2115	0	0	2038	0
Flt Permitted		0.990			0.955			0.996				
Satd. Flow (perm)	0	1869	0	0	1915	0	0	2115	0	0	2038	0
Link Speed (mph)		25			25			35			30	
Link Distance (ft)		511			525			1421			503	
Travel Time (s)		13.9			14.3			27.7			11.4	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	7%	0%	0%	19%	0%	0%	0%	3%	50%
Adj. Flow (vph)	109	1	453	18	0	1	26	326	0	1	108	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	563	0	0	19	0	0	352	0	0	114	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	11.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	1	385	15	0	1	22	277	0	1	92	4
Future Vol, veh/h	93	1	385	15	0	1	22	277	0	1	92	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	2	2	7	0	0	19	0	0	0	3	50
Mvmt Flow	109	1	453	18	0	1	26	326	0	1	108	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	492	491	111	718	493	326	113	0	0	326	0	0
Stage 1	113	113	-	378	378	-	-	-	-	-	-	-
Stage 2	379	378	-	340	115	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.22	7.17	6.5	6.2	4.29	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.318	3.563	4	3.3	2.371	-	-	2.2	-	-
Pot Cap-1 Maneuver	490	478	942	338	480	720	1377	-	-	1245	-	-
Stage 1	897	802	-	634	619	-	-	-	-	-	-	-
Stage 2	647	615	-	664	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	480	467	942	172	468	720	1377	-	-	1245	-	-
Mov Cap-2 Maneuver	480	467	-	172	468	-	-	-	-	-	-	-
Stage 1	876	801	-	619	605	-	-	-	-	-	-	-
Stage 2	631	601	-	344	803	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.9	27.2	0.6	0.1
HCM LOS	C	D		

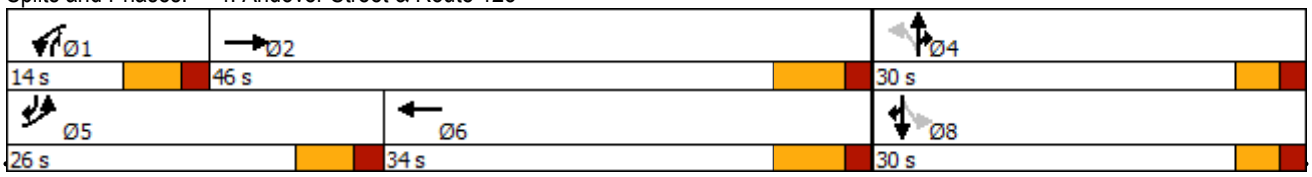
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1377	-	-	792	181	1245	-	-
HCM Lane V/C Ratio	0.019	-	-	0.712	0.104	0.001	-	-
HCM Control Delay (s)	7.7	0	-	19.9	27.2	7.9	0	-
HCM Lane LOS	A	A	-	C	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	6.1	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Future Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	11	12
Storage Length (ft)	500		0	365		600	0		140	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.989				0.850			0.850
Flt Protected	0.950			0.950				0.991			0.975	
Satd. Flow (prot)	1641	3544	0	1770	3461	0	0	1858	1599	0	1772	1583
Flt Permitted	0.950			0.950				0.877			0.662	
Satd. Flow (perm)	1641	3544	0	1770	3461	0	0	1644	1599	0	1203	1583
Right Turn on Red			Yes			No			No			No
Satd. Flow (RTOR)		8										
Link Speed (mph)		35			50			35			30	
Link Distance (ft)		970			606			620			192	
Travel Time (s)		18.9			8.3			12.1			4.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Adj. Flow (vph)	209	1316	77	59	499	39	34	156	431	147	138	639
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	1393	0	59	538	0	0	190	431	0	285	639
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4	4 1	8	8	8 5
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	22.0		14.0	25.0		13.0	13.0		13.0	13.0	
Total Split (s)	26.0	46.0		14.0	34.0		30.0	30.0		30.0	30.0	
Total Split (%)	28.9%	51.1%		15.6%	37.8%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	4.0	5.0		4.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Andover Street & Route 125



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	209	1393	59	538	190	431	285	639
v/c Ratio	0.69	0.91	0.37	0.46	0.42	0.62	0.85	0.76
Control Delay	46.0	33.9	46.0	25.8	29.9	24.6	56.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	33.9	46.0	25.8	29.9	24.6	56.0	23.2
Queue Length 50th (ft)	111	375	32	126	88	185	153	264
Queue Length 95th (ft)	179	#523	71	183	151	286	#296	383
Internal Link Dist (ft)		890		526	540		112	
Turn Bay Length (ft)	500		365			140		
Base Capacity (vph)	367	1551	158	1165	459	678	336	885
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.90	0.37	0.46	0.41	0.64	0.85	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Future Volume (vph)	199	1250	73	56	474	37	32	148	409	140	131	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	11	12
Total Lost time (s)	6.0	7.0		6.0	7.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.97	1.00
Satd. Flow (prot)	1641	3543		1770	3462			1858	1599		1772	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.66	1.00
Satd. Flow (perm)	1641	3543		1770	3462			1645	1599		1203	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	209	1316	77	59	499	39	34	156	431	147	138	639
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	209	1388	0	59	538	0	0	190	431	0	285	639
Heavy Vehicles (%)	10%	1%	2%	2%	3%	5%	3%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	5	2		1	6			4	4 1		8	8 5
Permitted Phases							4			8		
Actuated Green, G (s)	16.5	38.6		8.0	30.1			24.8	37.8		24.8	46.3
Effective Green, g (s)	16.5	38.6		8.0	30.1			24.8	37.8		24.8	46.3
Actuated g/C Ratio	0.18	0.43		0.09	0.34			0.28	0.42		0.28	0.52
Clearance Time (s)	6.0	7.0		6.0	7.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	302	1529		158	1165			456	676		333	819
v/s Ratio Prot	0.13	c0.39		0.03	0.16				0.27			c0.40
v/s Ratio Perm								0.12			0.24	
v/c Ratio	0.69	0.91		0.37	0.46			0.42	0.64		0.86	0.78
Uniform Delay, d1	34.1	23.7		38.3	23.3			26.4	20.4		30.6	17.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.7	8.3		1.5	0.4			0.6	2.0		18.9	4.8
Delay (s)	40.8	32.1		39.8	23.7			27.0	22.4		49.5	22.3
Level of Service	D	C		D	C			C	C		D	C
Approach Delay (s)		33.2			25.3			23.8			30.7	
Approach LOS		C			C			C			C	

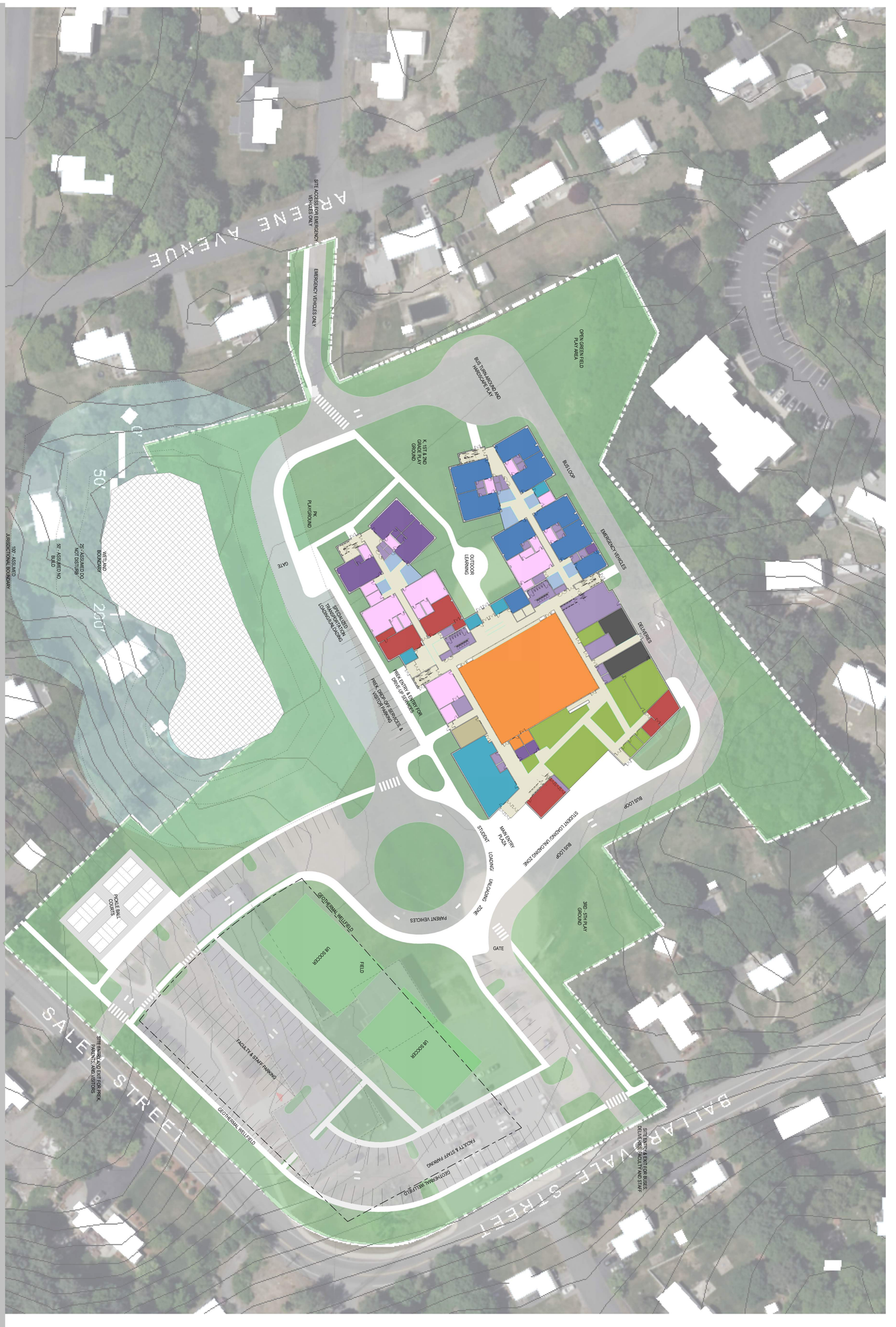
Intersection Summary

HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix E: Site Plan Alternatives

SITE BASE CONDITIONS



3

DORE + WHITTIER

DATE

SCALE

SCALE: 1"=0"-0" GRAPHIC SCALE 0 20' 40' 80'

WILMINGTON SCHOOLS

NORTH INTERMEDIATE - WILMINGTON MA

TRUE NORTH

LEGEND

- : PASSENGER CARS
- : MINIBUS
- : BUS
- : BUS CIRCULATION
- : CAR CIRCULATION

terraink
landscape architecture

WILMINGTON ELEMENTARY SCHOOL | VEHICULAR CIRCULATION - OPTION B

N.T.S. CONCEPT DESIGN PREPARED FOR TEAM COORDINATION . NOT FOR CONSTRUCTION

NORTH

Wilmington . Massachusetts
Schematic Design Phase
February 2025

Appendix F: Trip and Parking Generation Worksheets

Elementary School
(520)

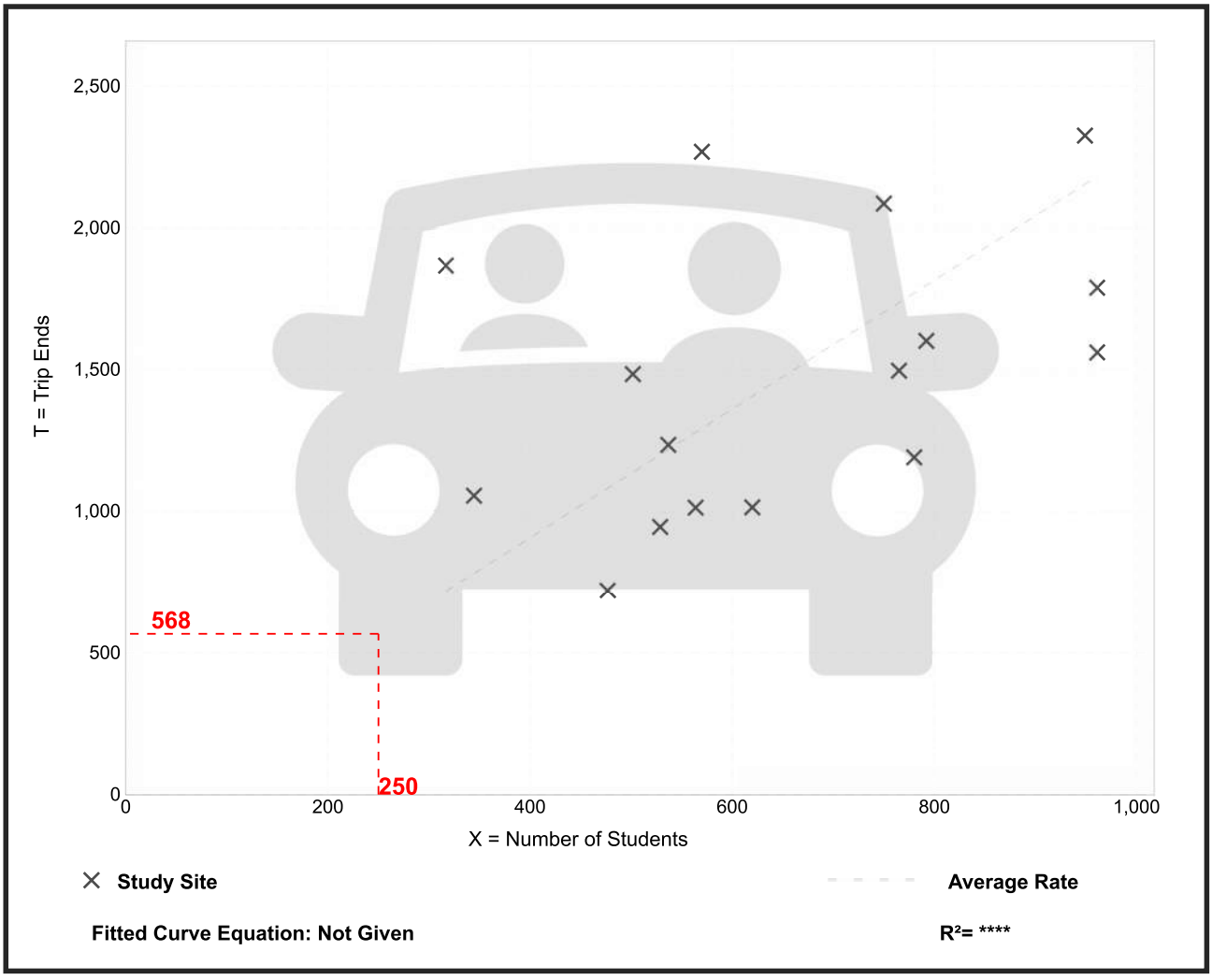
Vehicle Trip Ends vs: **Students**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 16
Avg. Num. of Students: 651
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
2.27	1.51 - 5.89	0.93

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Elementary School
(520)

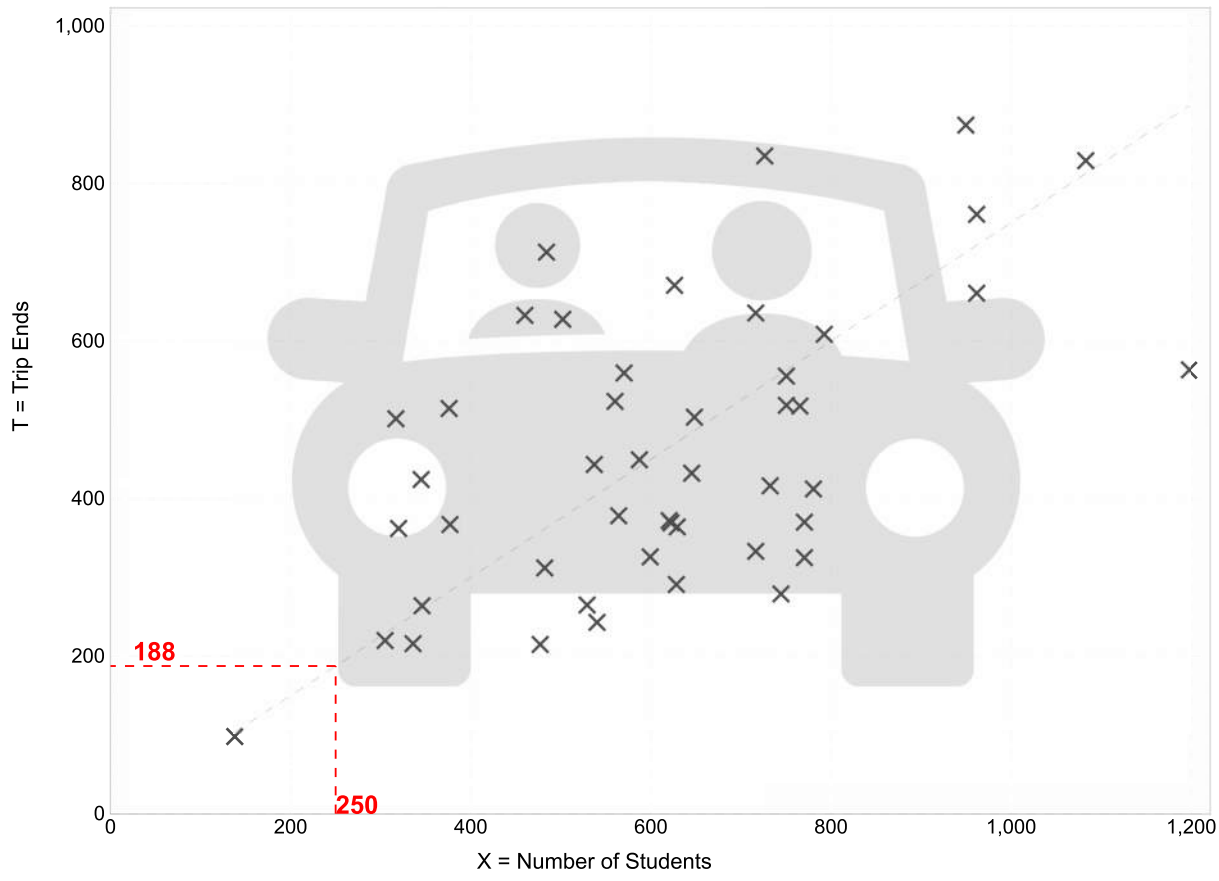
Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Students: 616
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.75	0.38 - 1.58	0.27

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Elementary School
(520)

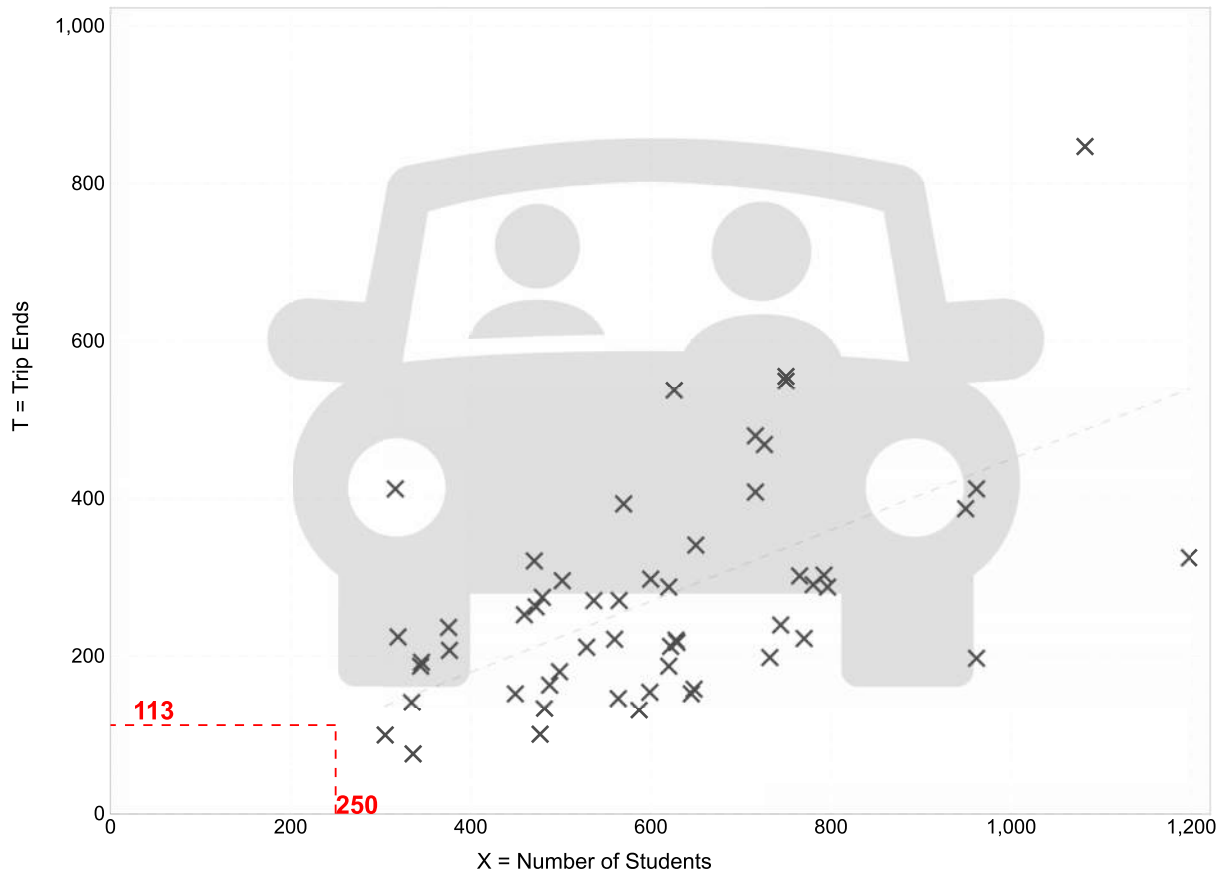
Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 54
Avg. Num. of Students: 608
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.45	0.21 - 1.30	0.19

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Trip Gen Manual, 11th Edition • Institute of Transportation Engineers

Elementary School
(520)

Vehicle Trip Ends vs: **Students**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
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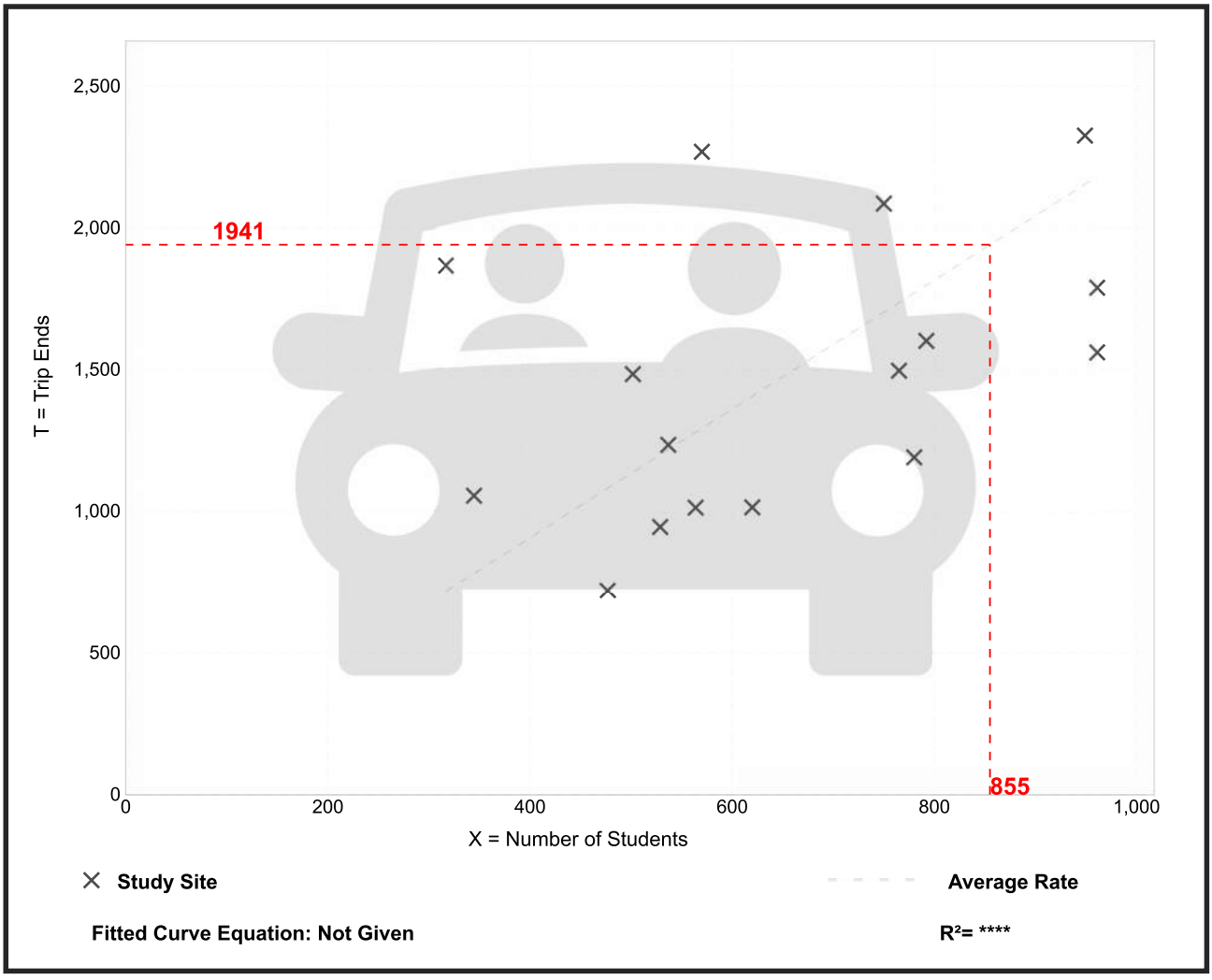
Avg. Num. of Students: 651
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
2.27	1.51 - 5.89	0.93

Data Plot and Equation



Elementary School
(520)

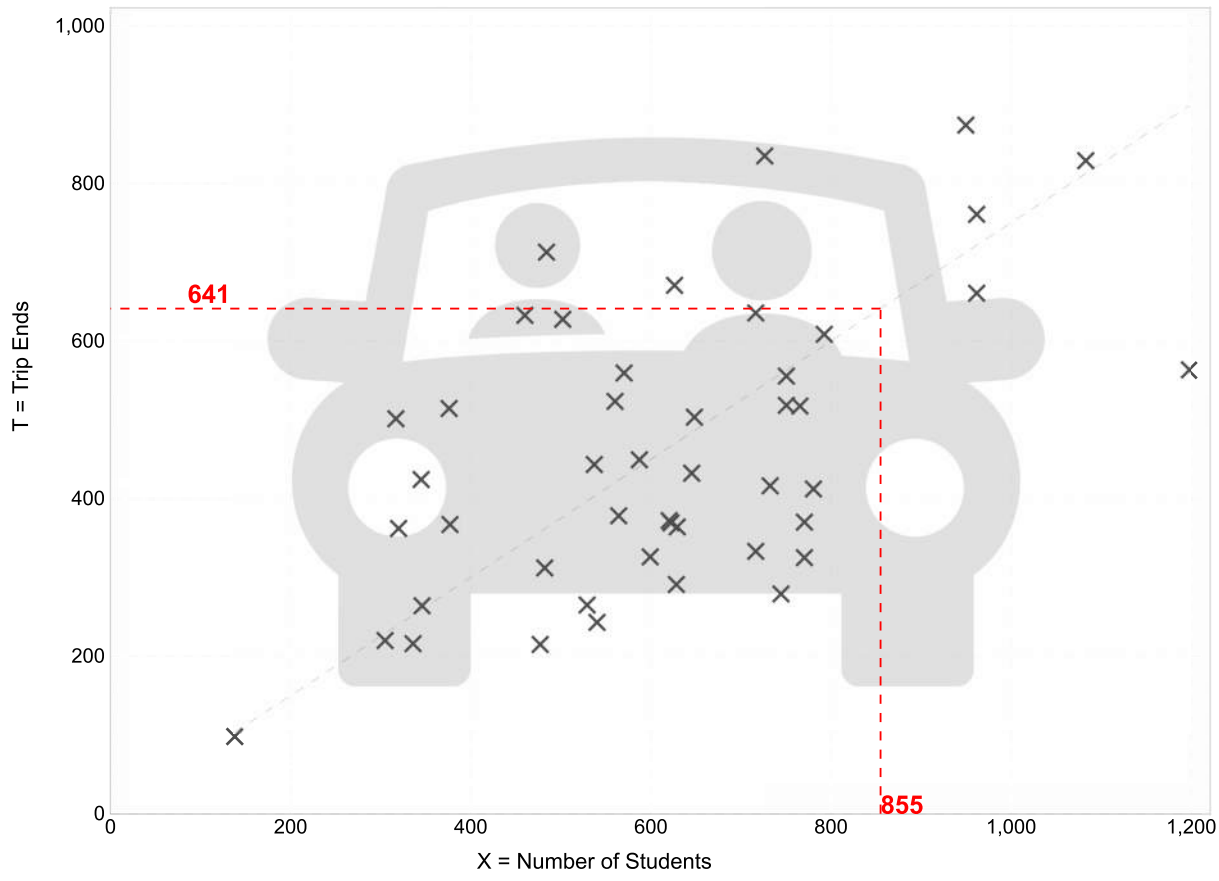
Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Students: 616
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.75	0.38 - 1.58	0.27

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Elementary School
(520)

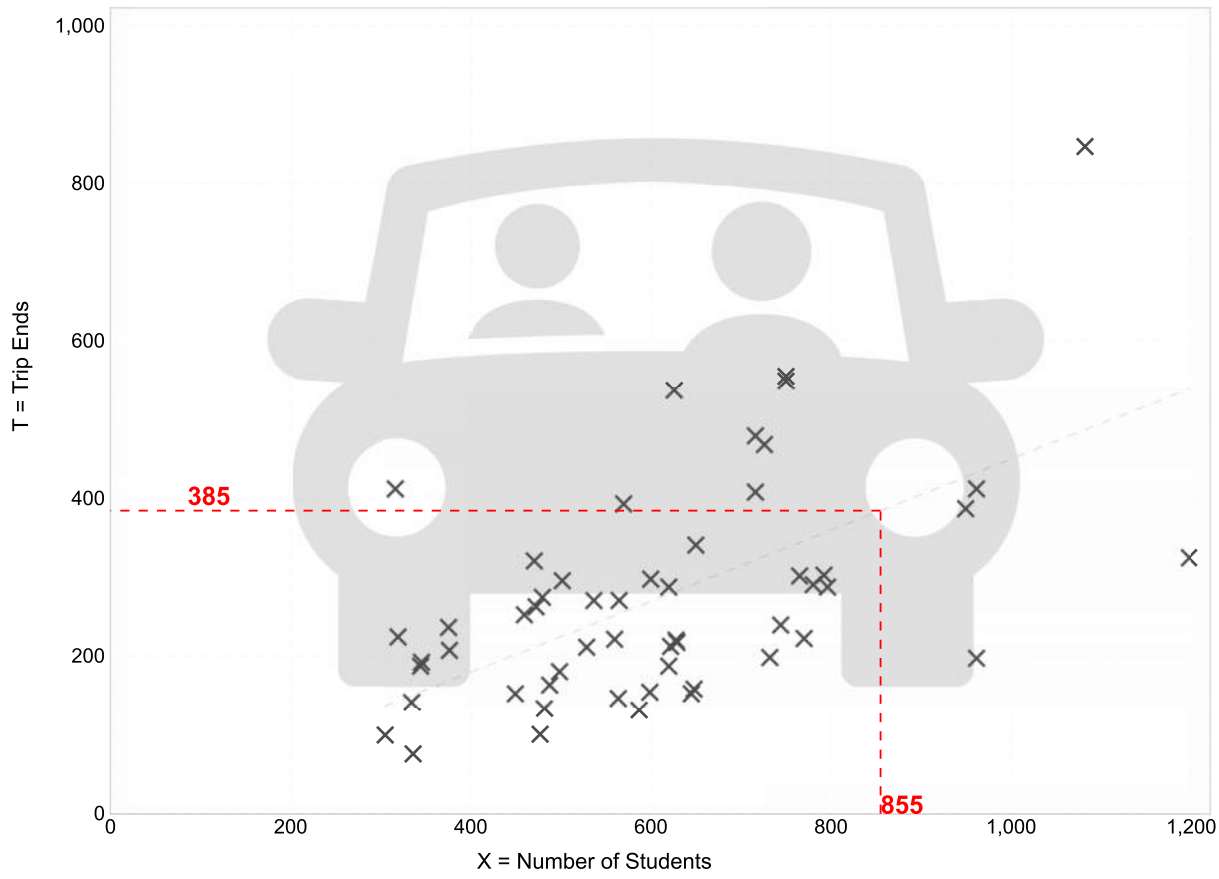
Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 54
Avg. Num. of Students: 608
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.45	0.21 - 1.30	0.19

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Trip Gen Manual, 11th Edition • Institute of Transportation Engineers

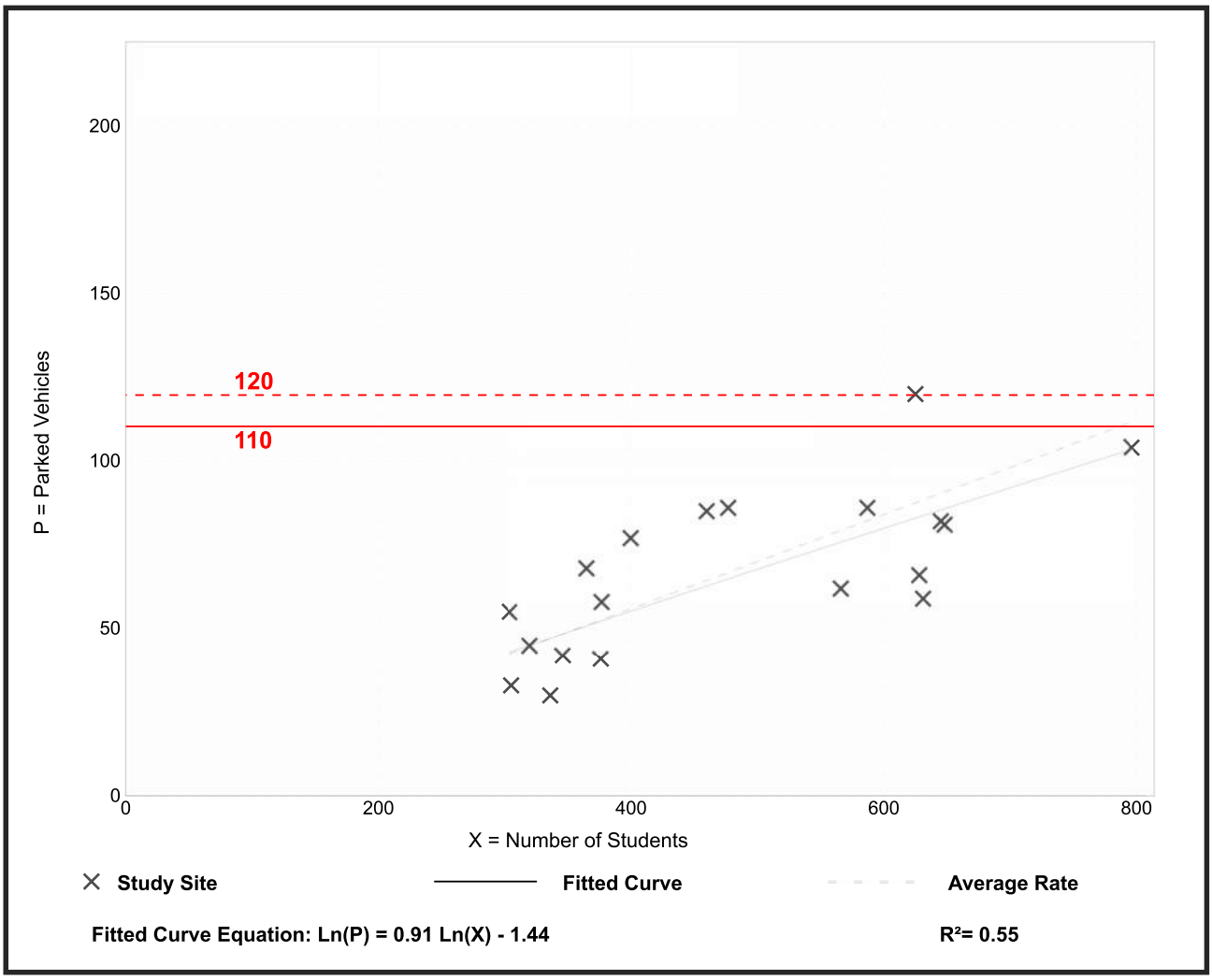
Elementary School
(520)

Peak Period Parking Demand vs: **Students**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 19
Avg. Num. of Students: 484

Peak Period Parking Demand per Student

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.14	0.09 - 0.19	0.12 / 0.19	***	0.03 (21%)

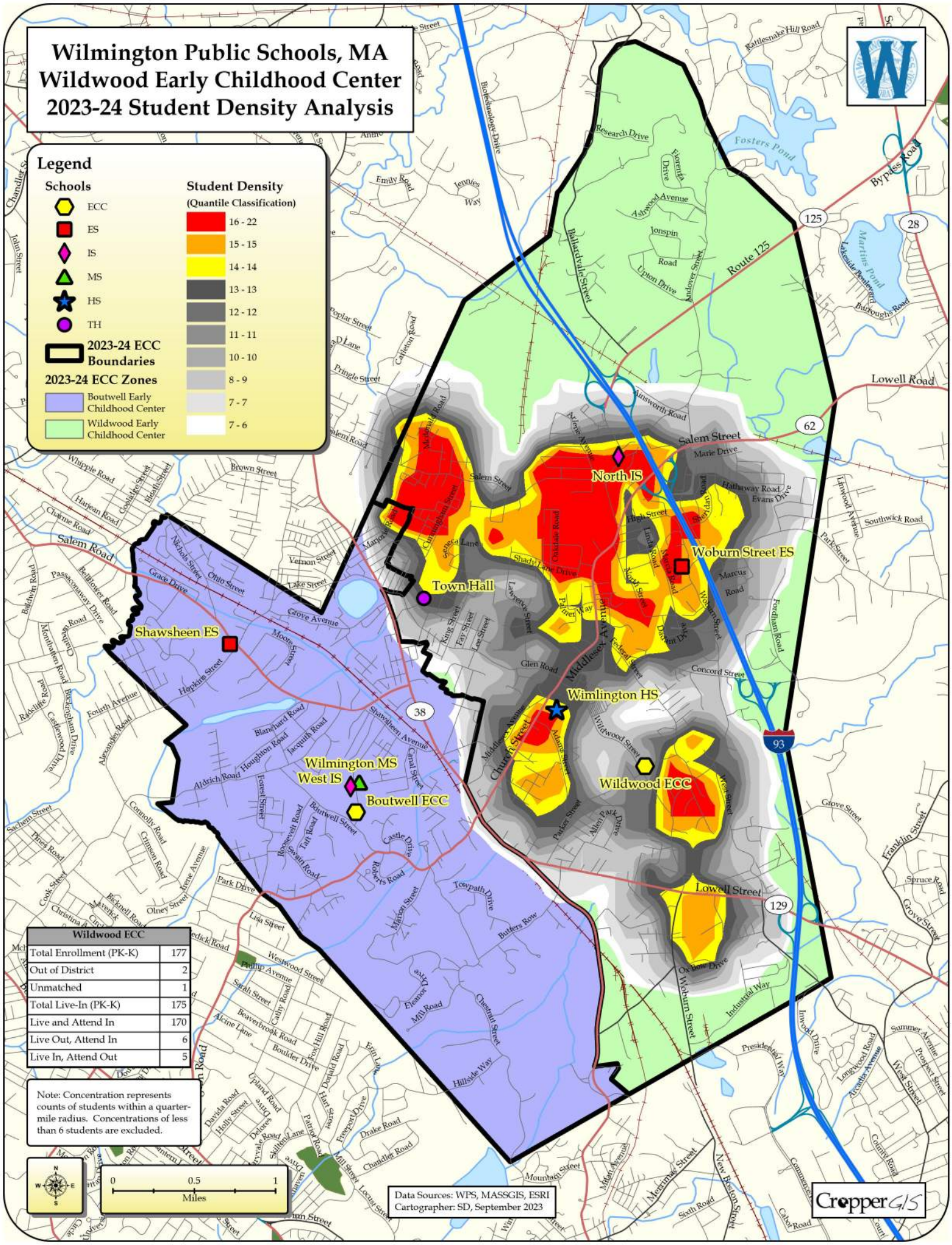
Data Plot and Equation

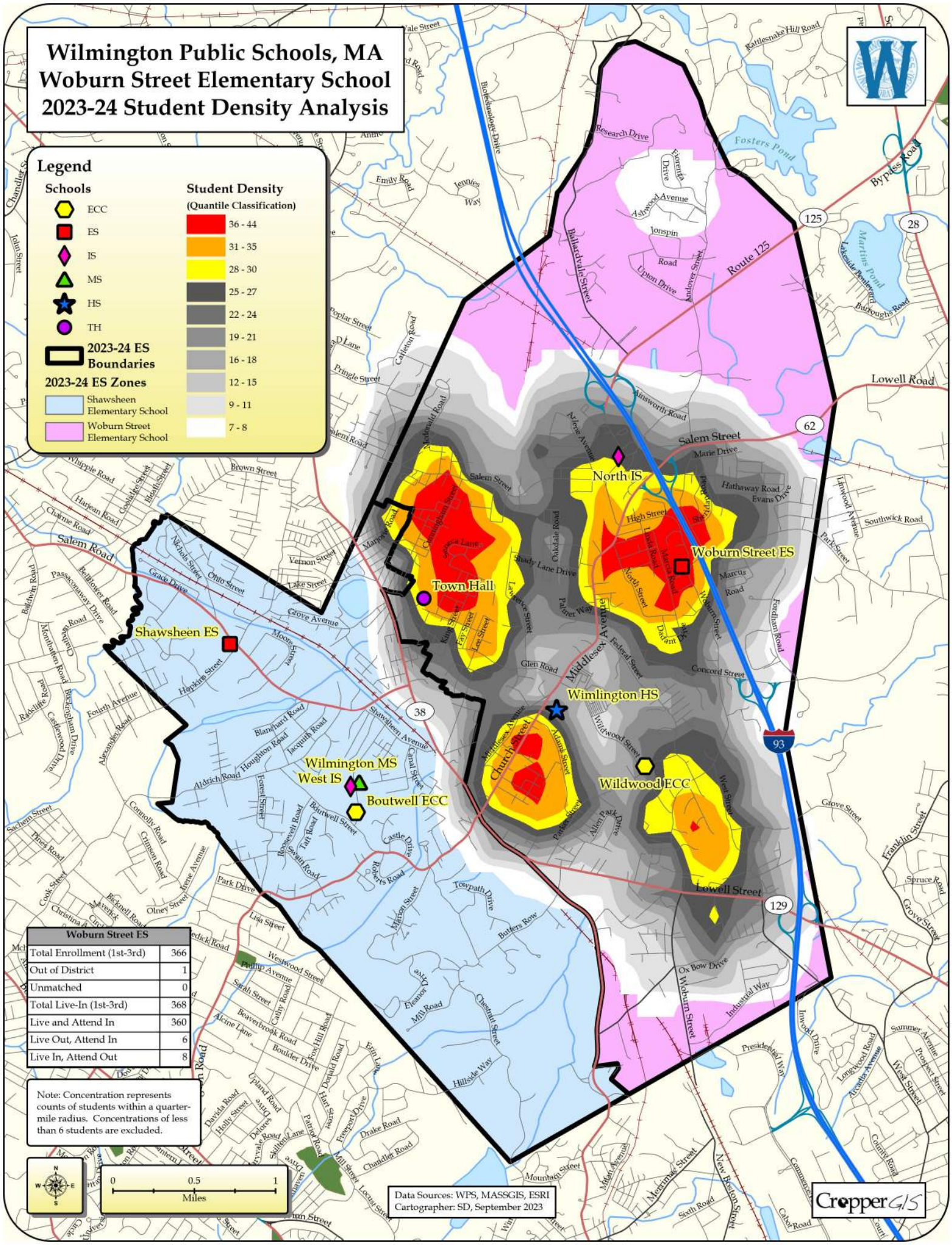


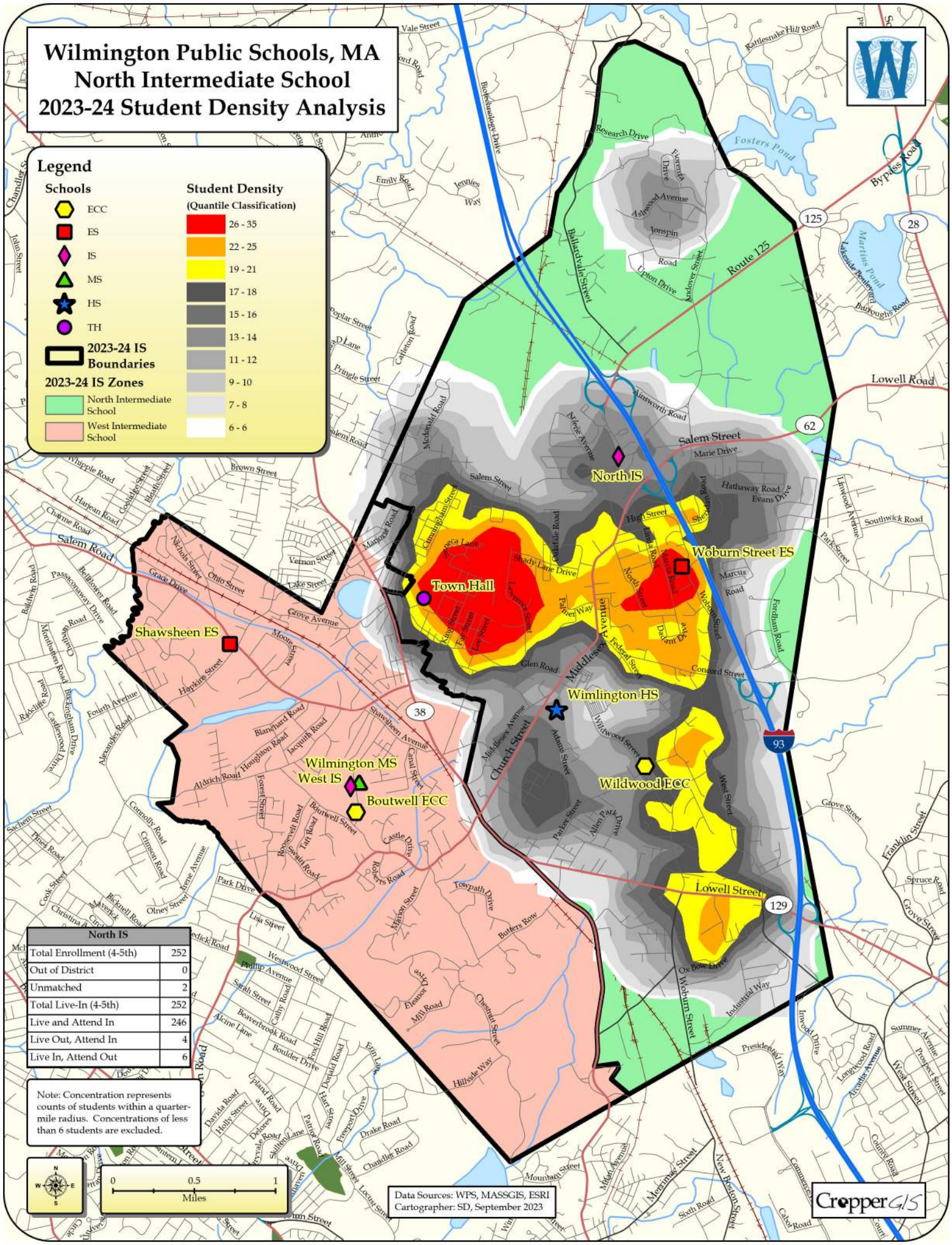
Fitted Curve Equation: Ln(P) = 0.91 Ln(X) - 1.44

R^2= 0.55

Appendix G: School Catchment Map


Wilmington Public Schools, MA
Wildwood Early Childhood Center
2023-24 Student Density Analysis
Legend
Schools
ECC
ES
IS
MS
HS
TH
2023-24 ECC Boundaries
2023-24 ECC Zones
Boutwell Early Childhood Center
Wildwood Early Childhood Center
Student Density
(Quantile Classification)
16 - 22
15 - 15
14 - 14
13 - 13
12 - 12
11 - 11
10 - 10
8 - 9
7 - 7
7 - 6
North IS
Woburn Street ES
Town Hall
Shawsheen ES
Wimlington HS
Wildwood ECC
Wilmington MS
West IS
Boutwell ECC
Wildwood ECC
Total Enrollment (PK-K) 177
Out of District 2
Unmatched 1
Total Live-In (PK-K) 175
Live and Attend In 170
Live Out, Attend In 6
Live In, Attend Out 5
Note: Concentration represents counts of students within a quarter-mile radius. Concentrations of less than 6 students are excluded.
0 0.5 1
Miles
Data Sources: WPS, MASSGIS, ESRI
Cartographer: SD, September 2023
CropperGIS


Wilmington Public Schools, MA
Woburn Street Elementary School
2023-24 Student Density Analysis
Legend
Schools
ECC
ES
IS
MS
HS
TH
2023-24 ES Boundaries
2023-24 ES Zones
Shawsheen Elementary School
Woburn Street Elementary School
Student Density
(Quantile Classification)
36 - 44
31 - 35
28 - 30
25 - 27
22 - 24
19 - 21
16 - 18
12 - 15
9 - 11
7 - 8
Shawsheen ES
Woburn Street ES
North IS
Town Hall
Wilmington MS
West IS
Boutwell ECC
Wimlington HS
Wildwood ECC
Route 125
Salem Road
Salem Street
Lowell Road
Lowell Street
Middlesex Avenue
Woburn Street
Church Street
Fosters Pond
Martins Pond
Bypass Road
Concord Street
Glen Road
Federal Street
Shawsheen Avenue
Grove Avenue
Boutwell Street
Roberts Road
Towpath Drive
Butters Row
Ox Bow Drive
Industrial Way
Research Drive
Ballardvale Street
Andover Street
Upton Drive
Ainsworth Road
Marie Drive
Hathaway Road
Evans Drive
Oakdale Road
Shady Lane Drive
Palmer Way
Lawrence Street
Fordham Road
Southwick Road
Park Street
Cunningham Street
Grace Lane
Kay Street
Fair Street
Lee Street
Nichols Street
Ohio Street
Grace Drive
Vernon Street
Lake Street
Moore Street
Hopkins Street
Fourth Avenue
Blanchard Road
Houghton Road
Jacquith Road
Aldrich Road
Forest Street
Canal Street
Roosevelt Road
Taft Road
Swain Road
Castle Drive
Allen Park Drive
Parkers Street
Atlantic Street
Wildwood Street
West Street
Grove Street
Franklin Street
Spruce Road
Eleanor Drive
Mill Road
Chestnut Street
Hillside Way
Woburn Street
Presidential Way
Irwood Drive
Longwood Road
Arcadia Avenue
Summer Avenue
Prospect Street
West Street
Colonial Road
Commerce Way
Mystic Avenue
Merrimac Street
New Boston Street
Sixth Road
Cabot Road
Mountain Street
Locust Street
Chandler Road
Drake Road
Freeport Drive
Hart Street
Dorfald Road
Fox Hill Road
Boulder Drive
Alcine Lane
Beaverbrook Road
Cathy Road
Sarah Street
Phillip Avenue
Westwood Street
Lisa Street
Park Drive
Olney Street
Irene Avenue
Connolly Road
Crimson Road
Pines Road
Cook Street
Sachem Street
Alexander Road
Buckingham Drive
Castlewood Drive
Radcliffe Road
Montbatten Road
Baldwin Road
Passaconaway Drive
Bellflower Road
Charme Road
Harjean Road
Coolidge Street
Heath Street
Whipple Road
Brown Street
Poplar Street
Carleton Road
Pringle Street
Nichols Road
Marjory Road
Nelson Avenue
Linwood Avenue
Whitehall Street
Kattlesnake Hill Road
Biotechnology Drive
Emily Road
Jeanne Way
John Street
Chandler Street
Davida Road
Holly Street
Upland Road
Delores Drive
Skillen Lane
Patriot Road
Mill Street
Data Sources: WPS, MASSGIS, ESRI
Cartographer: SD, September 2023
CropperGIS
Woburn Street ES
Total Enrollment (1st-3rd) 366
Out of District 1
Unmatched 0
Total Live-In (1st-3rd) 368
Live and Attend In 360
Live Out, Attend In 6
Live In, Attend Out 8
Note: Concentration represents counts of students within a quarter-mile radius. Concentrations of less than 6 students are excluded.
0
0.5
1
Miles


Wilmington Public Schools, MA
North Intermediate School
2023-24 Student Density Analysis
Legend
Schools
ECC
ES
IS
MS
HS
TH
2023-24 IS Boundaries
2023-24 IS Zones
North Intermediate School
West Intermediate School
Student Density
(Quantile Classification)
26 - 35
22 - 25
19 - 21
17 - 18
15 - 16
13 - 14
11 - 12
9 - 10
7 - 8
6 - 6
North IS
Town Hall
Woburn Street ES
Shawsheen ES
Wimlington HS
Wilmington MS
West IS
Boutwell ECC
Wildwood ECC
Lowell Street
North IS
Total Enrollment (4-5th) 252
Out of District 0
Unmatched 2
Total Live-In (4-5th) 252
Live and Attend In 246
Live Out, Attend In 4
Live In, Attend Out 6
Note: Concentration represents counts of students within a quarter-mile radius. Concentrations of less than 6 students are excluded.
0 0.5 1
Miles
Data Sources: WPS, MASSGIS, ESRI
Cartographer: SD, September 2023
CropperGIS
Route 125
Salem Street
Lowell Road
Middlesex Avenue
Church Street
Woburn Street
Salem Road
Shawsheen Avenue
Lowell Street
Fosters Pond
Martins Pond
Bypass Road
Research Drive
Ballardvale Street
Andover Street
Upton Drive
Ainsworth Road
Aldrich Road
Houghton Road
Boutwell Street
Roberts Road
Towpath Drive
Butters Row
Ox Bow Drive
Industrial Way
Glen Road
Concord Street
Federal Street
Wildwood Street
Parker Street
Allen Park Drive
Adams Street
West Street
Grove Street
Franklin Street
Spruce Road
Fordham Road
Southwick Road
Park Street
Marcus Road
Hathaway Road
Evans Drive
Marie Drive
Lakeside Boulevard
Burroughs Road
Mountain Street
Merrimack Street
New Boston Street
Sixth Road
Colonial Road
Calvary Road
Presidential Way
Irwood Drive
Longwood Road
Arcadia Avenue
Summer Avenue
Prospect Street
West Street
Eleanor Drive
Mill Road
Chestnut Street
Hillside Way
Beaverbrook Road
Boulder Drive
Fox Hill Road
Dorfald Road
Hart Street
Freeport Drive
Drake Road
Chandler Road
Mill Street
Locust Street
Upland Road
Davida Road
Holly Street
Delores Drive
Skillen Lane
Patriot Road
Acine Lane
Cathy Road
Philip Avenue
Westwood Street
Lisa Street
Park Drive
Olney Street
Irene Avenue
Cook Street
Christina Avenue
Bicknell Road
Pines Road
Connolly Road
Crimson Road
Sachem Street
Radcliffe Road
Buckingham Drive
Castlewood Drive
Alexander Road
Fourth Avenue
Montheathen Road
Baldwin Road
Passaconaway Drive
Bellflower Road
Grace Drive
Nichols Street
Ohio Street
Moore Street
Hopkins Street
Blanchard Road
Jacquith Road
Forest Street
Canal Street
Roosevelt Road
Taft Road
Swain Road
Castle Drive
Marion Street
Eleanor Drive
Mill Road
Chestnut Street
Hillside Way
Beaverbrook Road
Boulder Drive
Fox Hill Road
Dorfald Road
Hart Street
Freeport Drive
Drake Road
Chandler Road
Mill Street
Locust Street
Upland Road
Davida Road
Holly Street
Delores Drive
Skillen Lane
Patriot Road
Acine Lane
Cathy Road
Philip Avenue
Westwood Street
Lisa Street
Park Drive
Olney Street
Irene Avenue
Cook Street
Christina Avenue
Bicknell Road
Pines Road
Connolly Road
Crimson Road
Sachem Street
Radcliffe Road
Buckingham Drive
Castlewood Drive
Alexander Road
Fourth Avenue
Montheathen Road
Baldwin Road
Passaconaway Drive
Bellflower Road
Grace Drive
Nichols Street
Ohio Street
Moore Street
Hopkins Street
Blanchard Road
Jacquith Road
Forest Street
Canal Street
Roosevelt Road
Taft Road
Swain Road
Castle Drive
Marion Street
Towpath Drive
Butters Row
Ox Bow Drive
Industrial Way
Glen Road
Concord Street
Federal Street
Wildwood Street
Parker Street
Allen Park Drive
Adams Street
West Street
Grove Street
Franklin Street
Spruce Road
Fordham Road
Southwick Road
Park Street
Marcus Road
Hathaway Road
Evans Drive
Marie Drive
Lakeside Boulevard
Burroughs Road
Mountain Street
Merrimack Street
New Boston Street
Sixth Road
Colonial Road
Calvary Road
Presidential Way
Irwood Drive
Longwood Road
Arcadia Avenue
Summer Avenue
Prospect Street
West Street
Eleanor Drive
Mill Road
Chestnut Street
Hillside Way
Beaverbrook Road
Boulder Drive
Fox Hill Road
Dorfald Road
Hart Street
Freeport Drive
Drake Road
Chandler Road
Mill Street
Locust Street
Upland Road
Davida Road
Holly Street
Delores Drive
Skillen Lane
Patriot Road
Acine Lane
Cathy Road
Philip Avenue
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Lisa Street
Park Drive
Olney Street
Irene Avenue
Cook Street
Christina Avenue
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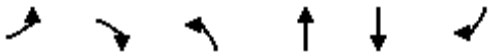
Jacquith Road
Forest Street
Canal Street
Roosevelt Road
Taft Road
Swain Road
Castle Drive
Marion Street
Towpath Drive
Butters Row
Ox Bow Drive
Industrial Way
Glen Road
Concord Street
Federal Street
Wildwood Street
Parker Street
Allen Park Drive
Adams Street
West Street
Grove Street
Franklin Street
Spruce Road
Fordham Road
Southwick Road
Park Street
Marcus Road
Hathaway Road
Evans Drive
Marie Drive
Lakeside Boulevard
Burroughs Road
Mountain Street
Merrimack Street
New Boston Street
Sixth Road
Colonial Road
Calvary Road
Presidential Way
Irwood Drive
Longwood Road
Arcadia Avenue
Summer Avenue
Prospect Street
West Street

Appendix H: Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	199	382	217	104	160	134
Future Volume (Veh/h)	199	382	217	104	160	134
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.94	0.94
Hourly flow rate (vph)	216	415	244	117	170	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	846	242	313			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	846	242	313			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	*2.2			
p0 queue free %	88	87	74			
cM capacity (veh/h)	1834	3233	953			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	631	361	313
Volume Left	216	244	0
Volume Right	415	0	143
cSH	4916	953	1700
Volume to Capacity	0.13	0.26	0.18
Queue Length 95th (ft)	11	26	0
Control Delay (s)	6.6	7.7	0.0
Lane LOS	A	A	
Approach Delay (s)	6.6	7.7	0.0
Approach LOS	A		

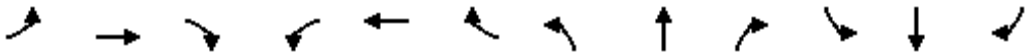
Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	284	0	3	276
Future Volume (Veh/h)	3	1	284	0	3	276
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.77	0.77	0.92	0.92
Hourly flow rate (vph)	6	2	369	0	3	300
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	675	369			369	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	369			369	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	421	681			1201	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	369	303
Volume Left	6	0	3
Volume Right	2	0	0
cSH	466	1700	1201
Volume to Capacity	0.02	0.22	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	12.9	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.9	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		26.9%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	17	0	0	1	38	244	1	0	259	11
Future Volume (Veh/h)	5	0	17	0	0	1	38	244	1	0	259	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Peak Hour Factor	0.28	0.28	0.28	0.25	0.25	0.25	0.79	0.79	0.79	0.90	0.90	0.90
Hourly flow rate (vph)	18	0	61	0	0	4	48	309	1	0	288	12
Pedestrians		3										
Lane Width (ft)		16.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	706	703	297	760	708	310	303			310		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	706	703	297	760	708	310	303			310		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	92	100	100	99	96			100		
cM capacity (veh/h)	339	349	744	289	347	735	1265			1262		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	79	4	358	300
Volume Left	18	0	48	0
Volume Right	61	4	1	12
cSH	585	735	1265	1262
Volume to Capacity	0.14	0.01	0.04	0.00
Queue Length 95th (ft)	12	0	3	0
Control Delay (s)	12.1	9.9	1.4	0.0
Lane LOS	B	A	A	
Approach Delay (s)	12.1	9.9	1.4	0.0
Approach LOS	B	A		

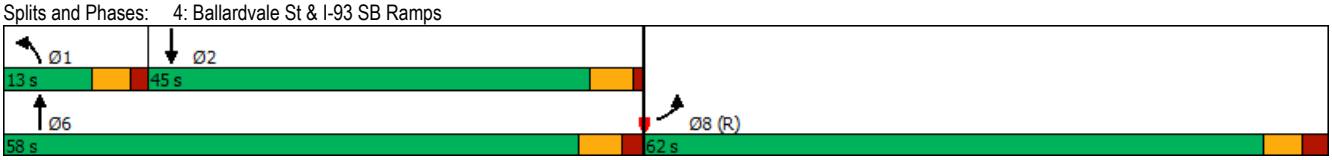
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	484	100	27	239	163	605
Future Volume (vph)	484	100	27	239	163	605
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3093	1839	1653	1756	1819	1670
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3093	1839	1653	1756	1819	1670
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		108				617
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.85	0.85	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	0%	4%	3%	6%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	520	108	32	281	166	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	520	108	32	281	166	617
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	62.0		13.0	58.0	45.0	
Total Split (%)	51.7%		10.8%	48.3%	37.5%	
Maximum Green (s)	56.0		8.0	52.0	40.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	C-Max		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	82.7	120.0	7.4	25.3	18.8	120.0
Actuated g/C Ratio	0.69	1.00	0.06	0.21	0.16	1.00
v/c Ratio	0.24	0.06	0.32	0.76	0.58	0.37
Control Delay	8.1	0.1	62.3	57.1	55.9	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	0.1	62.3	57.1	55.9	0.6
LOS	A	A	E	E	E	A
Approach Delay	6.7			57.6	12.4	
Approach LOS	A			E	B	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	72	0	24	203	125	0
Queue Length 95th (ft)	117	0	55	259	189	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	2130	1839	110	760	606	1670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.29	0.37	0.27	0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 113 (94%), Referenced to phase 8:EBL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 41.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Ballardvale St & I-93 SB Ramps

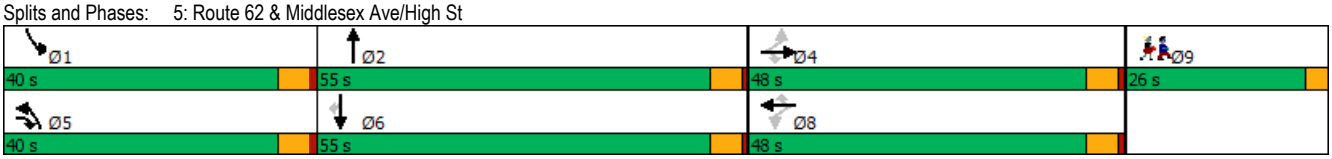


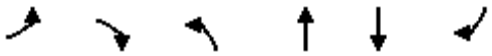
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	290	87	143	17	56	29	96	356	33	10	334	168	
Future Volume (vph)	290	87	143	17	56	29	96	356	33	10	334	168	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850			0.850		0.987				0.850	
Flt Protected		0.963			0.988		0.950			0.950			
Satd. Flow (prot)	0	1734	1522	0	1742	1584	1693	1747	0	1745	1749	1531	
Flt Permitted		0.698			0.863		0.950			0.950			
Satd. Flow (perm)	0	1257	1522	0	1521	1584	1693	1747	0	1745	1749	1531	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			45			65		3				122	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.88	0.88	0.88	0.61	0.61	0.61	0.87	0.87	0.87	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	8%	4%	6%	5%	3%	5%	6%	3%	0%	5%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	330	99	163	28	92	48	110	409	38	12	393	198	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	429	163	0	120	48	110	447	0	12	393	198	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	48.0	48.0	40.0	48.0	48.0	48.0	40.0	55.0		40.0	55.0	55.0	26.0
Total Split (%)	28.4%	28.4%	23.7%	28.4%	28.4%	28.4%	23.7%	32.5%		23.7%	32.5%	32.5%	15%
Maximum Green (s)	43.0	43.0	35.0	43.0	43.0	43.0	35.0	50.0		35.0	50.0	50.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		45.0	60.9		45.0	45.0	11.4	41.9		4.7	26.8	26.8	
Actuated g/C Ratio		0.44	0.59		0.44	0.44	0.11	0.41		0.05	0.26	0.26	
v/c Ratio		0.78	0.18		0.18	0.07	0.59	0.62		0.15	0.86	0.40	
Control Delay		39.7	7.9		24.9	5.0	60.3	29.5		61.2	55.8	15.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		39.7	7.9		24.9	5.0	60.3	29.5		61.2	55.8	15.6	
LOS		D	A		C	A	E	C		E	E	B	
Approach Delay		30.9			19.2			35.6			42.7		
Approach LOS		C			B			D			D		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		199	26		40	0	63	195		7	219	35	
Queue Length 95th (ft)		#695	77		97	0	164	452		33	433	110	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		552	1285		668	732	605	916		623	893	841	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		0.78	0.13		0.18	0.07	0.18	0.49		0.02	0.44	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 169			
Actuated Cycle Length: 102.4			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 35.0		Intersection LOS: C	
Intersection Capacity Utilization 64.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	186	323	460	105	178	416
Future Volume (Veh/h)	186	323	460	105	178	416
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.94	0.94
Hourly flow rate (vph)	200	347	495	113	189	443
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1514	410	632			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1514	410	632			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	*2.2			
p0 queue free %	0	88	10			
cM capacity (veh/h)	175	2998	548			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	547	608	632
Volume Left	200	495	0
Volume Right	347	0	443
cSH	453	548	1700
Volume to Capacity	1.21	0.90	0.37
Queue Length 95th (ft)	534	268	0
Control Delay (s)	140.5	45.7	0.0
Lane LOS	F	E	
Approach Delay (s)	140.5	45.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	58.6		
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	2	271	3	2	562
Future Volume (Veh/h)	2	2	271	3	2	562
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	4	4	327	4	2	624
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	957	329			331	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	957	329			331	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	288	717			1240	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	331	626
Volume Left	4	0	2
Volume Right	4	4	0
cSH	411	1700	1240
Volume to Capacity	0.02	0.19	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.9	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	13.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	55	4	0	1	31	239	2	0	514	8
Future Volume (Veh/h)	24	0	55	4	0	1	31	239	2	0	514	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Peak Hour Factor	0.53	0.53	0.53	0.63	0.63	0.63	0.80	0.80	0.80	0.86	0.86	0.86
Hourly flow rate (vph)	45	0	104	6	0	2	39	299	2	0	598	9
Pedestrians		8										
Lane Width (ft)		16.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	990	990	610	1084	993	300	615			301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	990	990	610	1084	993	300	615			301		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	100	79	96	100	100	96			100		
cM capacity (veh/h)	216	236	489	148	235	744	950			1272		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	149	8	340	607
Volume Left	45	6	39	0
Volume Right	104	2	2	9
cSH	354	185	950	1272
Volume to Capacity	0.42	0.04	0.04	0.00
Queue Length 95th (ft)	51	3	3	0
Control Delay (s)	22.4	25.3	1.4	0.0
Lane LOS	C	D	A	
Approach Delay (s)	22.4	25.3	1.4	0.0
Approach LOS	C	D		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	174	119	40	227	459	759
Future Volume (vph)	174	119	40	227	459	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2984	1821	1637	1774	1891	1734
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2984	1821	1637	1774	1891	1734
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		129				761
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.85	0.85	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	14%	1%	5%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	189	129	47	267	516	853
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	129	47	267	516	853
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	31.0		20.0	55.0	35.0	
Total Split (%)	36.0%		23.3%	64.0%	40.7%	
Maximum Green (s)	25.0		15.0	49.0	30.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	None		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	9.9	46.9	7.7	24.2	21.2	46.9
Actuated g/C Ratio	0.21	1.00	0.16	0.52	0.45	1.00
v/c Ratio	0.30	0.07	0.18	0.29	0.60	0.49
Control Delay	19.6	0.1	22.8	6.7	14.5	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	0.1	22.8	6.7	14.5	1.0
LOS	B	A	C	A	B	A
Approach Delay	11.7			9.1	6.1	
Approach LOS	B			A	A	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	16	0	8	33	69	0
Queue Length 95th (ft)	61	0	41	61	232	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	1691	1821	556	1655	1285	1734
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.08	0.16	0.40	0.49

Intersection Summary			
Area Type:	Other		
Cycle Length: 86			
Actuated Cycle Length: 46.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 7.5		Intersection LOS: A	
Intersection Capacity Utilization 50.7%		ICU Level of Service A	
Analysis Period (min) 15			

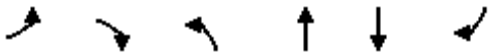
Splits and Phases: 4: Ballardvale St & I-93 SB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	244	76	187	44	110	31	126	451	28	15	327	303	
Future Volume (vph)	244	76	187	44	110	31	126	451	28	15	327	303	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor												0.98	
Frt			0.850			0.850		0.991				0.850	
Flt Protected		0.963			0.986		0.950			0.950			
Satd. Flow (prot)	0	1734	1522	0	1806	1631	1743	1816	0	1631	1766	1561	
Flt Permitted		0.607			0.734		0.950			0.950			
Satd. Flow (perm)	0	1093	1522	0	1344	1631	1743	1816	0	1631	1766	1526	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			66			66		2				240	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.75	0.75	0.75	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	11%	4%	2%	1%	0%	2%	2%	4%	7%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	294	92	225	59	147	41	134	480	30	15	337	312	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	386	225	0	206	41	134	510	0	15	337	312	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	60.0		40.0	60.0	60.0	26.0
Total Split (%)	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	36.1%		24.1%	36.1%	36.1%	16%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	55.0		35.0	55.0	55.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		36.8	53.0		36.8	36.8	11.6	34.3		4.9	21.0	21.0	
Actuated g/C Ratio		0.41	0.60		0.41	0.41	0.13	0.39		0.06	0.24	0.24	
v/c Ratio		0.85	0.24		0.37	0.06	0.59	0.73		0.17	0.81	0.57	
Control Delay		46.8	7.0		26.5	3.3	50.7	32.0		53.1	48.6	12.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		46.8	7.0		26.5	3.3	50.7	32.0		53.1	48.6	12.9	
LOS		D	A		C	A	D	C		D	D	B	
Approach Delay		32.1			22.6			35.9			32.0		
Approach LOS		C			C			D			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		160	29		65	0	64	192		7	157	28	
Queue Length 95th (ft)		#566	78		193	4	178	516		37	369	138	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		453	1330		557	715	723	1185		676	1151	1078	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		0.85	0.17		0.37	0.06	0.19	0.43		0.02	0.29	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 166			
Actuated Cycle Length: 88.7			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	219	389	221	114	166	138
Future Volume (Veh/h)	219	389	221	114	166	138
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.94	0.94
Hourly flow rate (vph)	238	423	248	128	177	147
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	874	250	324			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	874	250	324			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	*2.2			
p0 queue free %	87	87	73			
cM capacity (veh/h)	1789	3220	935			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	661	376	324
Volume Left	238	248	0
Volume Right	423	0	147
cSH	4968	935	1700
Volume to Capacity	0.13	0.27	0.19
Queue Length 95th (ft)	11	27	0
Control Delay (s)	6.7	7.7	0.0
Lane LOS	A	A	
Approach Delay (s)	6.7	7.7	0.0
Approach LOS	A		

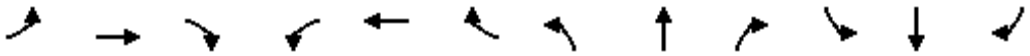
Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	313	0	3	286
Future Volume (Veh/h)	3	1	313	0	3	286
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.77	0.77	0.92	0.92
Hourly flow rate (vph)	6	2	406	0	3	311
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	723	406			406	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	723	406			406	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	395	649			1164	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	406	314
Volume Left	6	0	3
Volume Right	2	0	0
cSH	438	1700	1164
Volume to Capacity	0.02	0.24	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.4	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.4	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		27.4%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	17	0	0	1	38	272	1	0	269	11
Future Volume (Veh/h)	5	0	17	0	0	1	38	272	1	0	269	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Peak Hour Factor	0.28	0.28	0.28	0.25	0.25	0.25	0.79	0.79	0.79	0.90	0.90	0.90
Hourly flow rate (vph)	18	0	61	0	0	4	48	344	1	0	299	12
Pedestrians		3										
Lane Width (ft)		16.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	752	749	308	806	754	344	314			345		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752	749	308	806	754	344	314			345		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	92	100	100	99	96			100		
cM capacity (veh/h)	315	329	734	268	326	703	1253			1225		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	79	4	393	311
Volume Left	18	0	48	0
Volume Right	61	4	1	12
cSH	563	703	1253	1225
Volume to Capacity	0.14	0.01	0.04	0.00
Queue Length 95th (ft)	12	0	3	0
Control Delay (s)	12.4	10.2	1.3	0.0
Lane LOS	B	B	A	
Approach Delay (s)	12.4	10.2	1.3	0.0
Approach LOS	B	B		

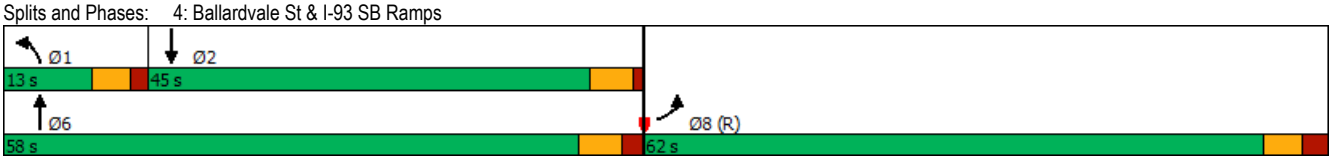
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	565	102	27	267	171	633
Future Volume (vph)	565	102	27	267	171	633
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3093	1839	1653	1756	1819	1670
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3093	1839	1653	1756	1819	1670
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		110				646
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.85	0.85	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	0%	4%	3%	6%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	608	110	32	314	174	646
Shared Lane Traffic (%)						
Lane Group Flow (vph)	608	110	32	314	174	646
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	62.0		13.0	58.0	45.0	
Total Split (%)	51.7%		10.8%	48.3%	37.5%	
Maximum Green (s)	56.0		8.0	52.0	40.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	C-Max		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	81.3	120.0	7.4	26.7	20.1	120.0
Actuated g/C Ratio	0.68	1.00	0.06	0.22	0.17	1.00
v/c Ratio	0.29	0.06	0.32	0.81	0.57	0.39
Control Delay	8.9	0.1	62.3	59.5	54.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	0.1	62.3	59.5	54.1	0.7
LOS	A	A	E	E	D	A
Approach Delay	7.6			59.7	12.0	
Approach LOS	A			E	B	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	89	0	24	231	131	0
Queue Length 95th (ft)	144	0	55	287	195	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	2096	1839	110	760	606	1670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.06	0.29	0.41	0.29	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 113 (94%), Referenced to phase 8:EBL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 44.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Ballardvale St & I-93 SB Ramps

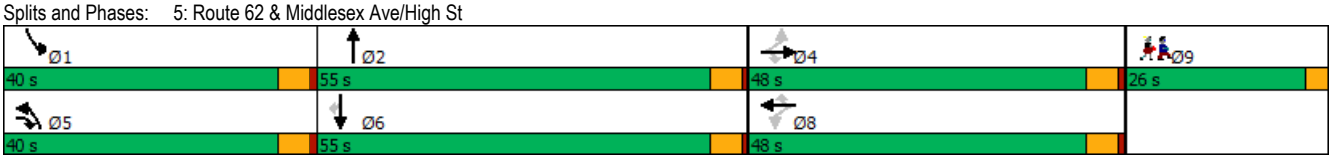


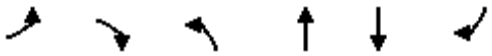
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	295	89	149	17	57	30	106	380	34	10	347	171	
Future Volume (vph)	295	89	149	17	57	30	106	380	34	10	347	171	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850			0.850		0.988				0.850	
Flt Protected		0.963			0.989		0.950			0.950			
Satd. Flow (prot)	0	1734	1522	0	1743	1584	1693	1748	0	1745	1749	1531	
Flt Permitted		0.698			0.848		0.950			0.950			
Satd. Flow (perm)	0	1257	1522	0	1495	1584	1693	1748	0	1745	1749	1531	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			46			65		3				119	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.88	0.88	0.88	0.61	0.61	0.61	0.87	0.87	0.87	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	8%	4%	6%	5%	3%	5%	6%	3%	0%	5%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	335	101	169	28	93	49	122	437	39	12	408	201	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	436	169	0	121	49	122	476	0	12	408	201	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	48.0	48.0	40.0	48.0	48.0	48.0	40.0	55.0		40.0	55.0	55.0	26.0
Total Split (%)	28.4%	28.4%	23.7%	28.4%	28.4%	28.4%	23.7%	32.5%		23.7%	32.5%	32.5%	15%
Maximum Green (s)	43.0	43.0	35.0	43.0	43.0	43.0	35.0	50.0		35.0	50.0	50.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		45.0	61.8		45.0	45.0	12.2	44.5		4.7	28.6	28.6	
Actuated g/C Ratio		0.43	0.59		0.43	0.43	0.12	0.42		0.04	0.27	0.27	
v/c Ratio		0.81	0.18		0.19	0.07	0.62	0.64		0.15	0.86	0.40	
Control Delay		43.5	8.4		26.5	5.3	62.2	29.5		63.0	55.4	16.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		43.5	8.4		26.5	5.3	62.2	29.5		63.0	55.4	16.1	
LOS		D	A		C	A	E	C		E	E	B	
Approach Delay		33.7			20.4			36.2			42.8		
Approach LOS		C			C			D			D		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		217	28		43	0	72	212		7	234	38	
Queue Length 95th (ft)		#740	83		101	0	182	486		34	457	117	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		538	1257		640	715	590	903		608	871	822	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		0.81	0.13		0.19	0.07	0.21	0.53		0.02	0.47	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 169			
Actuated Cycle Length: 105.1			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 36.2		Intersection LOS: D	
Intersection Capacity Utilization 65.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	194	329	468	110	188	438
Future Volume (Veh/h)	194	329	468	110	188	438
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.94	0.94
Hourly flow rate (vph)	209	354	503	118	200	466
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1557	433	666			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1557	433	666			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	*2.2			
p0 queue free %	0	88	3			
cM capacity (veh/h)	45	2968	516			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	563	621	666
Volume Left	209	503	0
Volume Right	354	0	466
cSH	119	516	1700
Volume to Capacity	4.71	0.97	0.39
Queue Length 95th (ft)	Err	323	0
Control Delay (s)	Err	61.9	0.0
Lane LOS	F	F	
Approach Delay (s)	Err	61.9	0.0
Approach LOS	F		

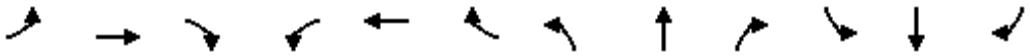
Intersection Summary			
Average Delay	3063.7		
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	2	284	3	2	594
Future Volume (Veh/h)	2	2	284	3	2	594
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	4	4	342	4	2	660
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1008	344			346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1008	344			346	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	268	703			1224	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	346	662
Volume Left	4	0	2
Volume Right	4	4	0
cSH	389	1700	1224
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	14.5	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	14.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	55	4	0	1	31	251	2	0	545	8
Future Volume (Veh/h)	24	0	55	4	0	1	31	251	2	0	545	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Peak Hour Factor	0.53	0.53	0.53	0.63	0.63	0.63	0.80	0.80	0.80	0.86	0.86	0.86
Hourly flow rate (vph)	45	0	104	6	0	2	39	314	2	0	634	9
Pedestrians		8										
Lane Width (ft)		16.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1042	1040	646	1136	1044	315	651			316		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1042	1040	646	1136	1044	315	651			316		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	100	78	96	100	100	96			100		
cM capacity (veh/h)	199	220	467	135	219	730	921			1256		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	149	8	355	643
Volume Left	45	6	39	0
Volume Right	104	2	2	9
cSH	332	170	921	1256
Volume to Capacity	0.45	0.05	0.04	0.00
Queue Length 95th (ft)	56	4	3	0
Control Delay (s)	24.4	27.3	1.4	0.0
Lane LOS	C	D	A	
Approach Delay (s)	24.4	27.3	1.4	0.0
Approach LOS	C	D		

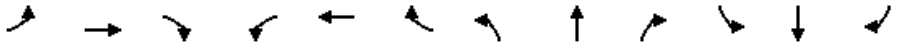
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	198	121	41	239	489	841
Future Volume (vph)	198	121	41	239	489	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2984	1821	1637	1774	1891	1734
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2984	1821	1637	1774	1891	1734
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		132				793
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.85	0.85	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	14%	1%	5%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	215	132	48	281	549	945
Shared Lane Traffic (%)						
Lane Group Flow (vph)	215	132	48	281	549	945
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	31.0		20.0	55.0	35.0	
Total Split (%)	36.0%		23.3%	64.0%	40.7%	
Maximum Green (s)	25.0		15.0	49.0	30.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	None		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	10.1	50.1	7.7	27.2	21.8	50.1
Actuated g/C Ratio	0.20	1.00	0.15	0.54	0.44	1.00
v/c Ratio	0.36	0.07	0.19	0.29	0.67	0.54
Control Delay	22.0	0.1	25.3	6.4	17.3	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	0.1	25.3	6.4	17.3	1.2
LOS	C	A	C	A	B	A
Approach Delay	13.7			9.2	7.2	
Approach LOS	B			A	A	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	30	0	13	35	140	0
Queue Length 95th (ft)	70	0	43	66	258	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	1581	1821	520	1608	1203	1734
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07	0.09	0.17	0.46	0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 86			
Actuated Cycle Length: 50.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 51.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Ballardvale St & I-93 SB Ramps

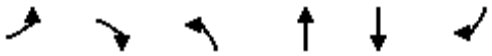


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	248	77	197	45	112	32	131	474	28	15	348	308	
Future Volume (vph)	248	77	197	45	112	32	131	474	28	15	348	308	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor												0.98	
Frt			0.850			0.850		0.992				0.850	
Flt Protected		0.963			0.986		0.950			0.950			
Satd. Flow (prot)	0	1735	1522	0	1806	1631	1743	1818	0	1631	1766	1561	
Flt Permitted		0.598			0.705		0.950			0.950			
Satd. Flow (perm)	0	1077	1522	0	1291	1631	1743	1818	0	1631	1766	1526	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			68			66		2				230	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.75	0.75	0.75	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	11%	4%	2%	1%	0%	2%	2%	4%	7%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	299	93	237	60	149	43	139	504	30	15	359	318	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	392	237	0	209	43	139	534	0	15	359	318	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	60.0		40.0	60.0	60.0	26.0
Total Split (%)	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	36.1%		24.1%	36.1%	36.1%	16%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	55.0		35.0	55.0	55.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		36.9	53.5		36.9	36.9	12.1	36.3		4.9	22.6	22.6	
Actuated g/C Ratio		0.41	0.59		0.41	0.41	0.13	0.40		0.05	0.25	0.25	
v/c Ratio		0.90	0.26		0.40	0.06	0.60	0.73		0.17	0.82	0.58	
Control Delay		54.2	7.5		28.4	3.8	52.0	31.8		54.8	48.9	13.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		54.2	7.5		28.4	3.8	52.0	31.8		54.8	48.9	13.9	
LOS		D	A		C	A	D	C		D	D	B	
Approach Delay		36.6			24.2			36.0			33.0		
Approach LOS		D			C			D			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		174	33		70	0	68	204		7	172	36	
Queue Length 95th (ft)		#599	87		203	5	187	546		38	398	153	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		437	1307		523	701	707	1160		662	1126	1056	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		0.90	0.18		0.40	0.06	0.20	0.46		0.02	0.32	0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 166			
Actuated Cycle Length: 90.8			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 33.9		Intersection LOS: C	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	389	221	227	221	148
Future Volume (Veh/h)	239	389	221	227	221	148
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.94	0.94
Hourly flow rate (vph)	260	423	248	255	235	157
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1064	314	392			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1064	314	392			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	2.2			
p0 queue free %	83	86	70			
cM capacity (veh/h)	1566	3131	828			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	683	503	392
Volume Left	260	248	0
Volume Right	423	0	157
cSH	4113	828	1700
Volume to Capacity	0.17	0.30	0.23
Queue Length 95th (ft)	15	32	0
Control Delay (s)	6.9	7.5	0.0
Lane LOS	A	A	
Approach Delay (s)	6.9	7.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	290	0	3	288
Future Volume (Veh/h)	3	1	290	0	3	288
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.77	0.77	0.92	0.92
Hourly flow rate (vph)	6	2	377	0	3	313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	696	377			377	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	696	377			377	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	410	674			1193	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	377	316
Volume Left	6	0	3
Volume Right	2	0	0
cSH	454	1700	1193
Volume to Capacity	0.02	0.22	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.1	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.1	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		27.5%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	1	276	1	0	288
Future Volume (Veh/h)	0	1	276	1	0	288
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.25	0.25	0.79	0.79	0.90	0.90
Hourly flow rate (vph)	0	4	349	1	0	320
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	670	350			350	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	670	350			350	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	426	698			1220	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	350	320
Volume Left	0	0	0
Volume Right	4	1	0
cSH	698	1700	1220
Volume to Capacity	0.01	0.21	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	10.2	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.2	0.0	0.0
Approach LOS	B		

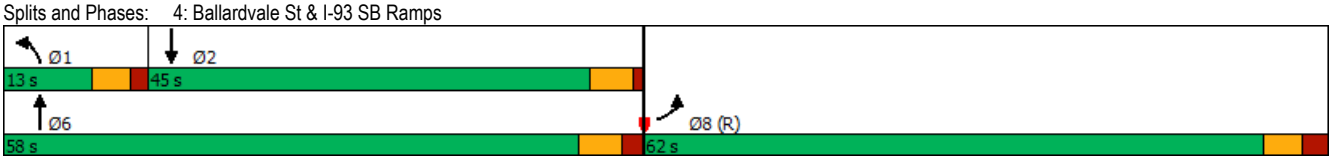
Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		25.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	565	102	27	267	169	633
Future Volume (vph)	565	102	27	267	169	633
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3093	1839	1653	1756	1819	1670
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3093	1839	1653	1756	1819	1670
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		110				646
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.85	0.85	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	0%	4%	3%	6%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	608	110	32	314	172	646
Shared Lane Traffic (%)						
Lane Group Flow (vph)	608	110	32	314	172	646
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	62.0		13.0	58.0	45.0	
Total Split (%)	51.7%		10.8%	48.3%	37.5%	
Maximum Green (s)	56.0		8.0	52.0	40.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	C-Max		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	81.4	120.0	7.4	26.6	20.0	120.0
Actuated g/C Ratio	0.68	1.00	0.06	0.22	0.17	1.00
v/c Ratio	0.29	0.06	0.32	0.81	0.57	0.39
Control Delay	8.9	0.1	62.3	59.7	54.0	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	0.1	62.3	59.7	54.0	0.7
LOS	A	A	E	E	D	A
Approach Delay	7.6			59.9	11.9	
Approach LOS	A			E	B	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	89	0	24	231	129	0
Queue Length 95th (ft)	144	0	55	287	193	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	2097	1839	110	760	606	1670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.06	0.29	0.41	0.28	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 113 (94%), Referenced to phase 8:EBL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 44.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Ballardvale St & I-93 SB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	295	109	184	17	98	30	178	380	34	10	347	171	
Future Volume (vph)	295	109	184	17	98	30	178	380	34	10	347	171	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850			0.850		0.988				0.850	
Flt Protected		0.965			0.993		0.950			0.950			
Satd. Flow (prot)	0	1734	1522	0	1752	1584	1693	1748	0	1745	1749	1531	
Flt Permitted		0.615			0.801		0.950			0.950			
Satd. Flow (perm)	0	1105	1522	0	1413	1584	1693	1748	0	1745	1749	1531	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			54			65		3				119	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.88	0.88	0.88	0.61	0.61	0.61	0.87	0.87	0.87	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	8%	4%	6%	5%	3%	5%	6%	3%	0%	5%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	335	124	209	28	161	49	205	437	39	12	408	201	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	459	209	0	189	49	205	476	0	12	408	201	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	48.0	48.0	40.0	48.0	48.0	48.0	40.0	55.0		40.0	55.0	55.0	26.0
Total Split (%)	28.4%	28.4%	23.7%	28.4%	28.4%	28.4%	23.7%	32.5%		23.7%	32.5%	32.5%	15%
Maximum Green (s)	43.0	43.0	35.0	43.0	43.0	43.0	35.0	50.0		35.0	50.0	50.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		45.2	68.1		45.2	45.2	18.3	50.5		4.8	30.5	30.5	
Actuated g/C Ratio		0.40	0.60		0.40	0.40	0.16	0.45		0.04	0.27	0.27	
v/c Ratio		1.04	0.22		0.34	0.07	0.75	0.61		0.16	0.87	0.40	
Control Delay		90.5	8.6		32.9	5.7	65.3	28.6		68.8	60.1	17.7	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		90.5	8.6		32.9	5.7	65.3	28.6		68.8	60.1	17.7	
LOS		F	A		C	A	E	C		E	E	B	
Approach Delay		64.8			27.3			39.7			46.5		
Approach LOS		E			C			D			D		

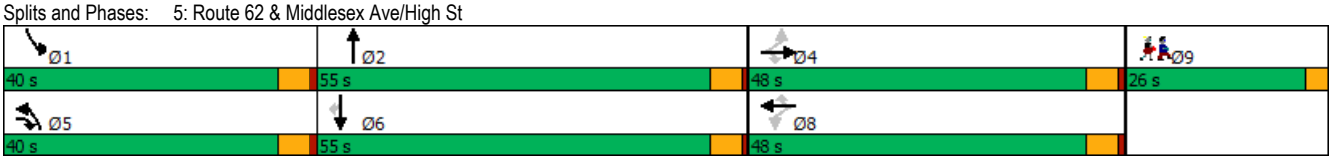
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		~307	40		84	0	131	212		8	257	42	
Queue Length 95th (ft)		#909	102		166	0	291	480		36	502	128	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		440	1174		562	670	549	871		566	810	773	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		1.04	0.18		0.34	0.07	0.37	0.55		0.02	0.50	0.26	

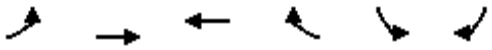
Intersection Summary			
Area Type:	Other		
Cycle Length: 169			
Actuated Cycle Length: 113.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 47.9		Intersection LOS: D	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 62 & Middlesex Ave/High St

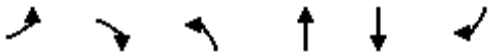




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	324	300	8	4	71
Future Volume (Veh/h)	160	324	300	8	4	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	208	421	326	9	4	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	335				1168	330
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	335				1168	330
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				98	89
cM capacity (veh/h)	1236				180	716

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	629	335	81
Volume Left	208	0	4
Volume Right	0	9	77
cSH	1236	1700	624
Volume to Capacity	0.17	0.20	0.13
Queue Length 95th (ft)	15	0	11
Control Delay (s)	4.1	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	4.1	0.0	11.6
Approach LOS			B

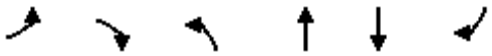
Intersection Summary			
Average Delay		3.4	
Intersection Capacity Utilization		56.8%	ICU Level of Service B
Analysis Period (min)		15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	11	11	266	277	1
Future Volume (Veh/h)	1	11	11	266	277	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.79	0.79	0.90	0.90
Hourly flow rate (vph)	1	12	14	337	308	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	674	308	309			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674	308	309			
tC, single (s)	7.4	7.2	5.1			
tC, 2 stage (s)						
tF (s)	4.4	4.2	3.1			
p0 queue free %	100	98	98			
cM capacity (veh/h)	296	551	854			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	351	309
Volume Left	1	14	0
Volume Right	12	0	1
cSH	516	854	1700
Volume to Capacity	0.03	0.02	0.18
Queue Length 95th (ft)	2	1	0
Control Delay (s)	12.2	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	210	329	468	198	367	469
Future Volume (Veh/h)	210	329	468	198	367	469
Sign Control	Yield			Free	Free	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.94	0.94
Hourly flow rate (vph)	226	354	503	213	390	499
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1858	640	889			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1858	640	889			
tC, single (s)	*2.1	*2.1	*7.3			
tC, 2 stage (s)						
tF (s)	*1.0	*1.0	2.2			
p0 queue free %	0	87	0			
cM capacity (veh/h)	0	2706	350			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	580	716	889
Volume Left	226	503	0
Volume Right	354	0	499
cSH	0	350	1700
Volume to Capacity	Err	1.44	0.52
Queue Length 95th (ft)	Err	658	0
Control Delay (s)	Err	242.1	0.0
Lane LOS	F	F	
Approach Delay (s)	Err	242.1	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	2	276	3	2	555
Future Volume (Veh/h)	2	2	276	3	2	555
Sign Control	Stop		Free			Free
Grade	0%		-6%			-1%
Peak Hour Factor	0.50	0.50	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	4	4	333	4	2	617
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	956	335			337	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	956	335			337	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	288	712			1234	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	337	619
Volume Left	4	0	2
Volume Right	4	4	0
cSH	410	1700	1234
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.9	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	13.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		40.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	1	274	2	0	561
Future Volume (Veh/h)	4	1	274	2	0	561
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.63	0.63	0.80	0.80	0.86	0.86
Hourly flow rate (vph)	6	2	342	2	0	652
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	995	343			344	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	995	343			344	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	274	704			1226	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	344	652
Volume Left	6	0	0
Volume Right	2	2	0
cSH	323	1700	1226
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	16.4	0.0	0.0
Lane LOS	C		
Approach Delay (s)	16.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	198	121	41	230	489	841
Future Volume (vph)	198	121	41	230	489	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	16	11	11	12	15
Grade (%)	-1%			3%	-3%	
Storage Length (ft)	75	0	175			0
Storage Lanes	2	1	1			1
Taper Length (ft)	200		100			
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2984	1821	1637	1774	1891	1734
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2984	1821	1637	1774	1891	1734
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		132				793
Link Speed (mph)	45			35	35	
Link Distance (ft)	338			607	429	
Travel Time (s)	5.1			11.8	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.85	0.85	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	14%	1%	5%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	215	132	48	271	549	945
Shared Lane Traffic (%)						
Lane Group Flow (vph)	215	132	48	271	549	945
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	8		1	6	2	
Permitted Phases		Free				Free
Detector Phase	8		1	6	2	
Switch Phase						
Minimum Initial (s)	9.0		7.0	10.0	10.0	
Minimum Split (s)	24.0		12.0	24.0	23.0	
Total Split (s)	31.0		20.0	55.0	35.0	
Total Split (%)	36.0%		23.3%	64.0%	40.7%	
Maximum Green (s)	25.0		15.0	49.0	30.0	
Yellow Time (s)	3.5		3.5	4.0	4.0	
All-Red Time (s)	2.5		1.5	2.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.0	6.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Minimum Gap (s)	3.0		3.0	3.0	3.0	
Time Before Reduce (s)	0.0		0.0	0.0	0.0	
Time To Reduce (s)	0.0		0.0	0.0	0.0	
Recall Mode	None		None	Min	Min	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	10.1	50.1	7.7	27.2	21.8	50.1
Actuated g/C Ratio	0.20	1.00	0.15	0.54	0.44	1.00
v/c Ratio	0.36	0.07	0.19	0.28	0.67	0.54
Control Delay	22.0	0.1	25.3	6.4	17.3	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	0.1	25.3	6.4	17.3	1.2
LOS	C	A	C	A	B	A
Approach Delay	13.7			9.2	7.2	
Approach LOS	B			A	A	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Queue Length 50th (ft)	30	0	13	33	140	0
Queue Length 95th (ft)	70	0	43	64	258	0
Internal Link Dist (ft)	258			527	349	
Turn Bay Length (ft)	75		175			
Base Capacity (vph)	1581	1821	520	1608	1203	1734
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07	0.09	0.17	0.46	0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 86			
Actuated Cycle Length: 50.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 51.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Ballardvale St & I-93 SB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	248	142	311	45	144	32	187	474	28	15	348	308	
Future Volume (vph)	248	142	311	45	144	32	187	474	28	15	348	308	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor												0.98	
Frt			0.850			0.850		0.992				0.850	
Flt Protected		0.969			0.988		0.950			0.950			
Satd. Flow (prot)	0	1724	1522	0	1810	1631	1743	1818	0	1631	1766	1561	
Flt Permitted		0.568			0.573		0.950			0.950			
Satd. Flow (perm)	0	1011	1522	0	1050	1631	1743	1818	0	1631	1766	1526	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			90			66		2				230	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.75	0.75	0.75	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	11%	4%	2%	1%	0%	2%	2%	4%	7%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	299	171	375	60	192	43	199	504	30	15	359	318	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	470	375	0	252	43	199	534	0	15	359	318	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	60.0		40.0	60.0	60.0	26.0
Total Split (%)	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	36.1%		24.1%	36.1%	36.1%	16%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	55.0		35.0	55.0	55.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		37.1	57.2		37.1	37.1	15.5	41.1		4.9	24.0	24.0	
Actuated g/C Ratio		0.39	0.60		0.39	0.39	0.16	0.43		0.05	0.25	0.25	
v/c Ratio		1.20	0.40		0.62	0.06	0.71	0.68		0.18	0.81	0.57	
Control Delay		142.9	9.2		37.7	4.0	55.2	28.7		58.7	50.5	14.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		142.9	9.2		37.7	4.0	55.2	28.7		58.7	50.5	14.4	
LOS		F	A		D	A	E	C		E	D	B	
Approach Delay		83.6			32.8			35.9			34.1		
Approach LOS		F			C			D			C		

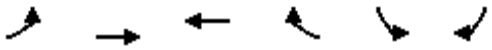
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		~304	64		105	0	103	204		8	183	38	
Queue Length 95th (ft)		#822	156		#319	5	265	540		40	425	162	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		391	1258		406	671	674	1127		631	1074	1018	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		1.20	0.30		0.62	0.06	0.30	0.47		0.02	0.33	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 166			
Actuated Cycle Length: 95.9			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 50.7		Intersection LOS: D	
Intersection Capacity Utilization 77.9%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

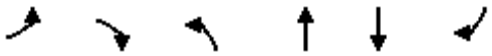
Splits and Phases: 5: Route 62 & Middlesex Ave/High St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	296	605	7	14	256
Future Volume (Veh/h)	126	296	605	7	14	256
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	152	357	672	8	15	278
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	680				1337	676
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680				1337	676
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				89	39
cM capacity (veh/h)	922				143	457

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	509	680	293
Volume Left	152	0	15
Volume Right	0	8	278
cSH	922	1700	411
Volume to Capacity	0.16	0.40	0.71
Queue Length 95th (ft)	15	0	136
Control Delay (s)	4.3	0.0	32.8
Lane LOS	A		D
Approach Delay (s)	4.3	0.0	32.8
Approach LOS			D

Intersection Summary			
Average Delay		8.0	
Intersection Capacity Utilization		81.4%	ICU Level of Service D
Analysis Period (min)		15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	9	9	266	552	1
Future Volume (Veh/h)	1	9	9	266	552	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.80	0.80	0.86	0.86
Hourly flow rate (vph)	1	10	11	332	642	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	996	642	643			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	996	642	643			
tC, single (s)	7.4	7.2	5.1			
tC, 2 stage (s)						
tF (s)	4.4	4.2	3.1			
p0 queue free %	99	97	98			
cM capacity (veh/h)	179	337	608			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	343	643
Volume Left	1	11	0
Volume Right	10	0	1
cSH	312	608	1700
Volume to Capacity	0.04	0.02	0.38
Queue Length 95th (ft)	3	1	0
Control Delay (s)	17.0	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.0	0.6	0.0
Approach LOS	C		

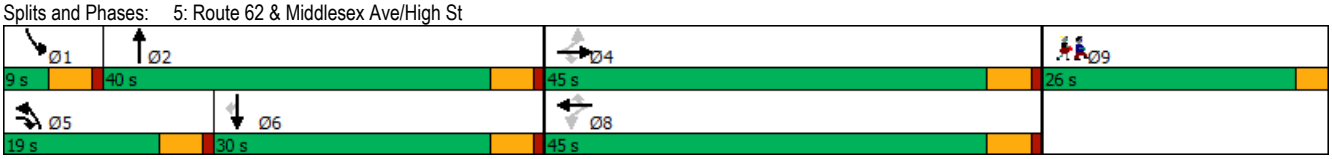
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	295	109	184	17	98	30	178	380	34	10	347	171	
Future Volume (vph)	295	109	184	17	98	30	178	380	34	10	347	171	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850			0.850		0.988				0.850	
Flt Protected		0.965			0.993		0.950			0.950			
Satd. Flow (prot)	0	1734	1522	0	1752	1584	1693	1748	0	1745	1749	1531	
Flt Permitted		0.624			0.827		0.950			0.950			
Satd. Flow (perm)	0	1121	1522	0	1459	1584	1693	1748	0	1745	1749	1531	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			75			136		4				149	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.88	0.88	0.88	0.61	0.61	0.61	0.87	0.87	0.87	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	8%	4%	6%	5%	3%	5%	6%	3%	0%	5%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	335	124	209	28	161	49	205	437	39	12	408	201	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	459	209	0	189	49	205	476	0	12	408	201	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	45.0	45.0	19.0	45.0	45.0	45.0	19.0	40.0		9.0	30.0	30.0	26.0
Total Split (%)	37.5%	37.5%	15.8%	37.5%	37.5%	37.5%	15.8%	33.3%		7.5%	25.0%	25.0%	22%
Maximum Green (s)	40.0	40.0	14.0	40.0	40.0	40.0	14.0	35.0		4.0	25.0	25.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		40.4	58.7		40.4	40.4	14.1	42.9		4.0	25.2	25.2	
Actuated g/C Ratio		0.41	0.59		0.41	0.41	0.14	0.43		0.04	0.25	0.25	
v/c Ratio		1.01	0.22		0.32	0.07	0.85	0.63		0.17	0.92	0.40	
Control Delay		75.3	6.0		23.9	0.2	73.2	29.1		55.5	64.1	13.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		75.3	6.0		23.9	0.2	73.2	29.1		55.5	64.1	13.1	
LOS		E	A		C	A	E	C		E	E	B	
Approach Delay		53.6			19.0			42.4			47.5		
Approach LOS		D			B			D			D		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		259	30		72	0	120	198		7	233	24	
Queue Length 95th (ft)		#624	53		113	0	#310	#531		29	#516	92	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		456	932		593	725	241	758		71	445	500	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		1.01	0.22		0.32	0.07	0.85	0.63		0.17	0.92	0.40	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 99.2			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	248	142	311	45	144	32	187	474	28	15	348	308	
Future Volume (vph)	248	142	311	45	144	32	187	474	28	15	348	308	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	11	12	12	12	12	11	11	11	
Grade (%)		4%			-2%			3%			0%		
Storage Length (ft)	0		50	0		25	115		0	115		175	
Storage Lanes	0		1	0		1	1		0	1		1	
Taper Length (ft)	25			25			25			80			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor												0.98	
Frt			0.850			0.850		0.992				0.850	
Flt Protected		0.969			0.988		0.950			0.950			
Satd. Flow (prot)	0	1724	1522	0	1810	1631	1743	1818	0	1631	1766	1561	
Flt Permitted		0.590			0.662		0.950			0.950			
Satd. Flow (perm)	0	1050	1522	0	1213	1631	1743	1818	0	1631	1766	1524	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			137			136		2				260	
Link Speed (mph)		30			30			45			45		
Link Distance (ft)		592			864			557			722		
Travel Time (s)		13.5			19.6			8.4			10.9		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.75	0.75	0.75	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	11%	4%	2%	1%	0%	2%	2%	4%	7%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	299	171	375	60	192	43	199	504	30	15	359	318	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	470	375	0	252	43	199	534	0	15	359	318	
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		9
Permitted Phases	4		4	8		8						6	
Detector Phase	4	4	5	8	8	8	5	2		1	6	6	
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		4.0	8.0	8.0	7.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		9.0	13.0	13.0	26.0
Total Split (s)	49.0	49.0	18.0	49.0	49.0	49.0	18.0	36.0		9.0	27.0	27.0	26.0
Total Split (%)	40.8%	40.8%	15.0%	40.8%	40.8%	40.8%	15.0%	30.0%		7.5%	22.5%	22.5%	22%
Maximum Green (s)	44.0	44.0	13.0	44.0	44.0	44.0	13.0	31.0		4.0	22.0	22.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None		None	None	None	None
Walk Time (s)													7.0
Flash Dont Walk (s)													16.0
Pedestrian Calls (#/hr)													5
Act Effct Green (s)		44.4	61.8		44.4	44.4	13.1	38.9		4.0	22.2	22.2	
Actuated g/C Ratio		0.45	0.62		0.45	0.45	0.13	0.39		0.04	0.22	0.22	
v/c Ratio		1.00	0.38		0.46	0.05	0.87	0.75		0.23	0.91	0.59	
Control Delay		71.4	6.2		24.6	0.1	76.7	35.9		58.2	66.7	13.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay		71.4	6.2		24.6	0.1	76.7	35.9		58.2	66.7	13.3	
LOS		E	A		C	A	E	D		E	E	B	
Approach Delay		42.5			21.1			47.0			42.0		
Approach LOS		D			C			D			D		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		260	51		97	0	117	251		9	207	28	
Queue Length 95th (ft)		#579	74		190	0	#320	#701		35	#508	138	
Internal Link Dist (ft)		512			784			477			642		
Turn Bay Length (ft)			50			25	115			115		175	
Base Capacity (vph)		470	999		542	805	230	713		66	395	542	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio		1.00	0.38		0.46	0.05	0.87	0.75		0.23	0.91	0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 99.2			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 77.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Route 62 & Middlesex Ave/High St

UTILITY INFORMATION STATEMENT

1. THE SUB-SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB-SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB-SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.
2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.
3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.
5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.
6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.
7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

NOTES

1. THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO DORE AND WHITTIER FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH DORE AND WHITTIER FOR PK-5 SITE. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.
2. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS PLAN AS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY WHICH OCCURRED OCTOBER 2024.
3. WETLAND RESOURCE AREA BOUNDARIES DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS, INC. ON NOVEMBER 5, 2024.
4. ELEVATION REFERS TO NORTH AMERICAN VERTICAL DATUM (NAVD88) VERTICAL BASED ON RTK GPS OBSERVATIONS WITH CORRECTIONS PROVIDED BY MaCORS NETWORK.
5. THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE SEARCH AND MAY NOT DISCLOSE ANY MATTERS THAT MAY BE REVEALED BY ONE.
6. THIS PLAN DOES NOT SHOW UNWRITTEN OR UNRECORDED EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT AND VISIBLE USES OF THE LAND. THIS PLAN DOES NOT GUARANTEE THAT NO SUCH EASEMENTS EXIST.
7. LEGAL STATUS OF EASEMENTS, WAYS AND RESTRICTIONS NOT DETERMINED BY THIS SURVEY.
8. TITLE TO LAND IN THE ABUTTING WAYS IS NOT SHOWN AND HAS NOT BEEN DETERMINED AS A RESULT OF THIS SURVEY.

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

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WILMINGTON ELEMENTARY SCHOOL

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WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

COMMONWEALTH OF MASSACHUSETTS
MARK E. VIOLETTE
#407768
REGISTERED PROFESSIONAL LAND SURVEYOR

Mark Violette
3.28.25

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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KEY PLAN

ORIENTATION AND SCALE:

SEE PLAN

SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET NUMBER:

EX-1.0

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www.nitscheng.com
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Boston, MA 02108
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- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

DORE + WHITTIER
MASSACHUSETTS
260 MERRIMAC STREET BUILDING 7, 2ND FLOOR
NEWBURYPORT, MA 01950
P: (978) 499-2999
VERMONT
212 BATTERY STREET
BURLINGTON, VT 05401
P: (802) 863-1428

WILMINGTON ELEMENTARY SCHOOL

320 SALEM ST.
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

COMMONWEALTH OF MASSACHUSETTS MARK E. VIOLETTE #40768 REGISTERED PROFESSIONAL LAND SURVEYOR

Mark Violette
3.28.25

REVISIONS:

NO.	DATE	TITLE

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SCHEMATIC DESIGN
04/24/2025

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SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET NUMBER:

EX-1.1

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 10, 2024

Ms. Rani Philip
Dore and Whittier Architects, Inc.
260 Merrimac Street, Building 7
Newburyport, MA 01950
Phone: (978) 778-5353
Fax: (978) 499-2944
E-mail: rphilip@DoreandWhittier.com

Re: **Preliminary Geotechnical Report**
Proposed Wildwood Early Childhood Center
North Intermediate School – 320 Salem Street Site
Wilmington, MA
LGCI Project No. 2437

Dear Ms. Philip:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a preliminary geotechnical study for the proposed Wildwood Early Childhood Center in Wilmington, Massachusetts. We are submitting our preliminary geotechnical report electronically. Please notify us if you need a hard copy.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

PRELIMINARY GEOTECHNICAL REPORT
PROPOSED WILDWOOD EARLY CHILDHOOD CENTER
NORTH INTERMEDIATE SCHOOL – 320 SALEM STREET SITE
WILMINGTON, MASSACHUSETTS

LGCI Project No. 2437
December 10, 2024

Prepared for:

Dore and Whittier Architects, Inc.
260 Merrimac Street, Building 7
Newburyport, MA 01950
Phone: (978) 778-5353
Fax: (978) 499-2944

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Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This geotechnical report presents the results of the subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Wildwood Early Childhood Center in Wilmington, Massachusetts. We performed our services in general accordance with our proposal No. 24084 dated August 9, 2024, and proposal No. 24107 dated October 15, 2024. Ms. Rani Philip of Dore and Whittier Architects, Inc. (Dore and Whittier) authorized our services by signing our proposals Nos. 24084 and 24107 on August 9, and October 15, 2024, respectively.

1.2 Purpose and Scope of Services

The purpose of our geotechnical services was to perform preliminary subsurface explorations at the site for the proposed Wildwood Early Childhood Center, and to provide preliminary foundation design and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with Dore and Whittier and with school staff.
- Marked the exploration locations at the site and notified Dig Safe Systems Inc. (Dig Safe) and the Town of Wilmington for utility clearance.
- Engaged a drilling subcontractor for two (2) days to advance eight (8) soil borings at the site.
- Coordinated with Dore and Whittier who arranged with the Town of Wilmington's Department of Public Works (DPW) to perform five (5) test pits at the site, as requested by the civil engineer.
- Provided an LGCI geotechnical field representative at the site to coordinate and observe the borings and test pits, describe the soil samples, and prepare field logs. The LGCI representative performed four (4) double ring infiltrometer tests within test pits TP-1, TP-2, TP-3, and TP-4.
- Submitted six (6) soil samples for laboratory tests, including two (2) soil samples from the borings, and four (4) samples from the test pits where double ring infiltrometer tests were performed.
- Prepared this preliminary geotechnical report containing the results of our preliminary subsurface explorations and our preliminary recommendations for foundation design and construction.

Our scope does not include preparing specifications, reviewing contract documents, and providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for stormwater management, erosion control, pavement design, slope stability analyses, site specific seismic and liquefaction analyses, pile analysis and design, FEMA 100-year flood elevation, historic uses of site, contaminated soil and groundwater treatment and disposal requirements and techniques, and cost or quantity estimates are not included in our scope of work.

LGCI's scope of services does not include an environmental assessment for the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site, or mold in the soil or in any structure at the site. Any statements regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client.

1.3 Site Description

Our understanding of the site is based on our field observations, our discussions with Dore and Wittier, and on the following document:

- Drawing EX-1 titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts," (Existing Conditions Plan) prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier via e-mail on November 11, 2024.

The North Intermediate School site is located at 320 Salem Street in Wilmington, Massachusetts as shown in Figure 1. The site is bordered by private residential properties and Salem Street on the southern side, by Ballardvale Street on the eastern side, and by private properties on the western and northern sides. The site is occupied by the existing school building, a drop off loop, a paved parking lot, a playground, a basketball court and tennis courts, and athletic fields, including a baseball field and a soccer field.

Based on the Existing Conditions Plan, the grades at the site generally range between El. 90 feet and El. 108 feet, generally rising in the north to south direction.

1.4 Project Description

Our understanding of the proposed construction is based on our discussions with Dore and Whittier and on the following drawing:

- "Site Base Condition, Wilmington Schools, North Intermediate- Wilmington, MA," (Site Base Conditions) prepared by Dore and Whittier, undated, and provided to LGCI by Dore and Whittier on October 11, 2024.

We understand that at this time, the size, layout, and location of the proposed school are preliminary. Based on the Site Base Conditions, the proposed school will have an irregular shape

and will have a footprint of about 80,500 square feet. The proposed building will be located in the area of the existing athletic fields north of the existing building. We understand that the existing building will be demolished to allow for the construction of the proposed athletic fields.

Information about the proposed building finished floor elevation (FFE) and the proposed grading are not available at the time of this report.

1.5 Elevation Datum

We understand that the elevations provided in the Existing Conditions Plan are referenced with respect to the North American Vertical Datum of 1988 (NAVD 1988).

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Surficial Materials Map of Wilmington Quadrangle, Massachusetts," prepared by Byron D. Stone, J.R. and DiGiacomo-Cohen, M.L., Scientific Investigation Map 3402, Quadrangle 113 – Wilmington, 2018.

The surficial geologic map of the site indicates that the natural soils in the general vicinity of the site consist of coarse deposits.

The coarse deposits consist of sand, sand and gravel, and gravel deposits as described below.

Sand Deposits – The sand deposits are comprised mostly of fine to coarse sand. Coarser layers may contain up to 25 percent gravel. Finer layers may contain fine sand, silt, and clay.

Sand and Gravel Deposits – The sand and gravel deposits occur as a mixture of gravel and sand within individual layers and as alternating layers of sand and gravel. The sand and gravel layers range between 25 to 50 percent gravel and 50 to75 percent sand.

Gravel Deposits – The gravel deposits are comprised of at least 50 percent gravel, cobbles, and boulders. Sand occurs within gravel beds and as separate layers within the gravel.

The surficial geologic map also shows swamp deposits not far from the site.

Swamp Deposits – the swamp deposits consist of organic muck and peat that contain minor amounts of sand, silt, and clay, are stratified and poorly sorted, and occur in swamps and freshwater marshes, in kettle depressions, or in poorly drained areas.

The Surficial Geologic Map is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with Dore and Whittier and marked the exploration locations in the field. LGCI notified Dig Safe and the Town of Wilmington for utility clearance prior to starting our explorations at the site.

Unless notified otherwise, we will dispose of the soil samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Soil Borings

LGCI engaged Soil X, Corp. (Soil X) of Leominster, Massachusetts to advance eight (8) soil borings (B-1 to B-8) at the site on October 28 and 29, 2024. The borings were advanced with a Diedrich D-70 Turbo ATV Drill Rig using hollow stem auger boring techniques with 4-1/4-inch inner diameter augers. The borings extended to depths ranging between 10.2 and 20.2 feet beneath the ground surface. Upon completion, the boreholes were backfilled with drill cuttings.

Soil X performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer at typical depth intervals of 2 feet or 5 feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical field representative observed and logged the borings in the field.

2.2.3 LGCI's Test Pits

Dore and Whittier coordinated with the Town of Wilmington DPW to perform five (5) test pits (TP-1, TP-2, TP-2A, TP-3, and TP-4) at the site on October 30 and 31, 2024. The purpose of the test pits was to perform double ring infiltrometer tests as described in Section 2.6. The test pits were excavated with a Volvo EWR150E excavator with a smooth-edge bucket. The test pits extended to depths ranging between 8.0 and 11.3 feet beneath the ground surface. Upon completion, the excavations were backfilled with excavated material in 12- to 18-inch lifts and tamped with the excavator bucket.

An LGCI geotechnical field representative observed and logged the test pits in the field.

2.2.4 Exploration Logs and Locations

The boring and test pit locations are shown in Figure 3A and Figure 3B. Appendices A and B contain LGCI's boring logs and test pits logs, respectively, and Tables 1 and 2 include summaries of LGCI's borings and test pits, respectively.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The exploration logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. Percentages of fines, sand, and gravel were estimated to the nearest 5 percent based on our field observations and laboratory inspection of the soil samples, except where a grain-size analysis was performed. The

strata boundaries shown in our exploration logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in LGCI's borings and test pits were as follows, starting at the ground surface.

Topsoil – A layer of surficial organic topsoil was encountered at the ground surface in borings B-1 to B-7, and in all test pits. The thickness of the topsoil ranged between 0.6 feet and 2.0 feet.

Fill – A layer of fill was encountered at the ground surface in boring B-8 and beneath the topsoil in all borings and test pits. The fill extended to depths ranging between 0.7 and 7.0 feet beneath the ground surface. The samples within this layer were mostly described as well graded sand, poorly graded sand, and silty sand. The fines content in the fill ranged between 0 and 30 percent, and the gravel content ranged between 0 and 25 percent. The fill contained traces of organic soil and roots. The fill contained 5 to 10 percent cobbles up to 12 inches in size in test pit TP-1.

The SPT N-values in this layer ranged between 7 blows per foot (bpf) and 54 bpf, with most values lower than 18 bpf, indicating mostly loose to medium dense material.

The excavation efforts within the fill layer ranged between easy, moderate, and difficult.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill layer in borings B-2, B-5, and B-7 The buried organic soil extended to depths of 4.0, 4.4, and 8.0 feet beneath the ground surface in borings B-2, B-5, and B-7, respectively. The samples in this layer were described as silty sand. The fines content in the buried organic soil ranged between 25 and 45 percent. The buried organic soil contained traces of organic soil and roots.

The SPT N-values in this layer ranged between 16 bpf and 40 bpf, indicating medium dense to dense material.

Buried Subsoil – A layer of buried subsoil was encountered beneath the fill in boring B-8 and test pit TP-4. The subsoil extended to depths of 4.0 and 3.2 feet beneath the ground surface in boring B-8 and test pit TP-4, respectively. In boring B-8, the samples were described as silty sand. The fines content in the subsoil ranged between 15 and 35 percent, and the gravel content ranged between 0 and 15 percent. In test pit TP-4, the sample was described as poorly graded sand. The fines content ranged between 10 and 15 percent, and the gravel content ranged between 0 and 5 percent. The samples contained traces of organic soil and roots.

The SPT N-values in this layer ranged between 11 bpf and 14 bpf, indicating a medium dense material.

The excavation effort within the subsoil layer was easy, consistent with loose to medium dense material.

Silt – A layer of silt was encountered beneath the fill layer in boring B-1 and extended to a depth of 9.0 feet beneath the ground surface. The sample was described as silt and was slightly plastic. The sand content ranged between 5 and 10 percent.

The SPT N-value in this layer was 13 bpf, indicating stiff material.

Clay – A layer of clay was encountered beneath the layer of silt in boring B-1 between depths of 9.0 to 14.0 feet. The sample was described as lean clay and was slightly plastic. The sand content ranged between 15 and 20 percent.

The SPT N-value in this layer was 12 bpf, indicating stiff material.

Swamp Deposit – A layer of swamp deposits was encountered beneath the layer of fill in test pit TP-1 and extended to a depth of 10 feet beneath the ground surface. The sample was described as silty sand. The fines content ranged between 20 and 25 percent and the gravel content ranged between 10 and 15 percent. The swamp deposit had traces of organic soil, roots, and an organic odor.

The excavation effort within the swamp deposit layer was difficult possibly due to the presence of roots.

Sand – A layer of sand was encountered in test pit TP-1 and extended to a depth of 11.0 feet beneath the ground surface. The sand was described as poorly graded sand. The fines content ranged between 0 and 5 percent.

The excavation effort within the sand layer was difficult.

Sand and Gravel – A layer of sand and gravel was encountered in all borings and test pits, except in test pit TP-1, and extended to the termination depths of the borings and test pits, except for boring B-6 where the sand and gravel layer extended to the top of weathered rock. The samples in this layer were mostly described as well graded sand and silty sand. Five (5) samples were described as poorly graded sand. The fines content in this layer ranged between 0 and 25 percent, and the gravel content ranged between 0 and 40 percent.

The SPT N-values in this layer ranged between 15 bpf and refusal, with most values ranging between 20 bpf and 67 bpf, indicating dense to very dense material. Please note that the high SPT N-values in the sand and gravel may be due to obstructions such as cobbles and boulders in the sand and gravel and may not represent the true density of the sand and gravel.

Weathered Rock – A layer of weathered rock was encountered in boring B-6 and extended to the termination depth of 19.7 feet beneath the ground surface. The sample within this layer was described as silty sand. The fines content ranged between 15 and 20 percent, and the gravel content ranged between 35 and 40 percent.

2.4 Groundwater

Groundwater was encountered in all the borings, except for B-3, and in test pits TP-1 and TP-2A, at depths ranging between 9.0 and 14.0 feet beneath the ground surface, as shown in Tables 1 and 2, and in the boring and test pit logs.

The groundwater information reported herein is based on observations made during or shortly after the completion of drilling and excavation. The reported groundwater levels may not represent the actual groundwater conditions, as additional time may be required for the groundwater levels to stabilize. The groundwater information presented in this report only represents the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Laboratory Test Data

LGCI submitted six (6) soil samples collected from the borings for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix C and are summarized in the table below.

Grain-Size Analysis Test Results

Exploration No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-1	S2	Fill	2.0 – 4.0	36.5	43.5	20.0
B-4	S2	Sand and Gravel	2.0 – 4.0	36.9	42.6	20.5
TP-1	Infiltrometer	Fill	5.0	14.1	58.9	27.0
TP-2	Infiltrometer	Fill	4.0	6.8	77.3	15.9
TP-3	Infiltrometer	Sand and Gravel	4.0	31.4	67.1	1.5
TP-4	Infiltrometer	Sand and Gravel	4.6	30.4	58.6	11.0

2.6 Double Ring Infiltrometer Tests

LGCI provided a geotechnical field engineer to perform four (4) double ring infiltrometer tests in test pits TP-1 to TP-4 (one in each).

In each case, the excavation was first advanced to the test depth where the test pit bottom was leveled using the excavator bucket. After the infiltrometer rings were driven into the ground, the test was conducted by filling the rings with water. The test pit was advanced deeper after the completion of the test.

The test results are included in Appendix D and are summarized below.

The results include plots of the hydraulic conductivity for flow within the inner and outer rings. The stabilized portion of the plot for the inner ring indicates the permeability value. The results indicate the following approximate permeability, K, value:

Double Ring Infiltrometer Test Results

Test Pit	Stratum	Test Depth (ft.)	Permeability, K (cm/sec)
TP-1	Fill	5.0	1.00×10^{-3}
TP-2	Fill	4.0	4.06×10^{-3}
TP-3	Sand and Gravel	4.0	6.73×10^{-2}
TP-4	Sand and Gravel	4.5	8.95×10^{-2}

3. EVALUATION AND RECOMMENDATIONS

3.1 Foundation Recommendations

3.1.1 General

Based on the results of the borings and test pits, the subsurface conditions at the site are suitable to support the proposed building after the topsoil, existing fill, buried organic soil, buried subsoil, and swamp deposits are removed or improved as described below. There are a few issues that we would like to highlight for consideration and discussion.

3.1.2 Topsoil, , Existing Fill Buried Organic Soil, Buried Subsoil, and Swamp Deposits

- The topsoil should be removed from within the entire construction area, including the proposed building footprint and the proposed paved areas.

- The existing fill was observed to be variable in composition and density. The existing fill contained traces of organic soil and roots. In addition, the existing fill overlaid buried organic soil and buried subsoil. Existing fill that was not placed with strict moisture, density, and gradation control presents risk of unpredictable settlement that may result in poor performance of floor slabs and foundations. Due to these risks, the existing fill, the buried organic soil, and the buried subsoil should be entirely removed from within the proposed building's footprint and should be replaced with Structural Fill. We anticipate that the removal will extend up to depths ranging between 2 and 6 feet beneath the existing ground surface, and up to a depth of 8 feet beneath the ground surface near boring B-7. The removal may extend to greater depths at locations not explored by LGCI. Laterally, the removal should extend beyond the proposed building's footprint a distance equal to the distance between the bottom of the proposed footings and the top of the native sand and gravel, or 5 feet, whichever is greater.

- At test pit TP-1, performed outside of the proposed building footprint, swamp deposits were observed beneath the existing fill and extended to a depth of 10 feet beneath the ground surface. If encountered within the proposed building footprint, the swamp deposits should be removed and replaced with Structural Fill.

- After the topsoil, existing fill, buried organic soil, buried subsoil, and swamp deposits, if any, are removed from within the proposed building footprint and zone of influence of footings, as described above, the proposed building and other structures may be supported on shallow footings bearing in Structural Fill placed directly on top of the native sand and gravel or stiff silt and clay.

- As an alternative to the removing the existing fill, the buried organic soil, and the buried subsoil we considered the option of improving the ground using aggregate piers (APs) or

rigid inclusions (RIs). We dismissed this option due to the depth to the bottom of these layers being 6 feet or less in a few explorations. We will reconsider this option after additional explorations are performed at the site during future phases of the project.

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- The proposed slab may be designed as a slab-on-grade bearing on Structural Fill placed directly on top of the native sand and gravel or stiff silt and clay.

- Within paved areas, the existing fill and the buried organic soil and buried subsoil should be removed to the top of the native sand and gravel or stiff silt and clay or to a depth of 18 inches beneath the bottom of the proposed pavement, whichever occurs first. Where soft organic soil is exposed, the organic soil should be removed. The existing fill and buried organic soil and buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement can remain in place provided that these materials are firm and unyielding following proofrolling as described in Section 4.1.

3.1.3 Additional Explorations

We recommend advancing additional explorations at the site during the schematic design (SD) phase and/or the design development (DD) phase. The additional explorations should include soil borings and test pits. We recommend installing at least one (1) groundwater observation well as part of the additional explorations.

3.2 Foundation Recommendations

We recommend supporting the proposed building on shallow footings placed on Structural Fill placed directly the native sand and gravel layer or the stiff silt and clay. Shallow foundations and slabs-on-grade should be placed on a subgrade that is prepared in accordance with the recommendations in this report. Recommendations for footing design and our settlement estimates are presented in Sections 3.2.1 and 3.2.2, respectively.

3.2.1 Footing Design

- Footings should be founded on Structural Fill placed directly on the native sand and gravel or on the stiff silt and clay. A representative of LGCI should observe the subgrade during construction to confirm that it is consistent with the materials encountered in our borings.

- For footing design, we recommend using a net allowable bearing pressure of 4 kips per square foot (ksf).

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- Foundations should be designed in accordance with The Commonwealth of Massachusetts State Building Code 780 CMR, Tenth Edition (MSBC 10th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4.0 feet below the final exterior grade to provide adequate frost cover protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- We recommend that wall footings have a minimum width of 2 feet, and that column footings have a minimum width of 3 feet. For foundations with a least lateral dimension smaller than 3 feet, the allowable bearing pressure should be reduced to 1/3 of the recommended allowable bearing pressure times the least dimension in feet.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

3.2.2 Settlement

Using the allowable bearing pressure of 4 ksf and the minimum footing sizes recommended above, we estimate for foundations constructed in accordance with the recommendations contained in this report that the total post-construction settlement will be less than about 1 inch and that the differential settlement will be 3/4 inch or less over a distance of 25 feet. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

- The proposed floor slab can be constructed as a slab-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the native sand and gravel.

- To reduce the potential for dampness in the proposed floor slab, the project architect may consider placing a vapor barrier beneath the floor slab. The vapor barrier should be protected from puncture during construction of the slab.

- For the design of the floor slab bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \text{Re}action\ (k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area,
k_{s1} = Coefficient of vertical subgrade reaction for 1 x 1 square foot area, and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed for construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- Backfill in interior and exterior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to the building foundation or superstructure, exterior slabs such as approach slabs and sidewalks, should be isolated from the building superstructure.

3.4 Under-slab Drainage

Based on the groundwater levels observed in our borings, we believe that an under-slab drainage system is not required beneath the slab.

3.5 Seismic Design Criteria

In accordance with Section 1613 of MSBC 10th Edition and based on the boring data, the seismic criteria are as follows:

- Site Class: D
- Spectral Response Acceleration at short period, S_s (Table 1604.11): 0.327g
- Spectral Response Acceleration at 1 sec., S_1 (Table 1604.11): 0.072g
- Site Coefficient, F_a (Table 1613.3.3(1)): 1.6
- Site Coefficient, F_v (Table 1613.3.3(2)): 2.4
- Adjusted spectral response S_{ms} (Equation 16-37): 0.523g
- Adjusted spectral responses S_{m1} (Equation 16-38): 0.173g

Based on the SPT data from the borings, we believe the site soils are not susceptible to liquefaction.

3.6 Lateral Pressures for Wall Design

3.6.1 Lateral Earth Pressures

Based on our understanding, the proposed construction will not include retaining walls or below-ground walls. Should the design change, the lateral earth pressures recommended shown below should be used to design proposed retaining walls.

Coefficient of Active Earth Pressure, K_A:	0.33
Coefficient of At-Rest Earth Pressure, K_o:	0.50
Coefficient of Passive Earth Pressure, K_p:	3.0
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 30 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and a vertical wall face.

- Exterior walls of below-ground spaces and retaining walls braced at the top to restrain movement/rotation, should be designed using the "at-rest" pressure coefficient.

- We recommend placing free-draining material within the 3 feet immediately behind retaining walls. We recommend providing weep holes in site walls to promote drainage where possible; or a pipe should be placed at the base of the wall to collect the groundwater. Groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 2 feet.

- Where a permanent vertical uniform load will be applied on the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the native sand and gravel or Structural Fill and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning. We recommend a factor of safety of 1.5 for global stability of walls.

3.6.2 Perimeter Drains

- Should the design change to include retaining walls, free-draining material should be placed within 3 feet of retaining walls and walls of below-grade spaces. To reduce the potential for dampness in below-ground spaces, if any, perimeter walls of the proposed below-ground spaces should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below-ground spaces, if any, and behind site retaining walls, if any. The drains should consist of 6-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile fabric for separation and filtration. Site retaining walls may be designed with weep holes discharging near the bottom of the face of the walls.

- Groundwater collected by the wall drains could be discharged in a lower area if gravity flow is possible. Alternatively, it should be discharged into the street drains. A permit would be required for discharge into street drains.

3.7 Pavement and Sidewalk Considerations

3.7.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, and sidewalks after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the topsoil and asphalt from within the footprint of the proposed driveways and parking lots.

- The existing fill should be improved within the proposed paved areas and under sidewalks in accordance with the recommendations in Sections 3.1.1 and 4.1.

Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement and sidewalks.

3.7.2 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5" Asphalt "Top Course"
2.0" Asphalt "Base Course"
8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

2.0" Asphalt "Top Course"
2.5" Asphalt "Base Course"
12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the "Standard Specifications for Highways and Bridges," prepared by the Commonwealth of Massachusetts Department of Transportation dated 2023.

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7.3 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

3.8 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer's recommendations. "Cushion" material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Before placing the bedding material, the bottom of utility trenches should be compacted to a firm and unyielding condition. Where soft or pumping material is encountered, it should be removed and replaced with Ordinary Fill.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill immediately above the utilities should be performed in accordance with the manufacturer's recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Existing asphalt, topsoil, existing fill, buried organic soil, buried subsoil, swamp deposits, if any, organic materials, abandoned utilities, buried foundations, remnants of demolished buildings, and other below-ground structures should be entirely removed from within the footprint of the proposed building before the start of foundation work.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Cobbles and boulders should be removed at least 6 inches from beneath footings and 18 inches beneath the bottom of slabs and paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.

- We recommend removing the existing fill, buried organic soil, buried subsoil, and swamp deposits, if any, from within the proposed building footprint and within the zone of influence of footings. We recommend compacting the exposed subgrade in the native sand and gravel layer or in the deep existing fill to a firm and unyielding condition with at least six (6) passes of a heavy roller compactor imparting a minimum dynamic effort of 40 kips. Where organic soil is exposed or where the subgrade is soft during the compaction effort, the organic soil or soft material should be removed and replaced with Structural Fill. The subgrade in the stiff silt and clay should be cut with a smooth bladed bucket and compacted statically with no more than 2 passes of a roller compactor.

- After the surficial topsoil, buried organic soil, buried subsoil, and existing fill are removed to a depth of 18 inches below the bottom of the proposed pavement, the exposed existing fill, buried organic soil, and buried subsoil should be improved by compacting the exposed surface of the existing fill with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft organic soil or other soft materials of soil are observed, the organic soil or other soft material should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the existing fill or buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement is observed, the soft and/or pumping material should be removed and replaced.

- The base of footing excavations should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.

- The subgrade of the proposed slab should be compacted with a dynamic vibratory compactor imparting a minimum of 10 kips of force to the subgrade before placing Structural Fill.

- To reduce the potential for disturbance of the footing subgrade, excavations should be extended an additional 12 inches and restored with Structural Fill or crushed stone to serve as a working mat.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- An LGCI geotechnical representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure.

- If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed, and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill or crushed stone wrapped in a geotextile filter fabric.

4.2 Subgrade Protection

The onsite sand and gravel is frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final 6 inches of soil just before pouring concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Earthwork operations should be suspended during freezing weather.

Materials with high fines content are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill. Fill placed outside the building footprint beneath any pavement subbase should meet the gradation and compaction requirements of Ordinary Fill.

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings, and deleterious materials.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 - 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 – 10

* 0 – 5 Under sidewalks and exterior pads and slabs

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 - 100
No. 4	20 – 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 – 20

4.4 Reuse of Onsite Materials

Based on the laboratory tests, the granular portion of the existing fill free of organic soil may be used as Ordinary Fill. The onsite materials are not suitable for reuse as Structural Fill.

Soils with high fines content (higher than about 20 percent) are generally very sensitive to moisture content variations and are susceptible to frost. These soils are difficult to compact at

moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during stockpiling, placement, and compaction of the existing fill.

All materials to be used as fill should first be tested for compliance with the applicable gradation specifications. During earthwork operations, the contractor should avoid mixing the reusable soils with fine-grained and/or organic soils.

4.5 Groundwater Control Procedures

Based on the groundwater levels encountered in our explorations, we anticipate the need for groundwater control procedures during footing and utility excavations. We anticipate that filtered sump pumps installed in pits located at least 3 feet below the bottom of the excavation may be sufficient to handle surface runoff that may enter the excavation. The contractor should be prepared to use multiple sump pumps as needed.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary, including well points, if necessary, to maintain the groundwater level below the excavation, and to maintain a dry excavation during wet weather. Placement of reinforcing steel or concrete in standing water should not be permitted.

Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pumps are no longer in use and the sump pump pits should be restored with suitable backfill.

4.6 Temporary Excavations

All excavations to receive human traffic, including utility trenches, basement or footing excavations, or others (i.e. underground storage tanks, etc.), should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have a shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Perform additional explorations at the site and update our geotechnical report.
- Prepare Earth Moving Specifications and review the geotechnical aspect of contract drawings.
- Review contractor submittals and Request for Information (RFIs);
- Provide a field representative during construction to observe the removal of the unsuitable soil, and to observe the subgrade of footings and slabs.

6. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Dore and Whittier Architects, Inc. for the proposed Wildwood Early Childhood Center at the North Intermediate School located at 320 Salem Street Site in Wilmington, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

American Society of Civil Engineers, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures," ASCE/SEI 7-16, 2017.

The Commonwealth of Massachusetts (2024), "The Massachusetts State Building Code, Ninth (10th) Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Wilmington, MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Wildwood Early Childcare Center
Wilmington, MA
LGCI Project No. 2437

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / **El.** (ft.)	Bottom of Topsoil Depth / **El.** (ft.)	Bottom of Fill Depth / **El.** (ft.)	Bottom of Buried Organic Soil / **Buried Subsoil** Depth / **El.** (ft.)	Bottom of Sand and Gravel Depth / **El.** (ft.)	Bottom of Weathered Rock Depth / **El.** (ft.)	Bottom of Boring Depth / **El.** (ft.)
B-1	93.0	9.0 / **84.0**	0.6 / **92.4**	6.0 [3]/ **87.0**	- / **-**	19.0 [4]/ **74.0**	- / **-**	19.0 / **74.0**
B-2	94.0	9.0 / **85.0**	0.8 / **93.2**	2.8 / **91.2**	4.0 / **90.0**	19.0 [4]/ **75.0**	- / **-**	19.0 / **75.0**
B-3	95.0	- / **-**	0.7 / **94.3**	2.0 / **93.0**	- / **-**	10.2 [4]/ **84.8**	- / **-**	10.2 / **84.8**
B-4	93.0	9.0 / **84.0**	0.6 / **92.4**	2.0 / **91.0**	- / **-**	11.0 [4]/ **82.0**	- / **-**	11.0 / **82.0**
B-5	94.0	9.0 / **85.0**	0.7 / **93.3**	4.0 / **90.0**	4.4 / **89.6**	10.5 [4]/ **83.5**	- / **-**	10.5 / **83.5**
B-6	94.0	14.0 / **80.0**	2.0 / **92.0**	6.0 / **88.0**	- / **-**	19.0 / **75.0**	19.7 [5]/ **74.3**	19.7 / **74.3**
B-7	92.0	10.0 / **82.0**	0.9 / **91.1**	6.0 / **86.0**	8.0 / **84.0**	20.2 [6]/ **71.8**	- / **-**	20.2 / **71.8**
B-8	94.0	9.0 / **85.0**	- / **-**	0.7 / **93.3**	**4.0** / **90.0**	19.8 [6]/ **74.2**	- / **-**	19.8 / **74.2**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled: “Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts,” prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.
2. Groundwater was measured during drilling, at the end of drilling, after drilling, or based on sample moisture whichever is shallower.
3. A layer of silt was encountered beneath the fill in boring B-1, between depths of 6 to 9 feet, and a layer of clay was encountered beneath the silt between depths of 9 and 14 feet.
4. Boring terminated due to split spoon / auger refusal on possible boulder or rock in the sand and gravel layer.
5. Boring terminated in the weathered rock layer.
6. Boring terminated in the sand and gravel layer.
7. "-" means the groundwater or layer was not encountered.

Table 1 - Summary of LGCI's Test Pits
Proposed Wildwood Early Childcare Center
Wilmington, MA
LGCI Project No. 2437

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / **El.** (ft.)	Bottom of Topsoil Depth / **El.** (ft.)	Bottom of Fill Depth / **El.** (ft.)	Bottom of Swamp Deposits / **Buried Subsoil** Depth / **El.** (ft.)	Bottom of Sand and Gravel Depth / **El.** (ft.)	Bottom of Sand Depth / **El.** (ft.)	Bottom of Boring Depth / **El.** (ft.)
TP-1	92.0	9.5 / **82.5**	1.5 / **90.5**	7.0 / **85.0**	10.0 / **82.0**	- / **-**	11.0 [4]/ **81.0**	11.0 / **81.0**
TP-2	94.0	- / **-**	0.7 / **93.3**	5.5 / **88.5**	- / **-**	9.0 [3]/ **85.0**	- / **-**	9.0 / **85.0**
TP-2A	94.0	9.5 / **84.5**	1.5 / **92.5**	7.0 / **87.0**	- / **-**	11.3 [3]/ **82.7**	- / **-**	11.3 / **82.7**
TP-3	94.0	- / **-**	0.8 / **93.2**	2.3 / **91.7**	- / **-**	8.0 [3]/ **86.0**	- / **-**	8.0 / **86.0**
TP-4	95.0	- / **-**	1.0 / **94.0**	2.0 / **93.0**	**3.2** / **91.8**	9.0 [3]/ **86.0**	- / **-**	9.0 / **86.0**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts," prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.
2. Groundwater was measured during drilling, at the end of drilling, after drilling, or based on sample moisture whichever is shallower.
3. Test Pit terminated in the sand and gravel layer.
4. Test Pit terminated in the sand layer.
5. "**-**" means the groundwater or layer was not encountered.

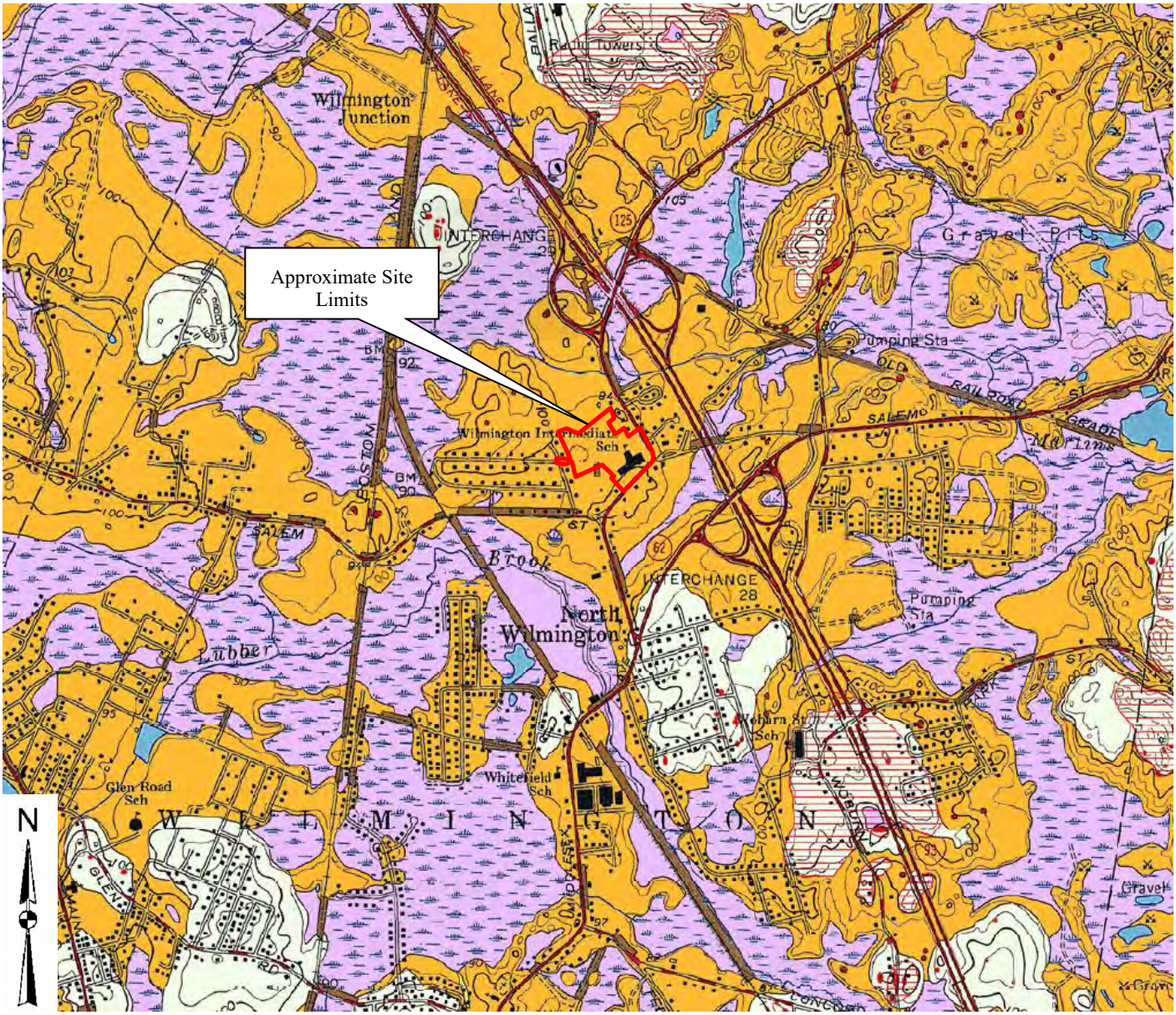
N

Contour Intervals: 10 feet

0.4 mi

Note: Figure based on USA Topo Maps of Wilmington, MA *ngmdb.usgs.gov/topoview/viewer*

Client:	Project:	Figure 1 – Site Location Map	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childhood Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec . 2024



Swamp deposits—Organic muck and peat that contain minor amounts of sand, silt, and clay, are stratified and poorly sorted, and occur in swamps and freshwater marshes, in kettle depressions, or in poorly drained areas. Unit is shown only where deposits are estimated to be at least 3 ft thick; most deposits are less than 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits

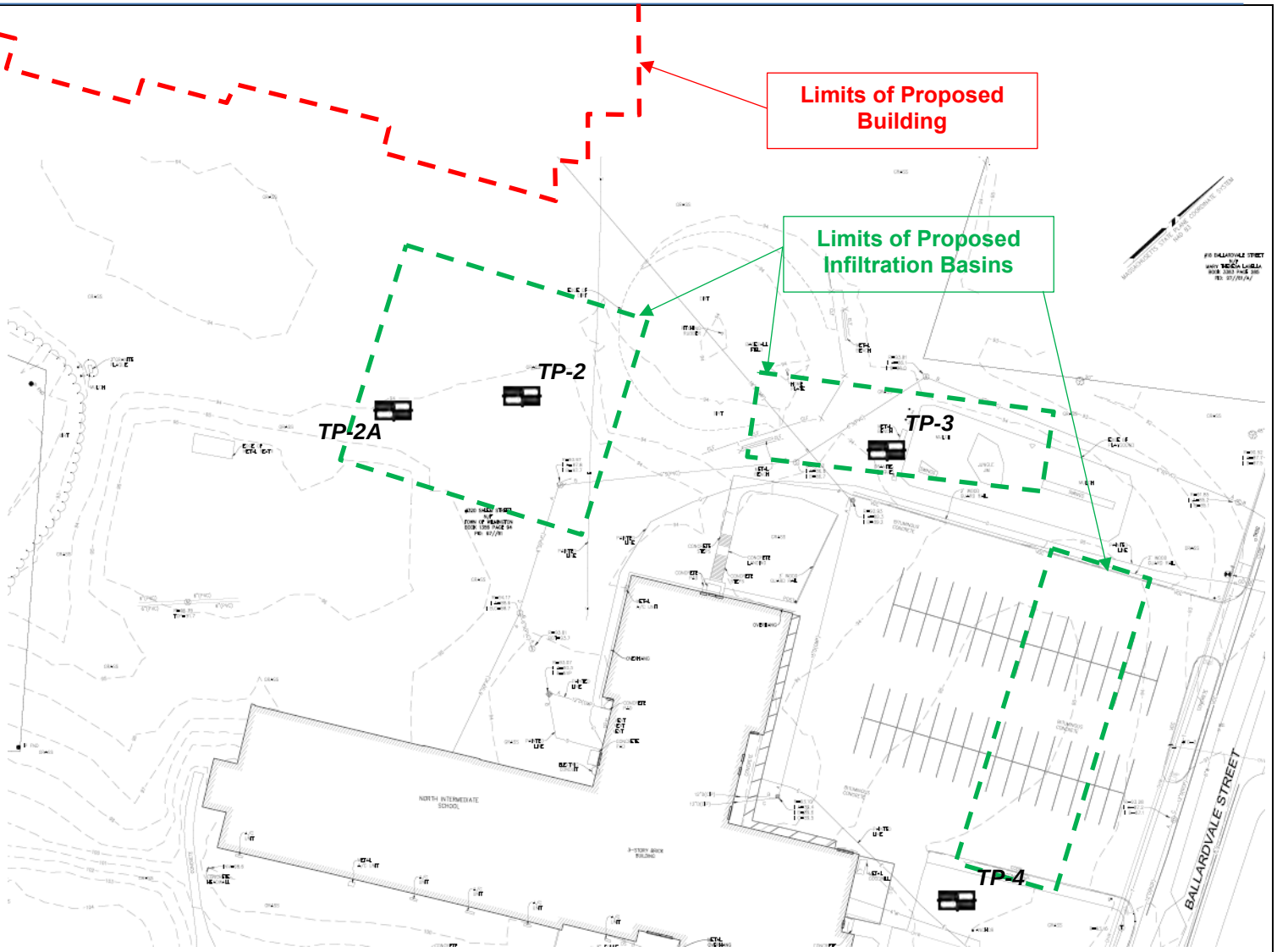
Coarse deposits consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

Note: Figure based on map titled: "Surficial Materials Map of Wilmington Quadrangle, Massachusetts," compiled by Byron D. Stone, Janet R. Stone, and Mary L. DiGiacomo-Cohen, Scientific Investigation Map 3402, Quadrangle 113 – Wilmington, 2018.

Client:	Project:	Figure 2 – Surficial Geologic Map	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childhood Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Legend

Approximate location of test pits advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 30, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).



Approximate Scale (ft.)

20 0 20 40 80

Note

Figure based on drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts", prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.

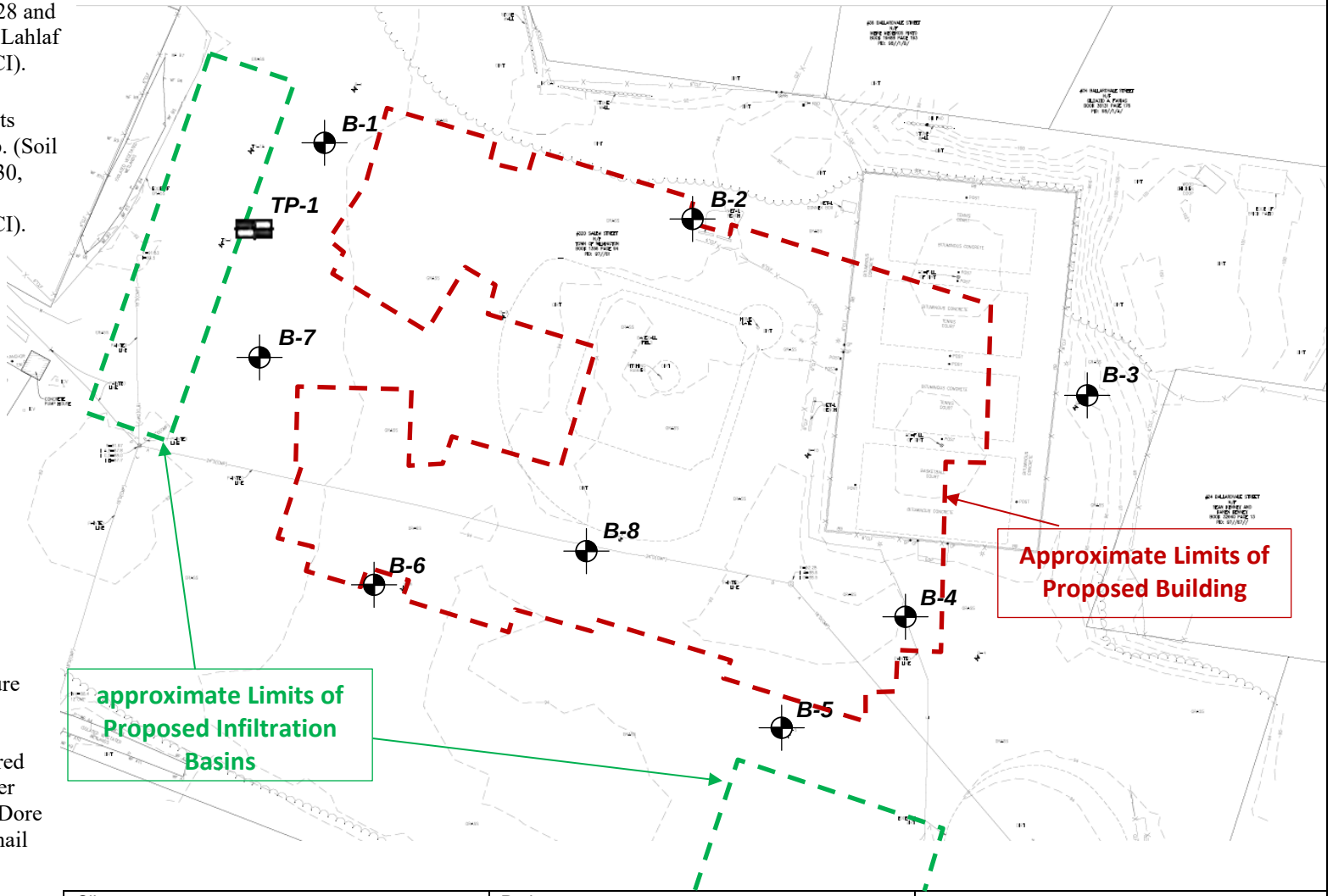
Limits of the proposed building and the infiltration basins are based on drawing titled: "Site Base Conditions, Wilmington Schools, North Intermediate, Wilmington, MA," prepared by Dore and Whittier, undated, and provided to LGCI by Dore and Whittier on October 11, 2024.

Client:	Project:	Figure 3A – Exploration Location Plan - South	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childcare Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Legend

Approximate location of borings advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 28 and October 29, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Approximate location of test pits advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 30, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).



MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NAD 83

Approximate Scale (ft.)

20 0 20 40 80

Note

Figure based on drawing titled: Figure based on drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts", prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.

Limits of the proposed building and the infiltration basins are based on drawing titled: "Site Base Conditions, Wilmington Schools, North Intermediate, Wilmington, MA," prepared by Dore and Whittier, undated, and provided to LGCI by Dore and

Client:	Project:	Figure 3B – Exploration Location Plan - North	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childcare Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Appendix A – LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-1
PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near NW corner of prop. building
COORDINATES: NA
SURFACE El.: 93.0 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 84.0 ft. based on sample moisture
AT END OF DRILLING: 9.5 ft. / El. 83.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6	S1 - Top 8": Topsoil
		0.6	S1 S1	3-8-15-38 (23)	24/17		Fill	92.4	S1 - Bot. 9": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown, moist S2 - Silty SAND with Gravel (SM), fine to coarse, 20% fines, 36.5% fine to coarse subangular gravel, brown, moist (Sieve Performed)
	90.0	2	S2	42-28-26-18 (54)	24/12				
5		4	S3	21-13-10-4 (23)	24/0				S3 - No recovery
		6	S4	10-8-5-3 (13)	24/6		Silt	6.0 87.0	S4 - SILT (ML), slightly plastic, 5-10% fine sand, grey, moist
	85.0	8						9.0	
		9	S5	4-7-5-6 (12)	24/24		Clay	84.0	S5 - Lean CLAY (CL), slightly plastic, 15-20% fine to coarse sand, grey, wet
10		11							
	80.0							14.0	
		14	S6	6-11-10-9 (21)	24/12		Sand and Gravel	79.0	S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse subangular gravel, brown, wet
15		16							
	75.0							19.0	
		19	S7	100/0"	0/0	1			REMARK 1: Split spoon and auger refused on possible large boulder or rock at a depth of 19.0 feet. S7 - No recovery Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near NW side of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. Based on sample moisture
AT END OF DRILLING: 13.0 ft. / El. 81.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-7-9-10 (16)	24/15		Topsoil	0.8 / 93.2	S1 - Top 10": Topsoil Bot. 5": Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 20-25% fine to coarse subangular gravel, trace of organic soil, trace of roots, brown, moist
		2	S2	9-8-8-4 (16)	24/13		Fill	2.8 / 91.2	S2 - Top 10": Silty SAND (SM), mostly fine to medium, ~15% fines, ~10% fine to coarse subangular gravel, trace of organic soil, light brown to brown, moist Bot. 3": Silty SAND (SM), fine, 40-45% fines, trace of roots, black, moist (mostly organic soil)
	90.0	4	S3	5-5-10-10 (15)	24/19		Buried Organic Soil	4.0 / 90.0	S3 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
5		6	S4	13-13-17-16 (30)	24/17				S4 - Similar to S3, grey to light brown
	85.0	8							
		9	S5	10-15-13-11 (28)	24/18				▽ S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown to orange, wet
10		11					Sand and Gravel		
	80.0	14	S6	19-20-21-29 (41)	24/14				▼ S6 - Silty SAND (SM), fine to medium, ~25% fines, 5-10% fine subangular gravel, grey, wet
15		16							
	75.0	19	S7	100/0"	0/0	1		19.0	REMARK 1: Split spoon and auger refusal at depth of 19 feet on possible boulder or rock. S7 - No Recovery Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near northern corner of prop. building
COORDINATES: NA
SURFACE El.: 95.0 ft. (see note 1) **TOTAL DEPTH:** 10.2 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: NE
AT END OF DRILLING: NE
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.7	S1 - Top 8": Topsoil
			S1	3-4-8-8 (12)	24/16		Fill	94.3	Bot. 8": Well Graded SAND (SW-SM), fine to coarse, 0-5% fines, ~5% fine subangular gravel, light brown to orange, moist
		2						2.0	
			S2	12-41-26-18 (67)	24/10			93.0	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subangular gravel, light brown, moist
		4							
5	90.0		S3	11-8-12-16 (20)	24/11				S3 - Silty SAND (SM), mostly fine to medium, 15-20% fines, ~10% fine to coarse subrounded gravel, light brown to orange, moist
		6				1	Sand and Gravel		REMARK 1: Auger chattering between depths of 6 to 9 feet.
			S4	26-20-22-80/2" (42)	20/0				S4 - No Recovery
		7.7							
		9							
10	85.0		S5	36-70-20/3" (90/9")	15/4				S5 - Silty SAND with Gravel (SM), mostly fine to medium, ~15% fines, 30-35% fine to coarse subangular gravel, grey, moist
		10.3				2		10.2	REMARK 2: Split spoon and auger refusal at depth of 10.2 feet on possible boulder or rock.
									Bottom of borehole at 10.2 feet. Backfilled borehole with drill cuttings.
15	80.0								
20	75.0								
25	70.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 93.0 ft. (see note 1) **TOTAL DEPTH:** 11 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 84.0 ft. based on sample moisture
AT END OF DRILLING: NE
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6 / 92.4	S1 - Top 8": Topsoil
			S1	3-8-10-20 (18)	24/15		Fill		Bot. 7": Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown to orange, moist
		2				1		2.0 / 91.0	REMARK 1: Drill chattering observed from depth of 2 feet on possible boulder.
	90.0		S2	29-26-33-70/3" (59)	21/11				S2 - Silty SAND with Gravel (SM), fine to coarse, 20.5% fines, 36.9% fine to coarse subangular gravel, light brown, moist (Sieve Performed)
		3.8							
5		4	S3	15-17-36-52 (53)	24/16				S3 - Similar to S2, 25-30% fine to coarse subangular gravel, light brown to grey
		6	S4	16-29-29-39 (58)	24/11		Sand and Gravel		S4 - Silty SAND with gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, brown, moist
	85.0	8							
		9	S5	18-82/4" (82/4")	10/5				S5 - Similar to S4, wet
10		9.8							
						2		11.0	REMARK 2: Split spoon and auger refusal at depth of 11 feet on possible large boulder or rock.
									Bottom of borehole at 11.0 feet. Backfilled borehole with drill cuttings.
	80.0								
15									
	75.0								
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 10.5 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. based on sample moisture
AT END OF DRILLING: 9.0 ft. / El. 85.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	3-5-5-5 (10)	24/14		Topsoil	0.7	S1 - Top 9": Topsoil
		2	S2	4-4-3-3 (7)	24/3		Fill	93.3	Bot. 5": Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, trace of organic soil, trace roots, dark brown, moist S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace roots, dark brown, moist
	90.0	4				1	Buried Organic Soil	4.0 90.0 4.4 89.6	REMARK 1: Split spoon bouncing at depth of 4 feet. Borehole offset 4 feet East.
5		6	S3	10-16-22-20 (38)	24/18				S3 - Top 4": Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, trace roots, dark brown, moist
		8	S4	21-33-24-17 (57)	24/12	2	Sand and Gravel		Bot. 14": Silty SAND (SM), fine to coarse, 15-20% fines, 20-25% fine subangular gravel, brown, moist REMARK 2: Drill chattering observed on possible boulders from depth of 6 feet. S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, brown to grey, moist
	85.0	9							
		9.2	S5	100/2"	2/1				S5 - Similar to S3 Bot. 14", wet, (little to no recovery)
10		10.5	S6	100/0"	0/0	3		10.5	REMARK 3: Auger and split spoon refusal on possible boulder or rock at depth of 10.5 feet. Due to time contraint boring was terminated. S6 - No recovery Bottom of borehole at 10.5 feet. Backfilled borehole with drill cuttings.
	80.0								
15									
	75.0								
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near southern face of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19.7 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 14.0 ft. / El. 80.0 ft. based on sample moisture
AT END OF DRILLING: 18.0 ft. / El. 76.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0							
			S1	2-2-6-11 (8)	24/16		Topsoil	2.0	S1 - Topsoil
		2						92.0	
			S2	12-9-12-17 (21)	24/14		Fill		S2 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~15% fine to coarse subangular gravel, orange to light brown, moist (possibly reworked)
	90.0	4							
5			S3	13-19-21-18 (40)	24/15				S3 - Similar to S2
		6						6.0	
			S4	15-13-22-23 (35)	24/17			88.0	S4 - Silty SAND (SM), fine to coarse, 15-20% fines, 0-5% fine to coarse subangular gravel, brown, moist
		8							
	85.0	9							
			S5	13-22-80/3" (102/9")	15/13	1			REMARK 1: Drill chattering observed on possible boulders at depth 9 feet. S5 - Similar to S4
10		10.3							
							Sand and Gravel		
	80.0	14							
			S6	14-17-26-35 (43)	24/21				S6 - Similar to S4, wet
15		16							
	75.0	19						19.0	
			S7	22-80/3" (80/3")	9/4		Weathered Rock	75.0 19.7	S7 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 35-40% fine to coarse subangular gravel, trace of weathered rock, black to brown, wet
20		19.8							Bottom of borehole at 19.7 feet. Backfilled borehole with drill cuttings.
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SW corner of prop. building
COORDINATES: NA
SURFACE El.: 92.0 ft. (see note 1) **TOTAL DEPTH:** 20.2 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 82.0 ft. based on sample moisture
AT END OF DRILLING: 10.5 ft. / El. 81.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-7-9 (10)	24/14		Topsoil	0.9	S1 - Top 11": Topsoil
	90.0	2	S2	8-7-10-10 (17)	24/0		Fill	91.1	Bot. 3": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, 20-25% fine to coarse subangular gravel, brown, moist S2 - No recovery
5		4	S3	14-10-5-6 (15)	24/0				S3 - No recovery
	85.0	6	S4	17-17-23-24 (40)	24/4		Buried Organic Soil	6.0 86.0	S4 - Silty SAND (SM), fine to medium, 25-30% fines, 0-5% fine to coarse subangular gravel, trace of organic soil, dark brown to black, moist
		8	S5	11-11-12-11 (23)	24/16			8.0 84.0	S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, grey, moist
10		10	S6	7-10-15-15 (25)	24/15				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, brown, wet
	80.0	12							
		14	S7	9-14-12-43/3" (26)	21/12		Sand and Gravel		S7 - Similar to S6, 25-30% fine to coarse subangular gravel
15		15.8							
	75.0	19	S8	24-26-75/3" (101/9")	15/11				S8 - Silty SAND (SM), fine to coarse, 15-20% fines, ~5% fine subangular gravel, brown, wet
20		20.3						20.2	
	70.0								Bottom of borehole at 20.2 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near center of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19.8 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. Based on sample moisture
AT END OF DRILLING: 16.5 ft. / El. 77.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-5-6-11 (11)	24/20		Fill	0.7 93.3	S1 - Top 9": Silty SAND (SM), fine, 25-30% fines, trace of roots, brown, moist Mid. 10": Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, black, moist
		2	S2	8-6-8-8 (14)	24/16		Subsoil		Bot. 1": Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~15% fine to coarse subangular gravel, trace of organic soil, orange, moist S2 - Top 10": Silty SAND (SM), fine, 25-30% fines, ~5% fine subangular gravel, brown, moist
	90.0	4						4.0 90.0	Bot. 6": Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine to coarse subangular gravel, light brown, moist
5			S3	12-18-25-24 (43)	24/15				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~30% fine to coarse subangular gravel, light brown, moist
		6	S4	24-21-23-29 (44)	24/18				S4 - Similar to S3, ~15% fine subangular gravel
		8							
	85.0	9	S5	18-82	12/8				S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, grey to olive, wet
10		10					Sand and Gravel		
	80.0	14	S6	20-25-25-45 (50)	24/14				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, olive to grey, wet
15		16							
	75.0	19	S7	10-95/4" (95/4")	10/8				S7 - Similar to S6
20		19.8				1		19.8	REMARK 1: Split spoon refusal at depth of 19.8 feet on possible boulder or rock. Bottom of borehole at 19.8 feet. Backfilled borehole with drill cuttings.
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

Appendix B – LGCI's Test Pit Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-1
PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near western face of prop. school
COORDINATES: NA
SURFACE EL.: 92.0 ft. (see note 1) **TOTAL DEPTH:** 11 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** 9.5 ft. / El. 82.5 ft.

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 9' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth / El. (ft.)	Material Description
		E		Topsoil	1.5 / 90.5	0 ft. - 1.5 ft.: Topsoil
		M				
	90.0	M		Fill		1.5 ft. - 5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace of roots, brown, moist (cobbles up to 12 inches make up 5-10% of stockpile)
2.5		D				
	87.5					
5.0			1			5 ft. - 7 ft.: Silty SAND with Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine subangular gravel, brown, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 5 feet beneath the ground surface.
		D				
	85.0				7.0 / 85.0	
7.5		D		Swamp Deposits		7 ft. - 10 ft.: Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace of roots, trace of organic odor, grey, moist to wet
	82.5					▼
10.0					10.0 / 82.0	
		D		Sand		10 ft. - 11 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, grey, wet
			2		11.0	REMARK 2: Test pit terminated due to excavator refusal at depth of 11 feet on possible boulder or rock. Bottom of test pit at 11.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-2
PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near southern face of proposed school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 10' X 7'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.7	0 ft. - 0.7 ft.: Topsoil
	92.5	E		Fill	93.3	0.7 ft. - 4 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, ~10% fine to coarse subangular gravel, trace of roots, trace of organic soil, brown to orange, moist
2.5						
	90.0		1			
		M	2			4 ft. - 5.5 ft.: Silty SAND (SM), mostly fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4 feet beneath the ground surface. REMARK 2: Unmarked cast iron pipe encuntered near the southwestern corner of the test pit, excavator bucket pulled and bent pipe. Pipe does not appear to be broken. DPW indicated that they are not aware of utilties at this location.
5.0					5.5	
	87.5	M		Sand and Gravel	88.5	5.5 ft. - 9 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 10-15% fine to coarse subangular gravel, light brown, moist
7.5						
	85.0				9.0	Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-2A
PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near southern face of prop. school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 11.3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: 9.5 ft. / El. 84.5 ft.

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 10' X 3'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	92.5	E		Topsoil	1.5 92.5	0 ft. - 1.5 ft.: Topsoil
2.5		E		Fill		1.5 ft. - 7 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of roots, trace of organic soil, brown to orange, moist
	90.0					
5.0		M				
	87.5				7.0 87.0	
7.5				Sand and Gravel		7 ft. - 11.3 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 10-15% fine to coarse subangular gravel, light brown, moist (wet after 9.5 feet)
	85.0	M				
10.0						
		V	1		11.3	REMARK 1: Test pit terminated due to excavator refusal at depth of 11.3 feet on possible boulder or rock.
						Bottom of test pit at 11.3 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

TEST PIT LOG

TP-3
PAGE 1 OF 1

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/31/24 **DATE COMPLETED:** 10/31/24
TEST PIT LOCATION: Near eastern face of prop. school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 8 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 11' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		E		Fill	93.2	0.8 ft. - 1 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, light brown, moist 1 ft. - 2.3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of roots, dark brown, moist
	92.5	E				
2.5		E		Sand and Gravel	2.3 91.7	2.3 ft. - 4 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 20-25% fine to coarse subangular gravel, light brown to orange, moist
		M				
	90.0		1			4 ft. - 8 ft.: Poorly Graded SAND with Gravel (SP), mostly medium to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4 feet beneath the ground surface.
5.0		M				
	87.5	D				
7.5		V			8.0	
			2			REMARK 2: Test pit terminated due to excavator refusal at depth of 8 feet on possible boulder or rock. Bottom of test pit at 8.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-4

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/31/24 **DATE COMPLETED:** 10/31/24
TEST PIT LOCATION: Near eastern face of exisitng school
COORDINATES: NA
SURFACE EL.: 95.0 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 10' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

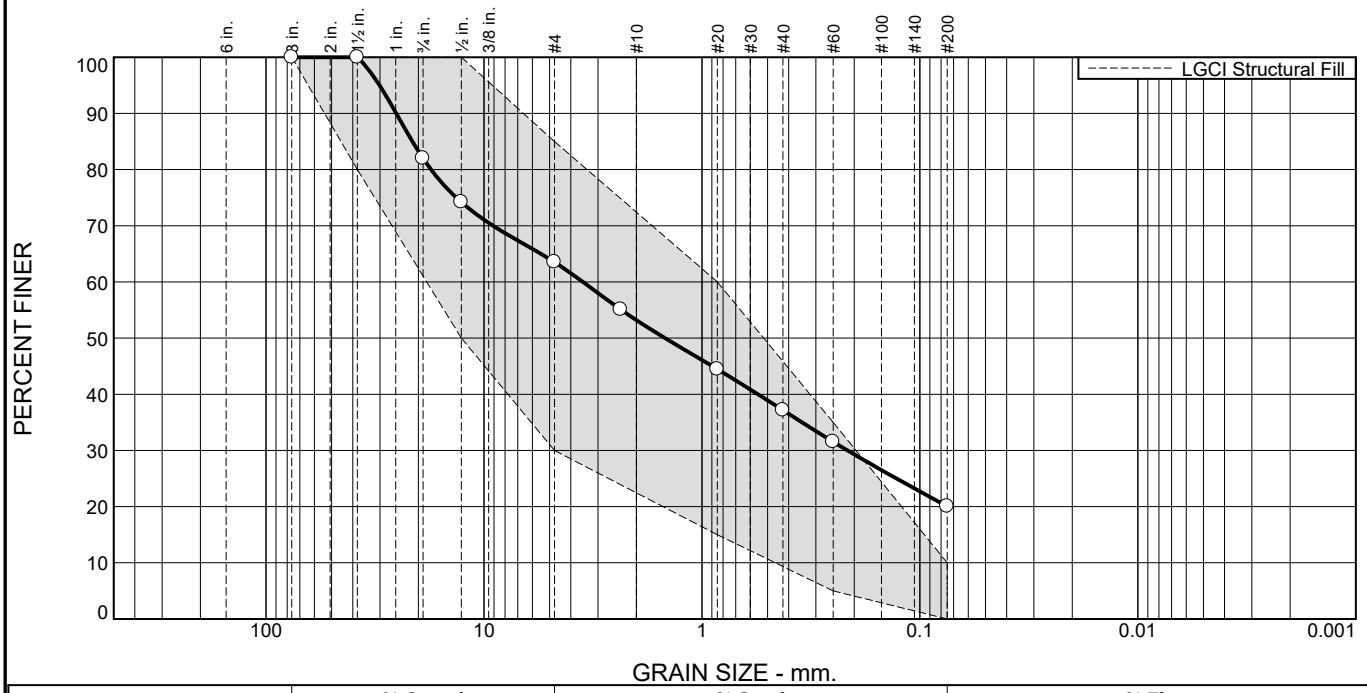
Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
		E		Fill	94.0 2.0	1 ft. - 2 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, 0-5% fine to coarse subangular gravel, light brown, moist
2.5	92.5	E		Subsoil	93.0 3.2	2 ft. - 3.2 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 0-5% fine to coarse subangular gravel, trace of organic soil, trace of roots, orange, moist
		E		Sand and Gravel	91.8	3.2 ft. - 4.6 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown to orange, moist
		M	1			
5.0	90.0	M				4.6 ft. - 9 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse subangular gravel, brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4.6 feet beneath the ground surface.
		D				
7.5	87.5	V				
			2		9.0	REMARK 2: Test pit terminated due to excavator refusal at depth of 9 feet on possible boulder or rock. Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

Appendix C – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.0	18.5	10.3	16.0	17.2	20.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	82.0		
1/2"	74.2	50.0 - 100.0	
#4	63.5	30.0 - 85.0	
#8	55.1		
#20	44.5	15.0 - 60.0	
#40	37.2		
#60	31.5	5.0 - 35.0	
#200	20.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 20% fines, 36.5% fine to coarse subangular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 25.2612 D_{85}= 21.2913 D_{60}= 3.5169
D_{50}= 1.4776 D_{30}= 0.2147 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.

Date Received: 10/28/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: JKW

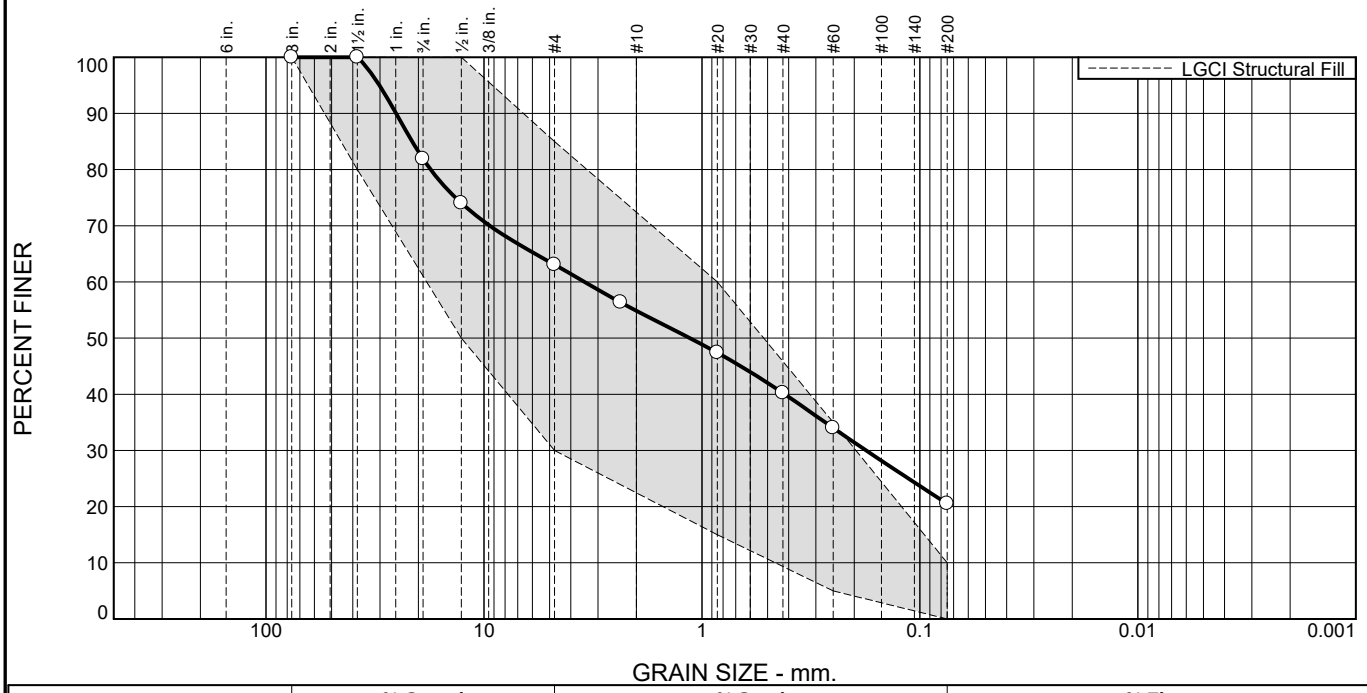
Location: B-1
Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 10/28/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.1	18.8	8.2	14.7	19.7	20.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	81.9		
1/2"	74.0	50.0 - 100.0	
#4	63.1	30.0 - 85.0	
#8	56.4		
#20	47.4	15.0 - 60.0	
#40	40.2		
#60	34.0	5.0 - 35.0	
#200	20.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 20.5% fines, 36.9% fine to coarse subangular gravel, light brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 25.3090 D_{85}= 21.3513 D_{60}= 3.4571
D_{50}= 1.1367 D_{30}= 0.1765 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sand and Gravel Sample.

Date Received: 10/29/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: JKW

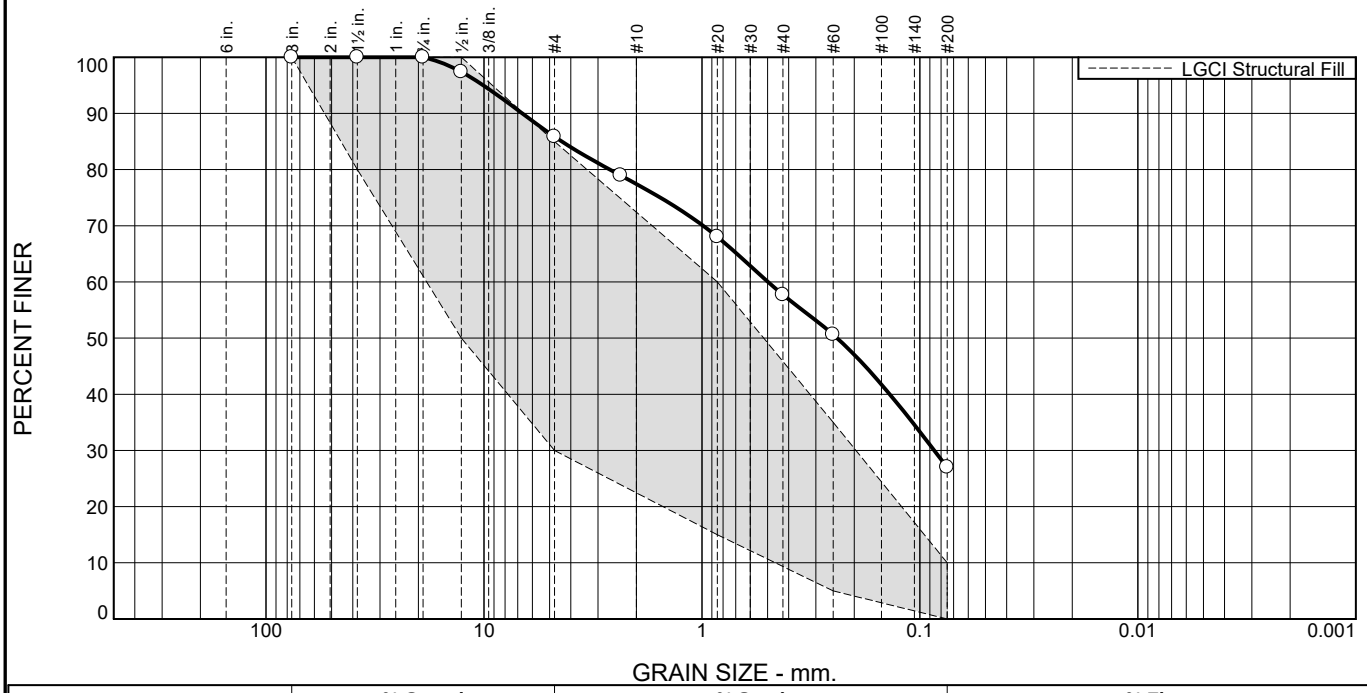
Location: B-4
Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 10/29/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.1	8.5	19.7	30.7	27.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	100.0		
1/2"	97.4	50.0 - 100.0	
#4	85.9	30.0 - 85.0	X
#8	79.0		
#20	68.0	15.0 - 60.0	X
#40	57.7		
#60	50.6	5.0 - 35.0	X
#200	27.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Silt and Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine subangular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 6.6746 D_{85}= 4.3959 D_{60}= 0.4977
D_{50}= 0.2399 D_{30}= 0.0859 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.
Infiltrometer Test.

Date Received: 10/30/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

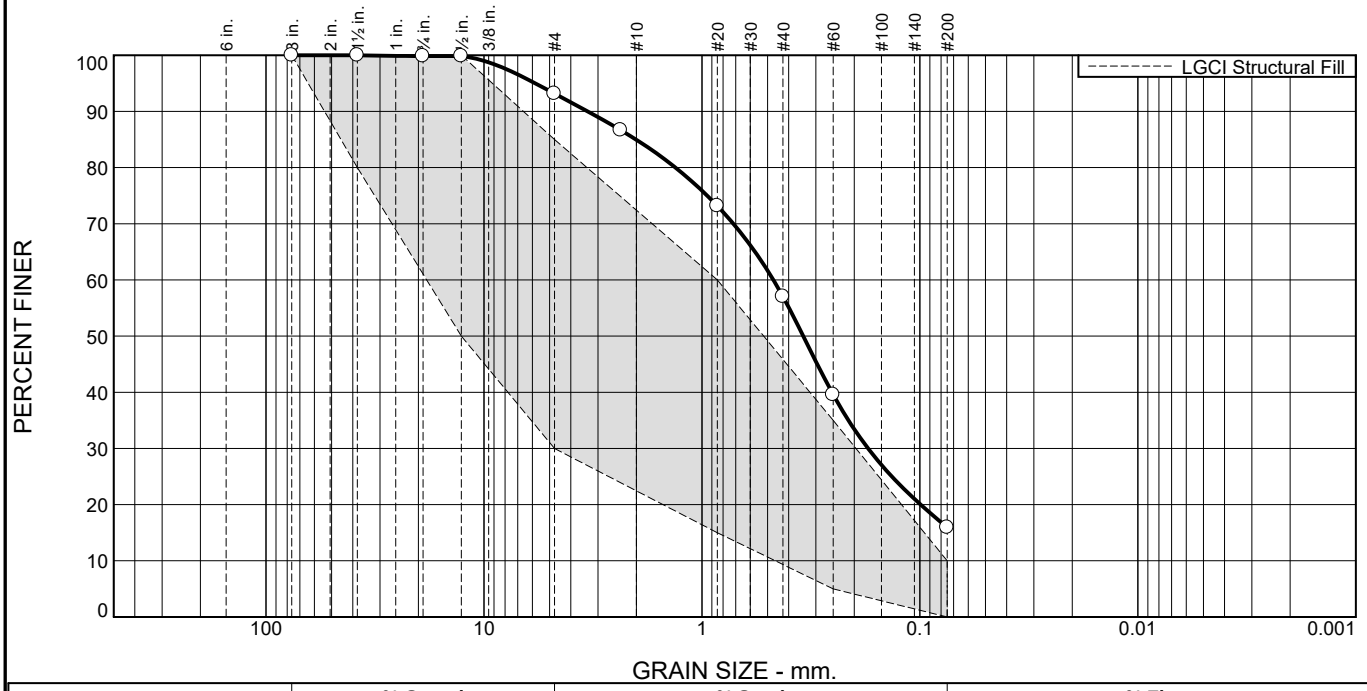
Location: TP-1
Sample Number: Infiltrometer **Depth:** 5'

Date Sampled: 10/30/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.2	6.6	8.2	28.0	41.1	15.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4'	99.8		
1/2"	99.8	50.0 - 100.0	
#4	93.2	30.0 - 85.0	X
#8	86.7		
#20	73.2	15.0 - 60.0	X
#40	57.0		
#60	39.6	5.0 - 35.0	X
#200	15.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), mostly fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 3.3438 D_{85}= 2.0080 D_{60}= 0.4704
D_{50}= 0.3428 D_{30}= 0.1729 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.
Infiltrometer Test.

Date Received: 10/30/24 **Date Tested:** 10/31/24

Tested By: LC

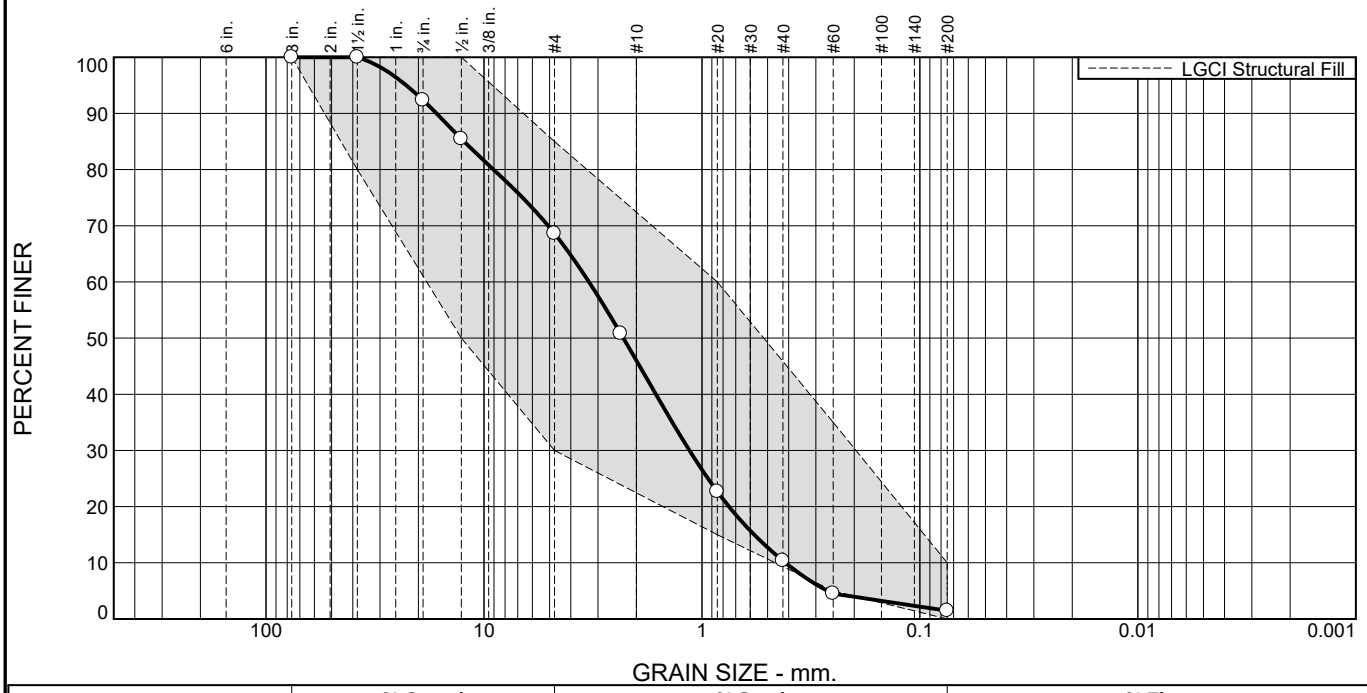
Checked By: SG

Location: TP-2
Sample Number: Infiltrometer **Depth:** 4' **Date Sampled:** 10/30/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.6	23.8	22.6	35.6	8.9	1.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	92.4		
1/2"	85.5	50.0 - 100.0	
#4	68.6	30.0 - 85.0	
#8	50.8		
#20	22.7	15.0 - 60.0	
#40	10.4		
#60	4.5	5.0 - 35.0	X
#200	1.5	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Gravel (SP), fine to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP **AASHTO (M 145)=**

Coefficients

D_{90}= 16.5194 D_{85}= 12.3470 D_{60}= 3.2999
D_{50}= 2.2934 D_{30}= 1.1409 D_{15}= 0.5758
D_{10}= 0.4140 C_u= 7.97 C_c= 0.95

Remarks

Sand and Gravel Sample.
Infiltrometer Test.

Date Received: 10/31/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

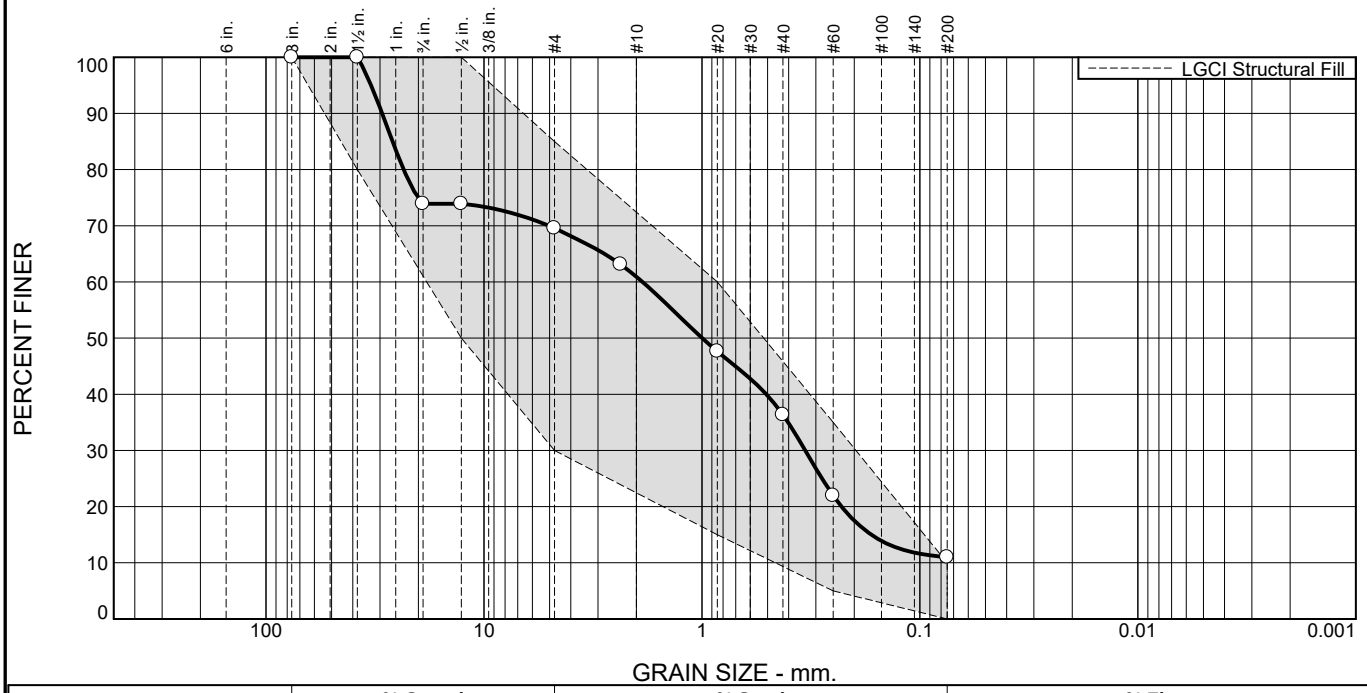
Location: TP-3
Sample Number: Infiltrometer **Depth:** 4'

Date Sampled: 10/31/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	26.1	4.3	8.7	24.6	25.3	11.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	73.9		
1/2"	73.9	50.0 - 100.0	
#4	69.6	30.0 - 85.0	
#8	63.1		
#20	47.6	15.0 - 60.0	
#40	36.3		
#60	22.0	5.0 - 35.0	
#200	11.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse subangular gravel, brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 29.3481 D_{85}= 26.2822 D_{60}= 1.8746
D_{50}= 0.9972 D_{30}= 0.3357 D_{15}= 0.1671
D_{10}= C_u= C_c=

Remarks

Sand and Gravel Sample.
Infiltrometer Test.

Date Received: 10/31/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

Location: TP-4
Sample Number: Infiltrometer **Depth:** 4.6'

Date Sampled: 10/31/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Appendix D – Results of Double Ring Infiltrometer Tests

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-1

Test Procedure: General accordance with ASTM D 3385

Test Date 10/30/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 5 feet

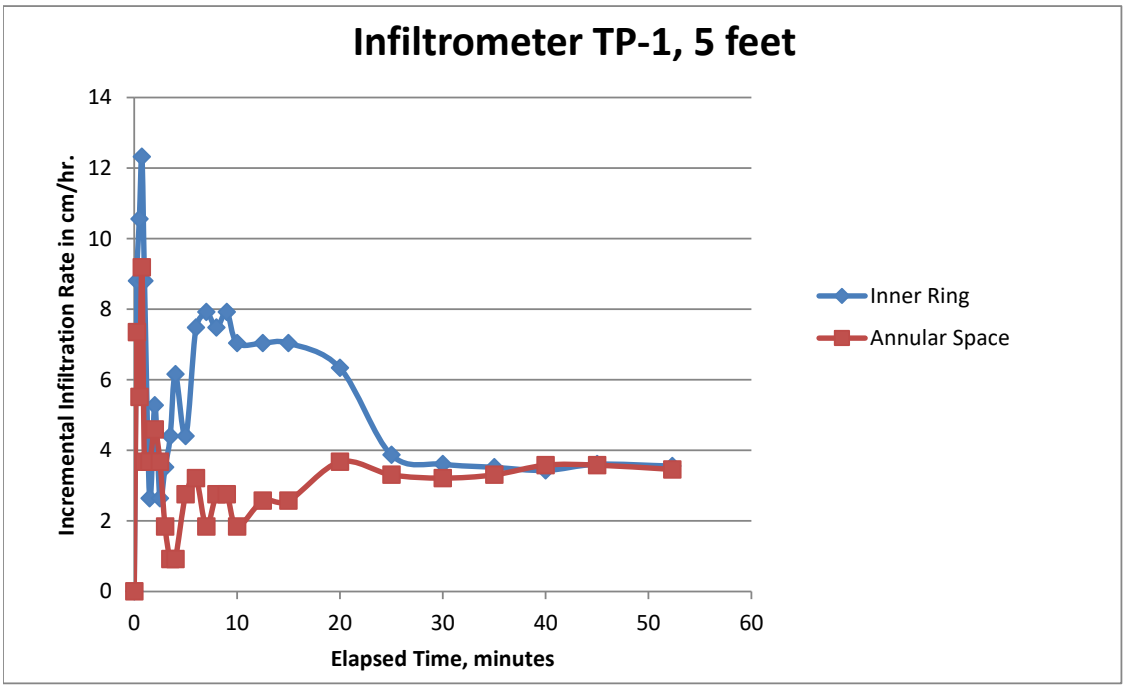
Groundwater Depth: 9.5 ft. / El. 82.5 ft. at the end of excavation

Soil Stratum: ASTM (D 2488) Classification: Silty SAND with Silt and Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine gravel, brown

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	56.3	0	0	57.2	0	0
0.25	0.25	55.8	27	8.8	56.8	67	7.3
0.5	0.25	55.2	32	10.6	56.5	50	5.5
0.75	0.25	54.5	37	12.3	56.0	84	9.2
1	0.25	54.0	27	8.8	55.8	34	3.7
1.5	0.5	53.7	16	2.6	55.4	67	3.7
2	0.5	53.1	32	5.3	54.9	84	4.6
2.5	0.5	52.8	16	2.6	54.5	67	3.7
3	0.5	52.4	21	3.5	54.3	34	1.8
3.5	0.5	51.9	27	4.4	54.2	17	0.9
4	0.5	51.2	37	6.2	54.1	17	0.9
5	1	50.2	54	4.4	53.5	101	2.8
6	1	48.5	91	7.5	52.8	117	3.2
7	1	46.7	96	7.9	52.4	67	1.8
8	1	45.0	91	7.5	51.8	101	2.8
9	1	43.2	96	7.9	51.2	101	2.8
10	1	41.6	86	7.0	50.8	67	1.8
12.5	2.5	37.6	214	7.0	49.4	235	2.6
15	2.5	33.6	214	7.0	48.0	235	2.6
20	5	26.4	385	6.3	44.0	670	3.7
25	5	22.0	235	3.9	40.4	603	3.3
30	5	17.9	219	3.6	36.9	586	3.2
35	5	13.9	214	3.5	33.3	603	3.3
40	5	10.0	209	3.4	29.4	653	3.6
45	5	5.9	219	3.6	25.5	653	3.6
52.3	7.3	0.0	316	3.6	20.0	921	3.5

Notes:



Estimated K = 1.00E-03 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-2

Test Procedure: General accordance with ASTM D 3385

Test Date 10/30/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4 feet

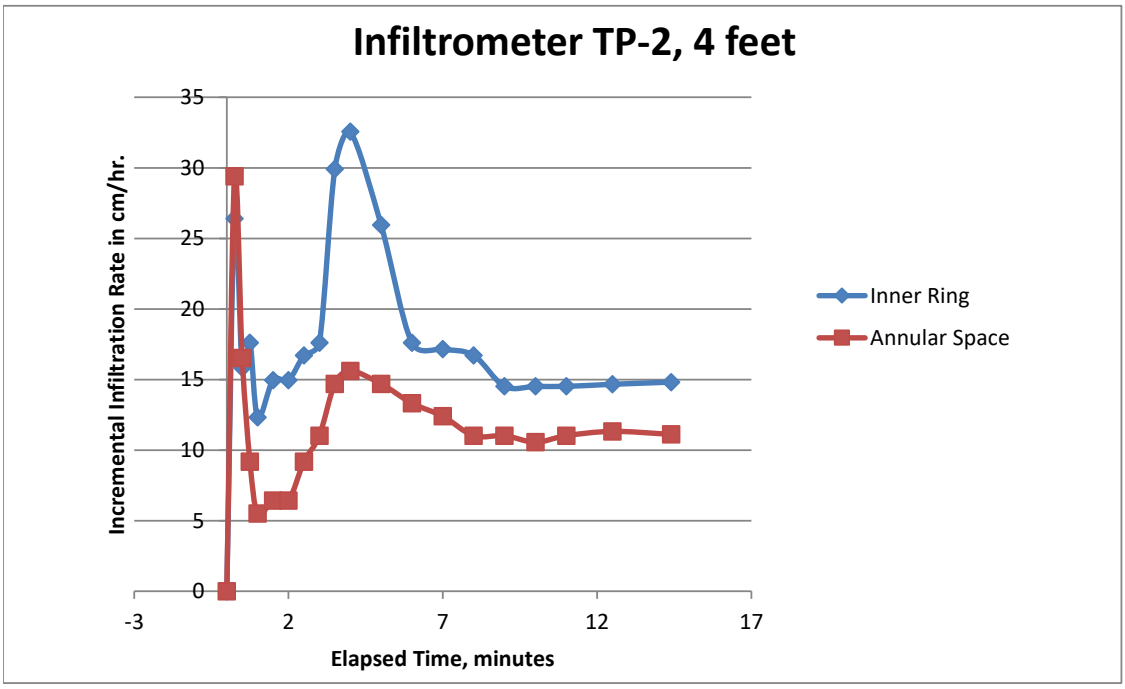
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Silty SAND (SM), moslty fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.4	0	0	57.5	0	0
0.25	0.25	55.9	80	26.4	55.9	268	29.4
0.5	0.25	55.0	48	15.8	55.0	151	16.5
0.75	0.25	54.0	54	17.6	54.5	84	9.2
1	0.25	53.3	37	12.3	54.2	50	5.5
1.5	0.5	51.6	91	15.0	53.5	117	6.4
2	0.5	49.9	91	15.0	52.8	117	6.4
2.5	0.5	48.0	102	16.7	51.8	168	9.2
3	0.5	46.0	107	17.6	50.6	201	11.0
3.5	0.5	42.6	182	29.9	49.0	268	14.7
4	0.5	38.9	198	32.6	47.3	285	15.6
5	1	33.0	316	26.0	44.1	536	14.7
6	1	29.0	214	17.6	41.2	486	13.3
7	1	25.1	209	17.2	38.5	452	12.4
8	1	21.3	203	16.7	36.1	402	11.0
9	1	18.0	177	14.5	33.7	402	11.0
10	1	14.7	177	14.5	31.4	385	10.6
11	1	11.4	177	14.5	29.0	402	11.0
12.5	1.5	6.4	268	14.7	25.3	620	11.3
14.4	1.9	0.0	343	14.8	20.7	771	11.1

Notes:



Estimated K = 4.06E-03 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-3

Test Procedure: General accordance with ASTM D 3385

Test Date 10/31/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4 feet

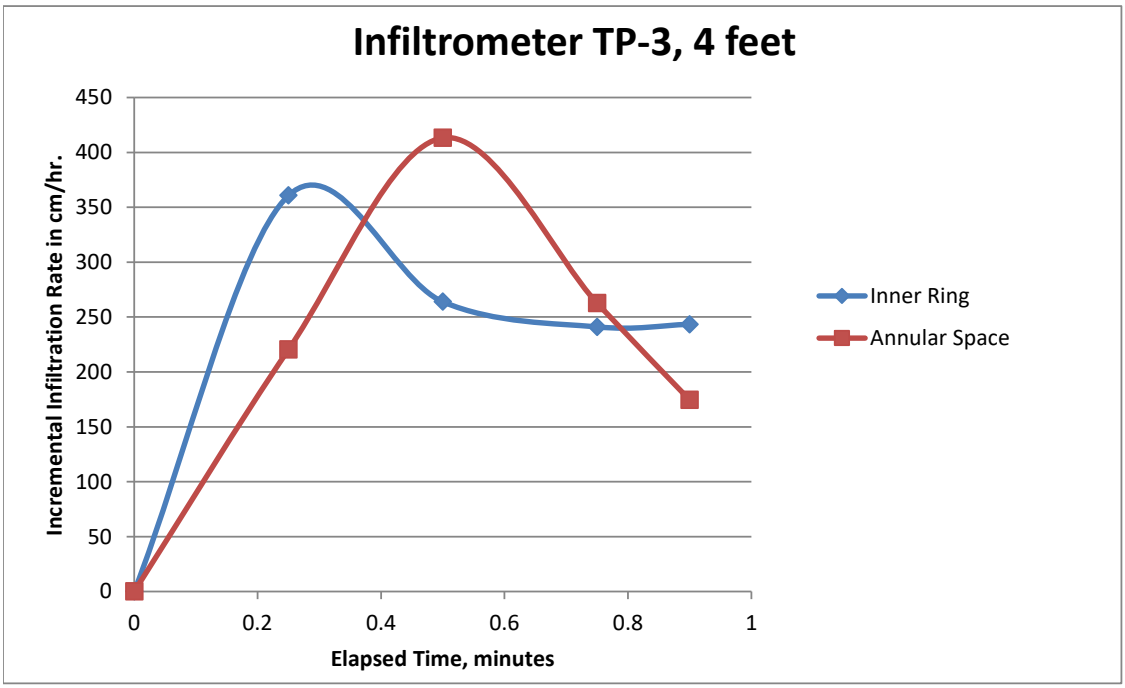
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Poorly Graded SAND with Gravel (SP), fine to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.5	0	0	57.5	0	0
0.25	0.25	37.0	1097	360.7	45.5	2010	220.4
0.5	0.25	22.0	803	263.9	23.0	3769	413.3
0.75	0.25	8.3	733	241.1	8.7	2396	262.7
0.9	0.15	0.0	444	243.4	3.0	955	174.5

Notes:



Estimated K 6.73E-02 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-4

Test Procedure: General accordance with ASTM D 3385

Test Date 10/31/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4.5 feet

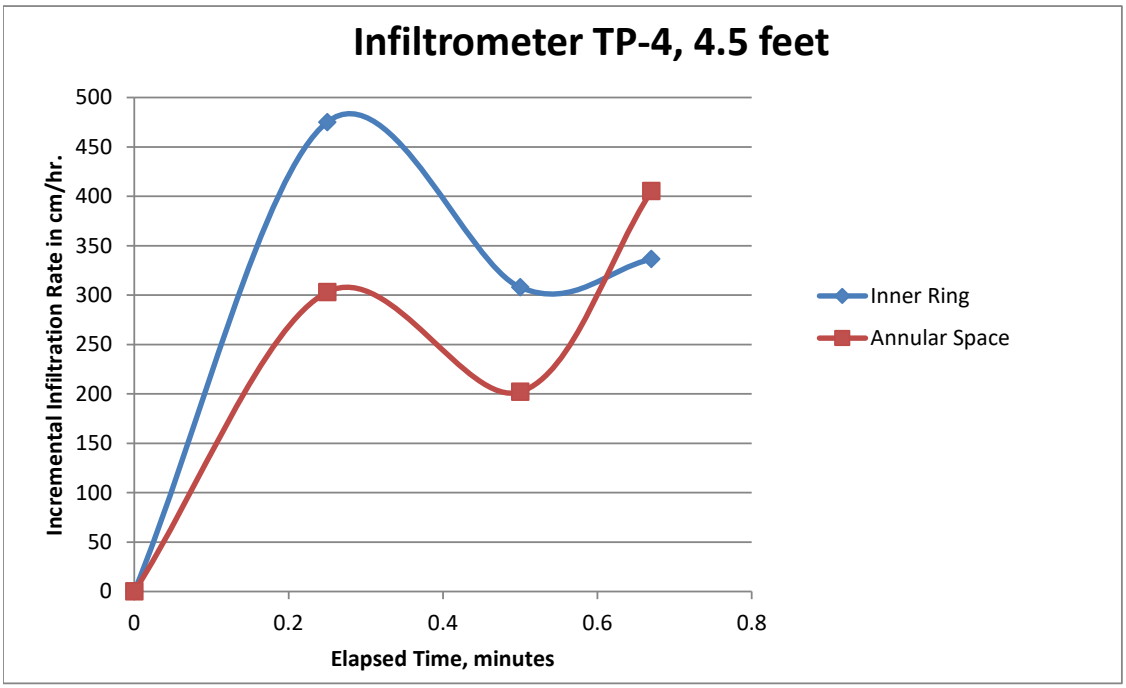
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse gravel, brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.5	0	0	57.5	0	0
0.25	0.25	30.5	1445	475.1	41.0	2764	303.1
0.5	0.25	13.0	937	307.9	30.0	1843	202.0
0.67	0.17	0.0	696	336.4	15.0	2513	405.2

Notes:



Estimated K* = 8.95E-02 cm/sec

* Value may not be reliable to short time to complete test

PEER
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Engineers • Scientists • Planners

November 15, 2024

Rani Philip, Assoc. AIA
Project Manager
DORE + WHITTIER
260 Merrimac Street
Newburyport, Massachusetts 01950

Re: WILMINGTON – WILDWOOD SCHOOL @ NORTH INTERMEDIATE SCHOOL
320 Salem Street, Wilmington, MA 01887
Limited Subsurface Soil Investigation Memorandum

Dear Ms. Philip:

PEER Consultants P.C. (PEER) completed an initial review of the environmental laboratory analytical results for the initial eight (8) combined geotechnical/geo-environmental borings completed at the North Intermediate School location on October 28, 2024 and October 29, 2024. The weather on October 28, 2024 was partly cloudy to sunny, and the temperature ranged from 34°F to 51°F. The weather on October 29, 2024 was cloudy with haze (smoke), and the temperature ranged from 36°F to 40°F. PEER understands that Soil X was the drilling contractor on the project site, and utilized a Dietrich D70 Turbo Track-Mounted Drill Rig, with hollow stem augers (and no drive and wash) to complete the borings. Soil X was represented by a driller, and driller's assistance. Lahlaf Geotechnical Consulting, Inc., the geotechnical contractor, was represented by Mr. Berke Hatipoglu. PEER was represented by Mr. Dave Gorden, Board Certified Environmental Scientist and Certified Professional Soil Scientist.

During the limited subsurface soil investigation at the North Intermediate School, combined with limited recovery of soil within the split spoons, PEER collected nine (9) separate, composited soil samples from specific boring depths, and/or from across multiple nearby borings, and related to an investigation for the presence or absence of pesticides and/or herbicides in Topsoil (TS) material, and related to an investigation of soil conditions for disposal pre-characterization purposes in Dry Native / Reworked Native / Suspected Imported Similar (DRY) material, and related to an investigation of soil conditions for disposal pre-characterization purposes in Wet Native (WET) material.

Please note that PEER considered reworked native soil to be soil which visually appeared similar to soil on the project site, and soil which was suspected of having been excavated during the development of the existing school, and then redeposited on the surface of other areas of the project site.

PEER selected representative aliquots of soil from the top soil (TS) of each one of the borings B1 through B8, at a depth, in general, from 0-2' (or consisting of the dark brown to black portion of the top soil) to be analyzed for Pesticides and Herbicides [**B1B8 TS**]. Please note that on November 13, 2024, subsequent to PEER receiving the analytical results for the entire sample delivery group from the analytical laboratory, PEER also requested that the analytical laboratory determine the concentration of arsenic in the sample [**B1B8 TS**].

PEER selected soil from the dry (not within the groundwater table) native soil / reworked native soil / suspect imported similar soil to be analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs), Metals, Polychlorinated Biphenyls (PCBs), Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO) {C10-C28}, and TPH Gasoline Range Organics (GRO) {C6-C10}, and for General Chemistry parameters such as Percent Solids, Conductivity, Corrosivity (pH), Flashpoint/Ignitability, Reactive Cyanide, and Reactive Sulfide.

Due to the predominance of visually similar soil across the completed borings down to the boring termination depth, PEER collected analytical samples for the above parameters based on the following depth intervals:

- **B3B4B5 DRY** was composited (including representative aliquots of) soil from Boring B3 at depths of 0-2', 2-4', and 4-6'; from Boring B4 at depths of 0-2', 2-2.9', and 4-6'; and from Boring B5 at depths of 0-2' and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B1 DRY** was composited (including representative aliquots of) soil from Boring B1 at depths of 0-2' and 2-4'. This composited sample did not include the dark brown to black portion of the top soil.
- **B2 DRY** was composited (including representative aliquots of) soil from Boring B2 at depths of 0-2', 2-4', and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B6 DRY** was composited (including representative aliquots of) soil from Boring B6 at depths of 0-2', 2-4', and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B8 DRY** was composited (including representative aliquots of) soil from Boring B8 at depths of 0-2', 2-4', 4-6', and 6-8'. This composited sample did not include the dark brown to black portion of the top soil.

PEER selected soil from the presumed wet (due to groundwater) native soil to be analyzed for VOCs, SVOCs, Metals, PCBs, TPH DRO, TPH GRO, and for General Chemistry parameters such as Percent Solids, Conductivity, Corrosivity (pH), Flashpoint/Ignitability, Reactive Cyanide, and Reactive Sulfide.

Due to the predominance of visually similar soil across the completed borings at or below the groundwater table, and down to the boring termination depth, PEER collected analytical samples for the above parameters based on the following depth intervals:

- **B6B8 WET** was composited (included representative aliquots of) soil from Boring B6 at depths of 9-11' and 14-16'; and from Boring B8 at depths of 9-11' and 14-16'.
- **B1B7 WET** was composited (including representative aliquots of) soil from Boring B1 at depths of 9-11' and 14-16'; and from Boring B7 at depths of 8-10', 10-12', and 14-16'.
- **B2 WET** was composited (included representative aliquots of) soil from Boring B2 at depths of 6-8', 9-11', and 14-16'.

PEER reviewed the textural and moisture conditions for each of the eight borings. PEER identified the following conditions in the subsurface soil:

- In general, soil from **Boring B1** consisted of material consisting of sand and gravel to at least 4 feet. The origin of this material (fill versus reworked native versus native) could be determined as the split spoon had no recovery for the 4-6' interval. However, soil from Boring B1 consisted of suspect native clayey silt to silty clay to clay from 6 feet to 11 feet, and suspect native sand and gravel to 19 feet, then suspect bedrock at 19 feet, and auger refusal at 19 feet. Groundwater indicators were observed at approximately between 8 feet and 9 feet.

- In general, soil from **Boring B2** consisted of suspect fill (sand) to 3 feet (with buried top soil observed at approximately 3 feet), then suspect native sand and gravel (with trace clay at depths) to 19.1 feet, then suspect bedrock at 19.1 feet, and auger refusal at 19.1 feet. Groundwater indicators were observed at approximately 6 feet.

- In general, soil from **Boring B3** consisted of suspect reworked native sand and gravel to 2 feet, then suspect native sand and gravel to 8 feet, then suspect bedrock at 9 feet, and auger refusal at 10.5 feet. Groundwater indicators were not observed.

- In general, soil from **Boring B4** consisted of suspect fill (sand) to 2.9 feet, then suspect native silty sand and a suspect weathered cobble to 9.7 feet, then suspect bedrock at 11 feet, and auger refusal at 11 feet. Remnant groundwater indicators (mottling) in a moist soil matrix were observed at approximately 6 feet.

- In general, soil from **Boring B5** consisted of suspect fill (sand) to 4 feet (with buried top soil observed at approximately 4 feet), then suspect native silty sand to 9 feet, then suspect bedrock at 9 feet, and auger refusal at 10 feet. Remnant groundwater indicators (mottling) in a moist soil matrix were observed at approximately 6 feet.

- In general, soil from **Boring B6** consisted of suspect fill (sand) to 2 feet, then suspect native sand and gravel to 19 feet, then suspect bedrock at 19 feet, and auger refusal at 19.7 feet. Groundwater indicators were observed at approximately 6.2 feet.

- In general, soil from **Boring B7** consisted of suspect fill (sand) to 4 feet (with buried organics observed between approximately 4 feet to 8 feet), then suspect native sand and gravel to 20.2 feet, then suspect bedrock at 20.2 feet, and auger refusal at 20.2 feet. Groundwater indicators were observed at approximately 8 feet.

- In general, soil from **Boring B8** consisted of suspect fill (sand) to 1 foot, then suspect native sand and gravel to 19.8 feet, and auger refusal at 19.8 feet. Groundwater indicators were observed at approximately between 8 feet and 9 feet.

PEER estimated and documented a global positioning system (GPS) point for each boring based on an open source electronic application; therefore, the location of each soil boring, as estimated in the below Google Earth image is considered approximate only.

Wildwood School @ North Intermediate School, Wilmington, MA
(North is Up)

PEER compared the laboratory analytical results to Massachusetts Department of Environmental Protection (MADEP) Policy # COMM-97-001, Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, August 1997. PEER also compared the laboratory analytical results to 310 CMR 40.00, the Massachusetts Contingency Plan (MCP) reporting category RCS-1 and reporting category RCS-2. General chemistry laboratory results were separately compared with RCRA Characteristics under 40 CFR 261. Additional discussions pertaining to the comparison of soil analytical results may be found in the paragraphs below.

The following information provides a summary of the laboratory analytical results from soil samples collected by PEER on October 28, 2024 and October 29, 2024. Please refer to Attachment A for a summary of the detected analytes, in surface and subsurface soil. The samples were kept under chain of custody by PEER, and in a cooler with ice packs, until Phoenix Environmental Laboratories, Inc. (Phoenix), of Manchester, CT couriered the samples back to their office on October 30, 2024. PEER received the Analysis Report from Phoenix with the test results on November 6, 2024. PEER received an updated Analysis Report from Phoenix which also included the test results for arsenic in sample **B1B8 TS** on November 14, 2024. Please refer to Attachment B for the November 14, 2024 Phoenix Analysis Report.

VOCs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were no detections of individual VOCs. In addition, there were no exceedances of the MCP RCS-1 Criteria for an individual VOC, and there were no exceedances of the MCP RCS-2 Criteria for an individual VOC. Furthermore, there were no exceedances of Total VOCs for acceptance at a lined landfill, and there were no exceedances of Total VOCs for acceptance at an unlined landfill. VOCs were not detected. VOCs were also not detected in the Trip Blanks for the day. **Refer to Table 1A** within Attachment A.

SVOCs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were no detections of individual SVOCs. In addition, there were no exceedances of the MCP RCS-1 Criteria for an individual SVOC, and there were no exceedances of the MCP RCS-2 Criteria for an individual SVOC. Furthermore, there were no exceedances of Total SVOCs for acceptance at a lined landfill, and there were no exceedances of Total SVOCs for acceptance at an unlined landfill. SVOCs were not detected. **Refer to Table 1B** within Attachment A.

Metals

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; and B1B7 WET, there were neither exceedances of the MCP RCS-1 Criteria for individual Metals nor exceedances of the MCP RCS-2 Criteria for individual Metals. In addition, there were neither exceedances of Metals for acceptance at a lined landfill nor exceedances of Metals for acceptance at an unlined landfill.

Of the 14 metals analyzed for in Samples B3B4B5 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, only eight metals were detected. Nine of 14 metals were detected in Sample B1 DRY.

For Samples B8 DRY; B6B8 WET; and B2 WET, there was each one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic). However, for Samples B8 DRY; B6B8 WET; and B2 WET, there were neither exceedances of Metals for acceptance at a lined landfill nor exceedances of Metals for acceptance at an unlined landfill.

For Samples B6 DRY; B6B8 WET; and B2 WET, there was each one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic).

For Sample B6 DRY, there was one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic). In addition, for Sample B6 DRY, there was one exceedance of a metal (arsenic) for acceptance at a lined landfill and one exceedance of a metal (arsenic) for acceptance at an unlined landfill.

Based on the above exceedances of arsenic, PEER requested that Phoenix analyze Sample B1B8 TS for arsenic. Arsenic was detected, however, for arsenic in this sample, there were neither exceedances of the MCP RCS-1 Criteria nor exceedances of the MCP RCS-2 Criteria. In addition, for arsenic in this sample, there were neither exceedances for acceptance at a lined landfill nor exceedances for acceptance at an unlined landfill. **Refer to Table 1C** within Attachment A.

PEER notes that spatially, borings B2, B8, and B6 are oriented in a linear shape from north to south across the Property, with one additional boring each (proposed, yet not completed as part of the Geotechnical program) to the east and west of this linear shape.

PEER notes that according to an abstract for the publication “Arsenic In Central Massachusetts Bedrock And Groundwater”, 2010, Authors: McTigue, DF, Stein, CL, Brandon, WC, Kopera, JP, Keskula, AJ, Koteas, CG, the authors cite the following:

> Across the New England "arsenic belt," groundwater arsenic (As) concentrations often exceed the EPA's 0.01-mg/L drinking water standard. In overburden groundwater at a site within this belt in north-central Massachusetts, As has been reported at levels up to 7.6 mg/L. Bedrock at the site consists of Silurian Central Maine Terrane metasediments intruded by the Devonian Ayer granodiorite and Chelmsford granite. Exchange of hydrothermal fluids between these lithologies during intrusion and later deformation, faulting, and metamorphism resulted in crystallization of arsenic-bearing minerals, including arsenopyrite. Quaternary deglaciation and unloading dilated joint systems in the bedrock, allowing increased exposure of the

> mineralogy to meteoric water. Several arsenopyrite alteration products (e.g., scorodite), of varying solubilities, precipitated on fracture surfaces and along grain boundaries between major phases. In the emerging conceptual model for this site, groundwater is recharged in bedrock uplands and moves downgradient through the fracture network, becoming increasingly reducing as it moves along a flow path. Arsenic dissolved from arsenopyrite and arsenic-bearing alteration phases in bedrock remains in solution until the groundwater discharges to lowland areas hydraulically downgradient. In these adjacent lowlands, glacial sand and gravel overburden lies above the bedrock. When the reducing water reaches more oxidizing conditions, As-sorbing hydrous ferric oxides (HFO) precipitate out on the aquifer solids, resulting in accumulation of As in the deep overburden aquifer. A large landfill at this site, now closed and capped, imposed reducing conditions, and As is mobilized into groundwater by reductive dissolution of the HFO. The presence of elevated As in groundwater is consistent with arsenic-bearing phases generated in granitoids at depth during regional metamorphism, which were subsequently altered, and are being solubilized at present by the circulation of shallow groundwater through varying redox environments. This scenario is supported by geochemical and petrographic studies of the granitoids and the occurrence of the highest groundwater and soil arsenic concentrations in the adjacent deep overburden.

PEER notes that the abstract references the term “site”; however, the abstract referenced “site” should not be confused with the Wildwood School at North Intermediate School project location. PEER also notes that the study referenced above is referred to as occurring in the “Primary Study Area”.

PEER further notes that according to the publication "Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts - Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps", by the United States Geological Service, prepared in cooperation with the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health, and dated 2011, the authors cite the following:

> The study encompasses the east-central arsenic belt in Massachusetts, the location of nearly all contamination of bedrock wells in the State by arsenic from a natural source. Arsenic has long been known to be present in water from bedrock wells in east-central Massachusetts, and the State straddles an arsenic belt that extends from Connecticut to New Brunswick, Canada. The distribution of bedrock units of crystalline igneous and metamorphic rocks in the study area is complex. The study area is crossed by major faults that divide parts of three geologic terranes that include the Merrimack belt, the Nashoba zone and the Milford-Dedham zone. The Primary Study Area includes most of the Merrimack belt, which extends from the Connecticut Valley belt (indicated by the Merrimack belt western boundary) to the Clinton-Newbury fault, and the western half of the Nashoba zone, which extends from the Clinton-Newbury fault to the Bloody Bluff fault. The Secondary Study Area includes the remainder of the Nashoba zone and the western edge of the Milford-Dedham zone, which begins at the Bloody Bluff fault and extends to the east.

PEER also notes that the study referenced above is referred to as occurring both in the “Primary Study Area” and in the “Secondary Study Area”.

In addition, according to a Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts, a Map which accompanies / compliments the Publication above, Wilmington in general appears in the ORANGE highlighted Section, inferring that Wilmington has a 5-10% probability of exceeding the public drinking water standard (of 10 parts per billion) for Arsenic in its groundwater. Refer to Attachment C for a copy of this Map.

PEER notes that the slightly elevated concentration of arsenic occurred in two soil samples above the groundwater table and occurred in two soil samples within the groundwater, at locations associated with playing fields which also receive irrigation. PEER understands that Mr. Jamie Magaldi, Wilmington Public Works Director, has indicated that the irrigation system at the North Intermediate runs off of a deep bedrock well (and) the pump house is the brick building (along the western edge of the Property), with two irrigation well points, one near the pump house marked with an irrigation box, and the second along the northwestern edge of the Property, and suspected of being buried.

The presence of arsenic in soil (above the groundwater table), suspected of being formed (i.e., parent material) from the bedrock of the region; combined with the presence of arsenic in soil (above the groundwater table), suspected of being irrigated with groundwater from a deep bedrock well; combined with consideration of the proximity of the irrigation system sprinkler heads to the specific boring locations; and combined with the presence of arsenic in soil within the groundwater table – from this project site, which is located in Wilmington, (i.e., in an arsenic belt in east central Massachusetts), may lend itself to the rationale outlined in the two studies cited above.

Furthermore, the Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that the soil series of Deerfield loamy fine sand, 0 to 3 percent slopes, from parent materials consisting of sandy outwash derived from granite, gneiss, and/or quartzite occurs near boring B2 and B6. The NRCS Web Soil Survey also indicates that the soil series of Udorthents, sandy, from parent materials consisting of loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till occurs near boring B6 and B8.

The Surficial Materials Map of the Wilmington Quadrangle, Massachusetts (2018) indicates that the surficial material at this project site consists of:

> "coarse deposits which consist of gravel deposits, sand and gravel deposits, and sand deposits, not differentiated in this report. Gravel deposits are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to post depositional collapse related to melting of ice. Sand and gravel deposits occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to post depositional collapse. Sand deposits are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay."

PCBs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of the MCP RCS-1 Criteria for individual Aroclors nor exceedances of the MCP RCS-2 Criteria for individual Aroclors. There were neither exceedances of Total PCBs for acceptance at a lined landfill nor exceedances of Total PCBs for acceptance at an unlined landfill. PCBs were not detected. **Refer to Table 1D** within Attachment A.

TPHs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of the MCP RCS-1 Criteria for TPH DRO nor exceedances of the MCP RCS-2 Criteria for TPH DRO. There were neither exceedances of TPH DRO for acceptance at a lined landfill nor exceedances of TPH DRO for acceptance at an unlined landfill. Individual DRO (such as Fuel Oil #2/Diesel Fuel, Fuel Oil #4, Fuel Oil #6, Kerosene, Motor Oil, Unidentified) were not detected. There are no comparison parameters for TPH GRO; however, TPH GRO was also not detected in the samples. **Refer to Table 1E** within Attachment A.

Pesticides

For Sample B1B8 TS, there were neither exceedances of the MCP RCS-1 Criteria for individual pesticides nor exceedances of the MCP RCS-2 Criteria for individual pesticides. COMM-97-001 does not provide regulatory criteria for pesticides. **Refer to Table 1F** within Attachment A.

Herbicides

For Sample B1B8 TS, there were neither exceedances of the MCP RCS-1 Criteria for individual herbicides nor exceedances of the MCP RCS-2 Criteria for individual herbicides. COMM-97-001 does not provide regulatory criteria for herbicides. **Refer to Table 1G** within Attachment A.

General Chemistry

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of Conductivity for acceptance at a lined landfill nor exceedances of Conductivity for acceptance at an unlined landfill. There were no exceedances of RCRA Characteristics for flashpoint/ignitability. Flashpoint/ignitability passed. There were no exceedances of RCRA Characteristics for pH. There were no exceedances of RCRA Characteristics for reactivity. Reactivity was Negative. **Refer to Table 1H** within Attachment A.

The Massachusetts Contingency Plan: 310 CMR 40.00

According to 310 CMR 40.0317: Releases and Threats of Release Which Do Not Require Notification, PEER understands that notwithstanding the provisions of 310 CMR 40.0311 through 310 CMR 40.0315, the following releases and threats of release of oil and/or hazardous material are exempt from the notification requirements set forth in 310 CMR 40.0300:

(22) arsenic, beryllium or nickel in Boston Blue Clay or **arsenic in an area documented by the U.S. Geological Survey or in other scientific literature as an area of elevated arsenic measured in soil or groundwater** that -

(a) is consistently present in the environment at and in the vicinity of the sampling location;

(b) is solely attributable to natural geologic or ecologic conditions; and

(c) has not been mobilized or transferred to another environmental medium or increased in concentration in an environmental medium as a result of anthropogenic activities.

PEER understands that as of the date of this Memorandum, PEER is aware of a Fill Management Plan prepared by Parker Environmental Corporation on behalf of Lighthouse Environmental Management, LLC (LEM) in support of a **Fill Project** at the property located on Parcel 35-D 1.2-0 on Stafford Street in Leicester, Massachusetts.

PEER further understands that as of the date of this Memorandum, PEER is aware that anticipated sources of fill material for the **Fill Project** include large volumes of excess soil from excavation and construction projects in Massachusetts with elevated levels of naturally occurring arsenic. The intended fill materials include native and reworked sand, gravel, rock and clay with elevated levels of naturally occurring arsenic. It is anticipated that completion of the fill Project will involve importation of approximately 95,000 cubic yards of material, and take approximately 5 years to complete based on available sources of fill materials. Anticipated sources of fill material include large volumes of excess soil from excavation and construction projects in Massachusetts with elevated levels of naturally occurring arsenic.

Initial Recommendations

As described above, PEER shadowed the geotechnical contractor during the advancement of eight geotechnical soil borings located proximate to the location of the proposed Wildwood School at North Intermediate School, in Wilmington, MA, and collected geo-environmental soil samples concurrent with the geotechnical boring advancement. PEER understands that the eight borings which were advanced proximate to the location of the proposed Wildwood School at North Intermediate School may not necessarily be representative of other soil boring profiles which may be advanced at other locations on the project site during future phases of this proposed project.

Therefore, PEER recommends that additional pre-characterization sampling of the subsurface soil in borings and/or test pits be completed once the exact location of the proposed building is determined and/or once

the location of utility runs requiring excavation and soil management is determined, and/or once the depths and locations of any other excavations related to site infrastructure are known.

Furthermore, should it be determined that the existing North Intermediate School will be demolished as part of any future development of a new school, PEER recommends that additional pre-characterization sampling of the subsurface soil in borings and/or test pits be completed within the parking lot (and paved areas) associated with the building, and proximate to the existing footprint of the building nearest the boiler room, and beneath the current building.

In addition, as it relates to the potential need for project-based dewatering activities (based on the estimated groundwater elevation beneath the project site, and based on the observation of wetlands and waterways on and near the project site), should a construction general permit or a remediation general permit be required for this activity, PEER recommends considering the implementation of a sampling and analysis program for groundwater through the installation of temporary groundwater monitoring wells during any additional subsurface soil investigation, and prior to site redevelopment.

Please contact us directly at 781.238.8880, should you have any questions or require any clarification on this Limited Subsurface Soil Investigation Memorandum at the Wildwood School at North Intermediate School, in Wilmington, MA.

Sincerely,

PEER Consultants, P.C.

David Gorden, BCES
Environmental Science Program Manager

Attachment A

Table 1A - Volatile Organic Compounds
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Volatiles By SW8260D																							
Total VOCs	ug/Kg	NL	NL	10,000	4,000	NS		--		--		--		--		--		--		--		NS	

-- = Analyte not detected in soil sample.
NS = VOCs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were no detections of individual VOCs.
There were no exceedances of the MCP RCS-1 Criteria for an individual VOC.
There were no exceedances of the MCP RCS-2 Criteria for an individual VOC.
There were no exceedances of Total VOCs for acceptance at a lined landfill.
There were no exceedances of Total VOCs for acceptance at an unlined landfill.

Table 1B - Semivolatile Organic Compounds
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																			
Units	RCS-1	RCS-2	Landfill	Landfill		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Semivolatiles By SW8270E																							
Total SVOCs	ug/Kg	NL	NL	100,000	100,000	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = SVOCs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were no detections of individual SVOCs.
There were no exceedances of the MCP RCS-1 Criteria for an individual SVOC.
There were no exceedances of the MCP RCS-2 Criteria for an individual SVOC.
There were no exceedances of Total SVOCs for acceptance at a lined landfill.
There were no exceedances of Total SVOCs for acceptance at an unlined landfill.

Table 1C - Metals
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
		2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																		
Units		RCS-1	RCS-2	Landfill	Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Metals, Total																							
Antimony	mg/Kg	20	40	NL	NL	NS		--		--		--		--		--		--		--		--	
Arsenic	mg/Kg	20	20	40	40	15	0.78	14.5	0.69	8.41	0.68	6.45	0.71	54.3	0.72	20.3	0.69	26.6	0.73	16.5	0.84	20.2	0.80
Barium	mg/Kg	1,000	3,000	NL	NL	NS		22.8	0.35	23.1	0.34	9.43	0.35	16.1	0.36	21.6	0.35	19.3	0.37	18.9	0.42	15	0.40
Beryllium	mg/Kg	100	200	NL	NL	NS		0.28	0.28	0.62	0.27	0.33	0.28	0.29	0.29	0.4	0.28	< 0.29	0.29	< 0.34	0.34	< 0.32	0.32
Cadmium	mg/Kg	80	80	80	30	NS		--		--		--		--		--		--		--		--	
Chromium	mg/Kg	100	200	1,000	1,000	NS		16.6	0.35	13.8	0.34	16.2	0.35	13.4	0.36	23.2	0.35	10.4	0.37	14.4	0.42	12.3	0.40
Lead	mg/Kg	200	600	2,000	1,000	NS		5.27	0.35	10.2	0.34	5.15	0.35	10.2	0.36	8.14	0.35	3.58	0.37	4.65	0.42	3.55	0.40
Mercury	mg/Kg	20	40	10	10	NS		--		0.05	0.03	--		--		--		--		--		--	
Nickel	mg/Kg	700	1,000	NL	NL	NS		6.85	0.35	7.47	0.34	8.6	0.35	6.48	0.36	9.35	0.35	8.74	0.37	9.23	0.42	8.57	0.40
Selenium	mg/Kg	400	800	NL	NL	NS		--		--		--		--		--		--		--		--	
Silver	mg/Kg	100	200	NL	NL	NS		--		--		--		--		--		--		--		--	
Thallium	mg/Kg	8	70	NL	NL	NS		--		--		--		--		--		--		--		--	
Vanadium	mg/Kg	500	800	NL	NL	NS		12.6	0.35	15.7	0.34	10.2	0.35	11.7	0.36	14.7	0.35	12.4	0.37	12.2	0.42	10.4	0.40
Zinc	mg/Kg	1,000	3,000	NL	NL	NS		15.1	0.7	25.1	0.7	13	0.7	11	0.7	16.2	0.7	17.1	0.7	14.7	0.8	17.4	0.8

-- = Analyte not detected in soil sample.
NS = Metals were not sampled for in this sample.
NL = COMM-97-001 does not list a standard for this metal.
There were four exceedances of the MCP RCS-1 Criteria for individual Metals (arsenic) and four exceedances of the MCP RCS-2 Criteria for individual Metals (arsenic).
There was one exceedance of a metal (arsenic) for acceptance at a lined landfill and one exceedance of a metal (arsenic) for acceptance at an unlined landfill.

According to the publication "Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts—Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps", by the United States Geological Service, Prepared in cooperation with the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health, and dated 2011. The distribution of bedrock units of crystalline igneous and metamorphic rocks in the study area is complex. The study area is crossed by major faults that divide parts of three geologic terranes that include the Merrimack belt, the Nashoba zone and the Milford-Dedham zone. The primary study area includes most of the Merrimack belt, which extends from the Connecticut Valley belt (indicated by the Merrimack belt western boundary) to the Clinton-Newbury fault, and the western half of the Nashoba zone, which extends from the Clinton-Newbury fault to the Bloody Bluff fault. The secondary study area includes the remainder of the Nashoba zone and the western edge of the Milford-Dedham zone, which begins at the Bloody Bluff fault and extends to the east. According to a Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts, a Map which accompanies the Publication, Wilmington in general appears in the ORANGE highlighted Section, inferring that Wilmington has a 5-10% probability of exceeding the public drinking water standard (of 10 parts per billion) for Arsenic in its groundwater.

Table 1D - Polychlorinated Biphenyls
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
		2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																		
Units		RCS-1	RCS-2	Landfill	Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
PCBs By SW8082A																							
Total PCBs		NL	NL	<2,000	<2,000	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = PCBs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were neither exceedances of the MCP RCS-1 Criteria for individual Aroclors nor exceedances of the MCP RCS-2 Criteria for individual Aroclors.
There were neither exceedances of Total PCBs for acceptance at a lined landfill nor exceedances of Total PCBs for acceptance at an unlined landfill.

Table 1E - Total Petroleum Hydrocarbons
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
TPH By SW8015D DRO																							
Total TPH	mg/kg	1,000	3,000	5,000	2,000	NS		--		--		--		--		--		--		--		--	
Gasoline Range Hydrocarbons (C6-C10) By SW8015D GRO																							
GRO (C6-C10)	mg/Kg	NL	NL	NL	NL	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = TPHs were not sampled for in this sample.
NL = The MCP and COMM-97-001 do not list a standard for this.
TPH DRO included Fuel Oil #2/Diesel Fuel, Fuel Oil #4, Fuel Oil #6, Kerosene, Motor Oil, Unidentified
GRO included gasoline range organics (C6-C10).
There were neither exceedances of the MCP RCS-1 Criteria for Total TPH DRO nor exceedances of the MCP RCS-2 Criteria for Total TPH DRO.
There were neither exceedances of TPH DRO for acceptance at a lined landfill nor exceedances of TPH DRO for acceptance at an unlined landfill.

Table 1F - Pesticides
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides By SW8081B																							
	ug/Kg			NL	NL	--		NS		NS		NS		NS		NS		NS		NS		NS	

There were no detections of Pesticides for the soil sample (B1B8 TS) analyzed.
-- = Analyte not detected in soil sample.
There were neither exceedances of MCP RCS-1 criteria for individual pesticides nor exceedances of MCP RCS-2 criteria for individual pesticides.
COMM-97-001 does not provide regulatory criteria for pesticides.
NS = Pesticides were not sampled for in this sample.

Table 1G - Herbicides
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																			
Units	RCS-1	RCS-2	Landfill	Landfill		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Chlorinated Herbicides By SW8151A																							
	ug/Kg			NL	NL	--		NS		NS		NS		NS		NS		NS		NS		NS	

There were no detections of Herbicides for the soil sample (B1B8 TS) analyzed.
-- = Analyte not detected in soil sample.
There were neither exceedances of MCP RCS-1 criteria for individual herbicides nor exceedances of MCP RCS-2 criteria for individual herbicides.
COMM-97-001 does not provide regulatory criteria for herbicides.
NS = Herbicides were not sampled for in this sample.

Table 1H - General Chemistry
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id							CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date							10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id							B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix							Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	RCRA Characteristics 40 CFR 261	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Miscellaneous/Inorganics																								
Percent Solid	%	NL	NL	NL	NL	NL	89		94		94		93		97		94		90		80		89	
Conductivity - Soil Matrix	umhos/cm	NL	NL	NL	8,000	4,000	NS		25	5	31	5	27	5	24	5	33	5	34	5	27	5	30	5
Corrosivity	Pos/Neg	NL	NL	NL	NL	NL	NS		Negative		Negative		Negative		Negative		Negative		Negative		Negative		Negative	
Flash Point	Degree F	NL	NL	≤ 140	NL	NL	NS		>200	200	>200	200	>200	200	>200	200	>200	200	>200	200	>200	200	>200	200
Ignitability	degree F	NL	NL	≤ 140	NL	NL	NS		Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140
pH at 25C - Soil	pH Units	NL	NL	≤ 2 and ≥ 12.5	NL	NL	NS		7.58	1.00	6.37	1.00	5.67	1.00	6.71	1.00	6.77	1.00	7.08	1.00	6.6	1.00	6.77	1.00
Reactivity Cyanide	mg/Kg	NL	NL	40 CFR 261.23	NL	NL	NS		< 5	5	< 5	5	< 5	5	< 5	5	< 5	5	< 5	5	< 6	6	< 6	6
Reactivity Sulfide	mg/Kg	NL	NL	40 CFR 261.23	NL	NL	NS		< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20
Reactivity	Pos/Neg	NL	NL	40 CFR 261.23	NL	NL	NS		Negative		Negative		Negative		Negative		Negative		Negative		Negative		Negative	

NL = The MCP and COMM-97-001 do not list a standard for this constituent.
NS = Constituent was not sampled for in this sample.
There were neither exceedances of Conductivity for acceptance at a lined landfill nor exceedances of Conductivity for acceptance at an unlined landfill.
There were no exceedances of RCRA Characteristics for flashpoint/ignitability. Flashpoint/ignitability passed.
There were no exceedances of RCRA Characteristics for pH.
There were no exceedances of RCRA Characteristics for reactivity. Reactivity was Negative.

Attachment B

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	16:50
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	24 Hour	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96234

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1B8 TS

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	15.0	0.78	mg/Kg	1	11/14/24	TH	SW6010D
Percent Solid	89		%		10/30/24	CV	SW846-%Solid
Soil Extraction for Herbicide	Completed				11/01/24	X/A/D	SW3546
Soil Extraction for Pesticide	Completed				10/31/24	J/T	SW3546
Total Metals Digest	Completed				11/13/24	P/AG	SW3050B
Chlorinated Herbicides							
2,4,5-T	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
2,4,5-TP (Silvex)	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
2,4-D	ND	280	ug/Kg	10	11/05/24	JRB	SW8151A
2,4-DB	ND	1400	ug/Kg	10	11/05/24	JRB	SW8151A
Dalapon	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
Dicamba	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
Dichloroprop	ND	210	ug/Kg	10	11/05/24	JRB	SW8151A
Dinoseb	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
MCPA	ND	42000	ug/Kg	10	11/05/24	JRB	SW8151A
MCPP	ND	42000	ug/Kg	10	11/05/24	JRB	SW8151A
QA/QC Surrogates							
% DCAA	136		%	10	11/05/24	JRB	30 - 150 %
% DCAA (Confirmation)	138		%	10	11/05/24	JRB	30 - 150 %
Pesticides							
4,4' -DDD	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
4,4' -DDE	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
4,4' -DDT	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
a-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Alachlor	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aldrin	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
b-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Chlordane	ND	15	ug/Kg	2	11/04/24	AW	SW8081B
d-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Dieldrin	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan I	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan II	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan sulfate	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin aldehyde	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin ketone	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
g-BHC	ND	1.5	ug/Kg	2	11/04/24	AW	SW8081B
Heptachlor	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Heptachlor epoxide	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Hexachlorobenzene	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
Methoxychlor	ND	37	ug/Kg	2	11/04/24	AW	SW8081B
Toxaphene	ND	150	ug/Kg	2	11/04/24	AW	SW8081B
QA/QC Surrogates							
% DCBP	92		%	2	11/04/24	AW	30 - 150 %
% DCBP (Confirmation)	49		%	2	11/04/24	AW	30 - 150 %
% TCMX	71		%	2	11/04/24	AW	30 - 150 %
% TCMX (Confirmation)	65		%	2	11/04/24	AW	30 - 150 %

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Herbicide Comment:
Due to a matrix interference and/or the presence of a large amount of non-target material in the sample, a dilution was required resulting in an elevated RL.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:01
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96235

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B3B4B5 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	14.5	0.69	mg/Kg	1	11/01/24	TH	SW6010D
Barium	22.8	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.28	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	16.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	6.85	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	5.27	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	15.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	25	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	7.58	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	J/T	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.6	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	80		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	79		%	2	11/01/24	SC	30 - 150 %
% TCMX	79		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	72		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	52	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	99		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	101		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.54	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	27	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	27	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	270	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	95		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	97		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	91		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	550	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	690	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	76		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	77		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	66		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	67		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	66		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	71		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

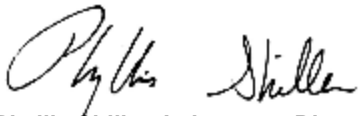
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:22
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96236

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	8.41	0.68	mg/Kg	1	11/01/24	TH	SW6010D
Barium	23.1	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.62	0.27	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	13.8	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	0.05	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	7.47	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Lead	10.2	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.4	3.4	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	15.7	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	25.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	31	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.37	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	93		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	72		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	69		%	2	11/01/24	SC	30 - 150 %
% TCMX	71		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	65		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	52	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	85		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	87		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	4.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.71	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1 DRY

Phoenix I.D.: CR96236

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	36	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	36	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	360	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	4.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	43	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	93		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	91		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	140	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	550	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	690	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	50		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	49		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	47		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	49		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

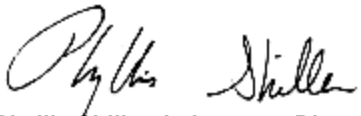
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:51
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96237

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B2 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	6.45	0.71	mg/Kg	1	11/01/24	TH	SW6010D
Barium	9.43	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.33	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	16.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.60	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	5.15	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.2	3.2	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	10.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	13.0	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	93		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	27	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	5.67	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	6.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	69		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	66		%	2	11/01/24	SC	30 - 150 %
% TCMX	66		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	60		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	53	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	94		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	94		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.66	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	330	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	39	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	94		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	96		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	130	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	560	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	700	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	49		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	52		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	47		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	50		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

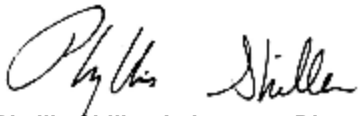
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:03
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96238

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B6 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.36	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	54.3	0.72	mg/Kg	1	11/01/24	TH	SW6010D
Barium	16.1	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.29	0.29	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.36	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	13.4	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	6.48	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Lead	10.2	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.6	3.6	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.2	3.2	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	11.7	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	11.0	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	97		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	24	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.71	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.6	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	82		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	87		%	2	11/01/24	SC	30 - 150 %
% TCMX	82		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	79		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	51	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	120		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	105		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.5	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.59	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	29	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	29	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	290	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.5	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	35	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	96		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	97		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	97		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	120	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	540	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B6 DRY

Phoenix I.D.: CR96238

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	680	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	59		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	48		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	47		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	49		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	45		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	48		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:19
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96239

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B8 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	20.3	0.69	mg/Kg	1	11/01/24	TH	SW6010D
Barium	21.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.40	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	23.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	9.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	8.14	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	14.7	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	16.2	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	33	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.77	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	72		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	71		%	2	11/01/24	SC	30 - 150 %
% TCMX	69		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	62		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	53	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	104		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	99		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.56	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	28	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	28	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	280	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	34	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	95		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	95		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	570	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	710	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	66		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	54		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	52		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	53		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	50		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	57		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:30
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96240

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B6B8 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.37	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	26.6	0.73	mg/Kg	1	11/01/24	TH	SW6010D
Barium	19.3	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.29	0.29	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.37	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	10.4	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.74	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Lead	3.58	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.7	3.7	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.3	3.3	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.4	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	17.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	90		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	34	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	7.08	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	4.9	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	81		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	80		%	2	11/01/24	SC	30 - 150 %
% TCMX	80		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	73		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	55	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	96		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	92		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	2.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.44	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	22	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	22	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	220	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	2.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	96		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	88	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	580	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	720	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	52		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	54		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	54		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	49		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	54		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

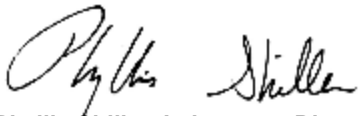
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:44
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96241

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1B7 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	16.5	0.84	mg/Kg	1	11/01/24	TH	SW6010D
Barium	18.9	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.42	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	14.4	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	9.23	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Lead	4.65	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 4.2	4.2	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.7	1.7	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.8	3.8	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.2	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	14.7	0.8	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	80		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	27	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.60	1.00	pH Units	1	10/30/24 22:10	MW	SW846 9045D
Reactivity Cyanide	< 6	6	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				11/01/24	J/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	6.3	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	94		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1221	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1232	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1242	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1248	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1254	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1260	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1262	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1268	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	63		%	1	11/05/24	SC	30 - 150 %
% DCBP (Confirmation)	71		%	1	11/05/24	SC	30 - 150 %
% TCMX	65		%	1	11/05/24	SC	30 - 150 %
% TCMX (Confirmation)	68		%	1	11/05/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	61	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	92		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	87		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.2	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.53	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	260	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.2	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	32	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	94		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	92		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	1400	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1B7 WET

Phoenix I.D.: CR96241

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	1800	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	700	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	72		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	56		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	53		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	52		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	51		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	59		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

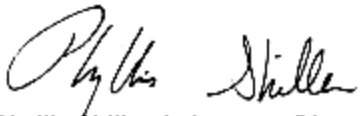
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	19:02
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96242

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B2 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.40	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	20.2	0.80	mg/Kg	1	11/01/24	TH	SW6010D
Barium	15.0	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.32	0.32	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.40	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	12.3	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.57	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Lead	3.55	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 4.0	4.0	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.6	1.6	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.6	3.6	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	10.4	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	17.4	0.8	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	89		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	30	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.77	1.00	pH Units	1	10/30/24 22:10	MW	SW846 9045D
Reactivity Cyanide	< 6	6	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				11/01/24	J/U	SW3546
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.3	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1221	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1232	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1242	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1248	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1254	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1260	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1262	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1268	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	68		%	2	11/05/24	SC	30 - 150 %
% DCBP (Confirmation)	74		%	2	11/05/24	SC	30 - 150 %
% TCMX	59		%	2	11/05/24	SC	30 - 150 %
% TCMX (Confirmation)	61		%	2	11/05/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	55	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	97		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	92		%	1	11/01/24	JRB	50 - 150 %
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	580	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	730	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	360	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Pentachlorophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	62		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	50		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	52		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	51		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	48		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	53		%	1	11/01/24	MR	30 - 130 %

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96243

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 HI

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Field Extraction	Completed				10/29/24		SW5035A
Volatiles							
1,1,1,2-Tetrachloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	50	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,4-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2-Hexanone	ND	1300	ug/Kg	50	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Chlorotoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	400	ug/Kg	50	11/01/24	JLI	SW8260D
Acetone	ND	5000	ug/Kg	50	11/01/24	JLI	SW8260D
Acrylonitrile	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Benzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromochloromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Bromoform	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Bromomethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chloroform	ND	200	ug/Kg	50	11/01/24	JLI	SW8260D
Chloromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	25	ug/Kg	50	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	50	ug/Kg	50	11/01/24	JLI	SW8260D
Dibromomethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Ethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
m&p-Xylene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	3000	ug/Kg	50	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Methylene chloride	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Naphthalene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
o-Xylene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Styrene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Toluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Total Xylenes	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	25	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Trichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Trichlorofluoromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Vinyl chloride	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4 (50x)	97		%	50	11/01/24	JLI	70 - 130 %

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 HI

Phoenix I.D.: CR96243

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Bromofluorobenzene (50x)	95		%	50	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane (50x)	86		%	50	11/01/24	JLI	70 - 130 %
% Toluene-d8 (50x)	97		%	50	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	800	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

TRIP BLANK INCLUDED.

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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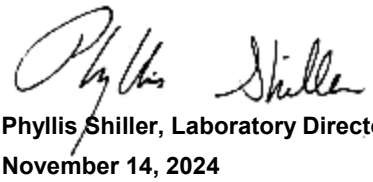

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96244

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 LO

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Field Extraction	Completed				10/29/24		SW5035A
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.50	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,4-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	25	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Chlorotoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	25	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	250	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	30	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorofluoromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	97		%	1	11/01/24	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Bromofluorobenzene	98		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	82		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	98		%	1	11/01/24	JLI	70 - 130 %

Oxygenates & Dioxane

1,4-Dioxane	ND	100	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

TRIP BLANK INCLUDED.

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

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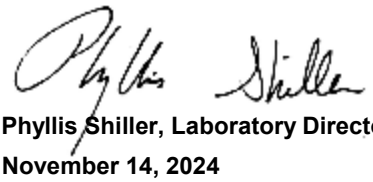


Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Sample Criteria Exceedances Report

GCR96234 - PEER

Criteria: MA: Com97-L, Com97-U, S1, S1G2, S2, S2G2

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CR96238	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / COMM 97 / Lined Landfills	54.3	0.72	40	40	mg/Kg
CR96238	AS-SM	Arsenic	MA / COMM 97 / Unlined Landfills	54.3	0.72	40	40	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	54.3	0.72	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	20.3	0.69	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	26.6	0.73	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	20.2	0.80	20	20	mg/Kg
CR96243	$8260MER	cis-1,3-Dichloropropene	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	25	10	10	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	50	5	5	ug/Kg
CR96243	$8260MER	trans-1,3-Dichloropropene	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	25	10	10	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	50	5	5	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / CMR 310.40.1600 / S2 (mg/kg)	ND	50	30	30	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / CMR 310.40.1600 / S2 (mg/kg)	ND	50	20	20	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	ND	50	20	20	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	ND	50	30	30	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	ND	50	20	20	ug/Kg

Sample Criteria Exceedances Report

GCR96234 - PEER

Criteria: MA: Com97-L, Com97-U, S1, S1G2, S2, S2G2

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	ND	50	30	30	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	800	200	200	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	800	200	200	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	800	200	200	ug/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Cooler: Yes ☑ No ☐
Coolant: IPK ☑ ICE ☐ No ☐

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 1.3 °C Pg 1 of 1

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☑ Email: gordon@peerepc.com

Customer: PEER Consultants
Address: 25 Mall Rd Suite 206
Burlington MA 01803
7812388880

Project: Wildwood@ North Intermed
Report to: d. gordon
Invoice to: d. gordon
QUOTE # Wilmington

Project P.O: 8593

This section MUST be completed with Bottle Quantities.

Sampler's Signature: _____ Date: 10/29/24

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hi level VOC	Lo level VOC	TPH GRO	Flashpt/Ignit	SVOC-TPH DRO, PCB (*)	Pest/Herb	TCLP 14 Metals (†)	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [✓] methanol [✓] H2O	GL Soil container (8) oz amber	GL Soil container (4) oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
96234	B1B8 TS	SD	10/29	1650						✓						1								
96235	B3B4B5 Dry	SD	10/29	1701	✓	✓	✓	✓	✓		†				5	2	1							
96236	B1 [redacted] Dry	SD	10/29	1722	✓	✓	✓	✓	✓		⊙				5	1	1							
96237	B2 Dry	SD	10/29	1751	✓	✓	✓	✓	✓		†				5	2	1							
96238	B6 Dry	SD	10/29	1803	✓	✓	✓	✓	✓		†				5	2	1							
96239	B8 Dry	SD	10/29	1819	✓	✓	✓	✓	✓		†				5	2	1							
96240	B6B8 Wet	SD	10/29	1830	✓	✓	✓	✓	✓		†				5	2	1							
96241	B1B7 Wet	SD	10/29	1844	✓	✓	✓	✓	✓		†				4.	2	1							
96242	B2 Wet	SD	10/29	1902			✓	✓	✓		†				2.	2	1							
96243	TB102924Hi	L	10/22	–	✓										1									
96244	TB102924Lo	L	10/22	–		✓									2									

Relinquished by: _____ Accepted by: _____

Date:	Time:
10/30/24	1145
10/30/24	14:37

Comments, Special Requirements or Regulations: ● missing lab BS
Ⓐ MCP 14 metals, pH, Corrosivity, Conductivity
Ⓣ only if exceeds 20x rule - call Client first to confirm Reactive
⊙ use any remaining soil from other

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☑ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ (Residential) Direct Exposure
☐ (Comm/Industrial) Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB-GW Objectives

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA mcpcomm 97-001
☐ MCP Certification
☑ GW-1 ☐ MWRA eSMART
☑ GW-2 ☐ S-1 10% CALC
☐ GW-3
☑ S-1 GW-1 ☑ S-1 GW-2 ☐ S-1 GW-3
☑ S-2 GW-1 ☑ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: MA

Data Format
☑ Excel
☑ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☑ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

Sarah Bell

Subject: FW: GCR96234

From: Dave Gorden <GordenD@peercpc.com>
Sent: Wednesday, November 13, 2024 11:31 AM
To: Sarah Bell <sarah@phoenixlabs.com>
Cc: Krystal Houle <Khoule@phoenixlabs.com>
Subject: RE: GCR96234

Sarah.

Please proceed with running that sample for total Arsenic at 24 hr TAT.

Cheers...

David

From: Dave Gorden <GordenD@peercpc.com>
Sent: Wednesday, November 13, 2024 10:16 AM
To: Sarah Bell <sarah@phoenixlabs.com>
Cc: Krystal Houle <Khoule@phoenixlabs.com>
Subject: GCR96234

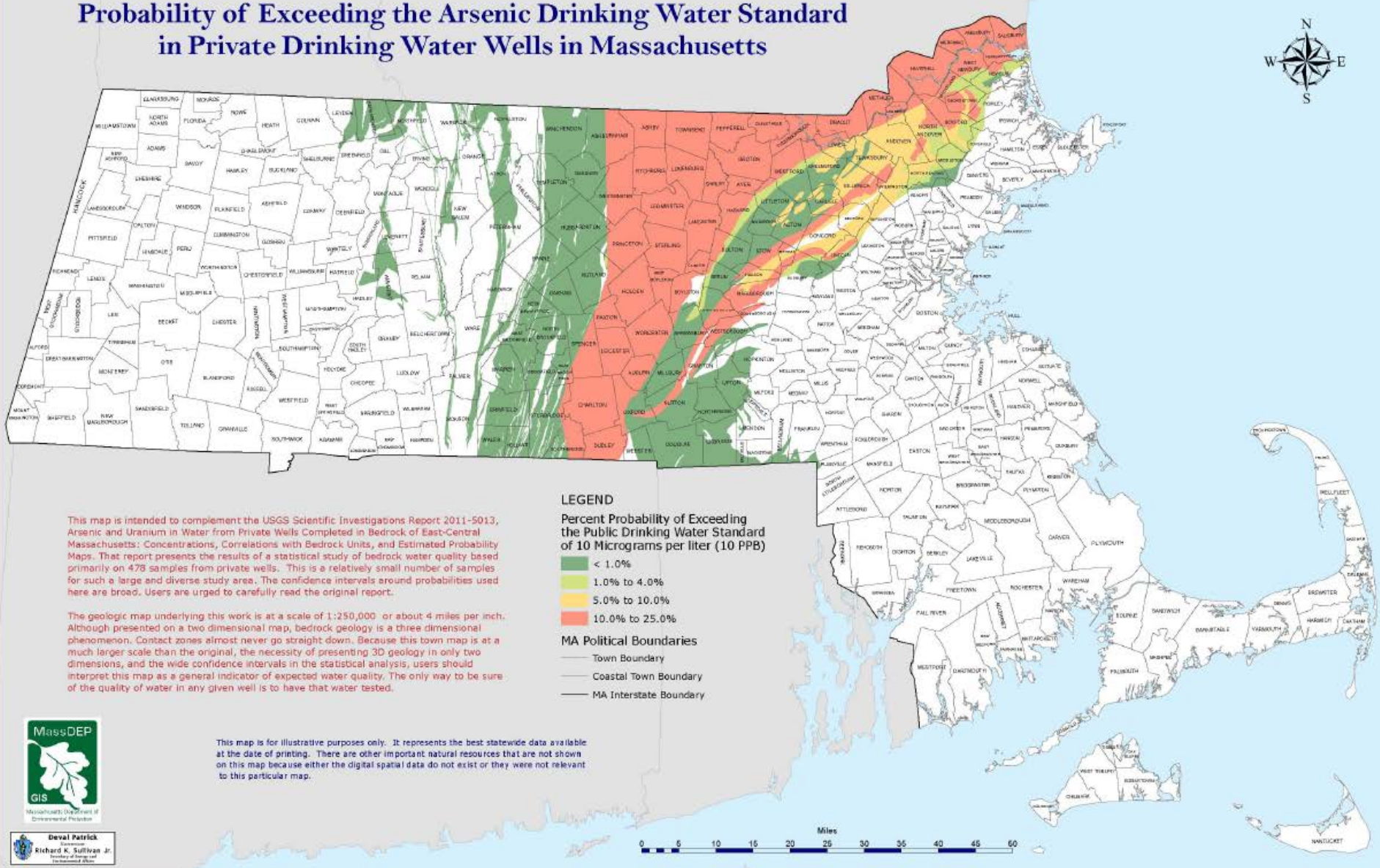
Sarah

For the B1B8 TS sample identifier (Lab ID CR96234), do you still have sufficient soil in this to run the metal arsenic?
If so, though I understand Standard TAT is running at 5 days, what would be the quickest TAT, and what would then be the cost?

Project ID:	WILDWOOD @ NORTH INTERMED
SDG ID:	GCR96234
Sample ID#s:	CR96234 - CR96244

Attachment C

Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts



This map is intended to complement the USGS Scientific Investigations Report 2011-5013, Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts: Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps. That report presents the results of a statistical study of bedrock water quality based primarily on 478 samples from private wells. This is a relatively small number of samples for such a large and diverse study area. The confidence intervals around probabilities used here are broad. Users are urged to carefully read the original report.

The geologic map underlying this work is at a scale of 1:250,000 or about 4 miles per inch. Although presented on a two dimensional map, bedrock geology is a three dimensional phenomenon. Contact zones almost never go straight down. Because this town map is at a much larger scale than the original, the necessity of presenting 3D geology in only two dimensions, and the wide confidence intervals in the statistical analysis, users should interpret this map as a general indicator of expected water quality. The only way to be sure of the quality of water in any given well is to have that water tested.

This map is for illustrative purposes only. It represents the best statewide data available at the date of printing. There are other important natural resources that are not shown on this map because either the digital spatial data do not exist or they were not relevant to this particular map.

MassDEP GIS
Massachusetts Department of Environmental Protection

Deval Patrick
Governor
Richard K. Sullivan Jr.
Secretary of Energy and Environmental Affairs

ESTIMATED SOIL QUANTITY REMOVAL MEMORANDUM X.08

PEER CONSULTANTS, P.C.
Est. 1978

25 Mall Road, Suite 206 • Burlington, MA 01803
Phone: 781-238-8880 • Fax: 781-238-8884 • www.peercpc.com

Engineers • Scientists • Planners

February 20, 2025

Rani Philip, Assoc. AIA
Project Manager
DORE + WHITTIER
260 Merrimac Street
Newburyport, Massachusetts 01950

RE: WILMINGTON – WILDWOOD SCHOOL @ NORTH INTERMEDIATE SCHOOL
320 Salem Street, Wilmington, MA 01887

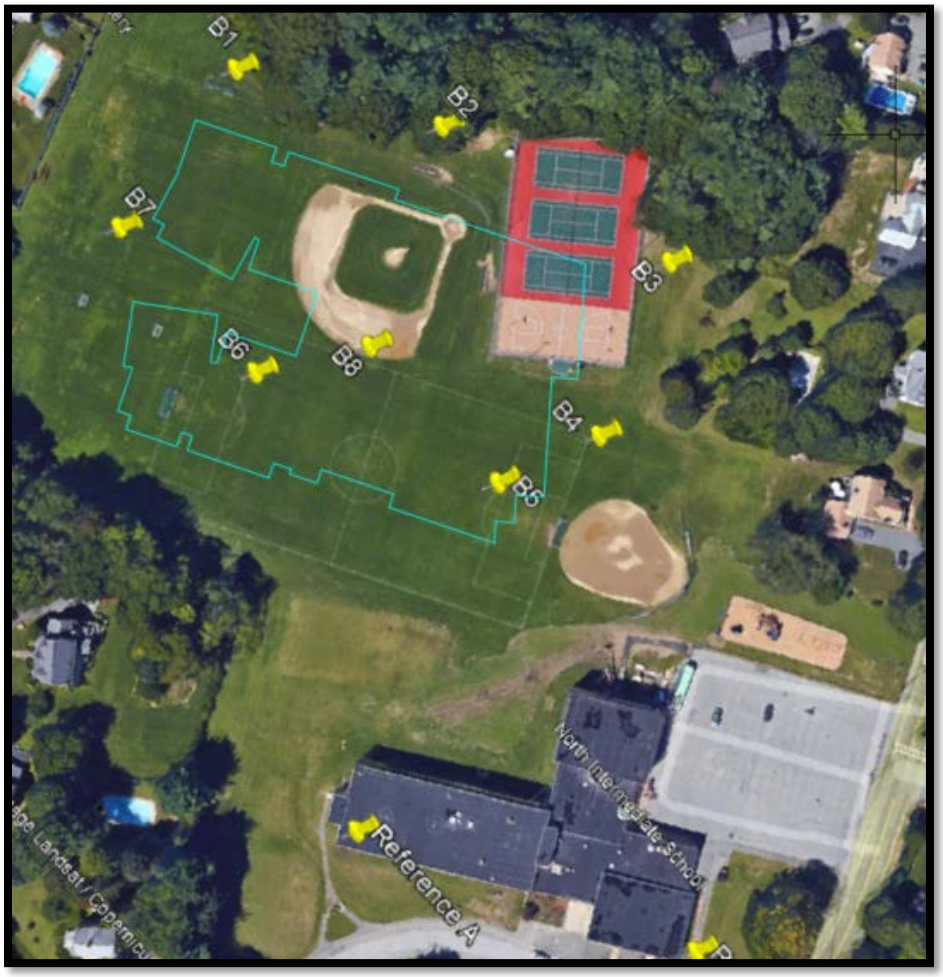
SUBJECT: Soil Quantity Estimates Memorandum, Including "Natural Arsenic" Findings

Dear Ms. Philip:

In response to your request, PEER Consultants (P.C.) has completed a review of information made available to us as part of a recently completed Geotech subsurface investigation (by others) and has prepared an estimate of soil volume characterized as exhibiting elevated levels of presumed "natural Arsenic" encountered in the proposed limits of excavation for the above referenced project.

Background Information

Test results from soils samples taken from several subsurface boring locations, as per the below image, revealed elevated presumed "natural arsenic" levels in the soil encountered within excavation limits of the proposed building footprint. The findings of this memorandum have been determined by compiling and analyzing existing subsurface data and proposed site configurations to estimate the quantity of soil that may require disposal at a "natural arsenic" landfill.



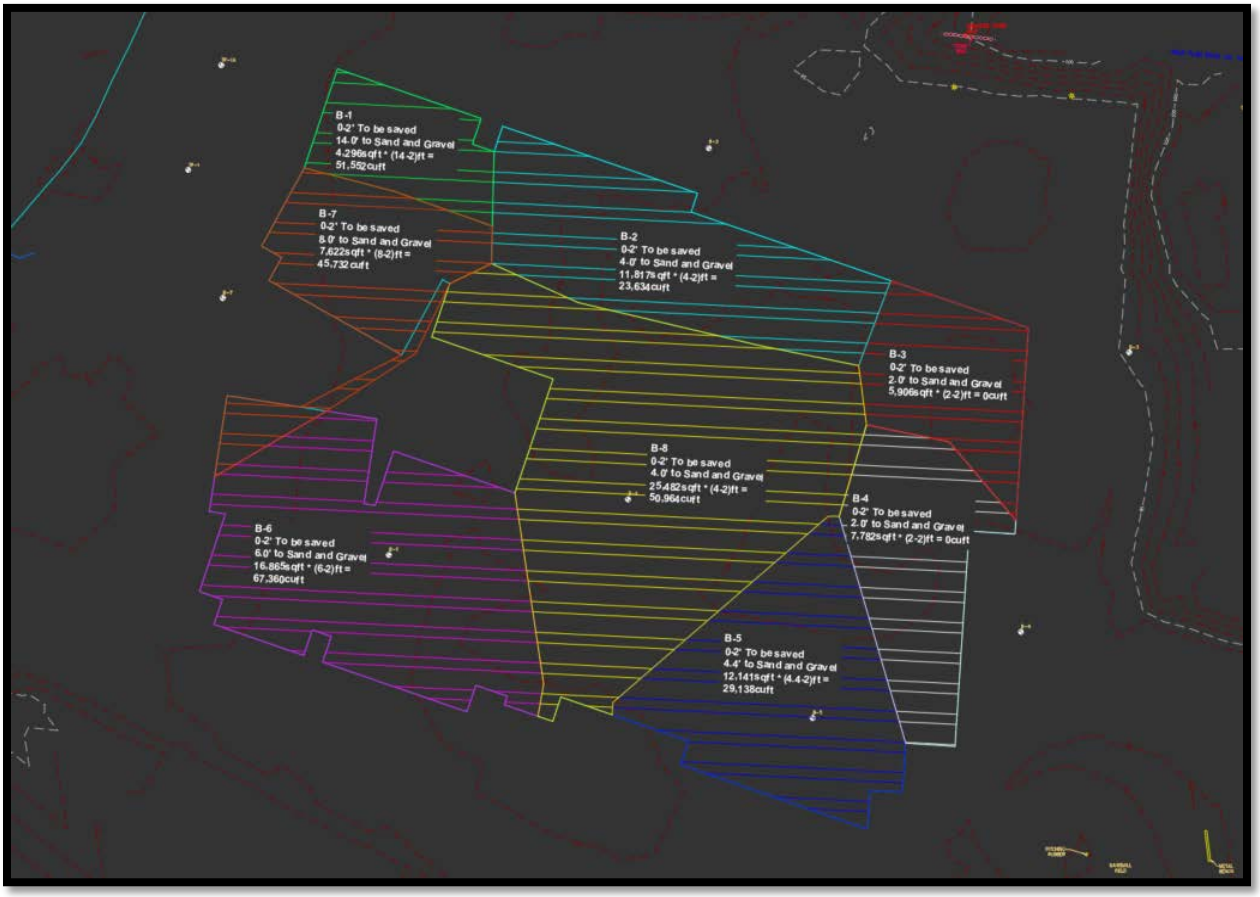
Wildwood School @ North Intermediate School, Wilmington, MA
Proposed New Building

Methodology

To determine an estimate for anticipated excavated soil that may be elevated and go to a "natural arsenic" landfill, PEER first superimposed the proposed building's footprint over an aerial image of the site showing soil boring locations as identified under the recently completed subsurface field testing program under *"Preliminary Geotechnical Report Proposed Wildwood Early Childhood Center North Intermediate School – 320 Salem Street Site Wilmington, Massachusetts"* prepared by Lahlaf Geotechnical Consulting, Inc. Some soil borings lay just outside the proposed footprint but will still be incorporated. Each boring was given a 100 foot (ft) radius which was then used to create sections of the footprint that could be attributed to each boring to loosely determine the soil characteristics for each area. The area of influence for potential excavation was assumed to include an additional 5 feet buffer beyond the proposed building footprint per Subtask 3.1.2, of the Lahlaf Geotechnical report.

After each section has been defined, PEER then using the Soil Boring data developed by Lahlaf Geotechnical Consulting, Inc to determine the anticipated depth of soil that may be sent to a "natural arsenic" landfill. Arsenic was not detected in the top 2 feet of soil above reporting limits so it may be expected to be saved and reused as top soil on-site and not send to a landfill. For each boring, we anticipated soil down to Sand and Gravel may be excavated and sent to a landfill.

Volume of potential excavated soils was determined as a function of the affected depths between ground surface elevation (excluding the top 2 feet) down to encounter clean Sand and Gravel soil materials multiplied by the areas represented by the corresponding soil borings. It should be noted that these volume quantities are estimated only and that the actual excavated soil materials may vary from this estimate.



Wildwood School @ North Intermediate School, Wilmington, MA
Proposed New Building Indicating Established Excavation Areas

Results

B-1 (Green Section) has a depth of 14 feet with Topsoil, Fill, Silt, and Clay before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-1 resulted in 4,296 ft^2. This will result in a volume of 51,552 ft^3 of soil to be excavated near the boring B-1 location (Green Section).

4,296 ft^2 x 12 ft = 51,552 ft^3 (1,909 CY in situ)

4 ft of Fill x 4,296 ft^2 = 17,184 ft^3
3 ft of Silt x 4,296 ft^2 = 12,888 ft^3
5 ft of Clay x 4,296 ft^2 = 21,480 ft^3

B-2 (Cyan Section) has a depth of 4 feet with Topsoil, Fill, and Buried Organic Soil before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-2 resulted in 11,817 ft^2. This will result in a volume of 23,634 ft^3 of soil to be excavated near the boring B-2 location (Cyan Section).

11,817 ft^2 x 2 ft = 23,634 ft^3 (875 CY in situ)

0.8 ft of Fill x 11,817 ft^2 = 9,454 ft^3
1.2 ft of Buried Organic Soil x 11,817 ft^2 = 14,180 ft^3

B-3 (Red Section) has a depth of 2 feet with Topsoil and Fill before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-3 resulted in 5,906 ft^2. This will result in a volume of 0 ft^3 of soil to be excavated near the boring B-3 location (Red Section).

5,906 ft^2 x 0 ft = 0 ft^3 (0 CY in situ)

B-4 (White Section) has a depth of 2 feet with Topsoil and Fill before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-4 resulted in 7,782 ft^2. This will result in a volume of 0 ft^3 of soil to be excavated near the boring B-4 location (White Section)

7,782 ft^2 x 0 ft = 0 ft^3 (0 CY in situ)

B-5 (Blue Section) has a depth of 4.4 feet with Topsoil, Fill, and Buried Organic Soil before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-5 resulted in 12,141 ft^2. This will result in a volume of 29,138 ft^3 of soil to be excavated near the boring B-5 location (Blue Section).

12,141 ft^2 x 2.4 ft = 29,138 ft^3 (1,079 CY in situ)

2 ft of Fill x 12,141 ft^2 = 24,282 ft^3
0.4 ft of Buried Organic Soil x 12,141 ft^2 = 4,856 ft^3

B-6 (Magenta Section) has a depth of 6 feet with Topsoil and Fill before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-6 resulted in 16,865 ft^2. This will result in a volume of 67,360 ft^3 of soil to be excavated near the boring B-6 location (Magenta Section).

16,865 ft^2 x 4 ft = 67,360 ft^3 (2,495 CY in situ)
4 ft of Fill x 16,865 ft^2 = 67,360 ft^3

B-7 (Orange Section) has a depth of 8 feet with Topsoil, Fill, and Buried Organic Soil before reaching Sand and Gravel The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-7 resulted in 7,622 ft^2. This will result in a volume of 45,732 ft^3 of soil to be excavated near the boring B-7 location (Orange Section).

7,622 ft^2 x 6 ft = 45,732 ft^3 (1,693 CY in situ)
4 ft of Fill x 7,622 ft^2 = 30,488 ft^3
2 ft of Buried Organic Soil x 7,622 ft^2 = 15,244 ft^3

B-8 (Yellow Section) has a depth of 4 feet with Fill and Subsoil before reaching Sand and Gravel. The first 2 feet are presumed to be removed and stored onsite and not sent to a landfill. The area around B-8 resulted in 25,482 ft^2. This will result in a volume of 50,964 ft^3 of soil to be excavated near the boring B-8 location (Yellow Section).

25,482 ft^2 x 2 ft = 50,964 ft^3 (1,888 CY in situ)
2 ft of Subsoil x 25,482 ft^2 = 50,964 ft^3

To find the collective estimate for total soil to be excavated, all section volumes are added together.
51,552 ft^3 + 23,634 ft^3 + 0 ft^3 + 0 ft^3 + 29,138 ft^3 + 67,360 ft^3 + 45,732 ft^3 + 50,964 ft^3 = 268,389 ft^3 (9,940 CY)

The estimated total volume of soil excavated directly within the limits of the proposed new building and the addition of an assumed 5 feet buffer around it, resulted in a volume of approximately **268,389 ft^3 or 9,940 CY**. This value includes any top soil, fill, subsoil, and buried organic soil. It does not include Sand and Gravel. This value also presumes the top 2 feet of excavation will be stored on site and can be reused.

Total of Fill = 148,768 ft^3
Total of Silt = 12,888 ft^3
Total of Clay = 21,480 ft^3
Total of Subsoil = 50,964 ft^3
Total of Buried Organic Soil = 34,280 ft^3

Please note boring locations are not exact and all values are rough estimates and do not necessarily reflect the actual value of soils that could be excavated and send to a "natural arsenic" landfill, especially with respect to this phase of the investigation of site soil characteristics.

Additional Information Pertaining to Potential Impacted Soil at the Groundwater Table

Proposed volume of soils excavation for potential disposal at a "natural arsenic" landfill was also calculated to determine the volume of soil that exists at or below the encountered groundwater table.

B-1: Groundwater at 9 vertical feet (VF). Auger refusal at 19 VF. This will result in 10 VF of soil to be removed.

10 ft x 4,296 ft^2 = 42, 960 ft^3 (1,591 CY in situ)

B-2: Groundwater at 9 VF. Auger refusal at 19 VF. This will result in 10 VF of soil to be removed.

10 ft x 11,817 ft^2 = 118,170 ft^3 (4,376 CY in situ)

B-3: Groundwater not detected. Auger refusal at 10.2 VF. This will result in 0 VF of soil to be removed.

B-4: Groundwater at 9 VF. Auger refusal at 11 VF. This will result in 2 VF of soil to be removed.

2 ft x 7,782 ft^2 = 15,564 ft^3 (576 CY in situ)

B-5: Groundwater at 9 VF. Auger refusal at 10.5 VF. This will result in 1.5 VF of soil to be removed.

1.5 ft x 12,141 ft^2 = 18,211 ft^3 (675 CY in situ)

B-6: Groundwater at 14 VF. Auger refusal at 19.7 VF. This will result in 5.7 VF of soil to be removed.

5.7 ft x 16,865 ft^2 = 96,130 ft^3 (3,560 CY in situ)

B-7: Groundwater at 10 VF. Auger refusal at 20.2 VF. This will result in 10.2 VF of soil to be removed.

10.2 ft x 7,622 ft^2 = 77,774 ft^3 (2,879 CY in situ)

B-8: Groundwater at 9 VF. Auger refusal at 19.8 VF. This will result in 10.8 VF of soil to be removed.

10.8 ft x 25,482 ft^2 = 275,206 ft^3 (10,193 CY in situ)

Total volume of soil at and below the encountered groundwater table for potentially being designated for disposal to a "natural arsenic" landfill is approximately **23,850 cubic yards.**

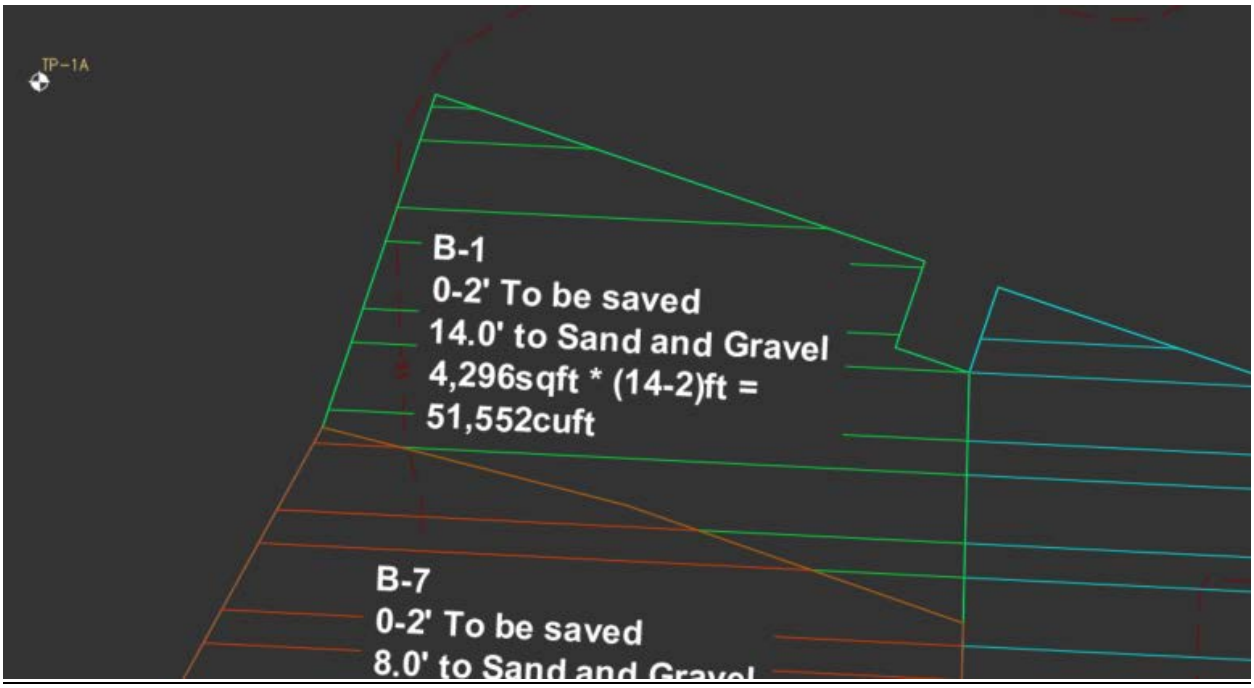
Please do not hesitate to contact us should you have any questions or require any clarification on the results presented here for estimating the Soil Removal Quantities at the *Wildwood School at North Intermediate School, in Wilmington, MA.*

Sincerely,

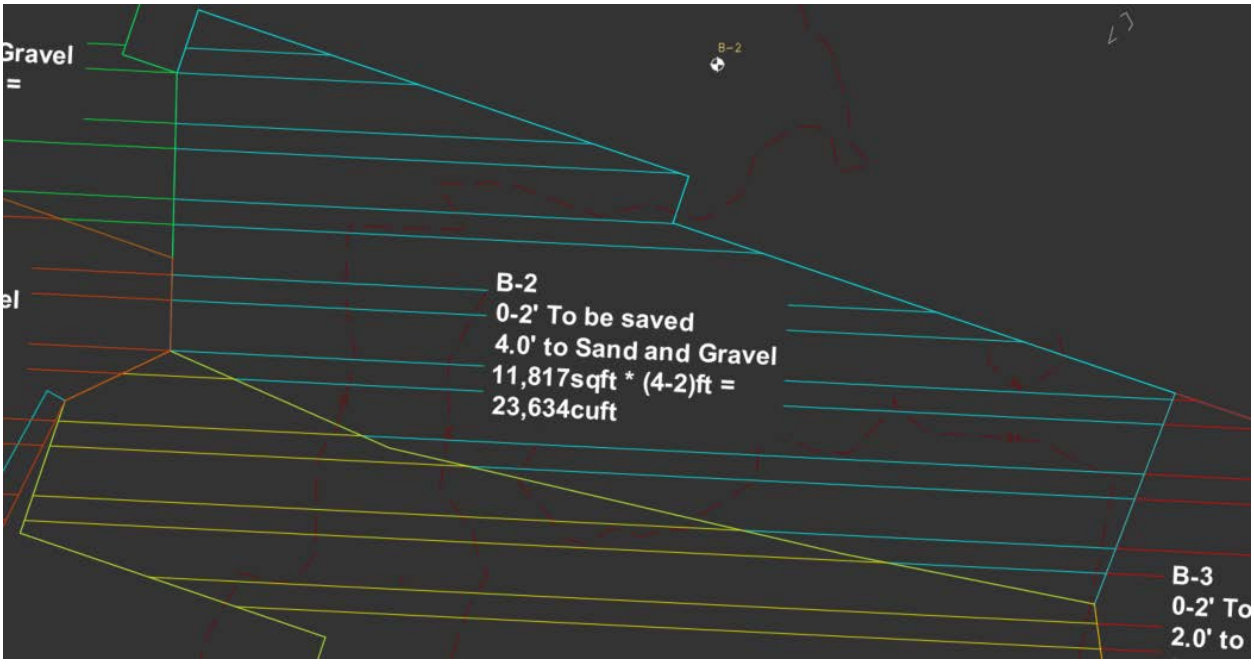
PEER Consultants, P.C.

Brandon Cote,
Staff Environmental Engineer III
Phone 781-238-8880

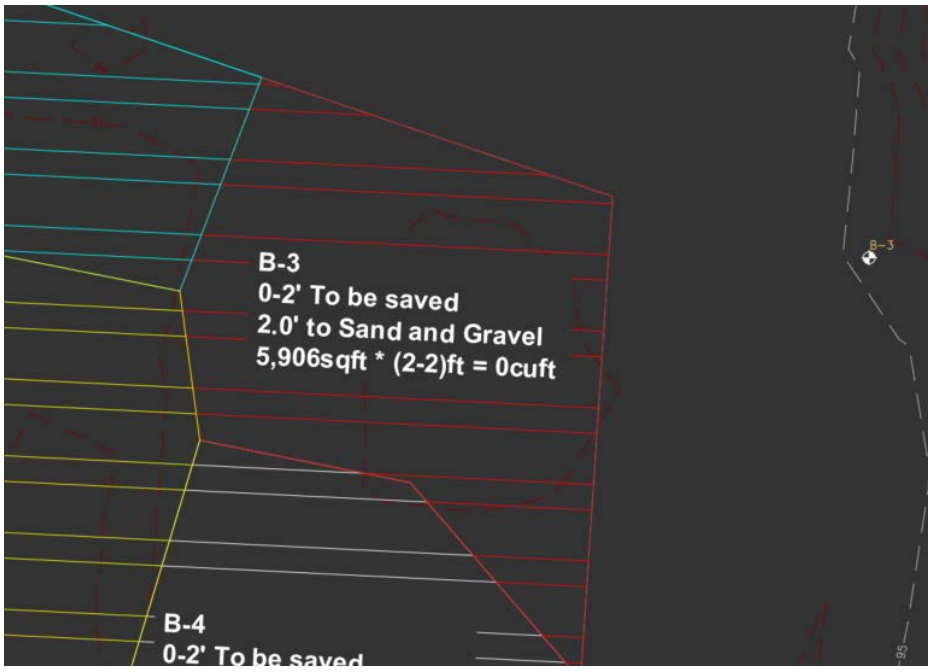
Appendix A
Sectional Areas



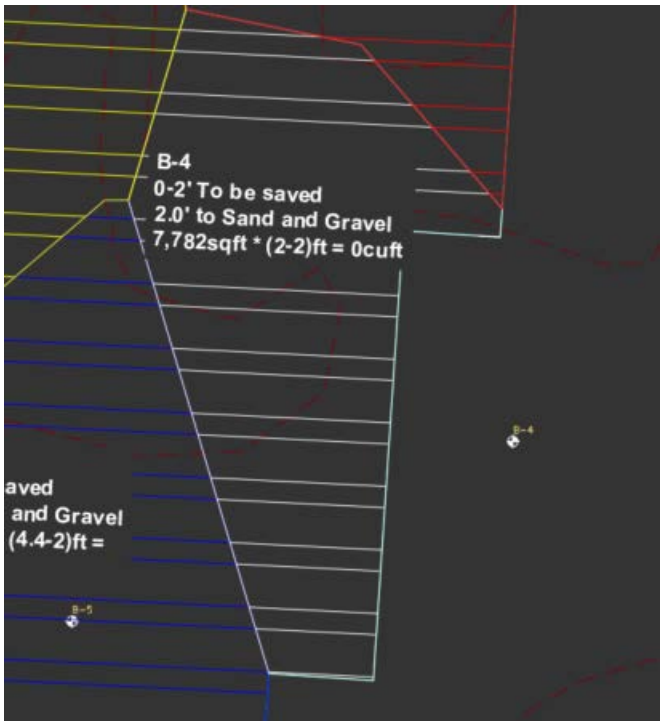
Wildwood School @ North Intermediate School, Wilmington, MA
B-1 (Green Section)



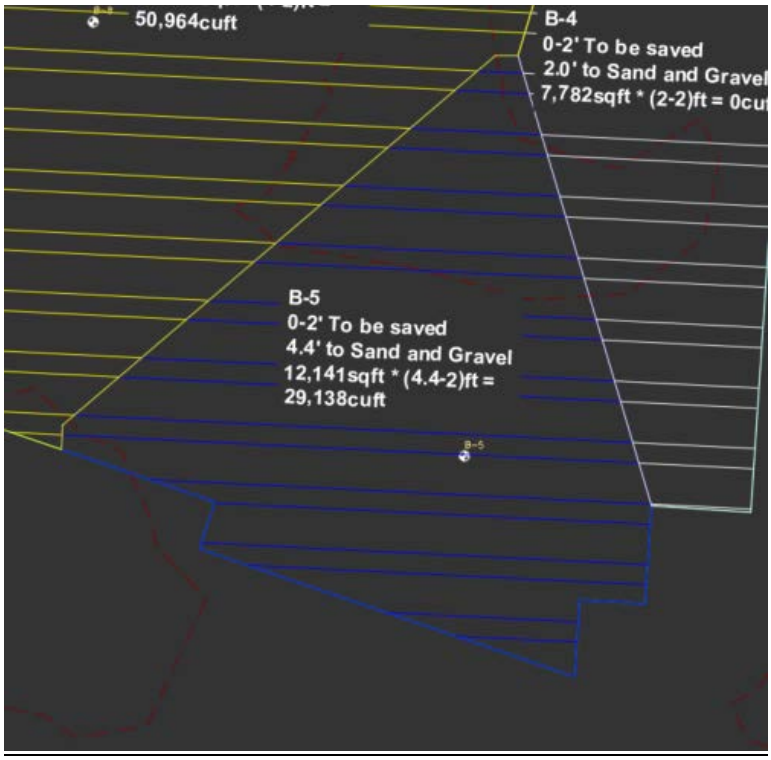
Wildwood School @ North Intermediate School, Wilmington, MA
B-2 (Cyan Section)



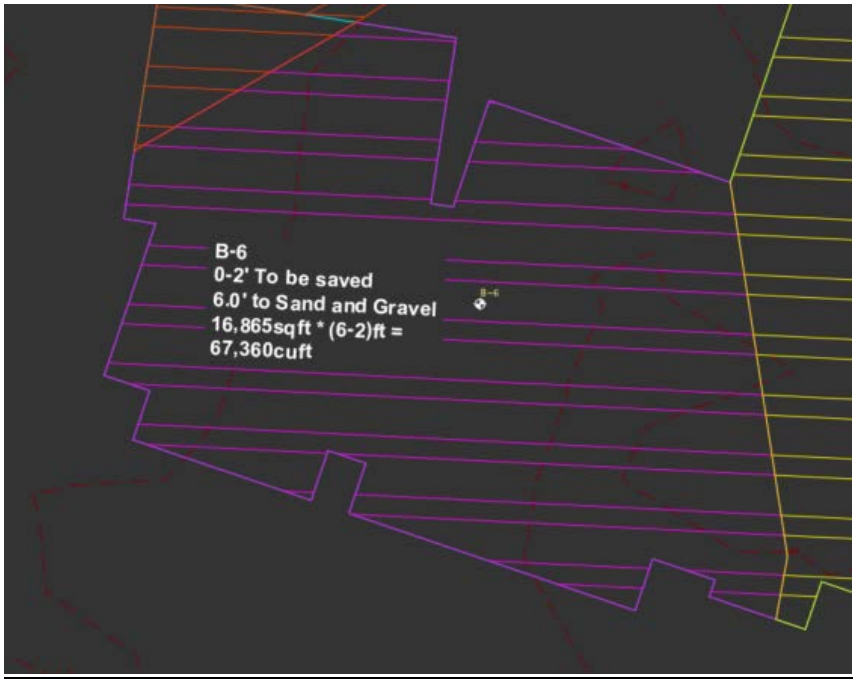
Wildwood School @ North Intermediate School, Wilmington, MA
B-3 (Red Section)



Wildwood School @ North Intermediate School, Wilmington, MA
B-4 (White Section)

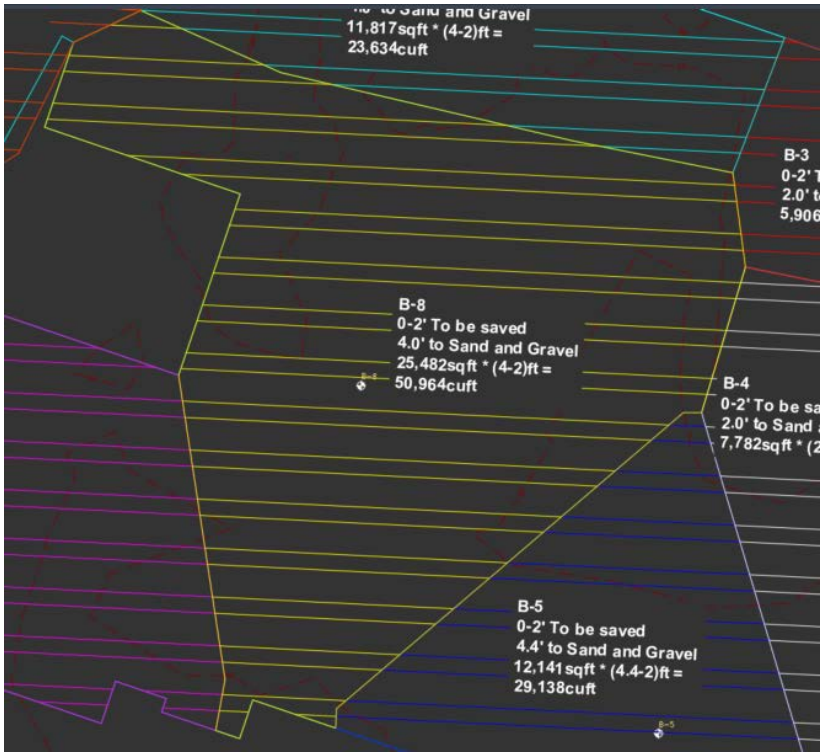


Wildwood School @ North Intermediate School, Wilmington, MA
B-5 (Blue Section)



Wildwood School @ North Intermediate School, Wilmington, MA
B-6 (Magenta Section)

Wildwood School @ North Intermediate School, Wilmington, MA
B-7 (Orange Section)



Wildwood School @ North Intermediate School, Wilmington, MA
B-8 (Yellow Section)

Engineering Economic Analysis
for
Wilmington Elementary School

Wilmington, MA

January 21, 2025

Prepared for:

WILMINGTON PUBLIC SCHOOLS

Prepared by:

GGD Consulting Engineers, Inc.
375 Faunce Corner Road, Suite D
Dartmouth, MA 02747

Wilmington Elementary School
Engineering Economic Analysis

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LEED v4.0 Energy Savings Summary Chart 13

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Energy Profiles 34

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EXECUTIVE SUMMARY

Section 1.0: Executive Summary

The Wilmington Elementary School is a new three-story school with an approximate gross area of 167,000 s.f. The building has been simulated with the school's anticipated hours of operation provided by the owner as follows:

It is anticipated that the typical student hours will occur from 6:30 am – 6:00 pm (Mon-Fri) while the building will be occupied between 6 pm – 9 pm (Mon-Fri) for limited community use, sports, and recreation programs. Limited summer programming shall occur throughout the building from 7:00 am – 3:30 pm (Mon-Fri) for special needs, summer camps, recreation, and sports practices. The Gym will also have limited community use on the weekends from 9:00 am – 9:00 pm.

The goal of the mechanical system lifecycle engineering economic analysis is to assess the performance of various mechanical systems in comparison to a baseline mechanical system.

Each option is compared to the baseline system to determine the greatest combined savings over a 50 year cycle to determine the most advantageous system considering anticipated hours of operation, electrical costs, maintenance costs, initial construction costs, and replacement costs.

By comparison of each option to the baseline system, the option with the greatest total life-cycle savings is generally recommended. To further enhance controllability and overall system performance, additional options should be considered that will enhance year round temperature control and comfort at a possible marginal increase in capital cost.

Upon completion of the mechanical system lifecycle engineering economic analysis, the design building is simulated with the recommended mechanical system in comparison to an ASHRAE Standard 90.1-2010 baseline building to project the anticipated energy cost percentage savings for LEED V4 EAc2 – Optimize Energy Performance.

Section 1.1: Mechanical System Analysis

1.1.A: Baseline System Option – Mixed-Air Overhead Chilled/Hot Water Variable Air Volume (VAV) Air Handling Unit Systems with Air-Source Heat Pump (ASHP) Heat Recovery Chiller/Heater Plant

- Chilled/hot water VAV air handling units with energy recovery wheels and terminal VAV boxes with hot water reheat coils and energy recovery providing mixed-air over-head distribution the following areas:
    - RTU-A: 30,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-B: 35,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-C: 30,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-D: 10,000 CFM Gym
    - RTU-E: 5,000 CFM Media Center, Support, & Circulation Areas
    - RTU-F: 10,000 CFM Cafeteria, Stage, & Support Areas
    - RTU-G: 3,000 CFM Kitchen, Custodial, & Support Areas
    - RTU-H: 6,000 CFM Administration, Support, & Circulation Areas
- 100% outside air chilled/hot water VAV make-up air handling unit and kitchen exhaust fans with kitchen hood controls serving the following areas:
    - MAU-A: 4,500 CFM Kitchen Hood Make-Up
- Overhead fiberglass insulated supply and return air ductwork distribution system

- Hot water radiation and unit heaters for heating only areas such as storage rooms, entry ways, corridors, etc.

- (15) 30 ton high-efficiency air-to-water source modular chilled/hot water heat recovery heat pump plant providing chilled and hot water to the building (450 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating, 4 modules redundant)

  (1) 1,194 MBH (350 kW) electric hot water boiler (Back Up Only)

- Insulated chilled water, hot water, and condensate piping systems

- Chilled and hot water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.B: System Option One – VRF ASHP System with Supplemental Electric Heating Units

- 100% outside air ASHP heating/cooling VAV air handling units with energy recovery wheels and terminal variable air volume boxes with demand control ventilation providing ventilation to the terminal VRF units serving the following areas:

  - RTU-A: 14,000 CFM Classrooms, Support, & Circulation Areas
  - RTU-B: 16,000 CFM Classrooms, Support, & Circulation Areas
  - RTU-C: 13,000 CFM Classrooms, Support, & Circulation Areas
  - RTU-E: 2,500 CFM Media Center, Support, & Circulation Areas
  - RTU-H: 3,000 CFM Administration, Support, & Circulation Areas

- Terminal VRF heat pump evaporator units serving the spaces indicated above

- Insulated refrigerant and condensate piping systems

- Air-source heat recovery VRF heat pump condensing units (240 ton total capacity)

- ASHP cooling/heating VAV air handling units with energy recovery wheels and demand control ventilation providing mixed-air over-head distribution the following areas:

  - RTU-D: 10,000 CFM Gym
  - RTU-F: 10,000 CFM Cafeteria, Stage, & Support Areas
  - RTU-G: 3,000 CFM Kitchen, Custodial, & Support Areas

- 100% outside air ASHP cooling/heating VAV make-up air handling unit and kitchen exhaust fans with kitchen hood controls serving the following areas:

  - MAU-A: 4,500 CFM Kitchen Hood Make-Up

- Overhead fiberglass insulated supply and return air ductwork distribution system

- Electric radiation and unit heaters for heating only areas such as storage rooms, entry ways, corridors, etc.

- Direct digital controls throughout

1.1.C: System Option Two – Geothermal Variable Refrigerant Flow (VRF) Ground-Source Heat Pump (GSHP) System with GSHP VAV Air Handling Units

- 100% outside air WSHP heating/cooling VAV air handling units with energy recovery heat exchangers and terminal variable air volume boxes with demand control ventilation providing ventilation to the terminal VRF units serving the following areas:
    - RTU-A: 14,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-B: 16,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-C: 13,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-E: 2,500 CFM Media Center, Support, & Circulation Areas
    - RTU-H: 3,000 CFM Administration, Support, & Circulation Areas
- Terminal VRF heat pump evaporator units serving the spaces indicated above
- Insulated refrigerant and condensate piping systems
- Water-source heat recovery VRF heat pump condensing units (240 ton total capacity)
- WSHP heating/cooling VAV air handling unit with energy recovery wheel and demand control ventilation providing mixed-air over-head distribution the following areas:
    - RTU-D: 10,000 CFM Gym
    - RTU-F: 10,000 CFM Cafeteria, Stage, & Support Areas
    - RTU-G: 3,000 CFM Kitchen, Custodial, & Support Areas
- 100% outside air WSHP cooling/heating VAV make-up air handling unit and kitchen exhaust fans with kitchen hood controls serving the following areas:
    - MAU-A: 4,500 CFM Kitchen Hood Make-Up
- Overhead fiberglass insulated supply and return air ductwork distribution system
- Electric radiation and unit heaters for heating only areas such as storage rooms, entry ways, corridors, etc.
- (80) 600’ closed-loop type ground source geothermal wells (4.25 tons each for 335 tons total capacity)
- (1) 1,194 MBH (350 kW) electric hot water boiler (Back Up Only)
- Insulated condenser water, geothermal water, and condensate piping systems
- Condenser and geothermal well primary pumping with variable frequency drives
- Direct digital controls throughout

1.1.D: System Option Three - Chilled/Hot Water VAV Air Handling Unit Displacement Ventilation Systems with ASHP Heat Recovery Chiller/Heater Plant

- 100% outside air hot water heating/chilled water cooling air handling units with energy recovery wheels and terminal variable air volume boxes with demand control ventilation providing displacement ventilation to the following areas:

    - RTU-A: 17,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-B: 20,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-C: 17,000 CFM Classrooms, Support, & Circulation Areas
    - RTU-E: 3,000 CFM Media Center, Support, & Circulation Areas
    - RTU-H: 4,000 CFM Administration, Support, & Circulation Areas

- Passive chilled beam cooling/heating panels located along exterior walls of the above areas

- Hot water heating/chilled water cooling VAV air handling units with energy recovery wheels and demand control ventilation providing displacement ventilation to the following areas:

    - RTU-D: 10,000 CFM Gym
    - RTU-F: 10,000 CFM Cafeteria, Stage, & Support Areas
    - RTU-G: 3,000 CFM Kitchen, Custodial, & Support Areas

- Hot water radiant heating panels located along exterior walls of the above areas

- 100% outside air chilled/hot water VAV make-up air handling unit and kitchen exhaust fans with kitchen hood controls serving the following areas:

    - MAU-A: 4,500 CFM Kitchen Hood Make-Up

- Overhead fiberglass insulated supply and return air ductwork distribution system

- Hot water radiation and unit heaters for heating only areas such as storage rooms, entry ways, corridors, etc.

- (15) 30 ton high-efficiency air-to-water source modular chilled/hot water heat recovery heat pump plant providing chilled and hot water to the building (450 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating, 4 modules redundant)

- (1) 1,194 MBH (350 kW) electric hot water boiler (Back Up Only)

- Chilled and hot water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.E: System Option Four – Chilled/Hot Water Cooling/Heating VAV Air Handling Unit Displacement Ventilation Systems with GSHP Heat Recovery Chiller/Heater Geothermal Plant

- This option is identical to Option 3 as outlined above but will utilize the following ground-source chilled/hot water plant equipment rather than the air-source heat pump chilled/hot water plant and wellfield outlined above:

    - (8) 50 ton high-efficiency air-to-water source modular chilled/hot water heat recovery heat pump plant providing chilled and hot water to the building (400 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating, 2 modules redundant)

    - (80) 600’ closed-loop type ground source geothermal wells (4.25 tons each for 335 tons total capacity)

- (1) 1,194 MBH (350 kW) electric hot water boiler (Back Up Only)
- Chilled, condenser, geothermal well, and hot water primary pumping with variable frequency drives

Section 1.2: Mechanical System Analysis Conclusion

The variable air volume air handling unit system is selected as the baseline system since it is similar to an ASHRAE 90.1/IECC baseline system but complies with the high-efficiency requirements of the MA Opt-In Stretch Energy Code. Unfortunately, the selection may result in overall ownership costs that in some cases are higher when compared to the alterative systems primarily relating to increased annual operating costs with potentially reduced thermal comfort conditions of the building. The option comparison of each alternative system to the baseline assesses the benefits of improved systems with potentially reduced combined operating costs and improved thermal comfort with the goal of selecting the system with the highest ownership savings over the 50 year study period.

Annual electrical consumption is calculated through the results of a thermal dynamic heat transfer analysis utilizing Department of Energy's (DOE) Energy Plus/Carrier Hourly Analysis Program (HAP) software with all architectural data provided by Dore & Whittier Architects.

The building envelope reflects Dore & Whittier Architects' high-efficiency design with effective insulation U-values in accordance with ASHRAE 90.1 Appendix A as follows:

- Roof: U-0.018
- Brick Veneer Walls: U-0.028
- MCM Panel Walls: U-0.025
- Windows: U-0.25, 0.30 SHGC
- Curtainwall: U-0.25, 0.30 SHGC

Utility cost data for electricity was obtained from utility bills provided by the owner as follows:

Reading Municipal Light Department (RMLD): Commercial Schedule C Rate

- Customer Charge: $13.00/month
- Distribution Demand: $13.11177/kW
- Distribution Energy: $0.02554/kWh
- Electrification Energy: $0.00500/kWh
- Fuel Charge: $0.05120/kWh
- Distributed Solar: $0.00402/kWh
- Purchase Power & Trans.: $0.04820/kWh

The "Building Life-Cycle" analysis was performed in BLCC v5.3-22 and includes future worth of each system option considered using the DOE rates for nominal discount (1.4%), escalation (for each utility type based on region), inflation (2.0%), and interest (2.0%). The analysis includes equipment replacement costs for major system components after 20, 30, and 40 years (varying per system option as indicated in the replacement cost estimate sheet).

Our observations of the Mechanical System Payback Summary suggest that Option 3, Displacement Ventilation with an Air-Source Heat Pump Plant, represents the lowest life cycle cost of the system options studied by yielding an approximate $5,680,330 savings over the 50 year study period with an instant payback by having a lower capital investment than the baseline system.

Section 1.3: Geothermal Federal Tax Credit

There are potentially significant federal tax credits available to the school for installing a geothermal heating system. Per the 2022 Inflation Reduction Act, the Federal Investment Tax Credit (§ 48) can range from 6% to 30% if Prevailing Wage and Apprenticeship (PWA) requirements are met. Additional tax credits may also be available for using Domestic Content (up to 10% of related domestic steel and iron material and manufactured product costs). For the purpose of this study, a 25.5% federal tax credit was factored at this time assuming PWA requirements would be met (accounting for a 15% deduction required by projects funded by tax exempt bonds to the 30% incentive). Please note that it is recommended that the Town consult with a financial tax advisor or attorney to complete the required IRS documentation if a Geothermal heating system is selected.

When accounting for the Federal Tax Credit, the Mechanical System Payback Summary suggests that System Option 4 represents the greatest total life cycle savings by yielding an approximate $8,710,034 savings over the 50 year study period with an instant payback.

The geothermal system additionally provides further benefits that should be considered such as providing the second lowest EUI of all options at 22.3 kBTU/s.f./yr. The system further provides system longevity, reduced maintenance, reduced downtime, and improved controllability of equipment. The geothermal design also does not require exterior mounted condensing equipment which will provide the best acoustics of all options studied.

For additional information please refer to the following references:

- ClimateMaster's IRA 2023 Commercial Geothermal Tax Guide, weblink @ lc028-climatemaster-commercial-federal-tax-incentives-brochure.pdf , and included in Appendix B
- IRS Clean Energy Tax Credit Information: Publication 5817-G (6-2023) (irs.gov), weblink @ https://www.irs.gov/pub/irs-pdf/p5817g.pdf, and included in Appendix B
- IRS & US Treasury Dept Notice 2023-44: Additional Guidance for the Qualifying Advanced Energy Project Credit Allocation Program under Section 48C(e) (irs.gov), weblink @ https://www.irs.gov/pub/irs-drop/n-23-44.pdf

Section 2.0: LEED Energy Savings Summary

To estimate the LEED V4 EAc2 – Optimize Energy Performance savings, energy model simulations have been performed comparing the design building to a baseline ASHRAE Standard 90.1-2010 building.

1. The ASHRAE Standard 90.1-2010 baseline building is as follows:

- Envelope:
  - Wall: U-0.064
  - Roof: U-0.048
  - Windows: 0.55 U-Value, 0.40 SHGC
  - Curtainwall/Storefront: 0.45 U-Value, 0.40 SHGC
- Mechanical System:
  - System 8 - Electric heating/chilled water cooling air handling units with energy recovery wheels and terminal fan-powered VAV boxes with electric reheat coils (one per floor)
  - System 4 – Packaged electric heat pump cooling/heating constant volume single zone air handling units (serving spaces with loads varying by 10 Btuh/s.f. of the average space load)
  - (2) high-efficiency water-cooled chillers with associated cooling tower

- Domestic Hot Water System:
    - Instantaneous electric domestic hot water system
- Lighting System:
    - 0.99 w/s.f.

2. The design building is as follows:

- Envelope:
    - Roof: U-0.018
    - Brick Veneer Walls: U-0.028
    - MCM Panel Walls: U-0.025
    - Windows: U-0.25, 0.30 SHGC
    - Curtainwall: U-0.25, 0.30 SHGC
- Mechanical System:
    - (Refer to System Option descriptions)
- Domestic Hot Water System:
    - Instantaneous electric domestic hot water system
- Lighting System:
    - 0.5 w/s.f.

Section 2.1: LEED Energy Savings Analysis Conclusion

A comparison of the Design Building against the ASHRAE Standard 90.1-2010 Baseline Building results in the following energy cost savings for LEED V4 EAc2 – Optimize Energy Performance for each System Option as follows:

- System Option 1 – 27.1% cost for 11 total points
- System Option 2 – 44.1% cost for 16 total points
- System Option 3 – 42.8% cost for 16 total points
- System Option 4 – 48.6% cost for 16 total points

Note:

The values indicated above are based on energy modelling performed for system comparison purposes only. Our office strongly recommends adding a 30% safety factor to the calculated values of this report for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

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Wilmington Elementary School - Mechanical System Payback Summary

Baseline	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
-	1. Mixed-Air Overhead CHW/HHW VAV AHU's w/ ERV & Terminal VAV's w/ Hot Water Re-Heat Coils 2. High-Efficiency ASHP Chiller/Heater Plant	$15,838,440	1,738,354	$327,852	$1.96	**35.5**	$77,410	$1,620,000	$3,198,500	$1,620,000	$405,262	-	-	-

Option	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****
1	1. Variable Refrigerant Flow (VRF) Units w/ Air-Source Condensers serving the Classrooms, Administration and Support Areas 2. ASHP DOAS AHU's w/ ERV & Terminal VAV's w/ DCV providing Ventilation to the VRF Units 3. Mixed-Air Overhead AHSP VAV AHU's w/ ERV & DCV serving the Cafe/Stage and Gym areas 4. Supplemental Electric Resistance Heating Units	$14,007,900	1,443,027	$291,930	$1.75	**29.5**	$58,460	$1,943,500	$1,185,000	$3,167,000	$350,390	**$54,872**	**$4,025,486**	**Instant*****
2	1. VRF System w/ Water-Source Heat Pump (WSHP) Heat Recovery Condensing Units 2. WSHP VAV Dedicated Outdoor Air Systems (DOAS) w/ ERV & DCV with Terminal VAV Boxes 3. Supplemental Electric Heating 4. Geothermal Well Field and Distribution Plant	$19,358,100	1,183,958	$223,944	$1.34	**24.2**	$62,235	$0	$3,945,000	$0	$286,179	**$119,083**	**$2,446,273**	**23**
3	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW Dedicated Outdoor Air System (DOAS) AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency ASHP Chiller/Heater Plant 4. Backup Electric Boiler Plant	$14,442,360	1,160,735	$229,174	$1.37	**23.7**	$74,000	$1,620,000	$2,289,500	$1,620,000	$303,174	**$102,088**	**$5,680,330**	**Instant*****
4	1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW DOAS AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency Ground Source Heat Pump (GSHP) Chiller/Heater Plant w/ Geothermal Well Field 4. Backup Side-Stream Electric Boiler Plant	$18,306,360	1,093,195	$205,748	$1.23	**22.3**	$75,675	$0	$3,379,500	$0	$281,423	**$123,839**	**$4,041,912**	**21**

* Capital Investment Costs based upon in-house cost estimate utilizing cost data from similar past projects and industry standard estimating references. Costs have been estimated for system comparison purposes only and do not incorporate all supplemental/independent HVAC system costs which would be required for all systems studied (i.e. specialty exhaust, overhead and profit).
** Combined expense savings is the difference between the combined annual expense of the baseline and system in comparison.
*** Total life-cycle savings is based on a 50 year study period.
**** Discounted payback years is based upon BLCC5 Life Cycle Analysis.
***** Discounted payback never reached because system is more efficient and/or less expensive than baseline system.

Note 1: Values based on energy model performed for HVAC System Life Cycle Cost Analysis purposes. A 30% safety factor should be applied for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

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Wilmington Elementary School - Mechanical System Payback Summary
Including Federal Tax Credit

Baseline	System	Gross Capital Investment*	25.5% IRA Geothermal Federal Tax Credit***	Net Investment	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings***	Total Life-Cycle Savings***	Discounted Payback (Years)****
-	**1. Mixed-Air Overhead CHW/HHW VAV AHU's w/ ERV & Terminal VAV's w/ Hot Water Re-Heat Coils 2. High-Efficiency ASHP Chiller/Heater Plant**	$15,838,440	$0	**$15,838,440**	1,738,354	$327,852	$1.96	**35.5**	$77,410	$1,620,000	$3,198,500	$1,620,000	$405,262	-	-	-

Option	System	Gross Capital Investment*	25.5% IRA Geothermal Federal Tax Credit***	Net Investment	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	20 Year Equipment Replacement Cost	30 Year Equipment Replacement Cost	40 Year Equipment Replacement Cost	Combined Annual Expense	Combined Expense Savings***	Total Life-Cycle Savings***	Discounted Payback (Years)****
1	**1. Variable Refrigerant Flow (VRF) Units w/ Air-Source Condensers serving the Classrooms, Administration and Support Areas 2. ASHP DOAS AHU's w/ ERV & Terminal VAV's w/ DCV providing Ventilation to the VRF Units 3. Mixed-Air Overhead AHSP VAV AHU's w/ ERV & DCV serving the Cafe/Stage and Gym areas 4. Supplemental Electric Resistance Heating Units**	$14,007,900	$0	**$14,007,900**	1,443,027	$291,930	$1.75	**29.5**	$58,460	$1,943,500	$1,185,000	$3,167,000	$350,390	**$54,872**	**$4,025,486**	**Instant*****
2	**1. VRF System w/ Water-Source Heat Pump (WSHP) Heat Recovery Condensing Units 2. WSHP VAV Dedicated Outdoor Air Systems (DOAS) w/ ERV & DCV with Terminal VAV Boxes 3. Supplemental Electric Heating 4. Geothermal Well Field and Distribution Plant**	$19,358,100	$4,936,316	**$14,421,785**	1,183,958	$223,944	$1.34	**24.2**	$62,235	$0	$3,945,000	$0	$286,179	**$119,083**	**$7,382,588**	**Instant*****
3	**1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW Dedicated Outdoor Air System (DOAS) AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency ASHP Chiller/Heater Plant 4. Backup Electric Boiler Plant**	$14,442,360	$0	**$14,442,360**	1,160,735	$229,174	$1.37	**23.7**	$74,000	$1,620,000	$2,289,500	$1,620,000	$303,174	**$102,088**	**$5,680,330**	**Instant*****
4	**1. Displacement Ventilation Diffusers w/ Radiant Cooling/Heating Panels 2. CHW/HHW DOAS AHU's ERV & Terminal VAV's w/ DCV 3. High-Efficiency Ground Source Heat Pump (GSHP) Chiller/Heater Plant w/ Geothermal Well Field 4. Backup Side-Stream Electric Boiler Plant**	$18,306,360	$4,668,122	**$13,638,238**	1,093,195	$205,748	$1.23	**22.3**	$75,675	$0	$3,379,500	$0	$281,423	**$123,839**	**$8,710,034**	**Instant*****

* Capital Investment Costs based upon in-house cost estimate utilizing cost data from similar past projects and industry standard estimating references. Costs have been estimated for system comparison purposes only and do not incorporate all supplemental/independent HVAC system costs which would be required for all systems studied (i.e. specialty exhaust, overhead and profit).

** Total payment costs indicated for these incentives need to be confirmed by the appropriate parties.

*** Combined expense savings is the difference between the combined annual expense of the baseline and system in comparison.

**** Total life-cycle savings is based on a 50 year study period.

***** Discounted payback years is based upon BLCC5 Life Cycle Analysis.

****** Discounted payback never reached because system is more efficient and/or less expensive than baseline system.

Note 1: Values based on energy model performed for HVAC System Life Cycle Cost Analysis purposes. A 30% safety factor should be applied for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

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Wilmington Elementary School - LEED v4.0 Energy Savings Summary

Baseline	Description	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual GHG Emissions (kg CO2)	Combined Expense Savings**	Energy Cost Savings Percentage**	Total LEED EAc2 Points
LEED Baseline	**1. ASHRAE 90.1-2010 Envelope 2. ASHRAE 90.1-2010 Mechanical Systems (System 8 - CHW VAV AHU's w/ Fan-Powered VAV Boxes w/ Electric Reheat) 3. ASHRAE 90.1-2010 Lighting System (0.99 w/s.f.) 4. ASHRAE 90.1-2010 Electric Domestic Hot Water Systems**	2,001,943	$400,661	$2.40	40.9	511,887.4	-	-	-

Option	Description	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual GHG Emissions (kg CO2)	Combined Expense Savings**	Energy Cost Savings Percentage**	Total LEED EAc2 Points
1	**1. Design Envelope 2. Design Mechanical Systems (Air-Source VRF System) 3. Design High-Efficiency Lighting System (0.45 w/s.f.) 4. Electric Domestic Hot Water Systems**	1,443,027	$291,930	$1.75	29.5	368,975.2	$108,731	**27.1%**	**11**
2	**1. Design Envelope 2. Design Mechanical Systems (Ground-Source VRF System) 3. Design High-Efficiency Lighting System (0.45 w/s.f.) 4. Electric Domestic Hot Water Systems**	1,183,958	$223,944	$1.34	24.2	302,732.5	$176,717	**44.1%**	**16**
3	**1. Design Envelope 2. Design Mechanical Systems (Displacement Ventilation System with Air-Source Heat Recovery Heat Pump Chiller/Heater Plant) 3. Design High-Efficiency Lighting System (0.45 w/s.f.) 4. Electric Domestic Hot Water Systems**	1,160,735	$229,174	$1.37	23.7	296,794.5	$171,487	**42.8%**	**16**
4	**1. Design Envelope 2. Design Mechanical Systems (Geothermal Displacement Ventilation System with Ground-Source Heat Recovery Heat Pump Chiller/Heater Plant) 3. Design High-Efficiency Lighting System (0.45 w/s.f.) 4. Electric Domestic Hot Water Systems**	1,093,195	$205,748	$1.23	22.3	279,524.8	$194,913	**48.6%**	**16**

*Combined expense savings is the difference between the combined annual expense of the baseline and building in comparison.
**Energy cost/Greenhouse Gas (GHG) emissions savings percentage is the difference between the annual energy costs of the baseline and building in comparison.

Note 1: Values based on energy model performed for HVAC System Life Cycle Cost Analysis purposes. A 30% safety factor should be applied for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

LIFE CYCLE ANALYSES

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: Option 1 - ASHP VRF System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:51:49 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$14,007,900	$1,830,540
Future Costs:			
Energy Consumption Costs	$8,347,407	$6,929,275	$1,418,131
Energy Demand Charges	$3,404,705	$3,535,184	-$130,479
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$6,160,732	$907,293
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$16,625,191	$2,194,946
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$30,633,091	$4,025,486

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$2,194,946
- Increased Total Investment	-$1,830,540

Net Savings	$4,025,486

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	1,738,354.0 kWh	1,443,027.0 kWh	295,327.0 kWh	14,765,945.7 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	5,931.5 MBtu	4,923.8 MBtu	1,007.7 MBtu	50,383.5 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	573,718.42 kg	476,250.04 kg	97,468.38 kg	4,873,285.33 kg
SO2	162.71 kg	135.07 kg	27.64 kg	1,382.13 kg
NOx	438.08 kg	363.65 kg	74.42 kg	3,721.12 kg
Total:				
CO2	573,718.42 kg	476,250.04 kg	97,468.38 kg	4,873,285.33 kg
SO2	162.71 kg	135.07 kg	27.64 kg	1,382.13 kg
NOx	438.08 kg	363.65 kg	74.42 kg	3,721.12 kg

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: Option 2 - GSHP VRF System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:52:15 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$19,358,100	-$3,519,660
Future Costs:			
Energy Consumption Costs	$8,347,407	$5,685,251	$2,662,156
Energy Demand Charges	$3,404,705	$2,342,200	$1,062,505
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$4,826,752	$2,241,273
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$12,854,203	$5,965,933
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$32,212,303	$2,446,273

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$5,965,933
- Increased Total Investment	$3,519,660

Net Savings	$2,446,273

Savings-to-Investment Ratio (SIR)

SIR = 1.70

Adjusted Internal Rate of Return

AIRR = 2.48%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

Simple Payback occurs in year	21
Discounted Payback occurs in year	23

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	1,738,354.0 kWh	1,183,958.0 kWh	554,396.0 kWh	27,719,041.1 kWh

Energy Savings Summary (in MBtu)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	5,931.5 MBtu	4,039.8 MBtu	1,891.7 MBtu	94,581.3 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	573,718.42 kg	390,748.09 kg	182,970.33 kg	9,148,265.80 kg
SO2	162.71 kg	110.82 kg	51.89 kg	2,594.57 kg
NOx	438.08 kg	298.37 kg	139.71 kg	6,985.39 kg
Total:				
CO2	573,718.42 kg	390,748.09 kg	182,970.33 kg	9,148,265.80 kg
SO2	162.71 kg	110.82 kg	51.89 kg	2,594.57 kg
NOx	438.08 kg	298.37 kg	139.71 kg	6,985.39 kg

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: Option 3 - ASHP Displacement System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:52:29 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$15,379,680	$458,760
Future Costs:			
Energy Consumption Costs	$8,347,407	$5,573,736	$2,773,670
Energy Demand Charges	$3,404,705	$2,641,190	$763,515
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$5,383,640	$1,684,385
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$13,598,566	$5,221,570
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$28,978,246	$5,680,330

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$5,221,570
- Increased Total Investment	-$458,760

Net Savings	$5,680,330

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	1,738,354.0 kWh	1,160,735.0 kWh	577,619.0 kWh	28,880,159.3 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	5,931.5 MBtu	3,960.6 MBtu	1,970.9 MBtu	98,543.2 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	573,718.42 kg	383,083.68 kg	190,634.74 kg	9,531,475.96 kg
SO2	162.71 kg	108.65 kg	54.07 kg	2,703.26 kg
NOx	438.08 kg	292.51 kg	145.56 kg	7,278.00 kg
Total:				
CO2	573,718.42 kg	383,083.68 kg	190,634.74 kg	9,531,475.96 kg
SO2	162.71 kg	108.65 kg	54.07 kg	2,703.26 kg
NOx	438.08 kg	292.51 kg	145.56 kg	7,278.00 kg

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: Option 4 - GSHP Displacement System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:52:50 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$18,306,360	-$2,467,920
Future Costs:			
Energy Consumption Costs	$8,347,407	$5,249,416	$3,097,991
Energy Demand Charges	$3,404,705	$2,125,799	$1,278,906
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$4,935,090	$2,132,935
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$12,310,305	$6,509,832
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$30,616,665	$4,041,912

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$6,509,832
- Increased Total Investment	$2,467,920

Net Savings	$4,041,912

Savings-to-Investment Ratio (SIR)

SIR = 2.64

Adjusted Internal Rate of Return

AIRR = 3.39%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

Simple Payback occurs in year	20
Discounted Payback occurs in year	21

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	1,738,354.0 kWh	1,093,195.0 kWh	645,159.0 kWh	32,257,066.8 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	5,931.5 MBtu	3,730.1 MBtu	2,201.4 MBtu	110,065.7 MBtu

Emissions Reduction Summary

Energy	-----Average	Annual	Emissions-----	Life-Cycle
Type	Base Case	Alternative	Reduction	Reduction
Electricity				
CO2	573,718.42 kg	360,793.09 kg	212,925.33 kg	10,645,975.11 kg
SO2	162.71 kg	102.33 kg	60.39 kg	3,019.34 kg
NOx	438.08 kg	275.49 kg	162.58 kg	8,129.00 kg
Total:				
CO2	573,718.42 kg	360,793.09 kg	212,925.33 kg	10,645,975.11 kg
SO2	162.71 kg	102.33 kg	60.39 kg	3,019.34 kg
NOx	438.08 kg	275.49 kg	162.58 kg	8,129.00 kg

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: IRA Rebate Option 2 - GSHP VRF System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:53:19 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$14,421,785	$1,416,655
Future Costs:			
Energy Consumption Costs	$8,347,407	$5,685,251	$2,662,156
Energy Demand Charges	$3,404,705	$2,342,200	$1,062,505
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$4,826,752	$2,241,273
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$12,854,203	$5,965,933
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$27,275,988	$7,382,588

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$5,965,933
- Increased Total Investment	-$1,416,655

Net Savings	$7,382,588

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	1,738,354.0 kWh	1,183,958.0 kWh	554,396.0 kWh	27,719,041.1 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	5,931.5 MBtu	4,039.8 MBtu	1,891.7 MBtu	94,581.3 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	573,718.42 kg	390,748.09 kg	182,970.33 kg	9,148,265.80 kg
SO2	162.71 kg	110.82 kg	51.89 kg	2,594.57 kg
NOx	438.08 kg	298.37 kg	139.71 kg	6,985.39 kg
Total:				
CO2	573,718.42 kg	390,748.09 kg	182,970.33 kg	9,148,265.80 kg
SO2	162.71 kg	110.82 kg	51.89 kg	2,594.57 kg
NOx	438.08 kg	298.37 kg	139.71 kg	6,985.39 kg

NIST BLCC 5.3-22: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - Mixed-Air VAV w/ ASHP Plant

Alternative: IRA Rebate Option 4 - GSHP Displacement System

General Information

File Name:	C:\Users\keith_lane.GGDMAIL\BLCC 5.3-22\projects\Wilmington Elementary School.xml
Date of Study:	Wed Jan 15 13:54:21 EST 2025
Project Name:	Wilmington Elementary School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	
Base Date:	September 1, 2026
Service Date:	September 1, 2026
Study Period:	50 years 0 months(September 1, 2026 through August 31, 2076)
Discount Rate:	1.4%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$15,838,440	$13,638,238	$2,200,202
Future Costs:			
Energy Consumption Costs	$8,347,407	$5,249,416	$3,097,991
Energy Demand Charges	$3,404,705	$2,125,799	$1,278,906
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$7,068,025	$4,935,090	$2,132,935
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	---	---	---
Subtotal (for Future Cost Items)	$18,820,137	$12,310,305	$6,509,832
	---	---	---
Total PV Life-Cycle Cost	$34,658,577	$25,948,543	$8,710,034

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$6,509,832
- Increased Total Investment	-$2,200,202

Net Savings	$8,710,034

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average Annual Consumption-----		Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	1,738,354.0 kWh	1,093,195.0 kWh	645,159.0 kWh	32,257,066.8 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average Annual Consumption-----		Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	5,931.5 MBtu	3,730.1 MBtu	2,201.4 MBtu	110,065.7 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	573,718.42 kg	360,793.09 kg	212,925.33 kg	10,645,975.11 kg
SO2	162.71 kg	102.33 kg	60.39 kg	3,019.34 kg
NOx	438.08 kg	275.49 kg	162.58 kg	8,129.00 kg
Total:				
CO2	573,718.42 kg	360,793.09 kg	212,925.33 kg	10,645,975.11 kg
SO2	162.71 kg	102.33 kg	60.39 kg	3,019.34 kg
NOx	438.08 kg	275.49 kg	162.58 kg	8,129.00 kg

COST ESTIMATES

GGD Consulting Engineers, Inc.
375 Faunce Corner Road, Suite D
Dartmouth, MA 02747

PROJECT: Wilmington Elementary School
JOB NO: 894 135 00
CLIENT: Dore & Whittier Architects
DATE: 1/13/2025 **BY:** KL

Baseline - Air-Source Heat Pump Plant VAV Systems (MA Opt-In Stretch Energy Code Compliant)

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
VAV Box with Hot Water Reheat Coils	150	$1,500			$ 225,000
RTU-A: Classroom Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	30,000 CFM	$21/CFM			$ 630,000
RTU-B: Classroom Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	35,000 CFM	$21/CFM			$ 735,000
RTU-C: Classroom Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	30,000 CFM	$21/CFM			$ 630,000
RTU-D: Gym Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-E: Media Center Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	5,000 CFM	$25/CFM			$ 125,000
RTU-F: Cafe/Stage Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-G: Kitchen/Custodial Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	3,000 CFM	$25/CFM			$ 75,000
RTU-H: Admin. Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	6,000 CFM	$23/CFM			$ 138,000
MAU-A: Kitchen 100% O.A. VAV MAU CHW/HHW Cooling/Heating w/ Kitchen Hood Controls	4,500 CFM	$23/CFM			$ 103,500
(15) 30 Ton High-Efficiency Air-Source Heat Recovery Heat Pump Chiller/Heater Plant (450 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating)	450 tons	$3,600/ton			$ 1,620,000
(1) 350 kW Electric Boiler including Accessories (For Back-Up Only)	1	$60,000			$ 60,000
Chilled Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Hot Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Hot Water Terminal Heating Units			167,000	$2.00	$ 334,000
Hot Water Piping & Ins. and Accessories			167,000	$6.50	$ 1,085,500
Chilled Water Piping & Insulation and Condensate Piping & Pumps			167,000	$7.00	$ 1,169,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			167,000	$25.00	$ 4,175,000
ATC/DDC Controls			167,000	$7.50	$ 1,252,500
Chilled/Hot Water Fan Coil Units (IDF, EMR, etc.)	10	$5,000			$ 50,000
Cabinet Hot Water Unit Heaters	16	$2,000			$ 32,000
Hot Water Unit Heaters	6	$1,200			$ 7,200
Exhaust Fans (Misc. Areas)					$ 40,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)	20.00%	$13,198,700			$ 2,639,740
				TOTAL	$ 15,838,440
				TOTAL ($/FT²)	$ 94.84

Cost estimates have been derived for system comparison purposes only and are based upon recent project costs. Estimates do not necessarily include HVAC systems and equipment that would be required for all system options studied (i.e. specialty cooling & exhaust systems, etc.).

* Air-Source Heat Pump replacement cost of $1,620,000 after 20 year equipment life expectancy carried in Life-Cycle Analysis calculations.

** Rooftop Unit and Pump replacement cost of $3,198,500 after 30 year equipment life expectancy carried in Life-Cycle Analysis calculations.

*** Air-Source Heat Pump replacement cost of $1,620,000 after 40 year equipment life expectancy carried in Life-Cycle Analysis calculations.

GGD Consulting Engineers, Inc.
375 Faunce Corner Road, Suite D
Dartmouth, MA 02747

Option 1 - Air-Source Heat Pump (ASHP) Variable Refrigerant Flow (VRF) Systems with ASHP Cooling/Heating Air Handling Units

PROJECT:	**Wilmington Elementary School**	
JOB NO:	**894 135 00**	
CLIENT:	**Dore & Whittier Architects**	
DATE:	**1/13/2025**	**BY: KL**

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Indoor VRF Evaporator Units	216	$4,500			$ 972,000
VRF Branch Controllers	14	$12,000			$ 168,000
Outdoor Air Cooled VRF Condensing Units (240 Ton Total Capacity)	240 tons	$3,000/ton			$ 720,000
VAV Box with Demand Ventilation Controls	150	$1,250			$ 187,500
RTU-A: Classroom 100% O.A. ASHP DOAS w/ ERV & DCV	14,000 CFM	$30/CFM			$ 420,000
RTU-B: Classroom 100% O.A. ASHP DOAS w/ ERV & DCV	16,000 CFM	$30/CFM			$ 480,000
RTU-C: Classroom 100% O.A. ASHP DOAS w/ ERV & DCV	13,000 CFM	$30/CFM			$ 390,000
RTU-D: Gym Overhead VAV ASHP w/ ERV & DCV	12,000 CFM	$30/CFM			$ 360,000
RTU-E: Media Center 100% O.A. ASHP DOAS w/ ERV & DCV	2,500 CFM	$35/CFM			$ 87,500
RTU-F: Cafe/Stage Overhead VAV ASHP w/ ERV & DCV	12,000 CFM	$30/CFM			$ 360,000
RTU-G: Kitchen/Custodial Overhead VAV ASHP w/ ERV & DCV	3,000 CFM	$35/CFM			$ 96,000
RTU-H: Admin. 100% O.A. ASHP DOAS w/ ERV & DCV	3,000 CFM	$35/CFM			$ 105,000
MAU-A: Kitchen 100% O.A. ASHP VAV MAU w/ Kitchen Hood Controls	4,500 CFM	$33/CFM			$ 148,500
Electric Terminal Heating Units			167,000	$3.50	$ 584,500
Electric Circuitry for VRF & Electric Terminal Heating Units			167,000	$3.00	$ 501,000
Refrigeration Piping & Insulation and Condensate Piping & Pumps			167,000	$10.00	$ 1,670,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			167,000	$18.00	$ 3,006,000
ATC/DDC Controls w/ Refrigerant Monitoring			167,000	$7.75	$ 1,294,250
Indoor VRF Evaporator Units (IDF, EMR, etc.)	10	$4,500			$ 45,000
Cabinet Electric Unit Heaters	16	$2,000			$ 32,000
Electric Unit Heaters	6	$1,000			$ 6,000
Exhaust Fans (Misc. Areas)					$ 40,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)	20.00%	$11,673,250			$ 2,334,650
				TOTAL	$ 14,007,900
				TOTAL ($/FT²)	$ 83.88

Cost estimates have been derived for system comparison purposes only and are based upon recent project costs. Estimates do not necessarily include HVAC systems and equipment that would be required for all system options studied (i.e. specialty cooling & exhaust systems, etc.).

* Rooftop Unit Condenser & Air-Source VRF Condenser replacement cost of $1,943,450 after 20 year equipment life expectancy carried in Life-Cycle Analysis calculations.

** VRF Evaporator Unit & Branch Controller replacement cost of $1,185,000 after 30 year equipment life expectancy carried in Life-Cycle Analysis calculations.

*** Rooftop Unit & Air-Source VRF Condenser replacement cost of $3,167,000 after 40 year equipment life expectancy carried in Life-Cycle Analysis calculations.

GGD Consulting Engineers, Inc.
375 Faunce Corner Road, Suite D
Dartmouth, MA 02747

PROJECT: Wilmington Elementary School

JOB NO: 894 135 00

CLIENT: Dore & Whittier Architects

DATE: 1/13/2025 **BY:** KL

Option 2 - Geothermal Ground-Source Heat Pump (GSHP) Variable Refrigerant Flow (VRF) Systems with GSHP Cooling/Heating Air Handling Units

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Indoor VRF Evaporator Units	216	$4,500			$ 972,000
VRF Branch Controllers	14	$12,000			$ 168,000
Indoor Water-Source VRF Condensing Units (240 Ton Total Capacity including Redundancy)	240 tons	$2,500/ton			$ 600,000
VAV Box with Demand Ventilation Controls	150	$1,250			$ 187,500
RTU-A: Classroom 100% O.A. GSHP DOAS w/ ERV & DCV	14,000 CFM	$24/CFM			$ 336,000
RTU-B: Classroom 100% O.A. GSHP DOAS w/ ERV & DCV	16,000 CFM	$24/CFM			$ 384,000
RTU-C: Classroom 100% O.A. GSHP DOAS w/ ERV & DCV	13,000 CFM	$24/CFM			$ 312,000
RTU-D: Gym Overhead VAV GSHP w/ ERV & DCV	12,000 CFM	$24/CFM			$ 288,000
RTU-E: Media Center 100% O.A. GSHP DOAS w/ ERV & DCV	2,500 CFM	$29/CFM			$ 72,500
RTU-F: Cafe/Stage Overhead VAV GSHP w/ ERV & DCV	12,000 CFM	$26/CFM			$ 312,000
RTU-G: Kitchen/Custodial Overhead VAV GSHP w/ ERV & DCV	3,000 CFM	$29/CFM			$ 87,000
RTU-H: Admin. 100% O.A. GSHP DOAS w/ ERV & DCV	3,000 CFM	$29/CFM			$ 87,000
MAU-A: Kitchen 100% O.A. GSHP VAV MAU w/ Kitchen Hood Controls	4,500 CFM	$27/CFM			$ 121,500
(80) 600' Deep Closed Loop Type Wells (4.25 tons/well; 335 Tons total capacity) including Underground Piping, Coring, Sleeves, Excavation, Dewatering, Oversight, etc.	80	$45,000			$ 3,600,000
(1) 350 kW Electric Boiler including Accessories (For Back-Up Only)	1	$60,000			$ 60,000
Ground/Condenser Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Geothermal Pumps and VFDs, Accessories	2	$45,000			$ 90,000
Geothermal CW Piping Mains + Added Glycol Fill					$ 120,000
Electric Terminal Heating Units			167,000	$3.50	$ 584,500
Electric Circuitry for VRF & Electric Terminal Heating Units			167,000	$3.00	$ 501,000
Refrigeration Piping & Insulation and Condensate Piping & Pumps			167,000	$10.00	$ 1,670,000
Condenser Water Piping & Insulation and Condensate Piping & Pumps			167,000	$6.00	$ 1,002,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			167,000	$18.00	$ 3,006,000
ATC/DDC Controls w/ Refrigerant Monitoring			167,000	$8.25	$ 1,377,750
Indoor VRF Evaporator Units (IDF, EMR, etc.)	10	$3,500			$ 35,000
Cabinet Electric Unit Heaters	16	$2,000			$ 32,000
Electric Unit Heaters	6	$1,000			$ 6,000
Exhaust Fans (Misc. Areas)					$ 40,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)	20.00%	$16,131,750			$ 3,226,350
				TOTAL	$ 19,358,100
				TOTAL ($/FT²)	$ 115.92

Cost estimates have been derived for system comparison purposes only and are based upon recent project costs. Estimates do not necessarily include HVAC systems and equipment that would be required for all system options studied (i.e. specialty cooling & exhaust systems, etc.).

* VRF Evaporator Unit & Branch Controller, Rooftop Unit, Water-Source Heat Pump, and Pump replacement cost of $3,945,000 after 30 year equipment life expectancy carried in Life-Cycle Analysis calculations.

GGD Consulting Engineers, Inc.
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PROJECT: Wilmington Elementary School

JOB NO: 894 135 00

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DATE: 1/13/2025 **BY:** KL

Option 3 - Air-Source Heat Pump Plant Displacement Ventilation CHW/HHW Cooling/Heating VAV Systems w/ Terminal Chilled/Hot Water Radiation

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Displacement Diffuser Assemblies	170	$950			$ 161,500
Small Displacement Diffuser Assemblies (Admin.)	46	$850			$ 39,100
VAV Box with Demand Ventilation Controls	150	$1,250			$ 187,500
RTU-A: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	17,000 CFM	$21/CFM			$ 357,000
RTU-B: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	20,000 CFM	$21/CFM			$ 420,000
RTU-C: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	17,000 CFM	$21/CFM			$ 357,000
RTU-D: Gym Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-E: Media Center Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	3,000 CFM	$25/CFM			$ 75,000
RTU-F: Cafe/Stage Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-G: Kitchen/Custodial Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	3,000 CFM	$25/CFM			$ 75,000
RTU-H: Admin. Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	4,000 CFM	$25/CFM			$ 100,000
MAU-A: Kitchen 100% O.A. VAV MAU CHW/HHW Cooling/Heating w/ Kitchen Hood	4,500 CFM	$23/CFM			$ 103,500
(15) 30 Ton High-Efficiency Air-Source Heat Recovery Heat Pump Chiller/Heater Plant (450 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating)	450 tons	$3,600/ton			$ 1,620,000
(1) 350 kW Electric Boiler including Accessories (For Back-Up Only)	1	$60,000			$ 60,000
Chilled Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Hot Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Compensated Loop Pumps w/ VFD's, Accessories	2	$20,000			$ 40,000
Hot Water Terminal Heating/Cooling Units			167,000	$4.00	$ 668,000
Hot Water Piping & Ins. and Accessories			167,000	$6.50	$ 1,085,500
Chilled Water Piping & Insulation and Condensate Piping & Pumps			167,000	$9.00	$ 1,503,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			167,000	$18.00	$ 3,006,000
ATC/DDC Controls			167,000	$8.00	$ 1,336,000
Chilled/Hot Water Fan Coil Units (IDF, EMR, etc.)	10	$5,000			$ 50,000
Cabinet Hot Water Unit Heaters	16	$2,000			$ 32,000
Hot Water Unit Heaters	6	$1,200			$ 7,200
Exhaust Fans (Misc. Areas)					$ 40,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)	20.00%	$12,035,300			$ 2,407,060
				TOTAL	$ 14,442,360
				TOTAL ($/FT²)	$ 86.48

Cost estimates have been derived for system comparison purposes only and are based upon recent project costs. Estimates do not necessarily include HVAC systems and equipment that would be required for all system options studied (i.e. specialty cooling & exhaust systems, etc.).

* Air-Source Heat Pump replacement cost of $1,620,000 after 20 year equipment life expectancy carried in Life-Cycle Analysis calculations.

** Rooftop Unit and Pump replacement cost of $2,289,500 after 30 year equipment life expectancy carried in Life-Cycle Analysis calculations.

*** Air-Source Heat Pump replacement cost of $1,620,000 after 40 year equipment life expectancy carried in Life-Cycle Analysis calculations.

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375 Faunce Corner Road, Suite D
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PROJECT: Wilmington Elementary School
JOB NO: 894 135 00
CLIENT: Dore & Whittier Architects
DATE: 1/13/2025 **BY:** KL

Option 4 - Geothermal Heat Pump Plant Displacement Ventilation CHW/HHW Cooling/Heating VAV Systems w/ Terminal Chilled/Hot Water Radiation

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Displacement Diffuser Assemblies	170	$950			$ 161,500
Small Displacement Diffuser Assemblies (Admin.)	46	$850			$ 39,100
VAV Box with Demand Ventilation Controls	150	$1,250			$ 187,500
RTU-A: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	17,000 CFM	$21/CFM			$ 357,000
RTU-B: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	20,000 CFM	$21/CFM			$ 420,000
RTU-C: Classroom Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	17,000 CFM	$21/CFM			$ 357,000
RTU-D: Gym Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-E: Media Center Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	3,000 CFM	$25/CFM			$ 75,000
RTU-F: Cafe/Stage Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	12,000 CFM	$23/CFM			$ 276,000
RTU-G: Kitchen/Custodial Overhead VAV CHW/HHW Cooling/Heating w/ ERV & DCV	3,000 CFM	$25/CFM			$ 75,000
RTU-H: Admin. Displacement VAV CHW/HHW Cooling/Heating w/ ERV & DCV	4,000 CFM	$25/CFM			$ 100,000
MAU-A: Kitchen 100% O.A. VAV MAU CHW/HHW Cooling/Heating w/ Kitchen Hood	4,500 CFM	$23/CFM			$ 103,500
(8) 50 Ton High-Efficiency Water-Source Heat Recovery Geothermal Heat Pump Chiller/Heater Plant (400 ton total capacity, 335 ton cooling, 320 ton HHW/DHW heating)	400 tons	$2,500/ton			$ 1,000,000
(80) 600' Deep Closed Loop Type Wells (4.25 tons/well; 335 Tons total capacity) including Underground Piping, Coring, Sleeves, Excavation, Dewatering, Oversight, etc.	80	$45,000			$ 3,600,000
(1) 350 kW Electric Boiler including Accessories (For Back-Up Only)	1	$60,000			$ 60,000
Chilled Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Hot Water Pumps w/ VFD's, Accessories	2	$40,000			$ 80,000
Compensated Loop Pumps w/ VFD's, Accessories	2	$20,000			$ 40,000
Geothermal Pumps and VFDs, Accessories	2	$45,000			$ 90,000
Geothermal CW Piping Mains + Added Glycol Fill					$ 150,000
Hot Water Terminal Heating/Cooling Units			167,000	$4.00	$ 668,000
Hot Water Piping & Ins. and Accessories			167,000	$6.00	$ 1,002,000
Chilled Water Piping & Insulation and Condensate Piping & Pumps			167,000	$9.00	$ 1,503,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			167,000	$18.00	$ 3,006,000
ATC/DDC Controls			167,000	$8.50	$ 1,419,500
Chilled/Hot Water Fan Coil Units (IDF, EMR, etc.)	10	$5,000			$ 50,000
Cabinet Hot Water Unit Heaters	16	$2,000			$ 32,000
Hot Water Unit Heaters	6	$1,200			$ 7,200
Exhaust Fans (Misc. Areas)					$ 40,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)	20.00%	$15,255,300			$ 3,051,060
				TOTAL	$ 18,306,360
				TOTAL ($/FT²)	$ 109.62

Cost estimates have been derived for system comparison purposes only and are based upon recent project costs. Estimates do not necessarily include HVAC systems and equipment that would be required for all system options studied (i.e. specialty cooling & exhaust systems, etc.).

* Rooftop Unit, Water-Source Heat Pump, and Pump replacement cost of $3,79,500 after 30 year equipment life expectancy carried in Life-Cycle Analysis calculations.

GGD Consulting Engineers, Inc.
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Wilmington Elementary School - Annual Maintenance Costs

Baseline - Air-Source Heat Pump Plant Overhead VAV

Unit Type	Quantity	Cost/Unit	Annual Cost
VAV Box w/ Reheat Coil	150	$75	$11,250
Terminal Equipment (CUH's, UH's, etc.)	167,000	$0.03	$5,010
Water Treatment	167,000	$0.10	$16,700
ATC Controls	167,000	$0.10	$16,700
Large CHW AHU's (>6,000 CFM)	6	$2,000	$12,000
Small CHW AHU's (<6,000 CFM)	3	$1,500	$4,500
Fan Coil Units	10	$125	$1,250
Air-Source Heat Pump Plant	1	$10,000	$10,000
		TOTAL	**$77,410**

Option 1 - Air-Source VRF System

Unit Type	Quantity	Cost/Unit	Annual Cost
Indoor VRF Evaporators		$150	$0
Air-Cooled VRF Outdoor Units	1	$5,000	$5,000
VAV Box	150	$50	$7,500
Terminal Equipment (CUH's, UH's, etc.)	167,000	$0.03	$5,010
ATC Controls	167,000	$0.10	$16,700
Large ASHP AHU's (>6,000 CFM)	5	$2,750	$13,750
Small ASHP AHU's (<6,000 CFM)	4	$2,250	$9,000
Indoor VRF Fan Coil Units	10	$150	$1,500
		TOTAL	**$58,460**

Option 2 - Geothermal VRF System

Unit Type	Quantity	Cost/Unit	Annual Cost
Indoor VRF Evaporators		$150	$0
VRF Ground Source Plant	1	$3,000	$3,000
VAV Box	150	$50	$7,500
Terminal Equipment (CUH's, UH's, etc.)	167,000	$0.03	$5,010
Water Treatment	167,000	$0.075	$12,525
ATC Controls	167,000	$0.10	$16,700
Large WSHP AHU's (>6,000 CFM)	5	$2,000	$10,000
Small WSHP AHU's (<6,000 CFM)	4	$1,500	$6,000
Indoor VRF Fan Coil Units	10	$150	$1,500
		TOTAL	**$62,235**

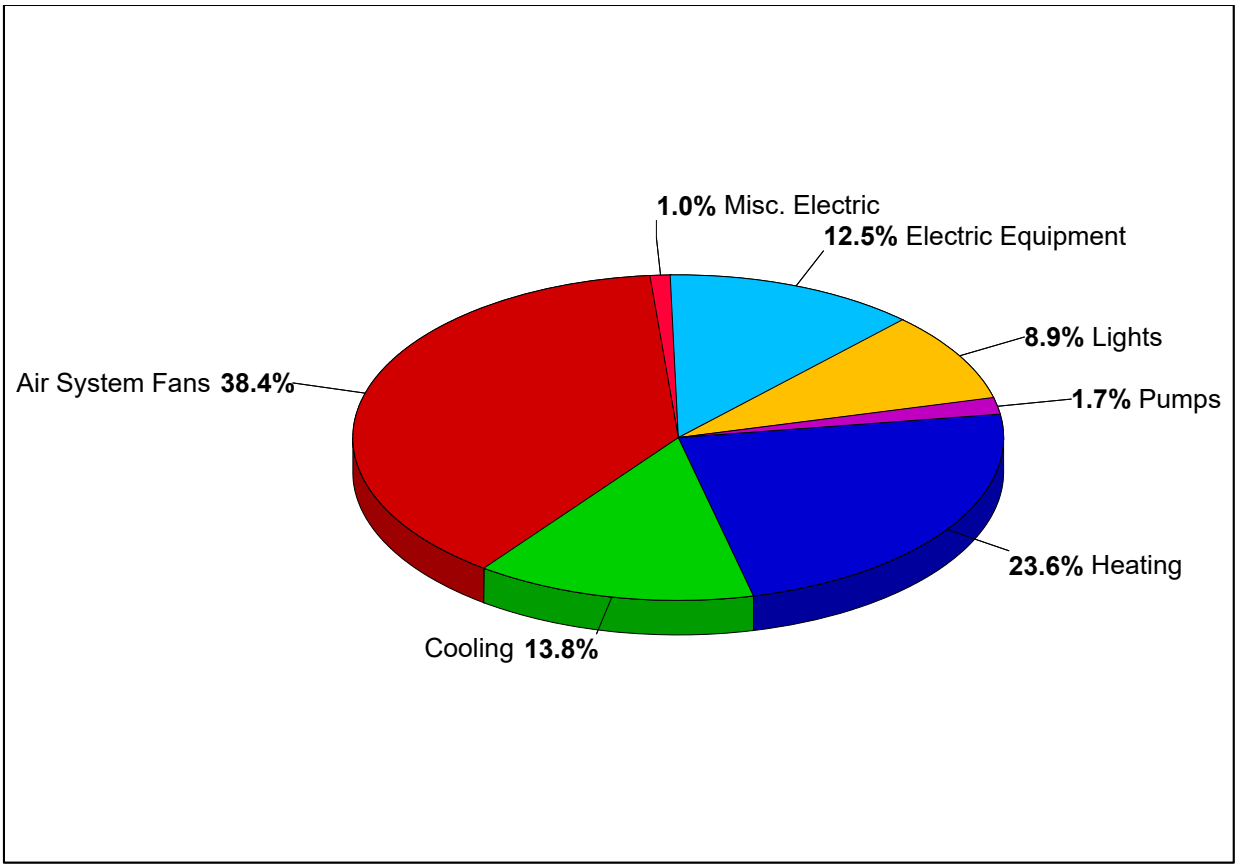
Option 3 - Air-Source Heat Pump Plant Displacement

Unit Type	Quantity	Cost/Unit	Annual Cost
VAV Box	150	$50	$7,500
Terminal Equipment (CUH's, UH's, RP's, etc.)	167,000	$0.05	$8,350
Water Treatment	167,000	$0.10	$16,700
ATC Controls	167,000	$0.10	$16,700
Large CHW AHU's (>6,000 CFM)	5	$2,000	$10,000
Small CHW AHU's (<6,000 CFM)	4	$1,500	$6,000
Fan Coil Units	10	$125	$1,250
Air-Source Heat Pump Plant	1	$7,500	$7,500
		TOTAL	**$74,000**

Option 4 - Geothermal Heat Pump Plant Displacement

Unit Type	Quantity	Cost/Unit	Annual Cost
VAV Box	150	$50	$7,500
Terminal Equipment (CUH's, UH's, RP's, etc.)	167,000	$0.05	$8,350
Water Treatment	167,000	$0.125	$20,875
ATC Controls	167,000	$0.10	$16,700
Large CHW AHU's (>6,000 CFM)	5	$2,000	$10,000
Small CHW AHU's (<6,000 CFM)	4	$1,500	$6,000
Fan Coil Units	10	$125	$1,250
Geothermal Plant	1	$5,000	$5,000
		TOTAL	**$75,675**

ENERGY MODEL OUTPUTS



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	125,958	0.753	38.4
Cooling	45,404	0.272	13.8
Heating	77,337	0.463	23.6
Pumps	5,483	0.033	1.7
Heat Rejection Fans	0	0.000	0.0
HVAC Sub-Total	**254,182**	**1.520**	**77.5**
Lights	29,306	0.175	8.9
Electric Equipment	40,926	0.245	12.5
Misc. Electric	3,439	0.021	1.0
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**73,671**	**0.441**	**22.5**
Grand Total	**327,852**	**1.961**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.7** sqft
Modeled Floor Area ..... **167,180.7** sqft

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	2,986,634	17.865
Heating Coil Loads	2,728,537	16.321
Grand Total	**5,715,171**	**34.186**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	2,286,775	13.679	8,167,054	48.852
Cooling	798,997	4.779	2,853,559	17.069
Heating	1,412,824	8.451	5,045,799	30.182
Pumps	99,188	0.593	354,241	2.119
Heat Rejection Fans	0	0.000	0	0.000
HVAC Sub-Total	**4,597,783**	**27.502**	**16,420,653**	**98.221**
Lights	530,509	3.173	1,894,674	11.333
Electric Equipment	740,552	4.430	2,644,829	15.820
Misc. Electric	62,643	0.375	223,724	1.338
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,333,703**	**7.978**	**4,763,227**	**28.492**
Grand Total	**5,931,486**	**35.480**	**21,183,880**	**126.713**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.7** sqft
   Modeled Floor Area ..... **167180.7** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	27,842	12,481	13	0	40,337
Feb	23,777	6,981	13	0	30,771
Mar	23,212	10,510	13	0	33,735
Apr	16,197	6,267	13	0	22,477
May	18,174	7,428	13	0	25,614
Jun	19,785	8,533	13	0	28,331
Jul	13,620	7,005	13	0	20,638
Aug	14,993	7,441	13	0	22,447
Sep	20,035	7,872	13	0	27,920
Oct	16,362	7,576	13	0	23,952
Nov	17,314	6,224	13	0	23,551
Dec	21,558	6,506	13	0	28,077
Totals	232,870	94,826	156	0	327,852

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	40,337	207,842	0.1941
Feb	30,771	177,492	0.1734
Mar	33,735	173,277	0.1947
Apr	22,477	120,910	0.1859
May	25,614	135,665	0.1888
Jun	28,331	147,696	0.1918
Jul	20,638	101,669	0.2030
Aug	22,447	111,920	0.2006
Sep	27,920	149,559	0.1867
Oct	23,952	122,142	0.1961
Nov	23,551	129,250	0.1822
Dec	28,077	160,932	0.1745
Totals	327,852	1,738,354	0.1886

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	207,842
Feb	0	0	0	0	177,492
Mar	0	0	0	0	173,277
Apr	0	0	0	0	120,910
May	0	0	0	0	135,665
Jun	0	0	0	0	147,696
Jul	0	0	0	0	101,669
Aug	0	0	0	0	111,920
Sep	0	0	0	0	149,559
Oct	0	0	0	0	122,142
Nov	0	0	0	0	129,250
Dec	0	0	0	0	160,932
Totals	0	0	0	0	1,738,354

4. Billing Demands

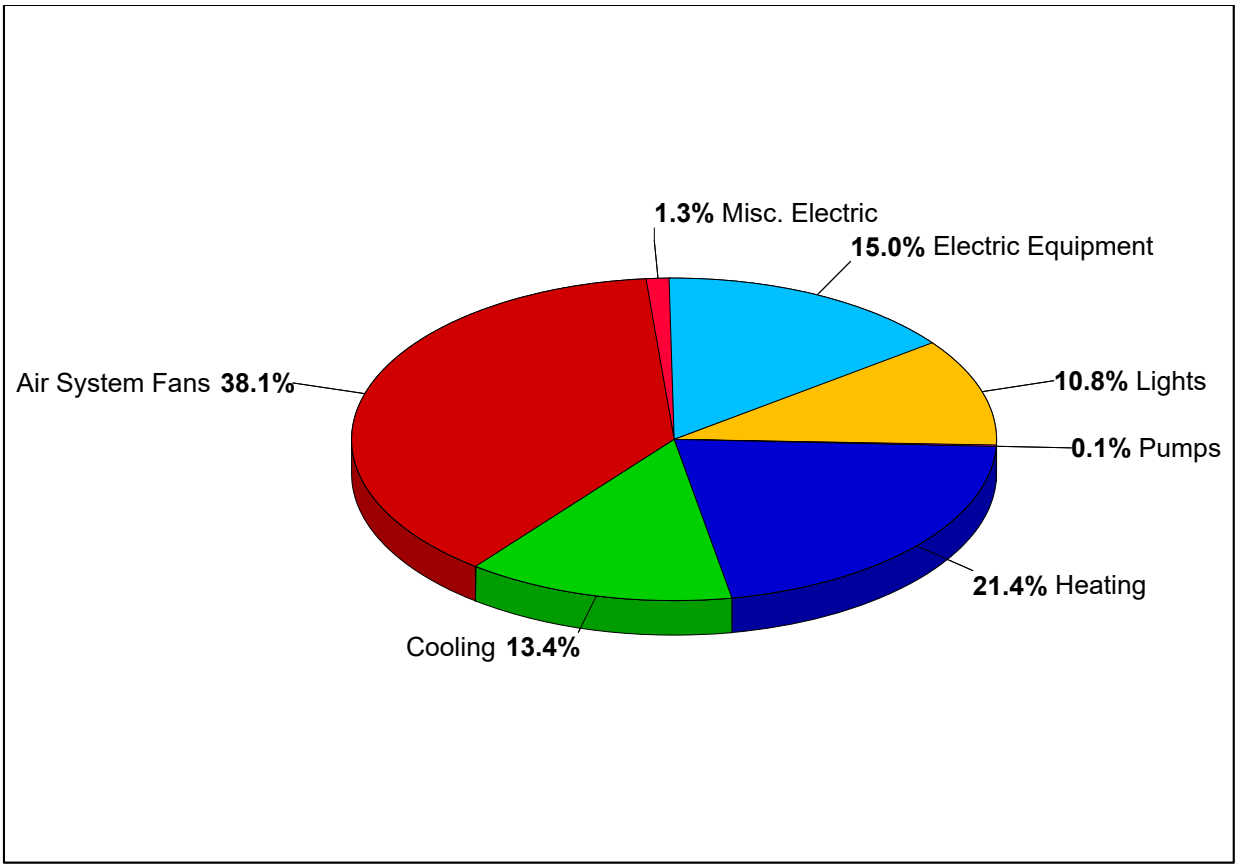
Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	951.9
Feb	0.0	0.0	0.0	0.0	532.5
Mar	0.0	0.0	0.0	0.0	801.6
Apr	0.0	0.0	0.0	0.0	478.0
May	0.0	0.0	0.0	0.0	566.5
Jun	0.0	0.0	0.0	0.0	650.8
Jul	0.0	0.0	0.0	0.0	534.3
Aug	0.0	0.0	0.0	0.0	567.5
Sep	0.0	0.0	0.0	0.0	600.4
Oct	0.0	0.0	0.0	0.0	577.8
Nov	0.0	0.0	0.0	0.0	474.7
Dec	0.0	0.0	0.0	0.0	496.2

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	951.9
Feb	0.0	0.0	0.0	0.0	532.5
Mar	0.0	0.0	0.0	0.0	801.6
Apr	0.0	0.0	0.0	0.0	478.0
May	0.0	0.0	0.0	0.0	566.5
Jun	0.0	0.0	0.0	0.0	650.8
Jul	0.0	0.0	0.0	0.0	534.3
Aug	0.0	0.0	0.0	0.0	567.5
Sep	0.0	0.0	0.0	0.0	600.4
Oct	0.0	0.0	0.0	0.0	577.8
Nov	0.0	0.0	0.0	0.0	474.7
Dec	0.0	0.0	0.0	0.0	496.2

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/30 07:00
Feb	n/a	n/a	n/a	n/a	2/9 08:00
Mar	n/a	n/a	n/a	n/a	3/1 06:00
Apr	n/a	n/a	n/a	n/a	4/21 09:00
May	n/a	n/a	n/a	n/a	5/10 09:00
Jun	n/a	n/a	n/a	n/a	6/28 09:00
Jul	n/a	n/a	n/a	n/a	7/20 14:00
Aug	n/a	n/a	n/a	n/a	8/24 10:00
Sep	n/a	n/a	n/a	n/a	9/4 08:00
Oct	n/a	n/a	n/a	n/a	10/27 09:00
Nov	n/a	n/a	n/a	n/a	11/27 08:00
Dec	n/a	n/a	n/a	n/a	12/25 07:00



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	111,092	0.665	38.1
Cooling	39,034	0.234	13.4
Heating	62,582	0.374	21.4
Pumps	234	0.001	0.1
Heat Rejection Fans	0	0.000	0.0
HVAC Sub-Total	**212,942**	**1.274**	**72.9**
Lights	31,424	0.188	10.8
Electric Equipment	43,874	0.262	15.0
Misc. Electric	3,687	0.022	1.3
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**78,985**	**0.473**	**27.1**
Grand Total	**291,927**	**1.746**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.7** sqft
Modeled Floor Area ..... **167,180.7** sqft

Energy Budget by System Component - [O1] ASHP VRF Design

Project: Wilmington ES - LCCA Energy Model 01/15/2025
Prepared by: GGD Consulting Engineers, Inc. 2:25 PM

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	3,964,639	23.715
Heating Coil Loads	1,748,837	10.461
Grand Total	**5,713,476**	**34.176**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	1,874,878	11.215	6,695,993	40.052
Cooling	649,569	3.885	2,319,889	13.877
Heating	1,061,620	6.350	3,791,500	22.679
Pumps	3,962	0.024	14,151	0.085
Heat Rejection Fans	0	0.000	0	0.000
HVAC Sub-Total	**3,590,029**	**21.474**	**12,821,533**	**76.693**
Lights	530,509	3.173	1,894,674	11.333
Electric Equipment	740,560	4.430	2,644,858	15.820
Misc. Electric	62,643	0.375	223,724	1.338
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,333,712**	**7.978**	**4,763,256**	**28.492**
Grand Total	**4,923,741**	**29.452**	**17,584,789**	**105.184**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.7** sqft
   Modeled Floor Area ..... **167180.7** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	19,297	9,213	13	0	28,524
Feb	16,445	8,053	13	0	24,511
Mar	17,685	7,349	13	0	25,047
Apr	14,024	8,345	13	0	22,382
May	16,235	7,850	13	0	24,098
Jun	18,550	9,076	13	0	27,639
Jul	12,023	7,538	13	0	19,574
Aug	13,188	7,823	13	0	21,024
Sep	18,874	8,830	13	0	27,717
Oct	14,744	7,504	13	0	22,261
Nov	15,713	8,213	13	0	23,939
Dec	16,530	8,670	13	0	25,213
Totals	193,308	98,466	156	0	291,930

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	28,524	144,054	0.1980
Feb	24,511	122,761	0.1997
Mar	25,047	132,016	0.1897
Apr	22,382	104,688	0.2138
May	24,098	121,190	0.1988
Jun	27,639	138,477	0.1996
Jul	19,574	89,751	0.2181
Aug	21,024	98,448	0.2136
Sep	27,717	140,893	0.1967
Oct	22,261	110,062	0.2023
Nov	23,939	117,295	0.2041
Dec	25,213	123,392	0.2043
Totals	291,930	1,443,027	0.2023

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	144,054
Feb	0	0	0	0	122,761
Mar	0	0	0	0	132,016
Apr	0	0	0	0	104,688
May	0	0	0	0	121,190
Jun	0	0	0	0	138,477
Jul	0	0	0	0	89,751
Aug	0	0	0	0	98,448
Sep	0	0	0	0	140,893
Oct	0	0	0	0	110,062
Nov	0	0	0	0	117,295
Dec	0	0	0	0	123,392
Totals	0	0	0	0	1,443,027

4. Billing Demands

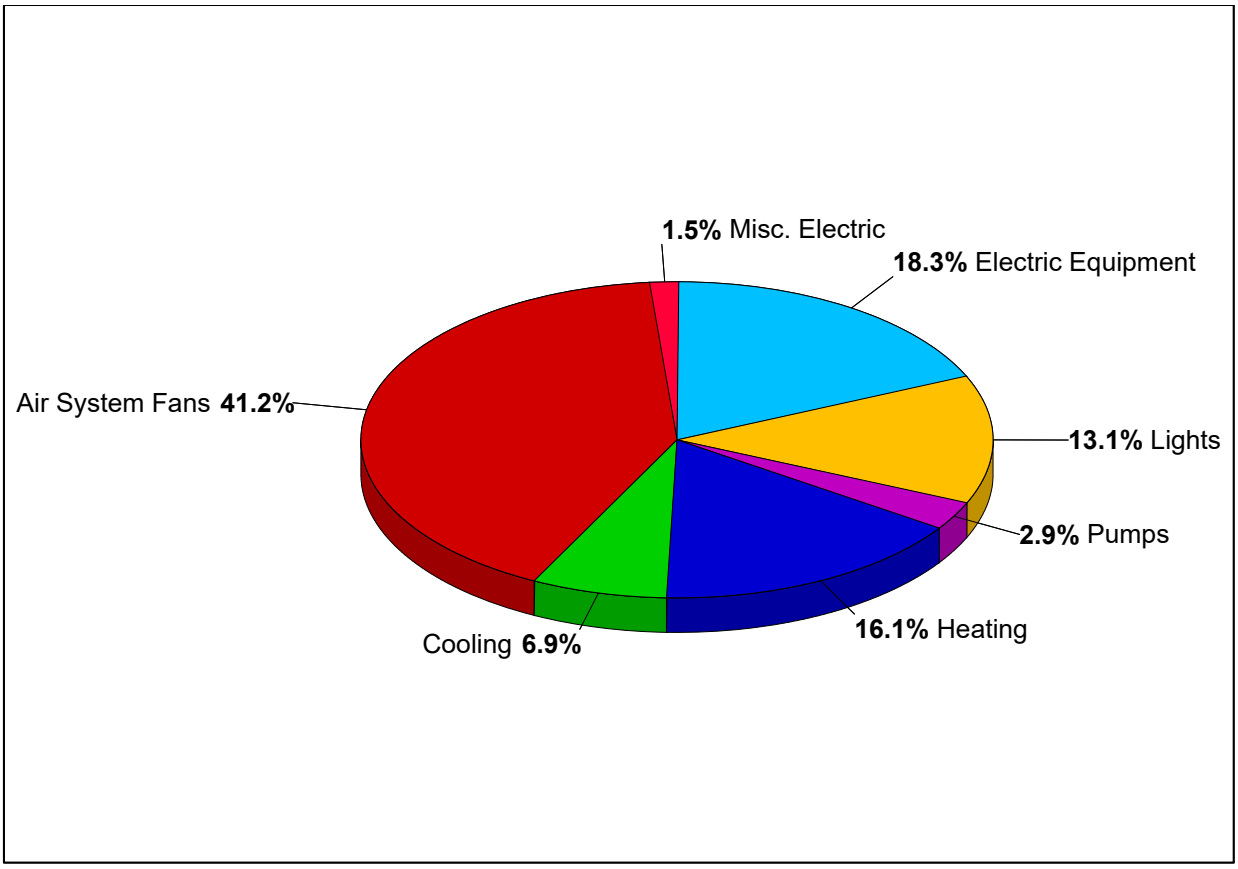
Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	702.7
Feb	0.0	0.0	0.0	0.0	614.2
Mar	0.0	0.0	0.0	0.0	560.5
Apr	0.0	0.0	0.0	0.0	636.4
May	0.0	0.0	0.0	0.0	598.7
Jun	0.0	0.0	0.0	0.0	692.2
Jul	0.0	0.0	0.0	0.0	574.9
Aug	0.0	0.0	0.0	0.0	596.6
Sep	0.0	0.0	0.0	0.0	673.5
Oct	0.0	0.0	0.0	0.0	572.3
Nov	0.0	0.0	0.0	0.0	626.4
Dec	0.0	0.0	0.0	0.0	661.3

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	702.7
Feb	0.0	0.0	0.0	0.0	614.2
Mar	0.0	0.0	0.0	0.0	560.5
Apr	0.0	0.0	0.0	0.0	636.4
May	0.0	0.0	0.0	0.0	598.7
Jun	0.0	0.0	0.0	0.0	692.2
Jul	0.0	0.0	0.0	0.0	574.9
Aug	0.0	0.0	0.0	0.0	596.6
Sep	0.0	0.0	0.0	0.0	673.5
Oct	0.0	0.0	0.0	0.0	572.3
Nov	0.0	0.0	0.0	0.0	626.4
Dec	0.0	0.0	0.0	0.0	661.3

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/30 07:00
Feb	n/a	n/a	n/a	n/a	2/27 11:00
Mar	n/a	n/a	n/a	n/a	3/6 10:00
Apr	n/a	n/a	n/a	n/a	4/10 10:00
May	n/a	n/a	n/a	n/a	5/15 14:00
Jun	n/a	n/a	n/a	n/a	6/29 10:00
Jul	n/a	n/a	n/a	n/a	7/7 09:00
Aug	n/a	n/a	n/a	n/a	8/21 09:00
Sep	n/a	n/a	n/a	n/a	9/5 10:00
Oct	n/a	n/a	n/a	n/a	10/26 10:00
Nov	n/a	n/a	n/a	n/a	11/30 11:00
Dec	n/a	n/a	n/a	n/a	12/18 11:00



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	92,153	0.551	41.2
Cooling	15,519	0.093	6.9
Heating	35,945	0.215	16.1
Pumps	6,511	0.039	2.9
Heat Rejection Fans	0	0.000	0.0
HVAC Sub-Total	**150,128**	**0.898**	**67.0**
Lights	29,371	0.176	13.1
Electric Equipment	41,000	0.245	18.3
Misc. Electric	3,443	0.021	1.5
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**73,815**	**0.442**	**33.0**
Grand Total	**223,943**	**1.339**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.7** sqft
Modeled Floor Area ..... **167,180.7** sqft

Energy Budget by System Component - [O2] Geo VRF Design

Project: Wilmington ES - LCCA Energy Model 01/15/2025
Prepared by: GGD Consulting Engineers, Inc. 2:25 PM

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	2,191,877	13.111
Heating Coil Loads	767,193	4.589
Grand Total	**2,959,070**	**17.700**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	1,664,212	9.955	5,943,614	35.552
Cooling	274,701	1.643	981,075	5.868
Heating	650,323	3.890	2,322,582	13.893
Pumps	116,843	0.699	417,296	2.496
Heat Rejection Fans	0	0.000	0	0.000
HVAC Sub-Total	**2,706,078**	**16.187**	**9,664,566**	**57.809**
Lights	530,513	3.173	1,894,688	11.333
Electric Equipment	740,556	4.430	2,644,844	15.820
Misc. Electric	62,643	0.375	223,724	1.338
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,333,712**	**7.978**	**4,763,256**	**28.492**
Grand Total	**4,039,790**	**24.164**	**14,427,822**	**86.301**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.7** sqft
   Modeled Floor Area ..... **167180.7** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	16,051	6,981	13	0	23,045
Feb	13,735	5,778	13	0	19,526
Mar	14,976	5,666	13	0	20,655
Apr	12,260	5,134	13	0	17,407
May	14,305	5,151	13	0	19,469
Jun	14,309	5,832	13	0	20,154
Jul	8,692	4,561	13	0	13,266
Aug	9,396	4,740	13	0	14,149
Sep	14,180	5,731	13	0	19,924
Oct	13,424	5,220	13	0	18,658
Nov	13,743	5,061	13	0	18,817
Dec	13,531	5,330	13	0	18,874
Totals	158,603	65,185	156	0	223,944

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	23,045	119,821	0.1923
Feb	19,526	102,529	0.1904
Mar	20,655	111,794	0.1848
Apr	17,407	91,518	0.1902
May	19,469	106,787	0.1823
Jun	20,154	106,813	0.1887
Jul	13,266	64,884	0.2045
Aug	14,149	70,143	0.2017
Sep	19,924	105,855	0.1882
Oct	18,658	100,212	0.1862
Nov	18,817	102,591	0.1834
Dec	18,874	101,011	0.1869
Totals	223,944	1,183,958	0.1891

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	119,821
Feb	0	0	0	0	102,529
Mar	0	0	0	0	111,794
Apr	0	0	0	0	91,518
May	0	0	0	0	106,787
Jun	0	0	0	0	106,813
Jul	0	0	0	0	64,884
Aug	0	0	0	0	70,143
Sep	0	0	0	0	105,855
Oct	0	0	0	0	100,212
Nov	0	0	0	0	102,591
Dec	0	0	0	0	101,011
Totals	0	0	0	0	1,183,958

4. Billing Demands

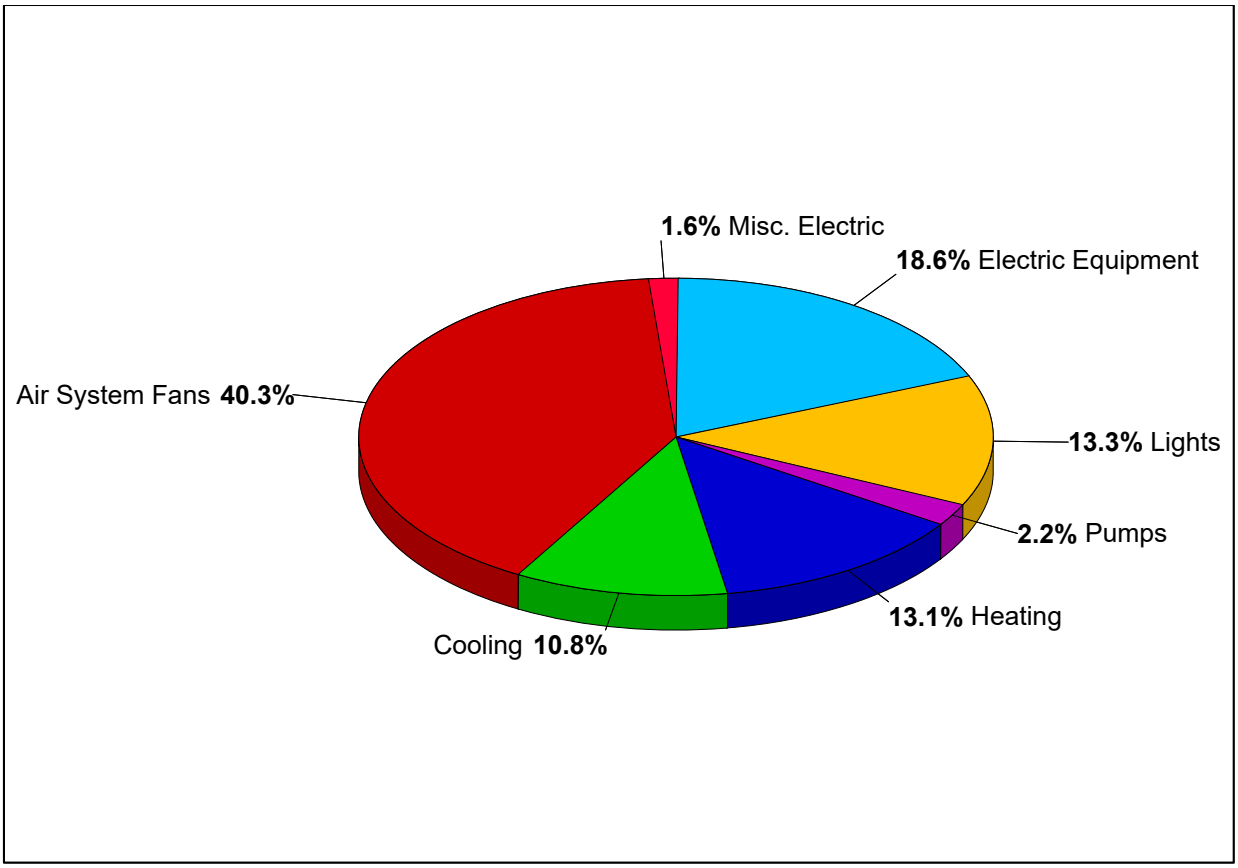
Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	532.4
Feb	0.0	0.0	0.0	0.0	440.7
Mar	0.0	0.0	0.0	0.0	432.2
Apr	0.0	0.0	0.0	0.0	391.6
May	0.0	0.0	0.0	0.0	392.8
Jun	0.0	0.0	0.0	0.0	444.8
Jul	0.0	0.0	0.0	0.0	347.9
Aug	0.0	0.0	0.0	0.0	361.5
Sep	0.0	0.0	0.0	0.0	437.1
Oct	0.0	0.0	0.0	0.0	398.1
Nov	0.0	0.0	0.0	0.0	386.0
Dec	0.0	0.0	0.0	0.0	406.5

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	532.4
Feb	0.0	0.0	0.0	0.0	440.7
Mar	0.0	0.0	0.0	0.0	432.2
Apr	0.0	0.0	0.0	0.0	391.6
May	0.0	0.0	0.0	0.0	392.8
Jun	0.0	0.0	0.0	0.0	444.8
Jul	0.0	0.0	0.0	0.0	347.9
Aug	0.0	0.0	0.0	0.0	361.5
Sep	0.0	0.0	0.0	0.0	437.1
Oct	0.0	0.0	0.0	0.0	398.1
Nov	0.0	0.0	0.0	0.0	386.0
Dec	0.0	0.0	0.0	0.0	406.5

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/2 09:00
Feb	n/a	n/a	n/a	n/a	2/9 10:00
Mar	n/a	n/a	n/a	n/a	3/1 10:00
Apr	n/a	n/a	n/a	n/a	4/10 09:00
May	n/a	n/a	n/a	n/a	5/16 10:00
Jun	n/a	n/a	n/a	n/a	6/26 09:00
Jul	n/a	n/a	n/a	n/a	7/10 10:00
Aug	n/a	n/a	n/a	n/a	8/21 10:00
Sep	n/a	n/a	n/a	n/a	9/4 09:00
Oct	n/a	n/a	n/a	n/a	10/26 10:00
Nov	n/a	n/a	n/a	n/a	11/30 10:00
Dec	n/a	n/a	n/a	n/a	12/26 10:00



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	92,404	0.553	40.3
Cooling	24,818	0.148	10.8
Heating	30,125	0.180	13.1
Pumps	5,123	0.031	2.2
Heat Rejection Fans	0	0.000	0.0
HVAC Sub-Total	**152,470**	**0.912**	**66.5**
Lights	30,523	0.183	13.3
Electric Equipment	42,602	0.255	18.6
Misc. Electric	3,577	0.021	1.6
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**76,702**	**0.459**	**33.5**
Grand Total	**229,172**	**1.371**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.7** sqft
Modeled Floor Area ..... **167,180.7** sqft

Energy Budget by System Component - [O3] ASHP Displacement Design

Project: Wilmington ES - LCCA Energy Model 01/15/2025
Prepared by: GGD Consulting Engineers, Inc. 2:25 PM

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	1,485,544	8.886
Heating Coil Loads	465,280	2.783
Grand Total	**1,950,824**	**11.669**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	1,602,666	9.586	5,723,809	34.237
Cooling	415,080	2.483	1,482,427	8.867
Heating	520,272	3.112	1,858,114	11.114
Pumps	88,818	0.531	317,206	1.897
Heat Rejection Fans	0	0.000	0	0.000
HVAC Sub-Total	**2,626,835**	**15.713**	**9,381,555**	**56.116**
Lights	530,509	3.173	1,894,674	11.333
Electric Equipment	740,552	4.430	2,644,829	15.820
Misc. Electric	62,643	0.375	223,724	1.338
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,333,703**	**7.978**	**4,763,227**	**28.492**
Grand Total	**3,960,539**	**23.690**	**14,144,782**	**84.608**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.7** sqft
   Modeled Floor Area ..... **167180.7** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	15,620	9,551	13	0	25,185
Feb	13,023	5,332	13	0	18,368
Mar	13,937	6,542	13	0	20,492
Apr	11,164	4,743	13	0	15,920
May	13,070	5,397	13	0	18,479
Jun	15,117	7,374	13	0	22,504
Jul	10,515	6,185	13	0	16,713
Aug	11,477	6,532	13	0	18,023
Sep	14,394	6,942	13	0	21,349
Oct	12,153	5,258	13	0	17,424
Nov	12,525	4,655	13	0	17,193
Dec	12,497	5,014	13	0	17,523
Totals	155,492	73,526	156	0	229,174

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	25,185	116,604	0.2160
Feb	18,368	97,214	0.1889
Mar	20,492	104,039	0.1970
Apr	15,920	83,339	0.1910
May	18,479	97,564	0.1894
Jun	22,504	112,845	0.1994
Jul	16,713	78,496	0.2129
Aug	18,023	85,677	0.2104
Sep	21,349	107,452	0.1987
Oct	17,424	90,722	0.1921
Nov	17,193	93,497	0.1839
Dec	17,523	93,286	0.1878
Totals	229,174	1,160,735	0.1974

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	116,604
Feb	0	0	0	0	97,214
Mar	0	0	0	0	104,039
Apr	0	0	0	0	83,339
May	0	0	0	0	97,564
Jun	0	0	0	0	112,845
Jul	0	0	0	0	78,496
Aug	0	0	0	0	85,677
Sep	0	0	0	0	107,452
Oct	0	0	0	0	90,722
Nov	0	0	0	0	93,497
Dec	0	0	0	0	93,286
Totals	0	0	0	0	1,160,735

4. Billing Demands

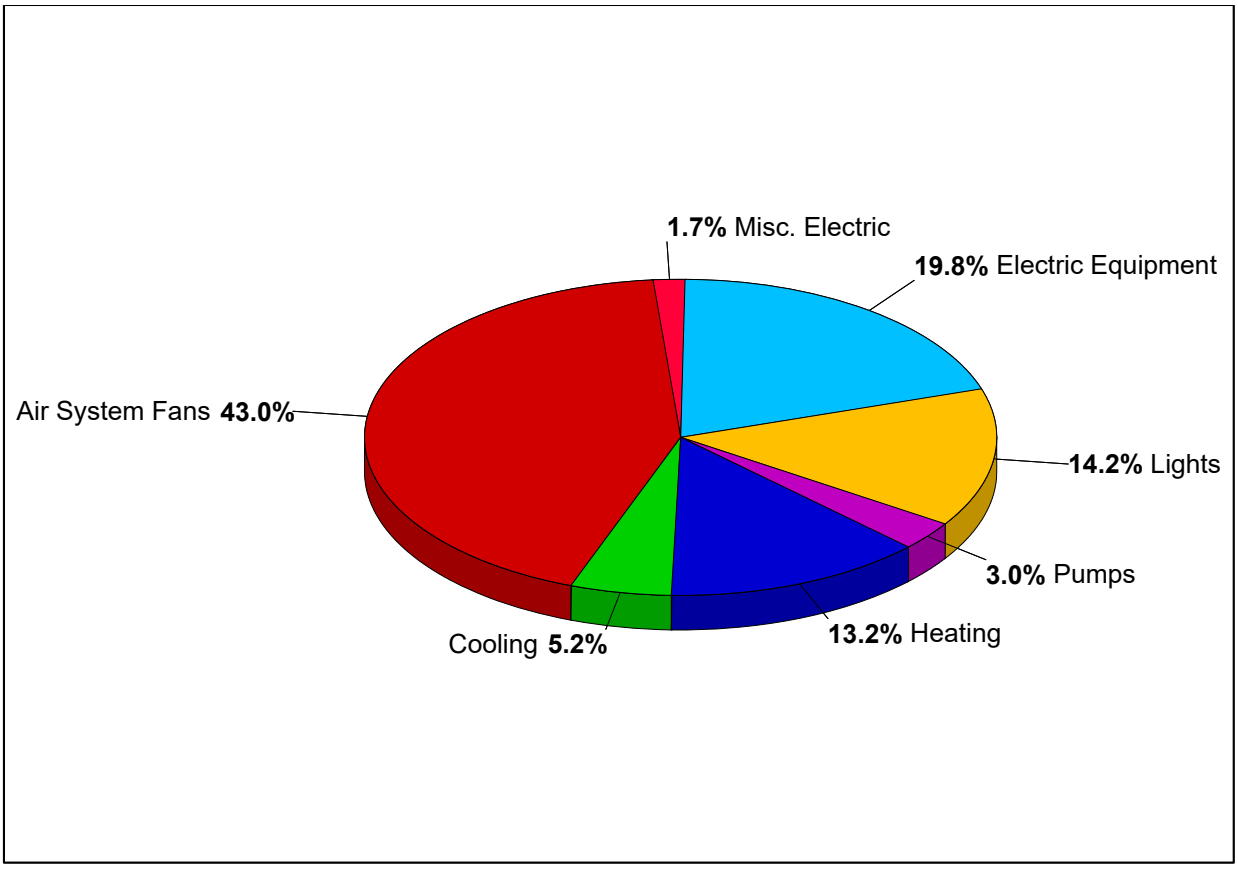
Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	728.5
Feb	0.0	0.0	0.0	0.0	406.6
Mar	0.0	0.0	0.0	0.0	499.0
Apr	0.0	0.0	0.0	0.0	361.8
May	0.0	0.0	0.0	0.0	411.6
Jun	0.0	0.0	0.0	0.0	562.4
Jul	0.0	0.0	0.0	0.0	471.7
Aug	0.0	0.0	0.0	0.0	498.2
Sep	0.0	0.0	0.0	0.0	529.5
Oct	0.0	0.0	0.0	0.0	401.0
Nov	0.0	0.0	0.0	0.0	355.0
Dec	0.0	0.0	0.0	0.0	382.4

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	728.5
Feb	0.0	0.0	0.0	0.0	406.6
Mar	0.0	0.0	0.0	0.0	499.0
Apr	0.0	0.0	0.0	0.0	361.8
May	0.0	0.0	0.0	0.0	411.6
Jun	0.0	0.0	0.0	0.0	562.4
Jul	0.0	0.0	0.0	0.0	471.7
Aug	0.0	0.0	0.0	0.0	498.2
Sep	0.0	0.0	0.0	0.0	529.5
Oct	0.0	0.0	0.0	0.0	401.0
Nov	0.0	0.0	0.0	0.0	355.0
Dec	0.0	0.0	0.0	0.0	382.4

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/30 08:00
Feb	n/a	n/a	n/a	n/a	2/9 08:00
Mar	n/a	n/a	n/a	n/a	3/1 06:00
Apr	n/a	n/a	n/a	n/a	4/10 08:00
May	n/a	n/a	n/a	n/a	5/10 14:00
Jun	n/a	n/a	n/a	n/a	6/26 09:00
Jul	n/a	n/a	n/a	n/a	7/10 10:00
Aug	n/a	n/a	n/a	n/a	8/21 10:00
Sep	n/a	n/a	n/a	n/a	9/5 09:00
Oct	n/a	n/a	n/a	n/a	10/27 09:00
Nov	n/a	n/a	n/a	n/a	11/22 10:00
Dec	n/a	n/a	n/a	n/a	12/26 09:00



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	88,407	0.529	43.0
Cooling	10,639	0.064	5.2
Heating	27,214	0.163	13.2
Pumps	6,131	0.037	3.0
Heat Rejection Fans	0	0.000	0.0
HVAC Sub-Total	**132,390**	**0.792**	**64.3**
Lights	29,184	0.175	14.2
Electric Equipment	40,755	0.244	19.8
Misc. Electric	3,417	0.020	1.7
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**73,357**	**0.439**	**35.7**
Grand Total	**205,747**	**1.231**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.7** sqft
Modeled Floor Area ..... **167,180.7** sqft

Energy Budget by System Component - [O4] Geo Displacement Design

Project: Wilmington ES - LCCA Energy Model 01/15/2025
Prepared by: GGD Consulting Engineers, Inc. 2:25 PM

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	1,485,544	8.886
Heating Coil Loads	465,280	2.783
Grand Total	**1,950,824**	**11.669**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	1,602,666	9.586	5,723,809	34.237
Cooling	185,027	1.107	660,811	3.953
Heating	498,224	2.980	1,779,370	10.643
Pumps	110,465	0.661	394,519	2.360
Heat Rejection Fans	0	0.000	0	0.000
HVAC Sub-Total	**2,396,382**	**14.334**	**8,558,509**	**51.193**
Lights	530,509	3.173	1,894,674	11.333
Electric Equipment	740,552	4.430	2,644,829	15.820
Misc. Electric	62,643	0.375	223,724	1.338
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,333,703**	**7.978**	**4,763,227**	**28.492**
Grand Total	**3,730,086**	**22.312**	**13,321,736**	**79.685**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.7** sqft
   Modeled Floor Area ..... **167180.7** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	14,347	5,473	13	0	19,833
Feb	12,388	4,930	13	0	17,331
Mar	13,460	4,722	13	0	18,195
Apr	11,295	4,529	13	0	15,836
May	13,001	4,724	13	0	17,738
Jun	13,439	5,769	13	0	19,221
Jul	8,732	4,639	13	0	13,384
Aug	9,441	4,966	13	0	14,420
Sep	13,006	5,490	13	0	18,510
Oct	12,354	4,718	13	0	17,085
Nov	12,612	4,618	13	0	17,243
Dec	12,369	4,570	13	0	16,952
Totals	146,444	59,148	156	0	205,748

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	19,833	107,100	0.1852
Feb	17,331	92,478	0.1874
Mar	18,195	100,475	0.1811
Apr	15,836	84,313	0.1878
May	17,738	97,051	0.1828
Jun	19,221	100,319	0.1916
Jul	13,384	65,187	0.2053
Aug	14,420	70,477	0.2046
Sep	18,510	97,091	0.1906
Oct	17,085	92,222	0.1853
Nov	17,243	94,149	0.1832
Dec	16,952	92,332	0.1836
Totals	205,748	1,093,195	0.1882

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	107,100
Feb	0	0	0	0	92,478
Mar	0	0	0	0	100,475
Apr	0	0	0	0	84,313
May	0	0	0	0	97,051
Jun	0	0	0	0	100,319
Jul	0	0	0	0	65,187
Aug	0	0	0	0	70,477
Sep	0	0	0	0	97,091
Oct	0	0	0	0	92,222
Nov	0	0	0	0	94,149
Dec	0	0	0	0	92,332
Totals	0	0	0	0	1,093,195

4. Billing Demands

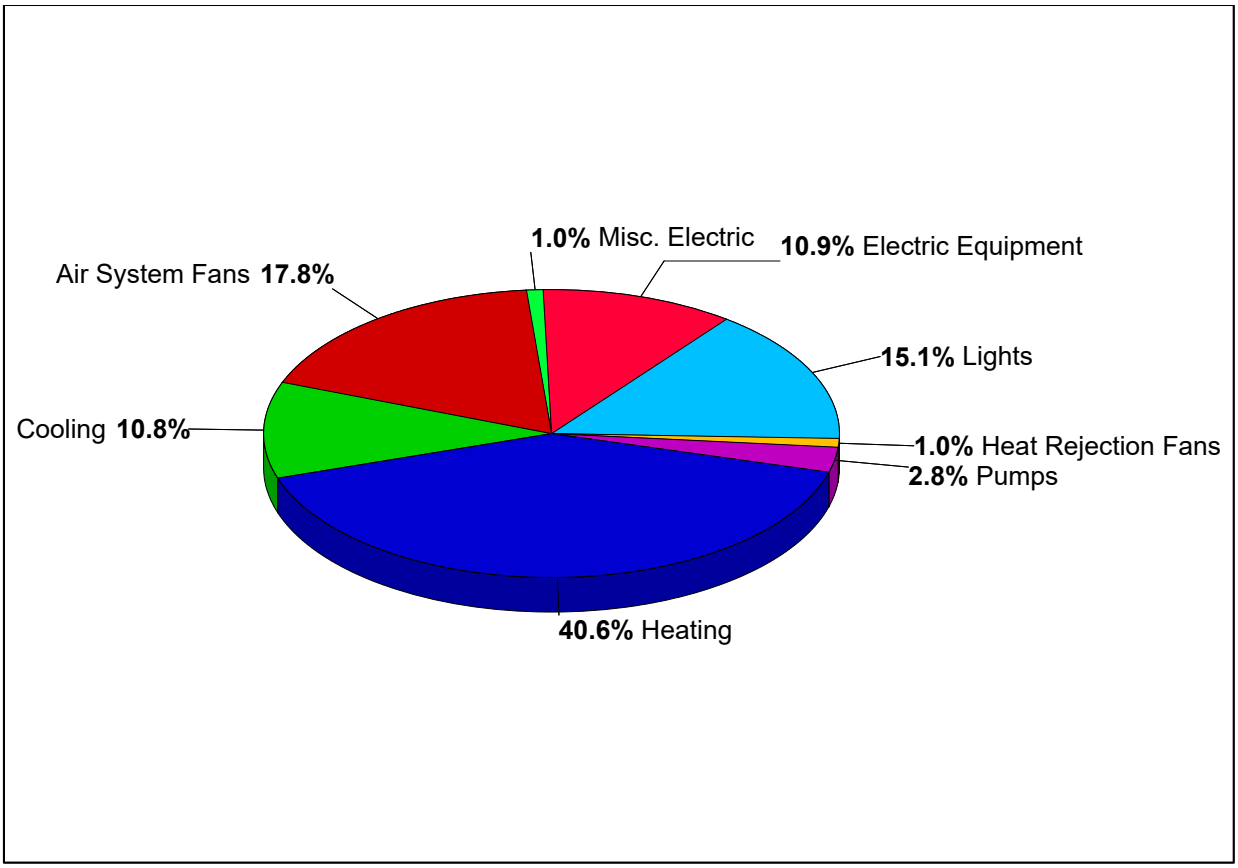
Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	417.4
Feb	0.0	0.0	0.0	0.0	376.0
Mar	0.0	0.0	0.0	0.0	360.2
Apr	0.0	0.0	0.0	0.0	345.4
May	0.0	0.0	0.0	0.0	360.3
Jun	0.0	0.0	0.0	0.0	440.0
Jul	0.0	0.0	0.0	0.0	353.8
Aug	0.0	0.0	0.0	0.0	378.7
Sep	0.0	0.0	0.0	0.0	418.7
Oct	0.0	0.0	0.0	0.0	359.8
Nov	0.0	0.0	0.0	0.0	352.2
Dec	0.0	0.0	0.0	0.0	348.5

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	417.4
Feb	0.0	0.0	0.0	0.0	376.0
Mar	0.0	0.0	0.0	0.0	360.2
Apr	0.0	0.0	0.0	0.0	345.4
May	0.0	0.0	0.0	0.0	360.3
Jun	0.0	0.0	0.0	0.0	440.0
Jul	0.0	0.0	0.0	0.0	353.8
Aug	0.0	0.0	0.0	0.0	378.7
Sep	0.0	0.0	0.0	0.0	418.7
Oct	0.0	0.0	0.0	0.0	359.8
Nov	0.0	0.0	0.0	0.0	352.2
Dec	0.0	0.0	0.0	0.0	348.5

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/30 08:00
Feb	n/a	n/a	n/a	n/a	2/6 08:00
Mar	n/a	n/a	n/a	n/a	3/1 09:00
Apr	n/a	n/a	n/a	n/a	4/13 10:00
May	n/a	n/a	n/a	n/a	5/11 09:00
Jun	n/a	n/a	n/a	n/a	6/26 09:00
Jul	n/a	n/a	n/a	n/a	7/10 10:00
Aug	n/a	n/a	n/a	n/a	8/21 10:00
Sep	n/a	n/a	n/a	n/a	9/4 09:00
Oct	n/a	n/a	n/a	n/a	10/9 09:00
Nov	n/a	n/a	n/a	n/a	11/30 10:00
Dec	n/a	n/a	n/a	n/a	12/18 10:00



1. Annual Costs

Component	Annual Cost ($)	($/sqft)	Percent of Total (%)
Air System Fans	71,423	0.427	17.8
Cooling	43,219	0.259	10.8
Heating	162,854	0.974	40.6
Pumps	11,182	0.067	2.8
Heat Rejection Fans	3,908	0.023	1.0
HVAC Sub-Total	**292,585**	**1.750**	**73.0**
Lights	60,611	0.363	15.1
Electric Equipment	43,596	0.261	10.9
Misc. Electric	3,866	0.023	1.0
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**108,074**	**0.646**	**27.0**
Grand Total	**400,659**	**2.397**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **167,180.6** sqft
Modeled Floor Area ..... **167,180.6** sqft

Energy Budget by System Component - [L-B] LEED Baseline

Project: Wilmington ES - LCCA Energy Model 01/15/2025
Prepared by: GGD Consulting Engineers, Inc. 2:26 PM

1. Annual Coil Loads

Component	Load (kBTU)	(kBTU/sqft)
Cooling Coil Loads	4,050,710	24.230
Heating Coil Loads	3,052,593	18.259
Grand Total	**7,103,303**	**42.489**

2. Energy Consumption by System Component

Component	Site Energy (kBTU)	Site Energy (kBTU/sqft)	Source Energy (kBTU)	Source Energy (kBTU/sqft)
Air System Fans	1,216,465	7.276	4,344,519	25.987
Cooling	732,592	4.382	2,616,399	15.650
Heating	2,790,328	16.691	9,965,459	59.609
Pumps	188,975	1.130	674,909	4.037
Heat Rejection Fans	65,945	0.395	235,516	1.409
HVAC Sub-Total	**4,994,304**	**29.874**	**17,836,802**	**106.692**
Lights	1,030,064	6.161	3,678,800	22.005
Electric Equipment	740,569	4.430	2,644,889	15.821
Misc. Electric	65,901	0.394	235,361	1.408
Misc. Fuel Use	0	0.000	0	0.000
Non-HVAC Sub-Total	**1,836,534**	**10.985**	**6,559,050**	**39.233**
Grand Total	**6,830,838**	**40.859**	**24,395,852**	**145.925**

Notes:
1. 'Cooling Coil Loads' is the sum of all air system cooling coil loads.
2. 'Heating Coil Loads' is the sum of all air system heating coil loads.
3. Site Energy is the actual energy consumed.
4. Source Energy is the site energy divided by the electric generating efficiency (28.0%).
5. Source Energy for fuels equals the site energy value.
6. Energy per unit floor area is based on the gross building floor area.
   Gross Floor Area ..... **167180.6** sqft
   Modeled Floor Area ..... **167180.6** sqft

1. Component Charges

Billing Period	Energy Charges ($)	Demand Charges ($)	Customer Charges ($)	Taxes ($)	Total Charge ($)
Jan	33,464	15,354	13	0	48,831
Feb	28,257	12,664	13	0	40,934
Mar	26,890	12,869	13	0	39,772
Apr	17,452	11,158	13	0	28,622
May	17,687	8,553	13	0	26,253
Jun	21,973	10,185	13	0	32,171
Jul	16,813	9,588	13	0	26,413
Aug	18,031	9,623	13	0	27,667
Sep	23,993	10,743	13	0	34,749
Oct	16,442	8,968	13	0	25,424
Nov	20,842	10,777	13	0	31,632
Dec	26,337	11,843	13	0	38,193
Totals	268,180	132,324	156	0	400,661

2. Totals

Billing Period	Total Charges ($)	Total Consumption (kWh)	Avg Price ($/kWh)
Jan	48,831	249,808	0.1955
Feb	40,934	210,936	0.1941
Mar	39,772	200,732	0.1981
Apr	28,622	130,276	0.2197
May	26,253	132,028	0.1988
Jun	32,171	164,026	0.1961
Jul	26,413	125,505	0.2105
Aug	27,667	134,598	0.2056
Sep	34,749	179,103	0.1940
Oct	25,424	122,741	0.2071
Nov	31,632	155,586	0.2033
Dec	38,193	196,604	0.1943
Totals	400,661	2,001,943	0.2001

3. Consumption Totals

Billing Period	Peak (kWh)	Mid-Peak (kWh)	Normal Peak (kWh)	Off-Peak (kWh)	Overall (kWh)
Jan	0	0	0	0	249,808
Feb	0	0	0	0	210,936
Mar	0	0	0	0	200,732
Apr	0	0	0	0	130,276
May	0	0	0	0	132,028
Jun	0	0	0	0	164,026
Jul	0	0	0	0	125,505
Aug	0	0	0	0	134,598
Sep	0	0	0	0	179,103
Oct	0	0	0	0	122,741
Nov	0	0	0	0	155,586
Dec	0	0	0	0	196,604
Totals	0	0	0	0	2,001,943

4. Billing Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	1171.0
Feb	0.0	0.0	0.0	0.0	965.9
Mar	0.0	0.0	0.0	0.0	981.5
Apr	0.0	0.0	0.0	0.0	851.0
May	0.0	0.0	0.0	0.0	652.4
Jun	0.0	0.0	0.0	0.0	776.8
Jul	0.0	0.0	0.0	0.0	731.2
Aug	0.0	0.0	0.0	0.0	733.9
Sep	0.0	0.0	0.0	0.0	819.4
Oct	0.0	0.0	0.0	0.0	684.0
Nov	0.0	0.0	0.0	0.0	821.9
Dec	0.0	0.0	0.0	0.0	903.2

5. Maximum Demands

Billing Period	Peak (kW)	Mid-Peak (kW)	Normal Peak (kW)	Off-Peak (kW)	Overall (kW)
Jan	0.0	0.0	0.0	0.0	1171.0
Feb	0.0	0.0	0.0	0.0	965.9
Mar	0.0	0.0	0.0	0.0	981.5
Apr	0.0	0.0	0.0	0.0	851.0
May	0.0	0.0	0.0	0.0	652.4
Jun	0.0	0.0	0.0	0.0	776.8
Jul	0.0	0.0	0.0	0.0	731.2
Aug	0.0	0.0	0.0	0.0	733.9
Sep	0.0	0.0	0.0	0.0	819.4
Oct	0.0	0.0	0.0	0.0	684.0
Nov	0.0	0.0	0.0	0.0	821.9
Dec	0.0	0.0	0.0	0.0	903.2

6. Time Of Maximum Demands (Date/Hour)

Billing Period	Peak	Mid-Peak	Normal Peak	Off-Peak	Overall
Jan	n/a	n/a	n/a	n/a	1/30 07:00
Feb	n/a	n/a	n/a	n/a	2/10 06:00
Mar	n/a	n/a	n/a	n/a	3/1 06:00
Apr	n/a	n/a	n/a	n/a	4/10 05:00
May	n/a	n/a	n/a	n/a	5/16 10:00
Jun	n/a	n/a	n/a	n/a	6/26 09:00
Jul	n/a	n/a	n/a	n/a	7/10 10:00
Aug	n/a	n/a	n/a	n/a	8/18 09:00
Sep	n/a	n/a	n/a	n/a	9/5 10:00
Oct	n/a	n/a	n/a	n/a	10/27 10:00
Nov	n/a	n/a	n/a	n/a	11/27 06:00
Dec	n/a	n/a	n/a	n/a	12/27 06:00

APPENDIX:
2022 GEOTHERMAL FEDERAL TAX CREDIT REFERENCES

CLIMATEMASTER
A NIBE GROUP MEMBER

IRA 2023

COMMERCIAL GEOTHERMAL

Tax Guide 2023

INFLATION REDUCTION ACT OF 2022 (IRA)

The Inflation Reduction Act of 2022 (IRA) substantially extends and enhances the federal income tax credits and incentives available for the installation of geothermal heat pump (GHP) energy property in commercial buildings, including the introduction of a new direct payment option for non-taxable entities. For taxable businesses, there are also new carryback and transfer provisions along with a continuation of the accelerated depreciation benefits. These new incentives are unfortunately more complex in structure. This guide is designed to provide a detailed review of the new tax and depreciation incentives available for commercial GHP energy property under the IRA.

Federal Income Tax Credits:

- Investment tax credit (ITC) up to 30% of system cost basis
- Domestic content bonus tax credit up to 10% of system cost basis
- Energy community bonus tax credit up to 10% of system cost basis
- Direct-pay option for non-taxable entities
- No cap on total credit amount
- Can be used to offset AMT tax
- Can be used in more than one year
- Can be carried back up to 3 years or transferred/sold to an unrelated party
- Can be combined with solar and other clean energy tax credits

Accelerated Depreciation:

- 5-year MACRS depreciation of system cost basis (less ½ of tax credit)
- Eligible for first-year bonus depreciation

Eligibility:

- Building located in U.S.
- Original use begins with taxpayer
- Construction commenced before 1/1/2035

Business Energy Investment Tax Credit

The business ITC for geothermal heat pump property was originally enacted in the Energy Improvement and Extension Act of 2008. This legislation added geothermal heat pumps to the definition of energy property under section 48(a) of the Internal Revenue Code with a 10% tax credit. This credit was extended by Bipartisan Budget Act of 2018 and most recently enhanced and further extended by the IRA of 2022. Effective 1/1/2023, there is now a 2-tier structure in place with a base credit rate of 6% and an increased rate of 30% if any one of the following criteria are met:

1. The maximum net output capacity of the GHP project is less than 1 megawatt (3.4 million Btu/h) of thermal energy. The Geothermal Exchange Organization (GEO) has submitted analysis that equates this to a total installed system capacity of 445 tons for distributed zone-level GHPs or 285 tons for central plant GHPs. The Department of Treasury is currently developing guidance.
2. The project is installed under specific prevailing wage and apprenticeship requirements. The IRS issued guidance for these requirements in Notice 2022-61 on 11-30-2022.
3. Construction of the project was commenced prior to 1-29-2023.

The ITC for GHP energy property is effective for projects that commence construction prior to 1/1/2035. In 2033 the base rate drops to 5.2% and the increased rate to 26%, while in 2034 they decline to 4.4% and 22% respectively.

Domestic Bonus Tax Credit

The domestic content bonus requires that any steel, iron, or manufactured product that is part of the GHP project at time of completion be produced in the United States. There is a 2-tier structure in place with a base credit rate of 2% and an increased rate of 10% that is based on the same criteria as for the ITC outlined above.

For purposes of this bonus, steel and iron used in the GHP project must be produced in the United States. This requirement applies to construction materials made primarily of steel or iron, but not to steel or iron used as components or sub-components of other manufactured products. Manufactured products are deemed to have been manufactured in the United States if at least 40% of the total cost of the incorporated components and subcomponents are mined, produced, or manufactured in the United States. The percentage of domestic content required for manufactured products increases to 45% for projects that begin construction in 2025, 50% for projects that begin construction in 2026, and 55% for projects that begin construction after 2026. GHP projects certainly appear to be able meet these requirements, however the Department of Treasury is developing necessary guidance.

The Domestic Content Bonus is not available for GHP projects completed before 1/1/2023

Direct Pay

Non-taxable entities have historically been unable to use the ITC. To address this, the IRA creates a new direct pay mechanism that, in effect, provides a refundable credit equal to the GHP project ITC with any domestic content bonus. Entities eligible include tax exempt organizations, a State or political subdivision thereof, the Tennessee Valley Authority, Indian tribal governments, Alaska Native Corporations, and rural electric cooperatives. Examples of these entities include charities, churches, foundations, state and local government buildings, schools, universities, and other nonprofits.

Direct pay is available for GHP projects that are placed in service after 12/31/2022.

Transfer or Sale of Tax Credit

Taxpayers may transfer the ITC including any domestic content bonus to an unrelated taxpayer. Consideration must be paid in cash, is not included in the income of the transferor, and is not deductible to the transferee. The transferee shall be treated as the taxpayer for all purposes with respect to the credit. For GHP energy projects held by a partnership, only the partnership can elect to transfer the eligible credits, not the individual partners. Direct pay is available for GHP projects that are placed in service after 12/31/2022.

Credit Carryback

The IRA extends the ITC carryback period to 3 years. The credit must originate in a tax year that begins after 12/31/2022. Any unused portion of the credit can also be carried forward.

Depreciation of Energy Property

Energy property is classified as a 5-year property in section 168(e) (3)(B)(vi) of the Internal Revenue Code, meaning the cost of the property can be deducted on an accelerated MACRS basis. For depreciation purposes, the system cost basis must be reduced by one half of the energy tax credit. In the example of a C-corporation in a 26% overall (federal plus state) tax bracket receiving a 40% ITC (includes the domestic content bonus), MACRS depreciation provides an additional tax savings equal to 20.8% of the energy property basis over the first 5 years, or optionally most within the first year. By comparison, conventional heating and cooling systems are generally depreciated on a 39-year straight line basis and would provide only 3.33% of the basis in tax savings over the first 5 years. The tax benefits for pass-through entities such as S-corporations could be much higher due to the higher marginal tax rates for individuals.

Energy property is eligible for first year bonus depreciation. The bonus allowance is 100% in 2022, 80% in 2023, 60% in 2024, 40% in 2025, 20% in 2026 and phases out in 2027. Refer to IRS Publication 946 for more information regarding how to depreciate property.

Eligible Geothermal Heat Pump Energy Property

The tax credit may be claimed for spending on equipment which uses the ground or ground water as a thermal energy source to heat a structure or as a thermal energy sink to cool a structure. The structure must be located in the United States. Spending includes costs of installation.

The credit cannot be claimed for spending on equipment used solely for a purpose other than heating or cooling a structure or on previously used equipment.

Construction Commenced Requirement

The credit can be claimed on spending for projects on which construction has commenced prior to January 1st, 2035. There is no time limit on when the construction must be completed for GHP energy projects. See IRS Notice 2018-59 for methods of establishing the commencement of construction.

System Cost Basis

The cost basis includes the direct costs associated with the purchase and installation of the energy property as well as any indirect costs that may be partly or fully allocable to its construction (including taxes). This includes equipment such as ground heat exchangers or wells, distribution piping and ductwork, pumps, GHPs and controls along with the associated installation labor and materials. The basis also generally includes those portions of the electrical, plumbing, design and GC fees that are specifically associated with the geothermal property. Utility rebates usually reduce the basis. See the uniform capitalization rules of IRS section 263A.

Dual Use Property Hybrid GHP Systems

If a GHP energy property contains a source of energy other than from the ground or ground water, portions of the system that carry both forms of energy may be considered dual use equipment. This would typically be equipment such as ductwork downstream of the GHP. The presence of an auxiliary energy source solely for emergency back-up purposes is not considered in this determination. Otherwise, if more than 25% of the annual energy (not peak energy) comes from the auxiliary source, any dual use equipment in the system may no longer be eligible for inclusion in the ITC cost basis. These comments are based on an interpretation of a 1979 code definition of energy property for direct use geothermal energy such as hot water for heating. There have been no further guidelines published by the IRS since that time. The IRS may not apply this language in this same way to GHP energy property and, as such, this interpretation is offered on a precautionary basis for those developing hybrid GHP energy projects. See 26 CFR 1.48-9 - Definition of energy property.

Energy Credit and AMT

The ITC can be used to offset both regular income taxes and alternative minimum taxes (AMT).

Ownership Considerations

Geothermal energy property ITC credits and depreciation deductions can only be claimed by the owner of the eligible property, including utilities that own energy property. At present, business models as used by the solar industry where a third-party owner (TPO) leases or sells energy from an energy property to a consumer are prohibited for GHP property due to IRS rules related to "limited use." The issue is the non-removable geothermal loop being dedicated to a single customer, in effect making the TPO a lender rather than a true owner. GEO is working with Treasury to develop a work around.

Energy Communities

The law includes an additional bonus credit of 10% (or 2% for projects over 1MW that don't meet prevailing wage/apprenticeship requirements) for Section 48 technologies that are installed in "energy communities." Energy communities are defined as:

- Census tract or adjoining tract with coal mine closed since 2000, or
- Census tract or adjoining tract with coal plant closed since 2010, or
- Defined as "a brownfield site" by the EPA, or
- a metropolitan or non-metropolitan statistical area where 0.17% or more direct employment, or at least 25% of local tax revenues, are related to extraction, processing, transport, or storage of coal, oil, or natural gas, and unemployment is at or above the national average in the previous year

Claiming the Credit

IRS Form 3468 is used to claim the Energy Credit. Visit www.irs.gov to download the latest tax form and instructions.

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Clean Energy Tax Incentives: Elective Pay Eligible Tax Credits

The Inflation Reduction Act of 2022 ("IRA") makes several clean energy tax credits available to businesses; tax-exempt organizations; state, local, and tribal governments; other entities; and individuals. The IRA also enables entities to take advantage of certain clean energy tax credits through its elective pay provision (also colloquially known as direct pay). Elective pay allows several types of entities, such as tax-exempts and governments, to treat the amount of certain credits as a payment against tax on their tax returns and as a result receive direct payments for certain clean energy tax credits.

	Tax Provision	Description
Energy Generation & Carbon Capture	**Production Tax Credit for Electricity from Renewables** (§ 45, pre-2025)	**For production of electricity from eligible renewable sources**, including wind, biomass, geothermal, solar, small irrigation, landfill and trash, hydropower, marine and hydrokinetic energy. **Credit Amount (for 2022):** 0.55 cents/kilowatt (kW); (1/2 rate for electricity produced from open loop biomass, landfill gas, and trash); 2.75 cents/kW if Prevailing Wage and Apprenticeship (PWA) rules are met [1,2,3,7]
	Clean Electricity Production Tax Credit (§ 45Y, 2025 onwards)	**Technology-neutral tax credit for production of clean electricity**. Replaces § 45 for facilities that begin construction and are placed in service after 2024. **Credit Amount:** Starts in 2025, consistent with credit amounts under section 45 [1,2,3,6,7]
	Investment Tax Credit for Energy Property (§ 48, pre-2025)	**For investment in renewable energy projects** including fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, and combined heat and power properties **Credit Amount:** 6% of qualified investment (basis); 30% if PWA requirements met [1,4,5,6,8]
	Clean Electricity Investment Tax Credit (§ 48E, 2025 onwards)	**Technology-neutral tax credit for investment in facilities that generate clean electricity** and qualified energy storage technologies. Replaces § 48 for facilities that begin construction and are placed in service after 2024 **Credit Amount:** 6% of qualified investment (basis); 30% if PWA requirements met [1,4,5,6]
	Low-Income Communities Bonus Credit (§ 48(e), 48E(h)) Application required	**Additional investment tax credit for small-scale solar and wind (§ 48(e)) or clean electricity (§48E(h)) facilities** (<5MW net output) on Indian land, federally subsidized housing, in low-income communities, and benefit low-income households. Allocated through an application process. **Credit Amount:** 10 or 20 percentage point increase on base investment tax credit [7]
	Credit for Carbon Oxide Sequestration (§ 45Q)	**Credit for carbon dioxide sequestration** coupled with permitted end uses in the United States. **Credit Amount:** $12-36 per metric ton of qualified carbon oxide captured and sequestered, used as a tertiary injectant, or used, depending on the specified end use; $60-$180 per metric ton if PWA requirements met.[1,7]
	Zero-Emission Nuclear Power Production Credit (§ 45U)	**For electricity from nuclear power facilities.** Facilities in operation prior to August 16, 2022. **Credit Amount (for 2023):** 0.3 cents/kWh (reduced rate for larger facilities); 1.5 cent/kWh if PW req's met [1,7]
Manufacturing	**Advanced Energy Project Credit** (§ 48C) Application required	**For investments in advanced energy projects.** A total of $10 billion will be allocated, not less than $4 billion of which will be allocated to projects in certain energy communities. **Credit Amount:** 6% of taxpayer's qualified investment; 30% if PWA requirements are met [1]
	Advanced Manufacturing Production Credit (§ 45X)	**Production tax credit for domestic clean energy manufacturing** of components including solar and wind energy, inverters, battery components, and critical materials. **Credit Amount:** Varies by component
Vehicles	**Credit for Qualified Commercial Clean Vehicles** (§ 45W)	**For purchasers of commercial clean vehicles**. Qualifying vehicles include passenger vehicles, buses, ambulances, and certain other vehicles for use on public streets, roads, and highways. **Credit Amount:** Up to $40,000 (max $7,500 for vehicles <14,000 lbs) [9]
	Alternative Fuel Vehicle Refueling Property Credit (§ 30C)	**For alternative fuel vehicle refueling and charging property**, located in low-income and non-urban areas. Qualified fuels include electricity, ethanol, natural gas, hydrogen, and biodiesel. **Credit Amount:** 6% of basis for businesses and can increase to 30% if PWA is met.
Fuels	**Clean Hydrogen Production Tax Credit** (§ 45V)	**For producing clean hydrogen** at a qualified, U.S.-based clean hydrogen production facility. **Credit Amount:** $0.60/kg multiplied by the applicable percentage (20% to 100%, depending on lifecycle greenhouse gas emissions), amount increases if PWA is met [1,7]
	Clean Fuel Production Credit (§ 45Z, 2025 onwards)	**Technology neutral tax credit for domestic production of clean transportation fuels**, including sustainable aviation fuels, beginning in 2025* **Credit Amount:** $0.20/gallon ($0.35/gal for aviation fuel) multiplied by CO2 "emissions factor"; $1.00/gallon ($1.75/gal for aviation fuel) multiplied by CO2 "emissions factor" if PWA is met [1,7]

Please see the notes on the next page or see IRS.gov/cleanenergy for more information.

Notes:

The information in this document may be subject to change as guidance is issued or finalized. For all IRA clean energy tax credits, please see **irs.gov/cleanenergy** for further details and eligibility requirements.

[1] Credit is increased by 5 times for projects that pay prevailing wages and use registered apprentices. Apprenticeship requirements do not apply for §§ 45L and 45U. Prevailing wage and apprenticeship requirements do not apply to certain projects, including certain projects of less than 1 megawatt or those that began construction prior to January 29, 2023.

[2] Credit is increased by 10% if the project meets certain domestic content requirements for steel or iron, and manufactured products.

[3] Credit is increased by 10% if located in an energy community.

[4] Credit is increased by up to 10 percentage points for projects meeting certain domestic content requirements for steel, iron, and manufactured products.

[5] Credit is increased by up to 10 percentage points if located in an energy community.

[6] Section 168(e) provides favorable depreciation treatment for facilities or property qualifying for this tax credit. These facilities or property will be treated as a 5-year property for purposes of cost recovery, leaving them with lower taxable income in the earlier years of a clean energy investment.

[7] Credit rate is adjusted annually for inflation.

[8] See section 48 for more detail and applicable exceptions to the credit rate.

[9] The entities eligible for elective pay of the commercial clean vehicle credit is a subset of the entities eligible for elective pay of other credits. In addition, starting January 1, 2024, the amount of a new clean vehicle or previously owned clean vehicle tax credit (but not a commercial clean vehicle credit) can be transferred to a dealer for an equivalent reduction in the eligible vehicle's sales price.

PROJECT MANUAL

Wilmington Elementary School

320 Salem Street, Wilmington, Massachusetts, 01887

Schematic Design - April 24, 2025

Dore & Whittier Architects Inc. Project Number: 23-0847

Awarding Authority / Owner
Town of Wilmington - Wilmington Public Schools

Architect
Dore & Whittier Architects Inc.

Geotechnical Consultant
Lahlaf Geotechnical Consulting

Civil and Site Consultant
CDW Consultants, Inc.

Landscape Consultant
Terraink

Structural Consultant
Engineers Design Group, Inc.

Plumbing and Fire Protection Consultant
Akal Engineering, Inc

HVAC and Electrical Consultant
GGD Consulting Engineers, Inc.

Geoenvironmental Consultant
PEER Consultants, P.C.

Owner's Project Manager
SMMA

Construction Manager
Fontaine Brothers, Inc.

Sustainable Design Consultant
The Green Engineer

Environmental / HAZMAT Consultant
Universal Environmental Consultants

Technology / Audio-Visual / Security Consultant
Edvance Technology Design

Acoustical Consultant
Acentech

Foodservice Consultant
Crabtree McGrath Associates, Inc.

Cost Estimating
PM&C

Traffic and Site Survey Consultant
Nitsch Engineering

DORE + WHITTIER

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END OF SECTION

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AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of Contract Documents, as follows:

1. Geotechnical Report: Prepared by Lahlaf Geotechnical Consulting, Inc., entitled Preliminary Geotechnical Report, and dated December 10, 2024.
   a. A copy of the full report, consisting of 66 pages, follows this section.
   b. This report, by its nature, cannot reveal all conditions that exist on the site. If subsurface conditions are found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price.
2. Hazardous Material Survey: Prepared by Universal Environmental Consultants, entitled Hazardous Materials Determination Survey, and dated October 10, 2023.
   a. A copy of the full report, consisting of 21 pages, follows this section.
3. Geoenvironmental Study: Prepared by PEER Consultants, P.C., entitled Limited Subsurface Soil Investigation Memorandum, and dated November 15, 2024.
   a. A copy of the full report, consisting of 81 pages, follows this section.
4. Traffic Study: Prepared by Nitsch Engineering, entitled Traffic Impact Study, and dated December 9, 2024.
   a. A copy of the full report, consisting of 864 pages, is available for review.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 10, 2024

Ms. Rani Philip
Dore and Whittier Architects, Inc.
260 Merrimac Street, Building 7
Newburyport, MA 01950
Phone: (978) 778-5353
Fax: (978) 499-2944
E-mail: rphilip@DoreandWhittier.com

Re: **Preliminary Geotechnical Report**
Proposed Wildwood Early Childhood Center
North Intermediate School – 320 Salem Street Site
Wilmington, MA
LGCI Project No. 2437

Dear Ms. Philip:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a preliminary geotechnical study for the proposed Wildwood Early Childhood Center in Wilmington, Massachusetts. We are submitting our preliminary geotechnical report electronically. Please notify us if you need a hard copy.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

PRELIMINARY GEOTECHNICAL REPORT
PROPOSED WILDWOOD EARLY CHILDHOOD CENTER
NORTH INTERMEDIATE SCHOOL – 320 SALEM STREET SITE
WILMINGTON, MASSACHUSETTS

LGCI Project No. 2437
December 10, 2024

Prepared for:

Dore and Whittier Architects, Inc.
260 Merrimac Street, Building 7
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Phone: (978) 778-5353
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PRELIMINARY GEOTECHNICAL REPORT
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Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This geotechnical report presents the results of the subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Wildwood Early Childhood Center in Wilmington, Massachusetts. We performed our services in general accordance with our proposal No. 24084 dated August 9, 2024, and proposal No. 24107 dated October 15, 2024. Ms. Rani Philip of Dore and Whittier Architects, Inc. (Dore and Whittier) authorized our services by signing our proposals Nos. 24084 and 24107 on August 9, and October 15, 2024, respectively.

1.2 Purpose and Scope of Services

The purpose of our geotechnical services was to perform preliminary subsurface explorations at the site for the proposed Wildwood Early Childhood Center, and to provide preliminary foundation design and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with Dore and Whittier and with school staff.
- Marked the exploration locations at the site and notified Dig Safe Systems Inc. (Dig Safe) and the Town of Wilmington for utility clearance.
- Engaged a drilling subcontractor for two (2) days to advance eight (8) soil borings at the site.
- Coordinated with Dore and Whittier who arranged with the Town of Wilmington's Department of Public Works (DPW) to perform five (5) test pits at the site, as requested by the civil engineer.
- Provided an LGCI geotechnical field representative at the site to coordinate and observe the borings and test pits, describe the soil samples, and prepare field logs. The LGCI representative performed four (4) double ring infiltrometer tests within test pits TP-1, TP-2, TP-3, and TP-4.
- Submitted six (6) soil samples for laboratory tests, including two (2) soil samples from the borings, and four (4) samples from the test pits where double ring infiltrometer tests were performed.
- Prepared this preliminary geotechnical report containing the results of our preliminary subsurface explorations and our preliminary recommendations for foundation design and construction.

Our scope does not include preparing specifications, reviewing contract documents, and providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for stormwater management, erosion control, pavement design, slope stability analyses, site specific seismic and liquefaction analyses, pile analysis and design, FEMA 100-year flood elevation, historic uses of site, contaminated soil and groundwater treatment and disposal requirements and techniques, and cost or quantity estimates are not included in our scope of work.

LGCI's scope of services does not include an environmental assessment for the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site, or mold in the soil or in any structure at the site. Any statements regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client.

1.3 Site Description

Our understanding of the site is based on our field observations, our discussions with Dore and Wittier, and on the following document:

- Drawing EX-1 titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts," (Existing Conditions Plan) prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier via e-mail on November 11, 2024.

The North Intermediate School site is located at 320 Salem Street in Wilmington, Massachusetts as shown in Figure 1. The site is bordered by private residential properties and Salem Street on the southern side, by Ballardvale Street on the eastern side, and by private properties on the western and northern sides. The site is occupied by the existing school building, a drop off loop, a paved parking lot, a playground, a basketball court and tennis courts, and athletic fields, including a baseball field and a soccer field.

Based on the Existing Conditions Plan, the grades at the site generally range between El. 90 feet and El. 108 feet, generally rising in the north to south direction.

1.4 Project Description

Our understanding of the proposed construction is based on our discussions with Dore and Whittier and on the following drawing:

- "Site Base Condition, Wilmington Schools, North Intermediate- Wilmington, MA," (Site Base Conditions) prepared by Dore and Whittier, undated, and provided to LGCI by Dore and Whittier on October 11, 2024.

We understand that at this time, the size, layout, and location of the proposed school are preliminary. Based on the Site Base Conditions, the proposed school will have an irregular shape

and will have a footprint of about 80,500 square feet. The proposed building will be located in the area of the existing athletic fields north of the existing building. We understand that the existing building will be demolished to allow for the construction of the proposed athletic fields.

Information about the proposed building finished floor elevation (FFE) and the proposed grading are not available at the time of this report.

1.5 Elevation Datum

We understand that the elevations provided in the Existing Conditions Plan are referenced with respect to the North American Vertical Datum of 1988 (NAVD 1988).

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Surficial Materials Map of Wilmington Quadrangle, Massachusetts," prepared by Byron D. Stone, J.R. and DiGiacomo-Cohen, M.L., Scientific Investigation Map 3402, Quadrangle 113 – Wilmington, 2018.

The surficial geologic map of the site indicates that the natural soils in the general vicinity of the site consist of coarse deposits.

The coarse deposits consist of sand, sand and gravel, and gravel deposits as described below.

Sand Deposits – The sand deposits are comprised mostly of fine to coarse sand. Coarser layers may contain up to 25 percent gravel. Finer layers may contain fine sand, silt, and clay.

Sand and Gravel Deposits – The sand and gravel deposits occur as a mixture of gravel and sand within individual layers and as alternating layers of sand and gravel. The sand and gravel layers range between 25 to 50 percent gravel and 50 to75 percent sand.

Gravel Deposits – The gravel deposits are comprised of at least 50 percent gravel, cobbles, and boulders. Sand occurs within gravel beds and as separate layers within the gravel.

The surficial geologic map also shows swamp deposits not far from the site.

Swamp Deposits – the swamp deposits consist of organic muck and peat that contain minor amounts of sand, silt, and clay, are stratified and poorly sorted, and occur in swamps and freshwater marshes, in kettle depressions, or in poorly drained areas.

The Surficial Geologic Map is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with Dore and Whittier and marked the exploration locations in the field. LGCI notified Dig Safe and the Town of Wilmington for utility clearance prior to starting our explorations at the site.

Unless notified otherwise, we will dispose of the soil samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Soil Borings

LGCI engaged Soil X, Corp. (Soil X) of Leominster, Massachusetts to advance eight (8) soil borings (B-1 to B-8) at the site on October 28 and 29, 2024. The borings were advanced with a Diedrich D-70 Turbo ATV Drill Rig using hollow stem auger boring techniques with 4-1/4-inch inner diameter augers. The borings extended to depths ranging between 10.2 and 20.2 feet beneath the ground surface. Upon completion, the boreholes were backfilled with drill cuttings.

Soil X performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer at typical depth intervals of 2 feet or 5 feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical field representative observed and logged the borings in the field.

2.2.3 LGCI's Test Pits

Dore and Whittier coordinated with the Town of Wilmington DPW to perform five (5) test pits (TP-1, TP-2, TP-2A, TP-3, and TP-4) at the site on October 30 and 31, 2024. The purpose of the test pits was to perform double ring infiltrometer tests as described in Section 2.6. The test pits were excavated with a Volvo EWR150E excavator with a smooth-edge bucket. The test pits extended to depths ranging between 8.0 and 11.3 feet beneath the ground surface. Upon completion, the excavations were backfilled with excavated material in 12- to 18-inch lifts and tamped with the excavator bucket.

An LGCI geotechnical field representative observed and logged the test pits in the field.

2.2.4 Exploration Logs and Locations

The boring and test pit locations are shown in Figure 3A and Figure 3B. Appendices A and B contain LGCI's boring logs and test pits logs, respectively, and Tables 1 and 2 include summaries of LGCI's borings and test pits, respectively.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The exploration logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. Percentages of fines, sand, and gravel were estimated to the nearest 5 percent based on our field observations and laboratory inspection of the soil samples, except where a grain-size analysis was performed. The

strata boundaries shown in our exploration logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in LGCI's borings and test pits were as follows, starting at the ground surface.

Topsoil – A layer of surficial organic topsoil was encountered at the ground surface in borings B-1 to B-7, and in all test pits. The thickness of the topsoil ranged between 0.6 feet and 2.0 feet.

Fill – A layer of fill was encountered at the ground surface in boring B-8 and beneath the topsoil in all borings and test pits. The fill extended to depths ranging between 0.7 and 7.0 feet beneath the ground surface. The samples within this layer were mostly described as well graded sand, poorly graded sand, and silty sand. The fines content in the fill ranged between 0 and 30 percent, and the gravel content ranged between 0 and 25 percent. The fill contained traces of organic soil and roots. The fill contained 5 to 10 percent cobbles up to 12 inches in size in test pit TP-1.

The SPT N-values in this layer ranged between 7 blows per foot (bpf) and 54 bpf, with most values lower than 18 bpf, indicating mostly loose to medium dense material.

The excavation efforts within the fill layer ranged between easy, moderate, and difficult.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill layer in borings B-2, B-5, and B-7 The buried organic soil extended to depths of 4.0, 4.4, and 8.0 feet beneath the ground surface in borings B-2, B-5, and B-7, respectively. The samples in this layer were described as silty sand. The fines content in the buried organic soil ranged between 25 and 45 percent. The buried organic soil contained traces of organic soil and roots.

The SPT N-values in this layer ranged between 16 bpf and 40 bpf, indicating medium dense to dense material.

Buried Subsoil – A layer of buried subsoil was encountered beneath the fill in boring B-8 and test pit TP-4. The subsoil extended to depths of 4.0 and 3.2 feet beneath the ground surface in boring B-8 and test pit TP-4, respectively. In boring B-8, the samples were described as silty sand. The fines content in the subsoil ranged between 15 and 35 percent, and the gravel content ranged between 0 and 15 percent. In test pit TP-4, the sample was described as poorly graded sand. The fines content ranged between 10 and 15 percent, and the gravel content ranged between 0 and 5 percent. The samples contained traces of organic soil and roots.

The SPT N-values in this layer ranged between 11 bpf and 14 bpf, indicating a medium dense material.

The excavation effort within the subsoil layer was easy, consistent with loose to medium dense material.

Silt – A layer of silt was encountered beneath the fill layer in boring B-1 and extended to a depth of 9.0 feet beneath the ground surface. The sample was described as silt and was slightly plastic. The sand content ranged between 5 and 10 percent.

The SPT N-value in this layer was 13 bpf, indicating stiff material.

Clay – A layer of clay was encountered beneath the layer of silt in boring B-1 between depths of 9.0 to 14.0 feet. The sample was described as lean clay and was slightly plastic. The sand content ranged between 15 and 20 percent.

The SPT N-value in this layer was 12 bpf, indicating stiff material.

Swamp Deposit – A layer of swamp deposits was encountered beneath the layer of fill in test pit TP-1 and extended to a depth of 10 feet beneath the ground surface. The sample was described as silty sand. The fines content ranged between 20 and 25 percent and the gravel content ranged between 10 and 15 percent. The swamp deposit had traces of organic soil, roots, and an organic odor.

The excavation effort within the swamp deposit layer was difficult possibly due to the presence of roots.

Sand – A layer of sand was encountered in test pit TP-1 and extended to a depth of 11.0 feet beneath the ground surface. The sand was described as poorly graded sand. The fines content ranged between 0 and 5 percent.

The excavation effort within the sand layer was difficult.

Sand and Gravel – A layer of sand and gravel was encountered in all borings and test pits, except in test pit TP-1, and extended to the termination depths of the borings and test pits, except for boring B-6 where the sand and gravel layer extended to the top of weathered rock. The samples in this layer were mostly described as well graded sand and silty sand. Five (5) samples were described as poorly graded sand. The fines content in this layer ranged between 0 and 25 percent, and the gravel content ranged between 0 and 40 percent.

The SPT N-values in this layer ranged between 15 bpf and refusal, with most values ranging between 20 bpf and 67 bpf, indicating dense to very dense material. Please note that the high SPT N-values in the sand and gravel may be due to obstructions such as cobbles and boulders in the sand and gravel and may not represent the true density of the sand and gravel.

Weathered Rock – A layer of weathered rock was encountered in boring B-6 and extended to the termination depth of 19.7 feet beneath the ground surface. The sample within this layer was described as silty sand. The fines content ranged between 15 and 20 percent, and the gravel content ranged between 35 and 40 percent.

2.4 Groundwater

Groundwater was encountered in all the borings, except for B-3, and in test pits TP-1 and TP-2A, at depths ranging between 9.0 and 14.0 feet beneath the ground surface, as shown in Tables 1 and 2, and in the boring and test pit logs.

The groundwater information reported herein is based on observations made during or shortly after the completion of drilling and excavation. The reported groundwater levels may not represent the actual groundwater conditions, as additional time may be required for the groundwater levels to stabilize. The groundwater information presented in this report only represents the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Laboratory Test Data

LGCI submitted six (6) soil samples collected from the borings for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix C and are summarized in the table below.

Grain-Size Analysis Test Results

Exploration No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-1	S2	Fill	2.0 – 4.0	36.5	43.5	20.0
B-4	S2	Sand and Gravel	2.0 – 4.0	36.9	42.6	20.5
TP-1	Infiltrometer	Fill	5.0	14.1	58.9	27.0
TP-2	Infiltrometer	Fill	4.0	6.8	77.3	15.9
TP-3	Infiltrometer	Sand and Gravel	4.0	31.4	67.1	1.5
TP-4	Infiltrometer	Sand and Gravel	4.6	30.4	58.6	11.0

2.6 Double Ring Infiltrometer Tests

LGCI provided a geotechnical field engineer to perform four (4) double ring infiltrometer tests in test pits TP-1 to TP-4 (one in each).

In each case, the excavation was first advanced to the test depth where the test pit bottom was leveled using the excavator bucket. After the infiltrometer rings were driven into the ground, the test was conducted by filling the rings with water. The test pit was advanced deeper after the completion of the test.

The test results are included in Appendix D and are summarized below.

The results include plots of the hydraulic conductivity for flow within the inner and outer rings. The stabilized portion of the plot for the inner ring indicates the permeability value. The results indicate the following approximate permeability, K, value:

Double Ring Infiltrometer Test Results

Test Pit	Stratum	Test Depth (ft.)	Permeability, K (cm/sec)
TP-1	Fill	5.0	1.00×10^{-3}
TP-2	Fill	4.0	4.06×10^{-3}
TP-3	Sand and Gravel	4.0	6.73×10^{-2}
TP-4	Sand and Gravel	4.5	8.95×10^{-2}

3. EVALUATION AND RECOMMENDATIONS

3.1 Foundation Recommendations

3.1.1 General

Based on the results of the borings and test pits, the subsurface conditions at the site are suitable to support the proposed building after the topsoil, existing fill, buried organic soil, buried subsoil, and swamp deposits are removed or improved as described below. There are a few issues that we would like to highlight for consideration and discussion.

3.1.2 Topsoil, , Existing Fill Buried Organic Soil, Buried Subsoil, and Swamp Deposits

- The topsoil should be removed from within the entire construction area, including the proposed building footprint and the proposed paved areas.

- The existing fill was observed to be variable in composition and density. The existing fill contained traces of organic soil and roots. In addition, the existing fill overlaid buried organic soil and buried subsoil. Existing fill that was not placed with strict moisture, density, and gradation control presents risk of unpredictable settlement that may result in poor performance of floor slabs and foundations. Due to these risks, the existing fill, the buried organic soil, and the buried subsoil should be entirely removed from within the proposed building's footprint and should be replaced with Structural Fill. We anticipate that the removal will extend up to depths ranging between 2 and 6 feet beneath the existing ground surface, and up to a depth of 8 feet beneath the ground surface near boring B-7. The removal may extend to greater depths at locations not explored by LGCI. Laterally, the removal should extend beyond the proposed building's footprint a distance equal to the distance between the bottom of the proposed footings and the top of the native sand and gravel, or 5 feet, whichever is greater.

- At test pit TP-1, performed outside of the proposed building footprint, swamp deposits were observed beneath the existing fill and extended to a depth of 10 feet beneath the ground surface. If encountered within the proposed building footprint, the swamp deposits should be removed and replaced with Structural Fill.

- After the topsoil, existing fill, buried organic soil, buried subsoil, and swamp deposits, if any, are removed from within the proposed building footprint and zone of influence of footings, as described above, the proposed building and other structures may be supported on shallow footings bearing in Structural Fill placed directly on top of the native sand and gravel or stiff silt and clay.

- As an alternative to the removing the existing fill, the buried organic soil, and the buried subsoil we considered the option of improving the ground using aggregate piers (APs) or

rigid inclusions (RIs). We dismissed this option due to the depth to the bottom of these layers being 6 feet or less in a few explorations. We will reconsider this option after additional explorations are performed at the site during future phases of the project.

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- The proposed slab may be designed as a slab-on-grade bearing on Structural Fill placed directly on top of the native sand and gravel or stiff silt and clay.

- Within paved areas, the existing fill and the buried organic soil and buried subsoil should be removed to the top of the native sand and gravel or stiff silt and clay or to a depth of 18 inches beneath the bottom of the proposed pavement, whichever occurs first. Where soft organic soil is exposed, the organic soil should be removed. The existing fill and buried organic soil and buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement can remain in place provided that these materials are firm and unyielding following proofrolling as described in Section 4.1.

3.1.3 Additional Explorations

We recommend advancing additional explorations at the site during the schematic design (SD) phase and/or the design development (DD) phase. The additional explorations should include soil borings and test pits. We recommend installing at least one (1) groundwater observation well as part of the additional explorations.

3.2 Foundation Recommendations

We recommend supporting the proposed building on shallow footings placed on Structural Fill placed directly the native sand and gravel layer or the stiff silt and clay. Shallow foundations and slabs-on-grade should be placed on a subgrade that is prepared in accordance with the recommendations in this report. Recommendations for footing design and our settlement estimates are presented in Sections 3.2.1 and 3.2.2, respectively.

3.2.1 Footing Design

- Footings should be founded on Structural Fill placed directly on the native sand and gravel or on the stiff silt and clay. A representative of LGCI should observe the subgrade during construction to confirm that it is consistent with the materials encountered in our borings.

- For footing design, we recommend using a net allowable bearing pressure of 4 kips per square foot (ksf).

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- Foundations should be designed in accordance with The Commonwealth of Massachusetts State Building Code 780 CMR, Tenth Edition (MSBC 10th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4.0 feet below the final exterior grade to provide adequate frost cover protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- We recommend that wall footings have a minimum width of 2 feet, and that column footings have a minimum width of 3 feet. For foundations with a least lateral dimension smaller than 3 feet, the allowable bearing pressure should be reduced to 1/3 of the recommended allowable bearing pressure times the least dimension in feet.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

3.2.2 Settlement

Using the allowable bearing pressure of 4 ksf and the minimum footing sizes recommended above, we estimate for foundations constructed in accordance with the recommendations contained in this report that the total post-construction settlement will be less than about 1 inch and that the differential settlement will be 3/4 inch or less over a distance of 25 feet. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

- The proposed floor slab can be constructed as a slab-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the native sand and gravel.

- To reduce the potential for dampness in the proposed floor slab, the project architect may consider placing a vapor barrier beneath the floor slab. The vapor barrier should be protected from puncture during construction of the slab.

- For the design of the floor slab bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \text{Re}action\ (k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area,
k_{s1} = Coefficient of vertical subgrade reaction for 1 x 1 square foot area, and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed for construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- Backfill in interior and exterior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to the building foundation or superstructure, exterior slabs such as approach slabs and sidewalks, should be isolated from the building superstructure.

3.4 Under-slab Drainage

Based on the groundwater levels observed in our borings, we believe that an under-slab drainage system is not required beneath the slab.

3.5 Seismic Design Criteria

In accordance with Section 1613 of MSBC 10th Edition and based on the boring data, the seismic criteria are as follows:

- Site Class: D
- Spectral Response Acceleration at short period, S_s (Table 1604.11): 0.327g
- Spectral Response Acceleration at 1 sec., S_1 (Table 1604.11): 0.072g
- Site Coefficient, F_a (Table 1613.3.3(1)): 1.6
- Site Coefficient, F_v (Table 1613.3.3(2)): 2.4
- Adjusted spectral response S_{ms} (Equation 16-37): 0.523g
- Adjusted spectral responses S_{m1} (Equation 16-38): 0.173g

Based on the SPT data from the borings, we believe the site soils are not susceptible to liquefaction.

3.6 Lateral Pressures for Wall Design

3.6.1 Lateral Earth Pressures

Based on our understanding, the proposed construction will not include retaining walls or below-ground walls. Should the design change, the lateral earth pressures recommended shown below should be used to design proposed retaining walls.

Coefficient of Active Earth Pressure, K_A:	0.33
Coefficient of At-Rest Earth Pressure, K_o:	0.50
Coefficient of Passive Earth Pressure, K_p:	3.0
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 30 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and a vertical wall face.

- Exterior walls of below-ground spaces and retaining walls braced at the top to restrain movement/rotation, should be designed using the "at-rest" pressure coefficient.

- We recommend placing free-draining material within the 3 feet immediately behind retaining walls. We recommend providing weep holes in site walls to promote drainage where possible; or a pipe should be placed at the base of the wall to collect the groundwater. Groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 2 feet.

- Where a permanent vertical uniform load will be applied on the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the native sand and gravel or Structural Fill and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning. We recommend a factor of safety of 1.5 for global stability of walls.

3.6.2 Perimeter Drains

- Should the design change to include retaining walls, free-draining material should be placed within 3 feet of retaining walls and walls of below-grade spaces. To reduce the potential for dampness in below-ground spaces, if any, perimeter walls of the proposed below-ground spaces should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below-ground spaces, if any, and behind site retaining walls, if any. The drains should consist of 6-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile fabric for separation and filtration. Site retaining walls may be designed with weep holes discharging near the bottom of the face of the walls.

- Groundwater collected by the wall drains could be discharged in a lower area if gravity flow is possible. Alternatively, it should be discharged into the street drains. A permit would be required for discharge into street drains.

3.7 Pavement and Sidewalk Considerations

3.7.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, and sidewalks after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the topsoil and asphalt from within the footprint of the proposed driveways and parking lots.

- The existing fill should be improved within the proposed paved areas and under sidewalks in accordance with the recommendations in Sections 3.1.1 and 4.1.

Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement and sidewalks.

3.7.2 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5" Asphalt "Top Course"
2.0" Asphalt "Base Course"
8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

2.0" Asphalt "Top Course"
2.5" Asphalt "Base Course"
12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the "Standard Specifications for Highways and Bridges," prepared by the Commonwealth of Massachusetts Department of Transportation dated 2023.

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7.3 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

3.8 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer's recommendations. "Cushion" material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Before placing the bedding material, the bottom of utility trenches should be compacted to a firm and unyielding condition. Where soft or pumping material is encountered, it should be removed and replaced with Ordinary Fill.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill immediately above the utilities should be performed in accordance with the manufacturer's recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Existing asphalt, topsoil, existing fill, buried organic soil, buried subsoil, swamp deposits, if any, organic materials, abandoned utilities, buried foundations, remnants of demolished buildings, and other below-ground structures should be entirely removed from within the footprint of the proposed building before the start of foundation work.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Cobbles and boulders should be removed at least 6 inches from beneath footings and 18 inches beneath the bottom of slabs and paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.

- We recommend removing the existing fill, buried organic soil, buried subsoil, and swamp deposits, if any, from within the proposed building footprint and within the zone of influence of footings. We recommend compacting the exposed subgrade in the native sand and gravel layer or in the deep existing fill to a firm and unyielding condition with at least six (6) passes of a heavy roller compactor imparting a minimum dynamic effort of 40 kips. Where organic soil is exposed or where the subgrade is soft during the compaction effort, the organic soil or soft material should be removed and replaced with Structural Fill. The subgrade in the stiff silt and clay should be cut with a smooth bladed bucket and compacted statically with no more than 2 passes of a roller compactor.

- After the surficial topsoil, buried organic soil, buried subsoil, and existing fill are removed to a depth of 18 inches below the bottom of the proposed pavement, the exposed existing fill, buried organic soil, and buried subsoil should be improved by compacting the exposed surface of the existing fill with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft organic soil or other soft materials of soil are observed, the organic soil or other soft material should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the existing fill or buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement is observed, the soft and/or pumping material should be removed and replaced.

- The base of footing excavations should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.

- The subgrade of the proposed slab should be compacted with a dynamic vibratory compactor imparting a minimum of 10 kips of force to the subgrade before placing Structural Fill.

- To reduce the potential for disturbance of the footing subgrade, excavations should be extended an additional 12 inches and restored with Structural Fill or crushed stone to serve as a working mat.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- An LGCI geotechnical representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure.

- If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed, and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill or crushed stone wrapped in a geotextile filter fabric.

4.2 Subgrade Protection

The onsite sand and gravel is frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final 6 inches of soil just before pouring concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Earthwork operations should be suspended during freezing weather.

Materials with high fines content are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill. Fill placed outside the building footprint beneath any pavement subbase should meet the gradation and compaction requirements of Ordinary Fill.

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings, and deleterious materials.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 - 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 – 10

* 0 – 5 Under sidewalks and exterior pads and slabs

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 - 100
No. 4	20 – 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 – 20

4.4 Reuse of Onsite Materials

Based on the laboratory tests, the granular portion of the existing fill free of organic soil may be used as Ordinary Fill. The onsite materials are not suitable for reuse as Structural Fill.

Soils with high fines content (higher than about 20 percent) are generally very sensitive to moisture content variations and are susceptible to frost. These soils are difficult to compact at

moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during stockpiling, placement, and compaction of the existing fill.

All materials to be used as fill should first be tested for compliance with the applicable gradation specifications. During earthwork operations, the contractor should avoid mixing the reusable soils with fine-grained and/or organic soils.

4.5 Groundwater Control Procedures

Based on the groundwater levels encountered in our explorations, we anticipate the need for groundwater control procedures during footing and utility excavations. We anticipate that filtered sump pumps installed in pits located at least 3 feet below the bottom of the excavation may be sufficient to handle surface runoff that may enter the excavation. The contractor should be prepared to use multiple sump pumps as needed.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary, including well points, if necessary, to maintain the groundwater level below the excavation, and to maintain a dry excavation during wet weather. Placement of reinforcing steel or concrete in standing water should not be permitted.

Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pumps are no longer in use and the sump pump pits should be restored with suitable backfill.

4.6 Temporary Excavations

All excavations to receive human traffic, including utility trenches, basement or footing excavations, or others (i.e. underground storage tanks, etc.), should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have a shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Perform additional explorations at the site and update our geotechnical report.
- Prepare Earth Moving Specifications and review the geotechnical aspect of contract drawings.
- Review contractor submittals and Request for Information (RFIs);
- Provide a field representative during construction to observe the removal of the unsuitable soil, and to observe the subgrade of footings and slabs.

6. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Dore and Whittier Architects, Inc. for the proposed Wildwood Early Childhood Center at the North Intermediate School located at 320 Salem Street Site in Wilmington, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

American Society of Civil Engineers, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures," ASCE/SEI 7-16, 2017.

The Commonwealth of Massachusetts (2024), "The Massachusetts State Building Code, Ninth (10th) Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Wilmington, MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Wildwood Early Childcare Center
Wilmington, MA
LGCI Project No. 2437

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / **El.** (ft.)	Bottom of Topsoil Depth / **El.** (ft.)	Bottom of Fill Depth / **El.** (ft.)	Bottom of Buried Organic Soil / **Buried Subsoil** Depth / **El.** (ft.)	Bottom of Sand and Gravel Depth / **El.** (ft.)	Bottom of Weathered Rock Depth / **El.** (ft.)	Bottom of Boring Depth / **El.** (ft.)
B-1	93.0	9.0 / **84.0**	0.6 / **92.4**	6.0 [3]/ **87.0**	- / **-**	19.0 [4]/ **74.0**	- / **-**	19.0 / **74.0**
B-2	94.0	9.0 / **85.0**	0.8 / **93.2**	2.8 / **91.2**	4.0 / **90.0**	19.0 [4]/ **75.0**	- / **-**	19.0 / **75.0**
B-3	95.0	- / **-**	0.7 / **94.3**	2.0 / **93.0**	- / **-**	10.2 [4]/ **84.8**	- / **-**	10.2 / **84.8**
B-4	93.0	9.0 / **84.0**	0.6 / **92.4**	2.0 / **91.0**	- / **-**	11.0 [4]/ **82.0**	- / **-**	11.0 / **82.0**
B-5	94.0	9.0 / **85.0**	0.7 / **93.3**	4.0 / **90.0**	4.4 / **89.6**	10.5 [4]/ **83.5**	- / **-**	10.5 / **83.5**
B-6	94.0	14.0 / **80.0**	2.0 / **92.0**	6.0 / **88.0**	- / **-**	19.0 / **75.0**	19.7 [5]/ **74.3**	19.7 / **74.3**
B-7	92.0	10.0 / **82.0**	0.9 / **91.1**	6.0 / **86.0**	8.0 / **84.0**	20.2 [6]/ **71.8**	- / **-**	20.2 / **71.8**
B-8	94.0	9.0 / **85.0**	- / **-**	0.7 / **93.3**	**4.0** / **90.0**	19.8 [6]/ **74.2**	- / **-**	19.8 / **74.2**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled: “Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts,” prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.
2. Groundwater was measured during drilling, at the end of drilling, after drilling, or based on sample moisture whichever is shallower.
3. A layer of silt was encountered beneath the fill in boring B-1, between depths of 6 to 9 feet, and a layer of clay was encountered beneath the silt between depths of 9 and 14 feet.
4. Boring terminated due to split spoon / auger refusal on possible boulder or rock in the sand and gravel layer.
5. Boring terminated in the weathered rock layer.
6. Boring terminated in the sand and gravel layer.
7. "-" means the groundwater or layer was not encountered.

Table 1 - Summary of LGCI's Test Pits
Proposed Wildwood Early Childcare Center
Wilmington, MA
LGCI Project No. 2437

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / **El.** (ft.)	Bottom of Topsoil Depth / **El.** (ft.)	Bottom of Fill Depth / **El.** (ft.)	Bottom of Swamp Deposits / **Buried Subsoil** Depth / **El.** (ft.)	Bottom of Sand and Gravel Depth / **El.** (ft.)	Bottom of Sand Depth / **El.** (ft.)	Bottom of Boring Depth / **El.** (ft.)
TP-1	92.0	9.5 / **82.5**	1.5 / **90.5**	7.0 / **85.0**	10.0 / **82.0**	- / **-**	11.0 [4]/ **81.0**	11.0 / **81.0**
TP-2	94.0	- / **-**	0.7 / **93.3**	5.5 / **88.5**	- / **-**	9.0 [3]/ **85.0**	- / **-**	9.0 / **85.0**
TP-2A	94.0	9.5 / **84.5**	1.5 / **92.5**	7.0 / **87.0**	- / **-**	11.3 [3]/ **82.7**	- / **-**	11.3 / **82.7**
TP-3	94.0	- / **-**	0.8 / **93.2**	2.3 / **91.7**	- / **-**	8.0 [3]/ **86.0**	- / **-**	8.0 / **86.0**
TP-4	95.0	- / **-**	1.0 / **94.0**	2.0 / **93.0**	**3.2** / **91.8**	9.0 [3]/ **86.0**	- / **-**	9.0 / **86.0**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts," prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.
2. Groundwater was measured during drilling, at the end of drilling, after drilling, or based on sample moisture whichever is shallower.
3. Test Pit terminated in the sand and gravel layer.
4. Test Pit terminated in the sand layer.
5. "**-**" means the groundwater or layer was not encountered.

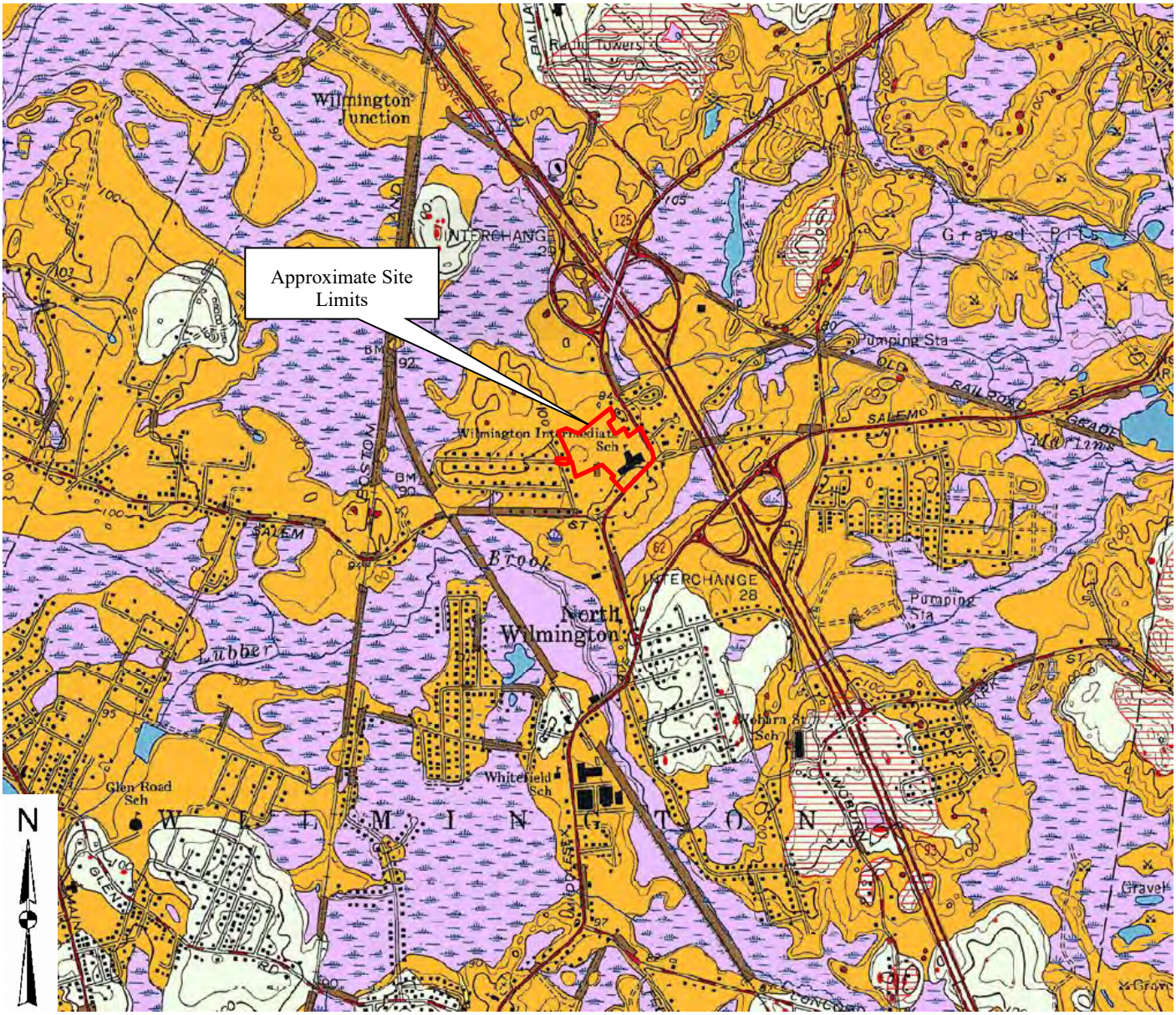
N

Contour Intervals: 10 feet

0.4 mi

Note: Figure based on USA Topo Maps of Wilmington, MA *ngmdb.usgs.gov/topoview/viewer*

Client:	Project:	Figure 1 – Site Location Map	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childhood Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec . 2024



Swamp deposits—Organic muck and peat that contain minor amounts of sand, silt, and clay, are stratified and poorly sorted, and occur in swamps and freshwater marshes, in kettle depressions, or in poorly drained areas. Unit is shown only where deposits are estimated to be at least 3 ft thick; most deposits are less than 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits

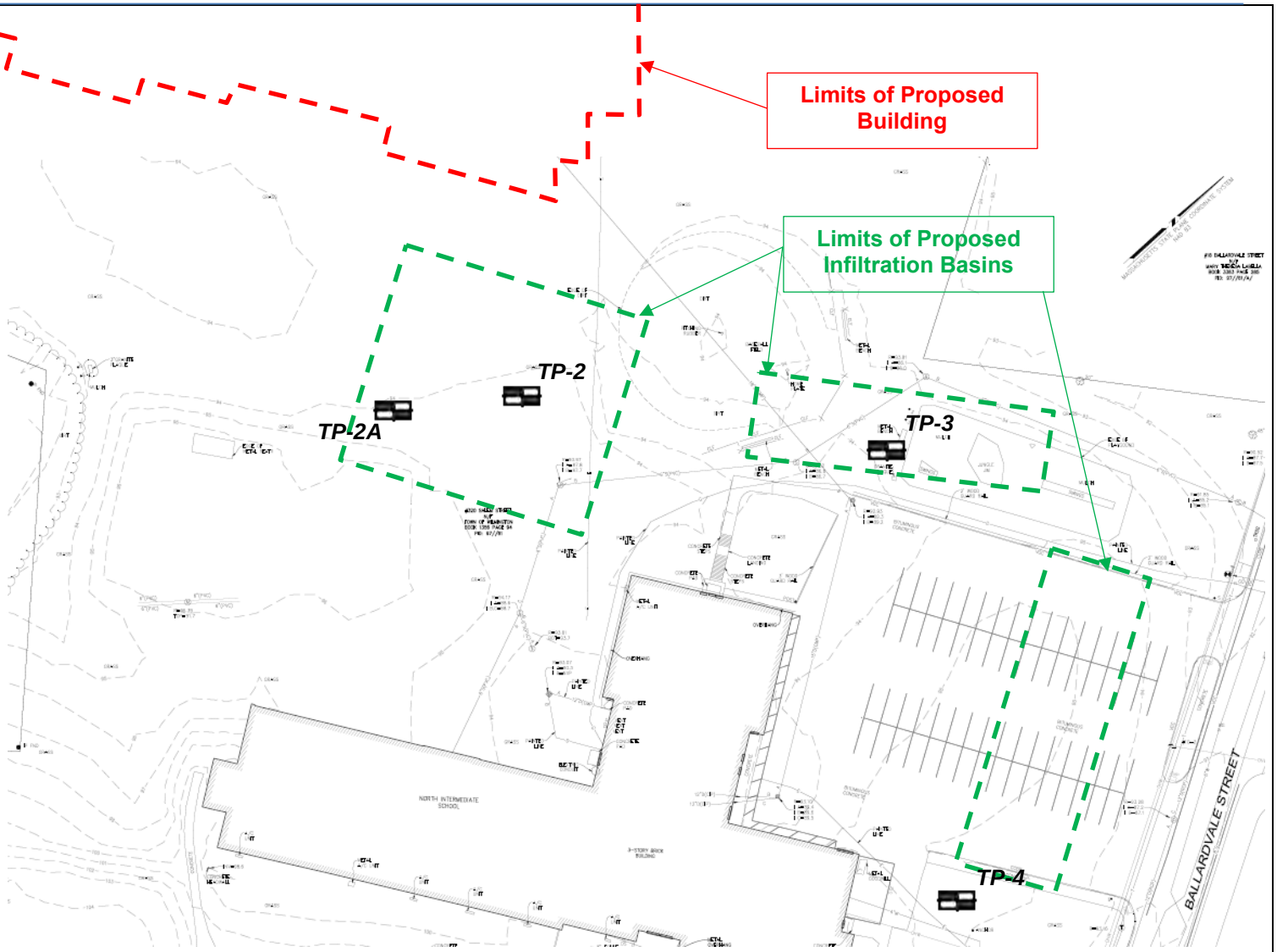
Coarse deposits consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

Note: Figure based on map titled: "Surficial Materials Map of Wilmington Quadrangle, Massachusetts," compiled by Byron D. Stone, Janet R. Stone, and Mary L. DiGiacomo-Cohen, Scientific Investigation Map 3402, Quadrangle 113 – Wilmington, 2018.

Client:	Project:	Figure 2 – Surficial Geologic Map	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childhood Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Legend

Approximate location of test pits advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 30, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).



Approximate Scale (ft.)

20 0 20 40 80

Note

Figure based on drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts", prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.

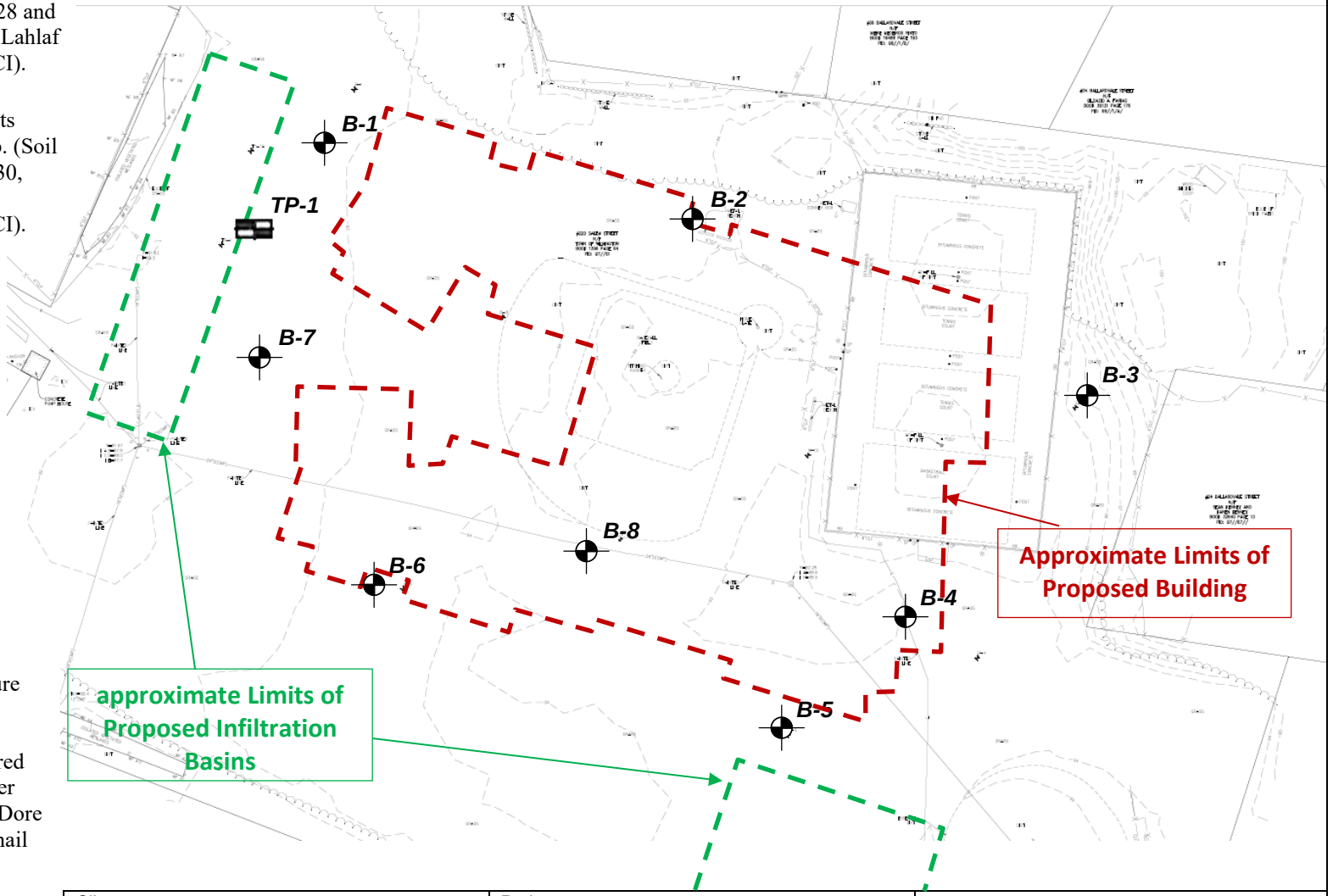
Limits of the proposed building and the infiltration basins are based on drawing titled: "Site Base Conditions, Wilmington Schools, North Intermediate, Wilmington, MA," prepared by Dore and Whittier, undated, and provided to LGCI by Dore and Whittier on October 11, 2024.

Client:	Project:	Figure 3A – Exploration Location Plan - South	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childcare Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Legend

Approximate location of borings advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 28 and October 29, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Approximate location of test pits advanced by Soil Exploration, Corp. (Soil X) of Leominster, MA on October 30, 2024, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).



MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NAD 83

Approximate Scale (ft.)

20 0 20 40 80

Note

Figure based on drawing titled: Figure based on drawing titled: "Existing Conditions Plan, 320 Salem Street, Wilmington, Massachusetts", prepared by Nitsch Engineering, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 8, 2024.

Limits of the proposed building and the infiltration basins are based on drawing titled: "Site Base Conditions, Wilmington Schools, North Intermediate, Wilmington, MA," prepared by Dore and Whittier, undated, and provided to LGCI by Dore and

Client:	Project:	Figure 3B – Exploration Location Plan - North	
Dore and Whittier Architects, Inc.	Proposed Wildwood Early Childcare Center		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wilmington, MA	LGCI Project No.: 2437	Date: Dec. 2024

Appendix A – LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near NW corner of prop. building
COORDINATES: NA
SURFACE El.: 93.0 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 84.0 ft. based on sample moisture
AT END OF DRILLING: 9.5 ft. / El. 83.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6	S1 - Top 8": Topsoil
		0.6	S1 S1	3-8-15-38 (23)	24/17		Fill	92.4	S1 - Bot. 9": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown, moist S2 - Silty SAND with Gravel (SM), fine to coarse, 20% fines, 36.5% fine to coarse subangular gravel, brown, moist (Sieve Performed)
	90.0	2	S2	42-28-26-18 (54)	24/12				
5		4	S3	21-13-10-4 (23)	24/0				S3 - No recovery
		6	S4	10-8-5-3 (13)	24/6		Silt	6.0 87.0	S4 - SILT (ML), slightly plastic, 5-10% fine sand, grey, moist
	85.0	8						9.0	
		9	S5	4-7-5-6 (12)	24/24		Clay	84.0	S5 - Lean CLAY (CL), slightly plastic, 15-20% fine to coarse sand, grey, wet
10		11							
	80.0							14.0	
		14	S6	6-11-10-9 (21)	24/12		Sand and Gravel	79.0	S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse subangular gravel, brown, wet
15		16							
	75.0							19.0	
		19	S7	100/0"	0/0	1			REMARK 1: Split spoon and auger refused on possible large boulder or rock at a depth of 19.0 feet. S7 - No recovery Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

BORING LOG

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PAGE 1 OF 1

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near NW side of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. Based on sample moisture
AT END OF DRILLING: 13.0 ft. / El. 81.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-7-9-10 (16)	24/15		Topsoil	0.8 / 93.2	S1 - Top 10": Topsoil Bot. 5": Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 20-25% fine to coarse subangular gravel, trace of organic soil, trace of roots, brown, moist
		2	S2	9-8-8-4 (16)	24/13		Fill	2.8 / 91.2	S2 - Top 10": Silty SAND (SM), mostly fine to medium, ~15% fines, ~10% fine to coarse subangular gravel, trace of organic soil, light brown to brown, moist Bot. 3": Silty SAND (SM), fine, 40-45% fines, trace of roots, black, moist (mostly organic soil)
	90.0	4	S3	5-5-10-10 (15)	24/19		Buried Organic Soil	4.0 / 90.0	S3 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
5		6	S4	13-13-17-16 (30)	24/17				S4 - Similar to S3, grey to light brown
	85.0	8							
		9	S5	10-15-13-11 (28)	24/18				▽ S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown to orange, wet
10		11					Sand and Gravel		
	80.0	14	S6	19-20-21-29 (41)	24/14				▼ S6 - Silty SAND (SM), fine to medium, ~25% fines, 5-10% fine subangular gravel, grey, wet
15		16							
	75.0	19	S7	100/0"	0/0	1		19.0	REMARK 1: Split spoon and auger refusal at depth of 19 feet on possible boulder or rock. S7 - No Recovery Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near northern corner of prop. building
COORDINATES: NA
SURFACE El.: 95.0 ft. (see note 1) **TOTAL DEPTH:** 10.2 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: NE
AT END OF DRILLING: NE
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.7	S1 - Top 8": Topsoil
			S1	3-4-8-8 (12)	24/16		Fill	94.3	Bot. 8": Well Graded SAND (SW-SM), fine to coarse, 0-5% fines, ~5% fine subangular gravel, light brown to orange, moist
		2						2.0	
			S2	12-41-26-18 (67)	24/10			93.0	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subangular gravel, light brown, moist
		4							
5	90.0		S3	11-8-12-16 (20)	24/11				S3 - Silty SAND (SM), mostly fine to medium, 15-20% fines, ~10% fine to coarse subrounded gravel, light brown to orange, moist
		6				1	Sand and Gravel		REMARK 1: Auger chattering between depths of 6 to 9 feet.
			S4	26-20-22-80/2" (42)	20/0				S4 - No Recovery
		7.7							
		9							
10	85.0		S5	36-70-20/3" (90/9")	15/4				S5 - Silty SAND with Gravel (SM), mostly fine to medium, ~15% fines, 30-35% fine to coarse subangular gravel, grey, moist
		10.3				2		10.2	REMARK 2: Split spoon and auger refusal at depth of 10.2 feet on possible boulder or rock.
									Bottom of borehole at 10.2 feet. Backfilled borehole with drill cuttings.
15	80.0								
20	75.0								
25	70.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 93.0 ft. (see note 1) **TOTAL DEPTH:** 11 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 84.0 ft. based on sample moisture
AT END OF DRILLING: NE
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6 / 92.4	S1 - Top 8": Topsoil
			S1	3-8-10-20 (18)	24/15		Fill		Bot. 7": Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown to orange, moist
		2				1		2.0 / 91.0	REMARK 1: Drill chattering observed from depth of 2 feet on possible boulder.
	90.0		S2	29-26-33-70/3" (59)	21/11				S2 - Silty SAND with Gravel (SM), fine to coarse, 20.5% fines, 36.9% fine to coarse subangular gravel, light brown, moist (Sieve Performed)
		3.8							
5		4	S3	15-17-36-52 (53)	24/16				S3 - Similar to S2, 25-30% fine to coarse subangular gravel, light brown to grey
		6	S4	16-29-29-39 (58)	24/11		Sand and Gravel		S4 - Silty SAND with gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, brown, moist
	85.0	8							
		9	S5	18-82/4" (82/4")	10/5				S5 - Similar to S4, wet
10		9.8							
						2		11.0	REMARK 2: Split spoon and auger refusal at depth of 11 feet on possible large boulder or rock.
									Bottom of borehole at 11.0 feet. Backfilled borehole with drill cuttings.
	80.0								
15									
	75.0								
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 10.5 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. based on sample moisture
AT END OF DRILLING: 9.0 ft. / El. 85.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	3-5-5-5 (10)	24/14		Topsoil	0.7	S1 - Top 9": Topsoil
		2	S2	4-4-3-3 (7)	24/3		Fill	93.3	Bot. 5": Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, trace of organic soil, trace roots, dark brown, moist S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace roots, dark brown, moist
	90.0	4				1	Buried Organic Soil	4.0 90.0 4.4 89.6	REMARK 1: Split spoon bouncing at depth of 4 feet. Borehole offset 4 feet East.
5		6	S3	10-16-22-20 (38)	24/18				S3 - Top 4": Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, trace roots, dark brown, moist
		8	S4	21-33-24-17 (57)	24/12	2	Sand and Gravel		Bot. 14": Silty SAND (SM), fine to coarse, 15-20% fines, 20-25% fine subangular gravel, brown, moist REMARK 2: Drill chattering observed on possible boulders from depth of 6 feet. S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, brown to grey, moist
	85.0	9							
		9.2	S5	100/2"	2/1				S5 - Similar to S3 Bot. 14", wet, (little to no recovery)
10		10.5	S6	100/0"	0/0	3		10.5	REMARK 3: Auger and split spoon refusal on possible boulder or rock at depth of 10.5 feet. Due to time contraint boring was terminated. S6 - No recovery Bottom of borehole at 10.5 feet. Backfilled borehole with drill cuttings.
	80.0								
15									
	75.0								
20									
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near southern face of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19.7 ft.
WEATHER: 60's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 14.0 ft. / El. 80.0 ft. based on sample moisture
AT END OF DRILLING: 18.0 ft. / El. 76.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0							
			S1	2-2-6-11 (8)	24/16		Topsoil	2.0	S1 - Topsoil
		2						92.0	
			S2	12-9-12-17 (21)	24/14		Fill		S2 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~15% fine to coarse subangular gravel, orange to light brown, moist (possibly reworked)
	90.0	4							
5			S3	13-19-21-18 (40)	24/15				S3 - Similar to S2
		6						6.0	
			S4	15-13-22-23 (35)	24/17			88.0	S4 - Silty SAND (SM), fine to coarse, 15-20% fines, 0-5% fine to coarse subangular gravel, brown, moist
		8							
	85.0	9							
			S5	13-22-80/3" (102/9")	15/13	1			REMARK 1: Drill chattering observed on possible boulders at depth 9 feet. S5 - Similar to S4
10		10.3							
							Sand and Gravel		
	80.0	14							
			S6	14-17-26-35 (43)	24/21				S6 - Similar to S4, wet
15		16							
	75.0	19						19.0	
			S7	22-80/3" (80/3")	9/4		Weathered Rock	75.0 19.7	S7 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 35-40% fine to coarse subangular gravel, trace of weathered rock, black to brown, wet
20		19.8							Bottom of borehole at 19.7 feet. Backfilled borehole with drill cuttings.
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/29/24 **DATE COMPLETED:** 10/29/24
BORING LOCATION: Near SW corner of prop. building
COORDINATES: NA
SURFACE El.: 92.0 ft. (see note 1) **TOTAL DEPTH:** 20.2 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 82.0 ft. based on sample moisture
AT END OF DRILLING: 10.5 ft. / El. 81.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-7-9 (10)	24/14		Topsoil	0.9	S1 - Top 11": Topsoil
	90.0	2	S2	8-7-10-10 (17)	24/0		Fill	91.1	Bot. 3": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, 20-25% fine to coarse subangular gravel, brown, moist S2 - No recovery
5		4	S3	14-10-5-6 (15)	24/0				S3 - No recovery
	85.0	6	S4	17-17-23-24 (40)	24/4		Buried Organic Soil	6.0 86.0	S4 - Silty SAND (SM), fine to medium, 25-30% fines, 0-5% fine to coarse subangular gravel, trace of organic soil, dark brown to black, moist
		8	S5	11-11-12-11 (23)	24/16			8.0 84.0	S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, grey, moist
10		10	S6	7-10-15-15 (25)	24/15				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, brown, wet
	80.0	12							
		14	S7	9-14-12-43/3" (26)	21/12		Sand and Gravel		S7 - Similar to S6, 25-30% fine to coarse subangular gravel
15		15.8							
	75.0	19	S8	24-26-75/3" (101/9")	15/11				S8 - Silty SAND (SM), fine to coarse, 15-20% fines, ~5% fine subangular gravel, brown, wet
20		20.3						20.2	
	70.0								Bottom of borehole at 20.2 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/28/24 **DATE COMPLETED:** 10/28/24
BORING LOCATION: Near center of prop. building
COORDINATES: NA
SURFACE El.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 19.8 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 85.0 ft. Based on sample moisture
AT END OF DRILLING: 16.5 ft. / El. 77.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 Turbo ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-5-6-11 (11)	24/20		Fill	0.7 93.3	S1 - Top 9": Silty SAND (SM), fine, 25-30% fines, trace of roots, brown, moist Mid. 10": Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, black, moist
		2	S2	8-6-8-8 (14)	24/16		Subsoil		Bot. 1": Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~15% fine to coarse subangular gravel, trace of organic soil, orange, moist S2 - Top 10": Silty SAND (SM), fine, 25-30% fines, ~5% fine subangular gravel, brown, moist
	90.0	4						4.0 90.0	Bot. 6": Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine to coarse subangular gravel, light brown, moist
5			S3	12-18-25-24 (43)	24/15				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~30% fine to coarse subangular gravel, light brown, moist
		6	S4	24-21-23-29 (44)	24/18				S4 - Similar to S3, ~15% fine subangular gravel
		8							
	85.0	9	S5	18-82	12/8				S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, grey to olive, wet
10		10					Sand and Gravel		
	80.0	14	S6	20-25-25-45 (50)	24/14				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, olive to grey, wet
15		16							
	75.0	19	S7	10-95/4" (95/4")	10/8				S7 - Similar to S6
20		19.8				1		19.8	REMARK 1: Split spoon refusal at depth of 19.8 feet on possible boulder or rock. Bottom of borehole at 19.8 feet. Backfilled borehole with drill cuttings.
	70.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

Appendix B – LGCI's Test Pit Logs

LGCI
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TEST PIT LOG

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CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near western face of prop. school
COORDINATES: NA
SURFACE EL.: 92.0 ft. (see note 1) **TOTAL DEPTH:** 11 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** 9.5 ft. / El. 82.5 ft.

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 9' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth / El. (ft.)	Material Description
		E		Topsoil	1.5 / 90.5	0 ft. - 1.5 ft.: Topsoil
		M				
	90.0	M		Fill		1.5 ft. - 5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace of roots, brown, moist (cobbles up to 12 inches make up 5-10% of stockpile)
2.5		D				
	87.5					
5.0			1			5 ft. - 7 ft.: Silty SAND with Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine subangular gravel, brown, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 5 feet beneath the ground surface.
		D				
	85.0				7.0 / 85.0	
7.5		D		Swamp Deposits		7 ft. - 10 ft.: Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace of roots, trace of organic odor, grey, moist to wet
	82.5					▼
10.0					10.0 / 82.0	
		D		Sand		10 ft. - 11 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, grey, wet
			2		11.0	REMARK 2: Test pit terminated due to excavator refusal at depth of 11 feet on possible boulder or rock. Bottom of test pit at 11.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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TEST PIT LOG

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PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near southern face of proposed school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 10' X 7'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.7	0 ft. - 0.7 ft.: Topsoil
	92.5	E		Fill	93.3	0.7 ft. - 4 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, ~10% fine to coarse subangular gravel, trace of roots, trace of organic soil, brown to orange, moist
2.5						
	90.0		1			
		M	2			4 ft. - 5.5 ft.: Silty SAND (SM), mostly fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4 feet beneath the ground surface. REMARK 2: Unmarked cast iron pipe encuntered near the southwestern corner of the test pit, excavator bucket pulled and bent pipe. Pipe does not appear to be broken. DPW indicated that they are not aware of utilties at this location.
5.0					5.5	
	87.5	M		Sand and Gravel	88.5	5.5 ft. - 9 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 10-15% fine to coarse subangular gravel, light brown, moist
7.5						
	85.0				9.0	Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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TEST PIT LOG

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PAGE 1 OF 1

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/30/24 **DATE COMPLETED:** 10/30/24
TEST PIT LOCATION: Near southern face of prop. school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 11.3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: 9.5 ft. / El. 84.5 ft.

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 60's / Cloudy
TEST PIT DIMENSIONS: 10' X 3'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	92.5	E		Topsoil	1.5 92.5	0 ft. - 1.5 ft.: Topsoil
2.5		E		Fill		1.5 ft. - 7 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of roots, trace of organic soil, brown to orange, moist
	90.0					
5.0		M				
	87.5				7.0 87.0	
7.5				Sand and Gravel		7 ft. - 11.3 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 10-15% fine to coarse subangular gravel, light brown, moist (wet after 9.5 feet)
	85.0	M				
10.0						
		V	1		11.3	REMARK 1: Test pit terminated due to excavator refusal at depth of 11.3 feet on possible boulder or rock.
						Bottom of test pit at 11.3 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

TEST PIT LOG

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PAGE 1 OF 1

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/31/24 **DATE COMPLETED:** 10/31/24
TEST PIT LOCATION: Near eastern face of prop. school
COORDINATES: NA
SURFACE EL.: 94.0 ft. (see note 1) **TOTAL DEPTH:** 8 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 11' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		E		Fill	93.2	0.8 ft. - 1 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, light brown, moist 1 ft. - 2.3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of roots, dark brown, moist
	92.5	E				
2.5		E		Sand and Gravel	2.3 91.7	2.3 ft. - 4 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 20-25% fine to coarse subangular gravel, light brown to orange, moist
		M				
	90.0		1			4 ft. - 8 ft.: Poorly Graded SAND with Gravel (SP), mostly medium to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4 feet beneath the ground surface.
5.0		M				
	87.5	D				
7.5		V			8.0	
			2			REMARK 2: Test pit terminated due to excavator refusal at depth of 8 feet on possible boulder or rock. Bottom of test pit at 8.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

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Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-4

CLIENT: Dore and Whittier Architects, Inc.
PROJECT NAME: Proposed Wildwood Early Childhood Center
LGCI PROJECT NUMBER: 2437
PROJECT LOCATION: Wilmington, MA

DATE STARTED: 10/31/24 **DATE COMPLETED:** 10/31/24
TEST PIT LOCATION: Near eastern face of exisitng school
COORDINATES: NA
SURFACE EL.: 95.0 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: NE
AT END OF EXCAVATION: NE

EXCAVATION SUBCONTRACTOR: Wilmington DPW
EXCAVATION FOREMAN: Sean Moon
EXCAVATOR TYPE/MODEL: Volvo EWR150E
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 10' X 6'
LOGGED BY: BH **CHECKED BY:** JKW

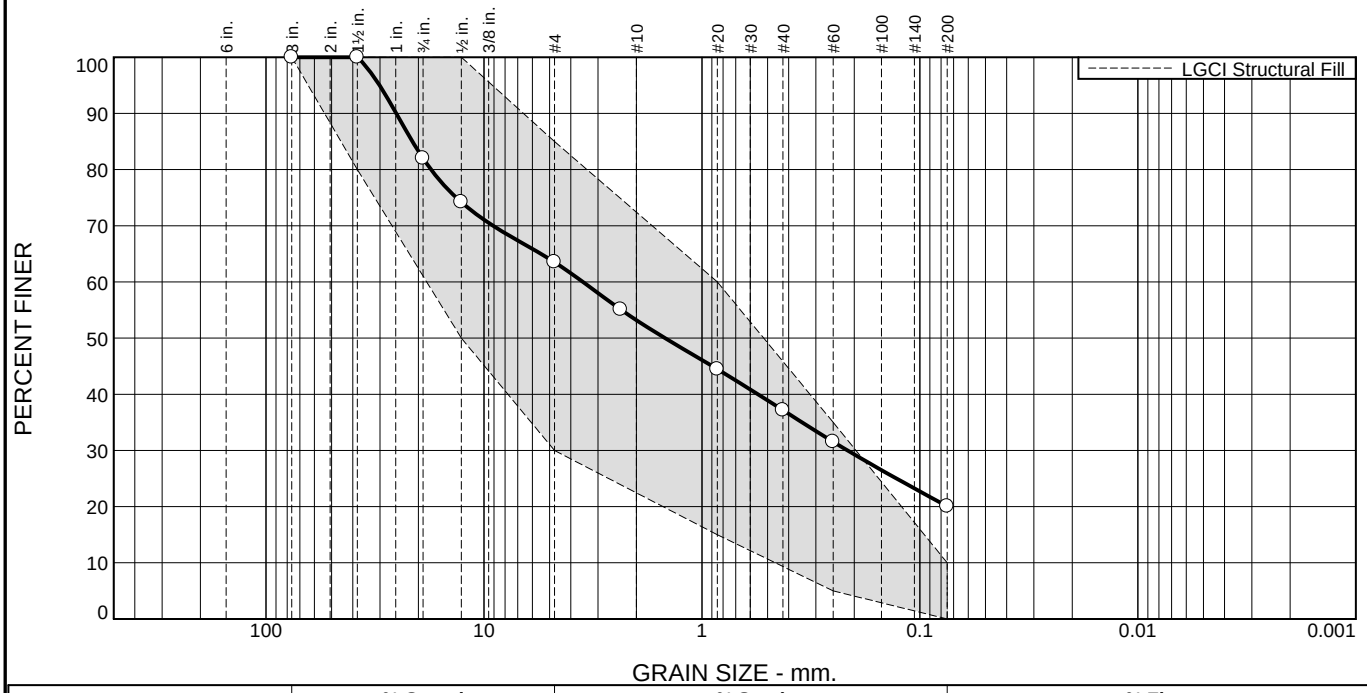
Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
		E		Fill	94.0 2.0	1 ft. - 2 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, 0-5% fine to coarse subangular gravel, light brown, moist
2.5	92.5	E		Subsoil	93.0 3.2	2 ft. - 3.2 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 0-5% fine to coarse subangular gravel, trace of organic soil, trace of roots, orange, moist
		E		Sand and Gravel	91.8	3.2 ft. - 4.6 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown to orange, moist
		M	1			
5.0	90.0	M				4.6 ft. - 9 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse subangular gravel, brown to orange, moist (Sieve Performed) REMARK 1: Double ring infiltrometer test performed at depth of 4.6 feet beneath the ground surface.
		D				
7.5	87.5	V				
			2		9.0	REMARK 2: Test pit terminated due to excavator refusal at depth of 9 feet on possible boulder or rock. Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material in 12 inch lifts and tamped with excavator.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing titled "Existing Conditions Plan 320 Salem Street Wilmington, Massachusetts," prepared by Dore AND Whittier 212 Battery Street, Burlington, VT 05401, dated October 24, 2024, and provided to LGCI by Dore and Whittier Architects, Inc. via e-mail on November 08, 2024.

Appendix C – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.0	18.5	10.3	16.0	17.2	20.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	82.0		
1/2"	74.2	50.0 - 100.0	
#4	63.5	30.0 - 85.0	
#8	55.1		
#20	44.5	15.0 - 60.0	
#40	37.2		
#60	31.5	5.0 - 35.0	
#200	20.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 20% fines, 36.5% fine to coarse subangular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 25.2612 D_{85}= 21.2913 D_{60}= 3.5169
D_{50}= 1.4776 D_{30}= 0.2147 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.

Date Received: 10/28/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: JKW

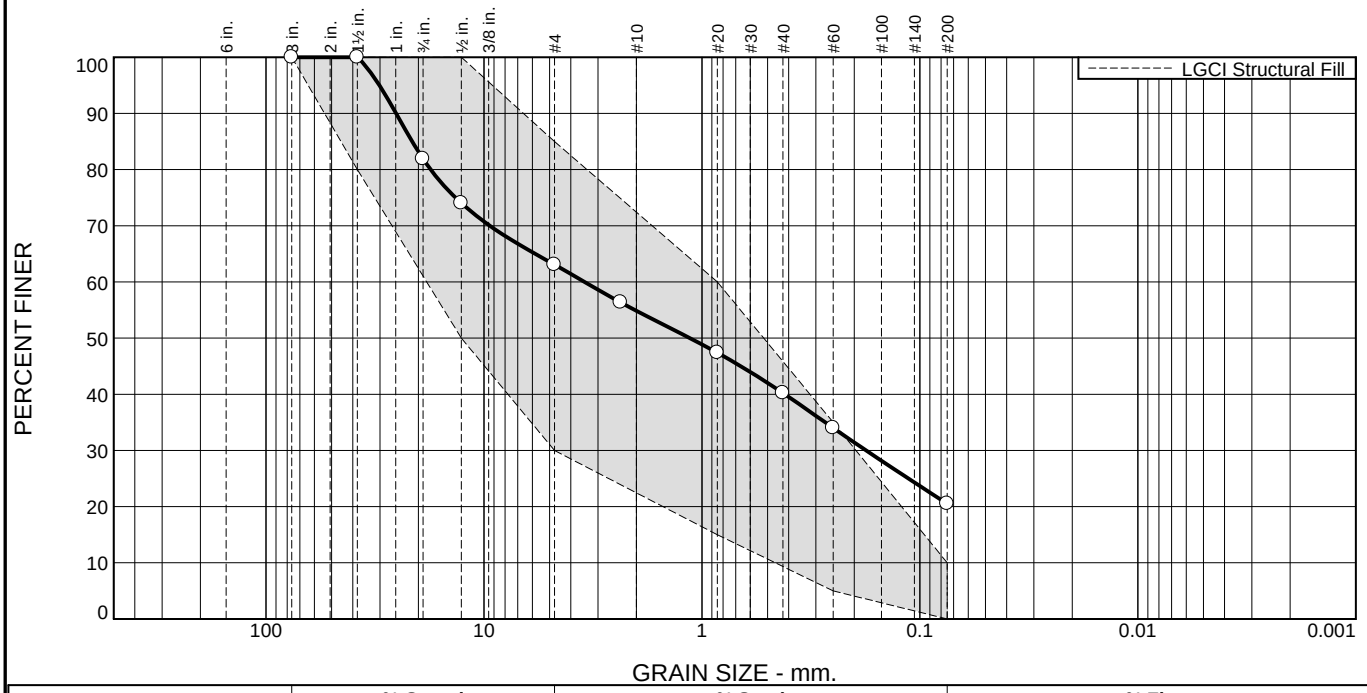
Location: B-1
Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 10/28/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.1	18.8	8.2	14.7	19.7	20.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	81.9		
1/2"	74.0	50.0 - 100.0	
#4	63.1	30.0 - 85.0	
#8	56.4		
#20	47.4	15.0 - 60.0	
#40	40.2		
#60	34.0	5.0 - 35.0	
#200	20.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 20.5% fines, 36.9% fine to coarse subangular gravel, light brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 25.3090 D_{85}= 21.3513 D_{60}= 3.4571
D_{50}= 1.1367 D_{30}= 0.1765 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sand and Gravel Sample.

Date Received: 10/29/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: JKW

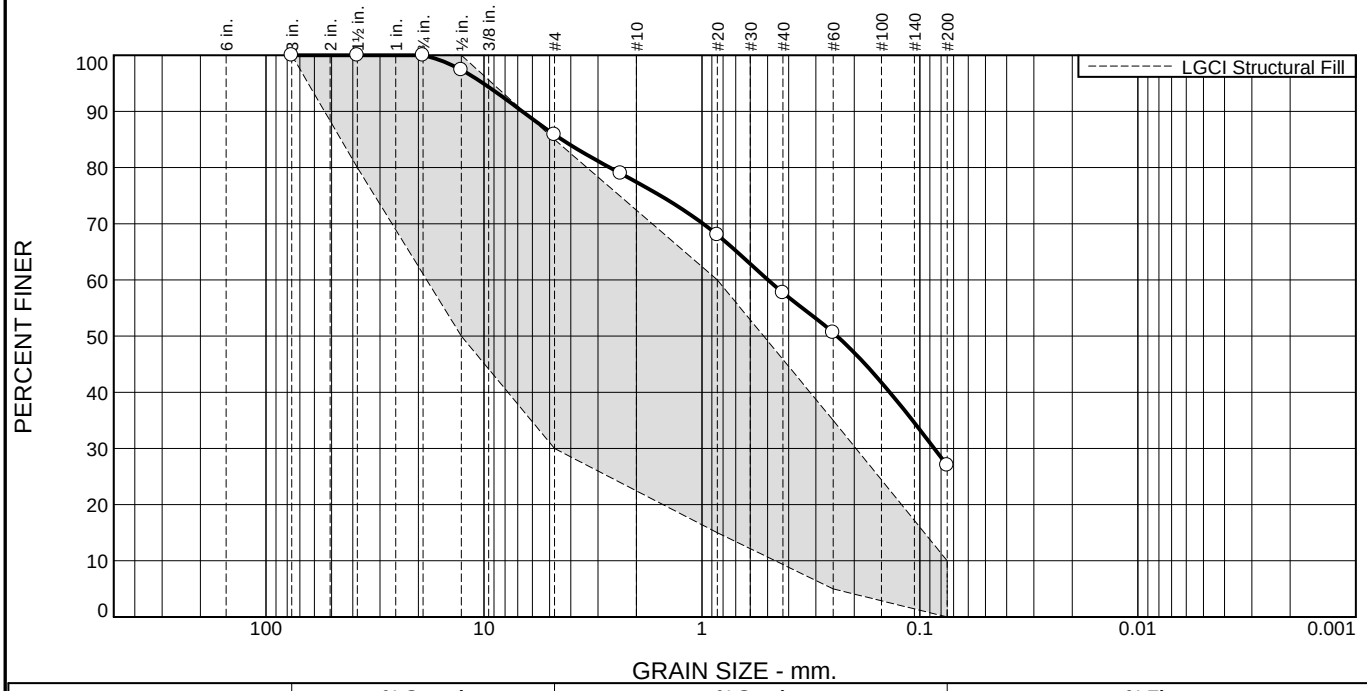
Location: B-4
Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 10/29/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.1	8.5	19.7	30.7	27.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	100.0		
1/2"	97.4	50.0 - 100.0	
#4	85.9	30.0 - 85.0	X
#8	79.0		
#20	68.0	15.0 - 60.0	X
#40	57.7		
#60	50.6	5.0 - 35.0	X
#200	27.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Silt and Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine subangular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 6.6746 D_{85}= 4.3959 D_{60}= 0.4977
D_{50}= 0.2399 D_{30}= 0.0859 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.
Infiltrometer Test.

Date Received: 10/30/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

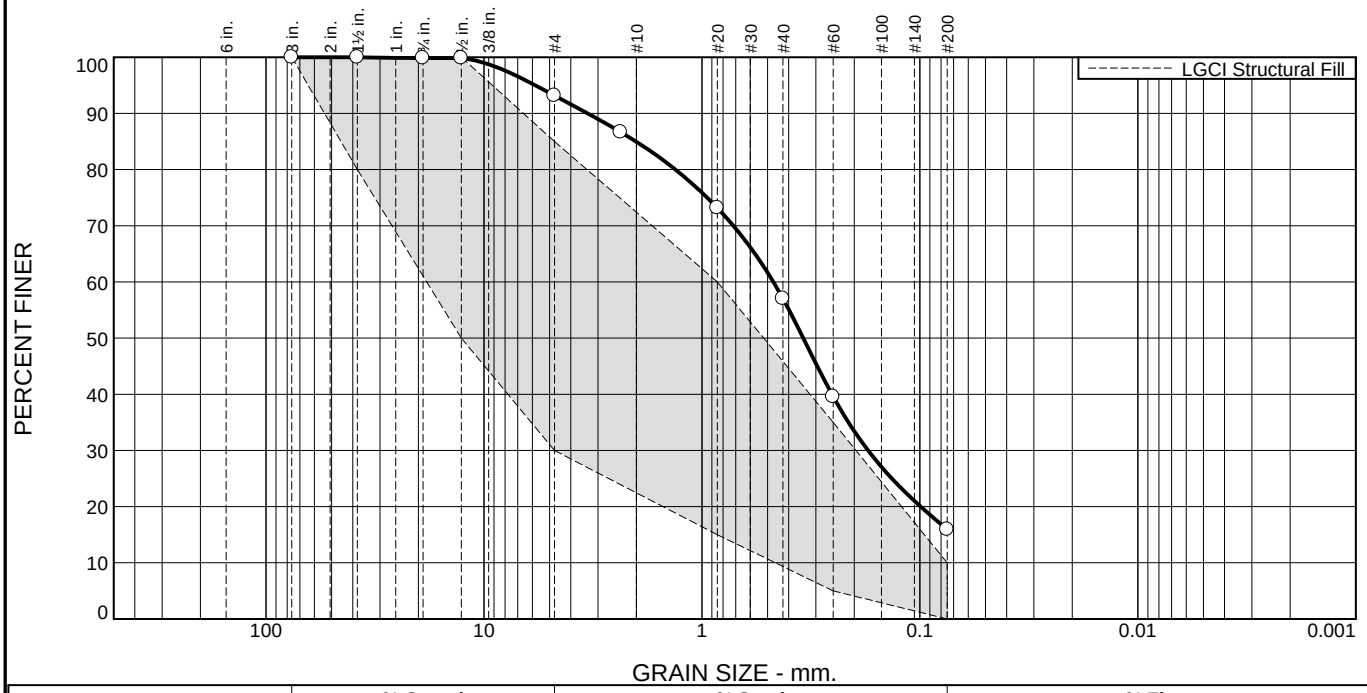
Location: TP-1
Sample Number: Infiltrometer **Depth:** 5'

Date Sampled: 10/30/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.2	6.6	8.2	28.0	41.1	15.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4'	99.8		
1/2"	99.8	50.0 - 100.0	
#4	93.2	30.0 - 85.0	X
#8	86.7		
#20	73.2	15.0 - 60.0	X
#40	57.0		
#60	39.6	5.0 - 35.0	X
#200	15.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), mostly fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 3.3438 D_{85}= 2.0080 D_{60}= 0.4704
D_{50}= 0.3428 D_{30}= 0.1729 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill Sample.
Infiltrometer Test.

Date Received: 10/30/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

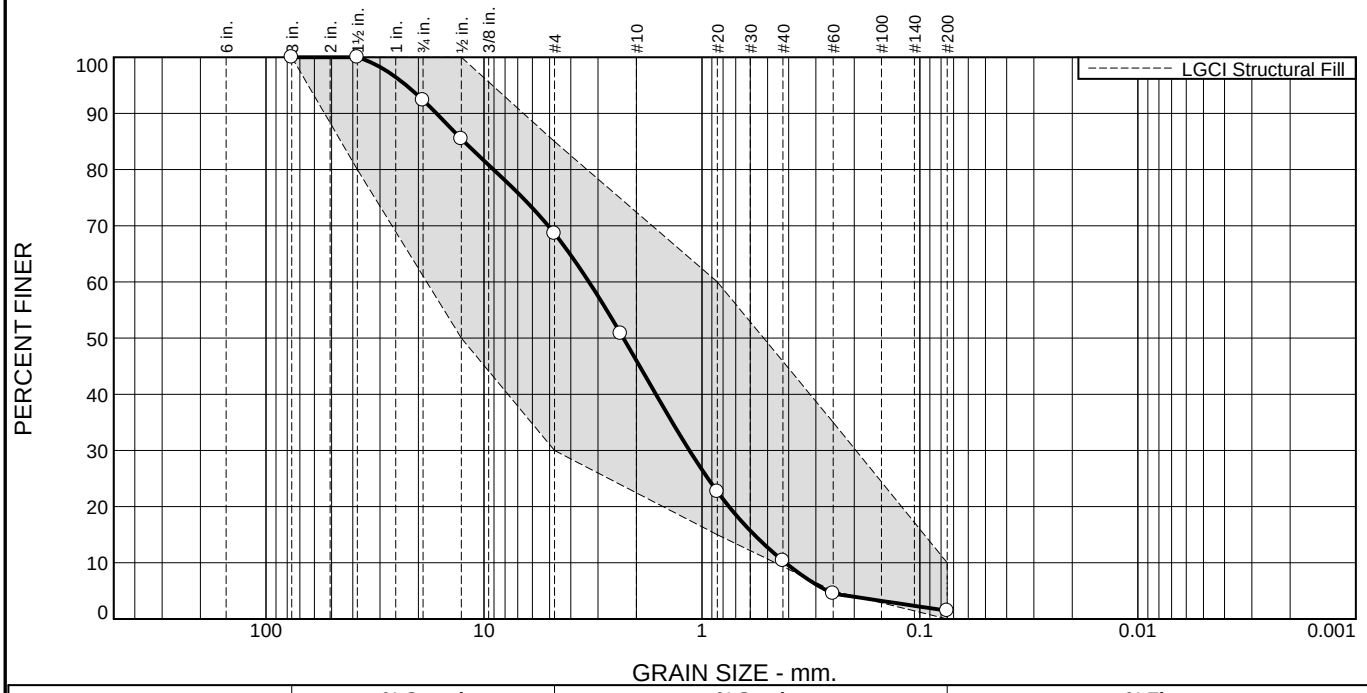
Location: TP-2
Sample Number: Infiltrometer **Depth:** 4'

Date Sampled: 10/30/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.6	23.8	22.6	35.6	8.9	1.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	92.4		
1/2"	85.5	50.0 - 100.0	
#4	68.6	30.0 - 85.0	
#8	50.8		
#20	22.7	15.0 - 60.0	
#40	10.4		
#60	4.5	5.0 - 35.0	X
#200	1.5	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Gravel (SP), fine to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP **AASHTO (M 145)=**

Coefficients

D_{90}= 16.5194 D_{85}= 12.3470 D_{60}= 3.2999
D_{50}= 2.2934 D_{30}= 1.1409 D_{15}= 0.5758
D_{10}= 0.4140 C_u= 7.97 C_c= 0.95

Remarks

Sand and Gravel Sample.
Infiltrometer Test.

Date Received: 10/31/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

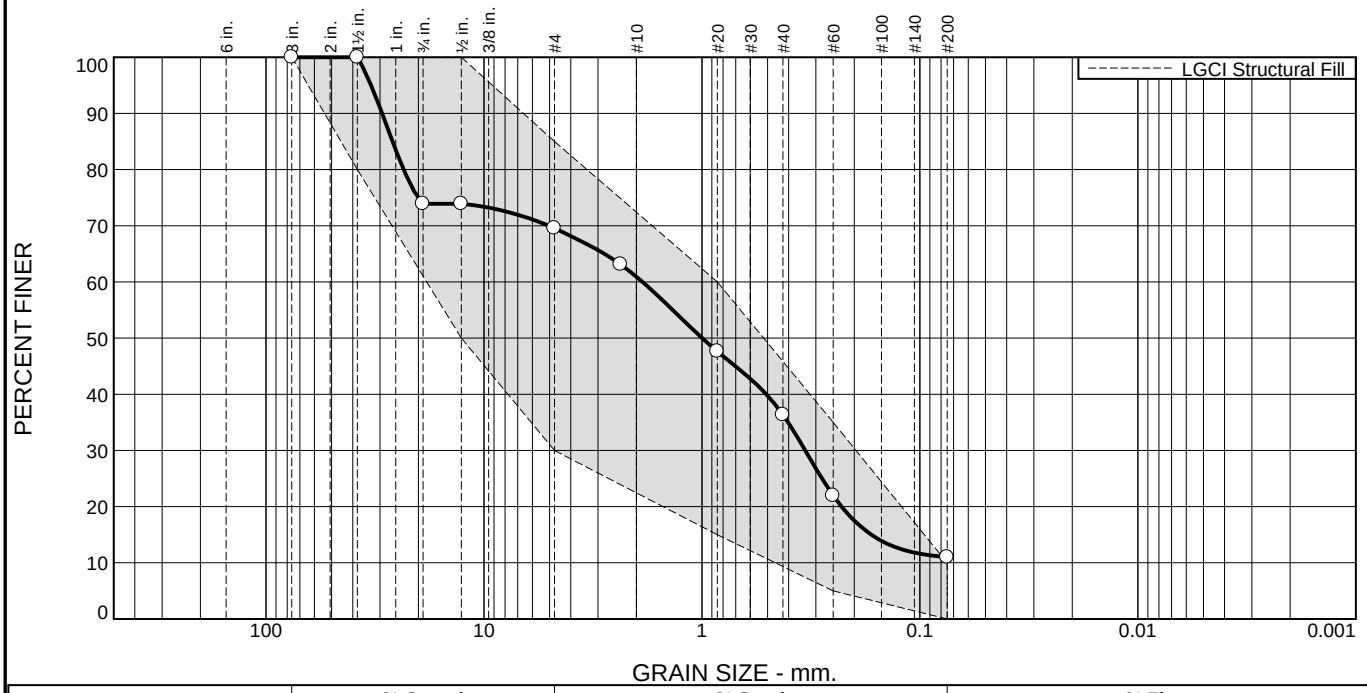
Location: TP-3
Sample Number: Infiltrometer **Depth:** 4'

Date Sampled: 10/31/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	26.1	4.3	8.7	24.6	25.3	11.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1 1/2"	100.0	80.0 - 100.0	
3/4"	73.9		
1/2"	73.9	50.0 - 100.0	
#4	69.6	30.0 - 85.0	
#8	63.1		
#20	47.6	15.0 - 60.0	
#40	36.3		
#60	22.0	5.0 - 35.0	
#200	11.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse subangular gravel, brown to orange

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 29.3481 D_{85}= 26.2822 D_{60}= 1.8746
D_{50}= 0.9972 D_{30}= 0.3357 D_{15}= 0.1671
D_{10}= C_u= C_c=

Remarks

Sand and Gravel Sample.
Infiltrometer Test.

Date Received: 10/31/24 **Date Tested:** 10/31/24

Tested By: LC

Checked By: SG

Location: TP-4
Sample Number: Infiltrometer **Depth:** 4.6'

Date Sampled: 10/31/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Dore and Whittier Architects, Inc.
Project: Proposed Wildwood Early Childhood Center
Wilmington, MA
Project No: 2437 **Figure**

Appendix D – Results of Double Ring Infiltrometer Tests

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-1

Test Procedure: General accordance with ASTM D 3385

Test Date 10/30/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 5 feet

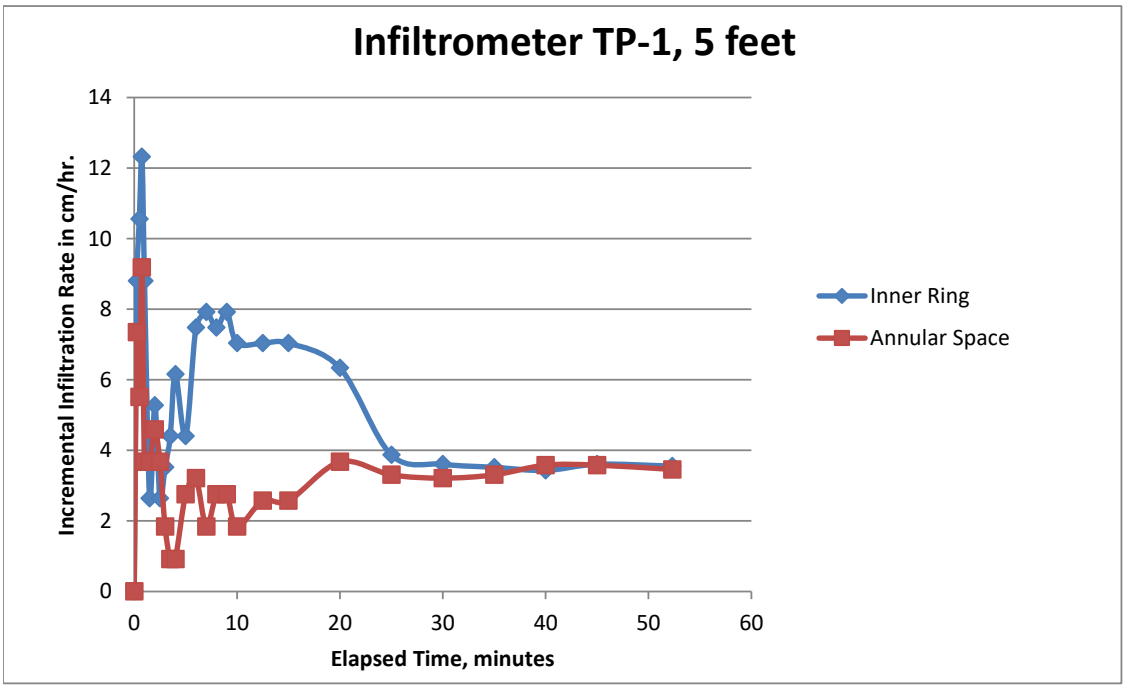
Groundwater Depth: 9.5 ft. / El. 82.5 ft. at the end of excavation

Soil Stratum: ASTM (D 2488) Classification: Silty SAND with Silt and Gravel (SM), mostly fine to medium, 27% fines, 14.1% fine gravel, brown

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	56.3	0	0	57.2	0	0
0.25	0.25	55.8	27	8.8	56.8	67	7.3
0.5	0.25	55.2	32	10.6	56.5	50	5.5
0.75	0.25	54.5	37	12.3	56.0	84	9.2
1	0.25	54.0	27	8.8	55.8	34	3.7
1.5	0.5	53.7	16	2.6	55.4	67	3.7
2	0.5	53.1	32	5.3	54.9	84	4.6
2.5	0.5	52.8	16	2.6	54.5	67	3.7
3	0.5	52.4	21	3.5	54.3	34	1.8
3.5	0.5	51.9	27	4.4	54.2	17	0.9
4	0.5	51.2	37	6.2	54.1	17	0.9
5	1	50.2	54	4.4	53.5	101	2.8
6	1	48.5	91	7.5	52.8	117	3.2
7	1	46.7	96	7.9	52.4	67	1.8
8	1	45.0	91	7.5	51.8	101	2.8
9	1	43.2	96	7.9	51.2	101	2.8
10	1	41.6	86	7.0	50.8	67	1.8
12.5	2.5	37.6	214	7.0	49.4	235	2.6
15	2.5	33.6	214	7.0	48.0	235	2.6
20	5	26.4	385	6.3	44.0	670	3.7
25	5	22.0	235	3.9	40.4	603	3.3
30	5	17.9	219	3.6	36.9	586	3.2
35	5	13.9	214	3.5	33.3	603	3.3
40	5	10.0	209	3.4	29.4	653	3.6
45	5	5.9	219	3.6	25.5	653	3.6
52.3	7.3	0.0	316	3.6	20.0	921	3.5

Notes:



Estimated K = 1.00E-03 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-2

Test Procedure: General accordance with ASTM D 3385

Test Date 10/30/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4 feet

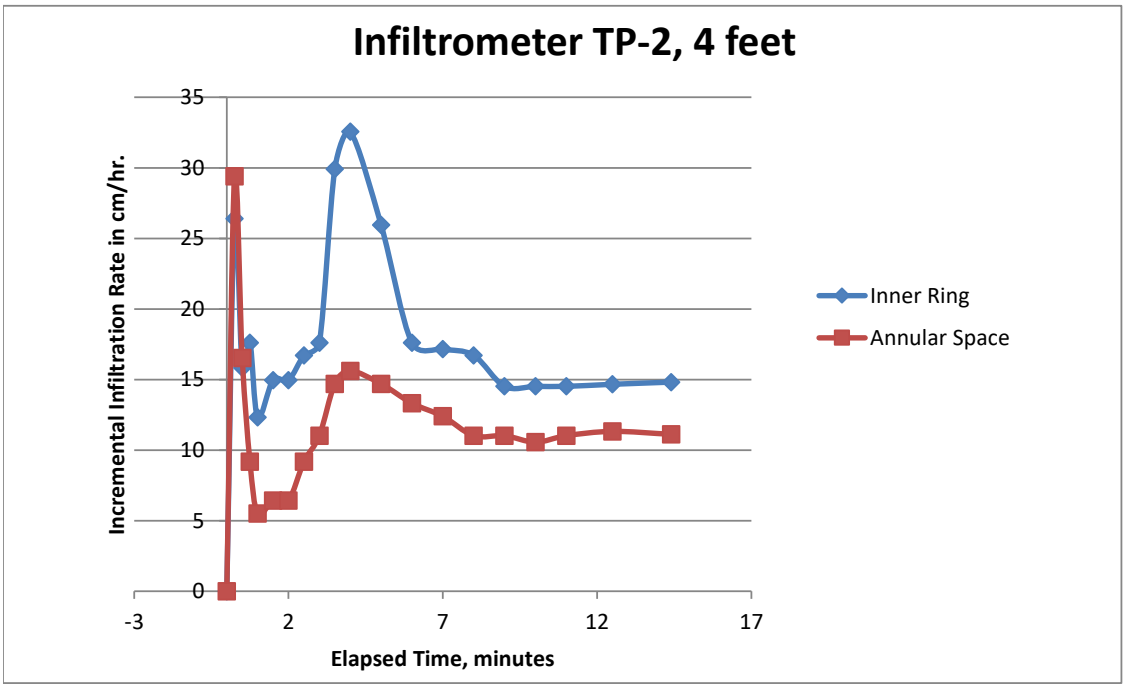
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Silty SAND (SM), moslty fine to medium, 15.9% fines, 6.8% mostly fine subangular gravel, brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.4	0	0	57.5	0	0
0.25	0.25	55.9	80	26.4	55.9	268	29.4
0.5	0.25	55.0	48	15.8	55.0	151	16.5
0.75	0.25	54.0	54	17.6	54.5	84	9.2
1	0.25	53.3	37	12.3	54.2	50	5.5
1.5	0.5	51.6	91	15.0	53.5	117	6.4
2	0.5	49.9	91	15.0	52.8	117	6.4
2.5	0.5	48.0	102	16.7	51.8	168	9.2
3	0.5	46.0	107	17.6	50.6	201	11.0
3.5	0.5	42.6	182	29.9	49.0	268	14.7
4	0.5	38.9	198	32.6	47.3	285	15.6
5	1	33.0	316	26.0	44.1	536	14.7
6	1	29.0	214	17.6	41.2	486	13.3
7	1	25.1	209	17.2	38.5	452	12.4
8	1	21.3	203	16.7	36.1	402	11.0
9	1	18.0	177	14.5	33.7	402	11.0
10	1	14.7	177	14.5	31.4	385	10.6
11	1	11.4	177	14.5	29.0	402	11.0
12.5	1.5	6.4	268	14.7	25.3	620	11.3
14.4	1.9	0.0	343	14.8	20.7	771	11.1

Notes:



Estimated K = 4.06E-03 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-3

Test Procedure: General accordance with ASTM D 3385

Test Date 10/31/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4 feet

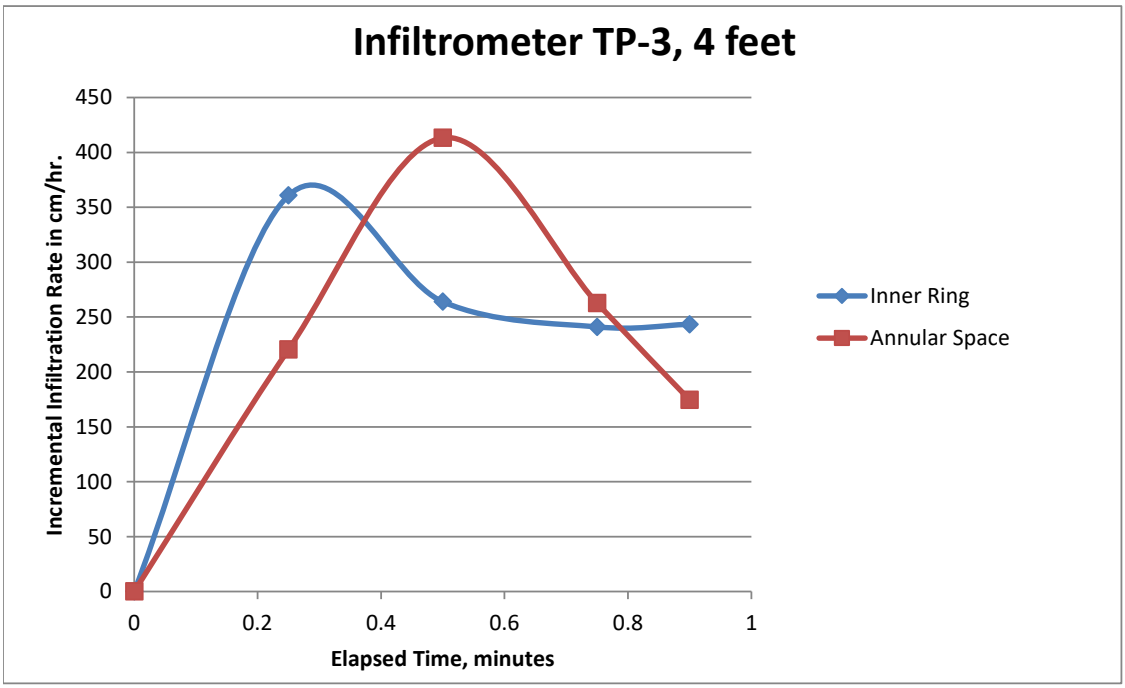
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Poorly Graded SAND with Gravel (SP), fine to coarse, 1.5% fines, 31.4% fine to coarse subangular gravel, light brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.5	0	0	57.5	0	0
0.25	0.25	37.0	1097	360.7	45.5	2010	220.4
0.5	0.25	22.0	803	263.9	23.0	3769	413.3
0.75	0.25	8.3	733	241.1	8.7	2396	262.7
0.9	0.15	0.0	444	243.4	3.0	955	174.5

Notes:



Estimated K 6.73E-02 cm/sec

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project: Name: Proposed Wilmington School, 320 Salem Street
Location: Wilmington, MA
LGCI Project Number: 2437

Test Location: TP-4

Test Procedure: General accordance with ASTM D 3385

Test Date 10/31/2024

LGCI Representative: BH

Weather Conditions: 60's / Cloudy

Test Depth: 4.5 feet

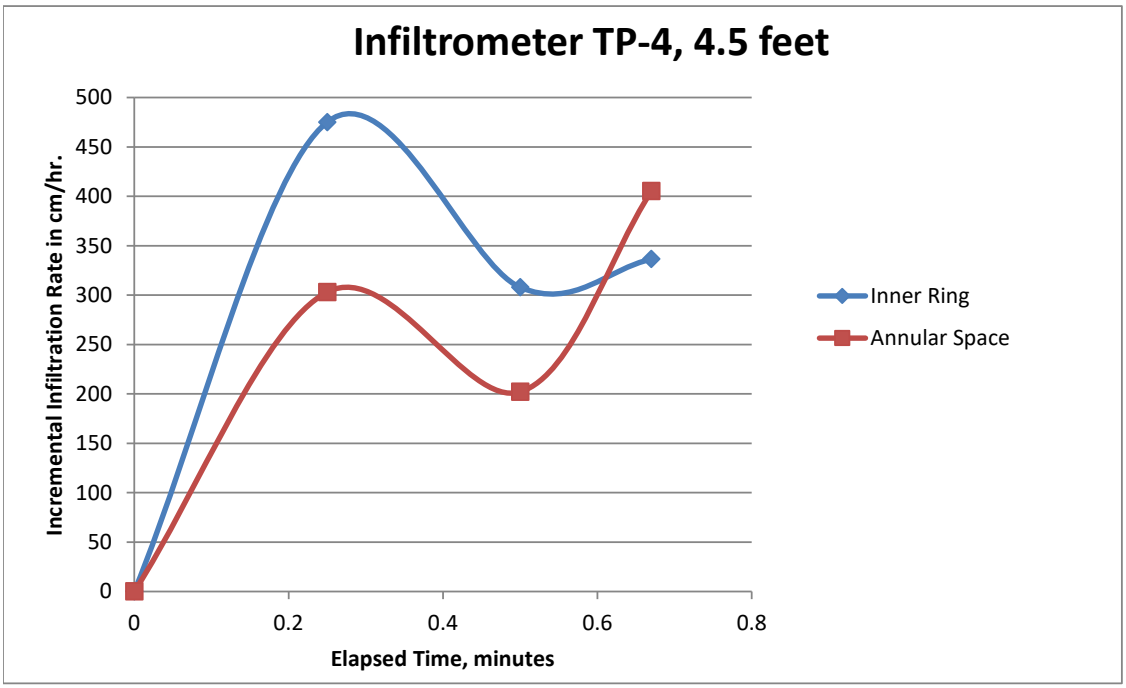
Groundwater Depth: Not Encountered

Soil Stratum: ASTM (D 2488) Classification: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly fine to medium, 11% fines, 30.4% fine to coarse gravel, brown to orange

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	57.5	0	0	57.5	0	0
0.25	0.25	30.5	1445	475.1	41.0	2764	303.1
0.5	0.25	13.0	937	307.9	30.0	1843	202.0
0.67	0.17	0.0	696	336.4	15.0	2513	405.2

Notes:



Estimated K* = 8.95E-02 cm/sec

* Value may not be reliable to short time to complete test

UEC universal environmental consultants

October 10, 2023

Ms. Rani Phillip
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
North Intermediate School, Wilmington, MA

Dear Ms. Phillip:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for Hazardous Materials determination survey at North Intermediate School, Wilmington, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

_____
Ammar M. Dieb
President

UEC:\223 514.00\Report.DOC

Enclosure

REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
NORTH INTERMEDIATE SCHOOL
WILMINGTON, MASSACHUSETTS

PROJECT NO: 223 514.00

Survey Dates:
January 20, 2012
October 3, 2023, October 9, 2023

SURVEY CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 BREWSTER ROAD
FRAMINGHAM, MA 01702

INTRODUCTION:
UEC has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of thirty-five years of experience.

UEC was contracted by Dore & Whittier Architects to conduct the following services at the North Intermediate School, Wilmington, MA:

- Inspection and Testing for Asbestos Containing Materials (ACM).
- Inspection for Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures.
- Inspection for PCB's-Caulking.
- Inspection for Lead Based Paint (LBP).
- Mercury in Rubber Flooring inspection and sampling.
- Airborne Mold inspection and sampling.
- Radon sampling.

A comprehensive survey per the Environmental Protection Agency (EPA) NESHAP regulation would be required prior to any renovation or demolition activities.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation. Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with EPA standard. Bulk samples were collected by a Massachusetts licensed asbestos inspector Mr. Jason Becotte (AI-034963) and analyzed by a Massachusetts licensed laboratory EMSL, Woburn, MA.

Airborne mold samples were analyzed by an EPA trained laboratory EMSL, Woburn, MA.

Radon samples were analyzed by an EPA licensed laboratory AccuStar, Ward Hill, MA.

Refer to samples results.

FINDINGS:
Asbestos Containing Materials (ACM):
The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed. All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to be ACM based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount of 1 percent or greater in accordance with DEP regulations.

All suspect materials that contain any amount of asbestos must be considered asbestos if it is scheduled to be removed per the Department of Environmental Protection (DEP) regulations.

Number of Samples Collected
January 12, 2012
Eight (8) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Sample

1. Ceiling tile at hallway outside gymnasium
2. Ceiling plaster at hallway outside room 207
3. Ceiling plaster at hallway outside room 211

4. Ceiling tile at hallway outside room 104
5. Ceiling plaster at hallway outside room 105
6. Ceiling plaster at hallway outside room 107
7. Ceiling plaster at first floor bathroom
8. Ceiling tile at hallway outside office

Sample Results

Type and Location of Sample	**Sample Result**
1. Ceiling tile at hallway outside gymnasium	No Asbestos Detected
2. Ceiling plaster at hallway outside room 207	No Asbestos Detected
3. Ceiling plaster at hallway outside room 211	No Asbestos Detected
4. Ceiling tile at hallway outside room 104	No Asbestos Detected
5. Ceiling plaster at hallway outside room 105	No Asbestos Detected
6. Ceiling plaster at hallway outside room 107	No Asbestos Detected
7. Ceiling plaster at first floor bathroom	No Asbestos Detected
8. Ceiling tile at hallway outside office	No Asbestos Detected

October 9, 2023
Twelve (12) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Sample

1. Exterior new door framing caulking
2. Exterior new door framing caulking
3. Exterior old door framing lintel caulking
4. Exterior old door framing lintel caulking
5. Exterior window framing caulking
6. Exterior window framing caulking
7. Exterior window framing caulking
8. Exterior window glazing caulking
9. Exterior window glazing caulking
10. Exterior unit vent grille caulking
11. Exterior unit vent grille caulking
12. Exterior unit vent grille caulking

Sample Results

Type and Location of Sample	**Sample Result**
1. Exterior new door framing caulking	No Asbestos Detected
2. Exterior new door framing caulking	No Asbestos Detected
3. Exterior old door framing lintel caulking	5% Asbestos
4. Exterior old door framing lintel caulking	5% Asbestos
5. Exterior window framing caulking	No Asbestos Detected
6. Exterior window framing caulking	No Asbestos Detected
7. Exterior window framing caulking	No Asbestos Detected
8. Exterior window glazing caulking	No Asbestos Detected
9. Exterior window glazing caulking	No Asbestos Detected
10. Exterior unit vent grille caulking	5% Asbestos
11. Exterior unit vent grille caulking	5% Asbestos
12. Exterior unit vent grille caulking	5% Asbestos

Observations and Recommendations:
The condition of ACM is very important. ACM in good condition does not present a health issue unless it is disturbed. Therefore, it is not necessary to remediate ACM in good condition unless it will be disturbed through renovation, demolition, or other activity.

1. Lab countertop was assumed to contain asbestos.
2. Hard joint insulation was assumed to contain asbestos. The ACM was found at various locations within the school including crawl space. ACM debris was found in the crawl space.
3. Flexible connector was assumed to contain asbestos.
4. 9" x 9" Vinyl floor tile and mastic were assumed to contain asbestos.
5. Transite panels were assumed to contain asbestos.
6. Interior windows glazing caulking was assumed to contain asbestos.
7. Sink coating was assumed to contain asbestos.
8. Blackboard/tackboard glue was assumed to contain asbestos.
9. Exterior old door framing lintel caulking was found to contain asbestos.
10. Exterior unit vent grille caulking was found to contain asbestos.
11. Exterior window framing caulking was found to contain asbestos.
12. Exterior window glazing caulking was found to contain asbestos.
13. Exterior door framing caulking was found to contain asbestos.
14. Gymnasium hardwood flooring paper and mastic were assumed to contain asbestos.
15. Transite sewer pipe was assumed to contain asbestos.
16. Damproofing on exterior and foundation walls was assumed to exist and assumed to contain asbestos. A Non-Traditional Work Plan will be required to be prepared and submitted to the DEP for approval.
17. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the Demolition/Roofing Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval
18. All other suspect materials were found not to contain asbestos. Hidden ACM may be found during demolition activities.

Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures:
Observations and Conclusions
Visual inspection of various equipment such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's since there were labels indicating that "No PCB's" was found. Tubes in light fixtures, thermostats, signs, and switches were assumed to contain mercury. It would be very costly to test those equipment and dismantling would be required to access. Therefore, the above-mentioned equipment should be disposed in an EPA approved landfill as part of the demolition project.

PCB's in Caulking:
Observations and Conclusions
Caulking was assumed to contain PCB's.

Lead Based Paint (LBP):
Observations and Conclusions
LBP was assumed to exit on painted surfaces. A school is not considered a regulated facility. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations. According to OSHA, any amount of LBP triggers compliance.

Mercury in Rubber Flooring:
Observations and Conclusions:
No rubber flooring exists in the school.

Airborne Mold:
Airborne mold testing was performed utilizing Zefon International Incorporated's Air-O-Cell® sampling device following all manufacturer supplied recommended sampling procedures.

The Air-O-Cell® is a direct read total particulate air sampling device. It works using the inertial impaction principle similar to other spore trap devices. It is designed for the rapid collection and analysis of airborne particulate including bioaerosols. The particulate includes fibers (e.g. asbestos, fiberglass, cellulose, clothing fibers) opaque particles (e.g. fly ash, combustion particles, copy toner, oil droplets, paint), and bioaerosols (e.g. mold spores, pollen, insect parts, skin cell fragments).[1]

The method involves drawing a known quantity of air through a sterile sampling cassette. Subsequent to sampling, the cassette is sealed and transferred to a microbiology laboratory under chain of custody protocol for microscopic analysis. This method counts both viable and nonviable mold spores.

AIRBORNE MOLD and PARTICULATE

Lab ID #	Location	Total Mold Counts/M^3	Pollen	Insect Fragment	Hyphal Fragments
132306392-0001	Cafeteria	1,900	40	ND	ND
132306392-0002	Office	220	ND	ND	ND
132306392-0003	Teacher's Lounge	310	ND	ND	ND
132306392-0004	Library	130	ND	ND	ND
132306392-0005	Room 100 Art	150	ND	ND	ND
132306392-0006	Room 103	60	ND	ND	ND
132306392-0007	Room 102	220	ND	ND	ND
132306392-0008	Room 107	3,150	ND	ND	ND
132306392-0009	Room 104	20	ND	ND	ND
132306392-0010	Outside	26,130	ND	ND	ND

AIRBORNE MOLD and PARTICULATE
(Subjective Scales)

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
132306392-0001	Cafeteria	1	1	1
132306392-0002	Office	1	1	1
132306392-0003	Teacher's Lounge	1	1	1
132306392-0004	Library	1	1	1
132306392-0005	Room 100 Art	1	1	1

[1] Zefon International Inc. <www.zefon.com>

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
132306392-0006	Room 103	1	1	1
132306392-0007	Room 102	1	1	1
132306392-0008	Room 107	1	1	1
132306392-0009	Room 104	1	1	1
132306392-0010	Outside	-	1	1

Legend:
ND - Not Detected

Observations:
There are currently no guidelines or standards promulgated by a government agency or widely recognized scientific organization for the interpretation of airborne mold spore levels. The most commonly employed tool used to assess if mold growth is occurring in a structure is to compare quantities and species of mold outdoors to indoor. If there were more mold indoor, and/or if species were present indoor which were not present outdoors, then growth is occurring, and remediation is recommended.

Based on comparisons with historical data from projects of similar type, building utilization, geographic location and season, the indoor airborne levels are considered very low. Indoor mold spore counts in the fall are typically in the 1,500-3,500-spores/cubic meter range.

Pollen, insect fragments and Hyphal fragments were either not present or low in the samples. Hyphal fragment is a non-reproductive part of the mold.

Total background particulate on all samples was assessed as “1” on a scale of 1-5 where 1 is low and 5 is high. Skin fragment density on all samples was assessed as “1” on a scale of 1-4 where 1 is low and 4 is high. The total background levels are measured to determine airborne dust not related to airborne mold. Skin fragments are measured to determine proper housing cleaning.

Radon:
Number of Samples Collected
Eight (8) air samples were collected at the following locations:

Location of Sample

1. Office
2. Teacher’s lounge
3. Library
4. Room 100
5. Room 103
6. Room 102
7. Room 107
8. Room 104

Location of Sample	Sample Result
1. Office	0.8 pCi\L
2. Teacher’s lounge	0.8 pCi\L
3. Library	1.4 pCi\L
4. Room 100	0.8 pCi\L

5. Room 103 0.7 pCi\L
6. Room 102 1.5 pCi\L
7. Room 107 2.6 pCi\L
8. Room 104 1.6 pCi\L

Observations and Conclusions:
The measured radon concentrations of the samples were found to be much lower than the EPA guideline of 4 picoCuris of radon per liter of air (pCi/L). No further action is required based on the results.

COST ESTIMATES:
The cost includes removal and disposal of all accessible ACM, other Asbestos Containing materials and an allowance for removal and disposal of inaccessible or hidden ACM that may be found during the demolition project.

Location	Material	Approximate Quantity	Cost Estimate ($)
Interior	Flooring Materials	32,000 SF	160,000.00
	Hard Joint Insulation	1,000 Total	30,000.00
	Hidden Hard Joint Insulation	Unknown	50,000.00
	Debris/Soil in Crawl Space	10,000 SF	30,000.00
	Transite Panels	18 Total	9,000.00
	Windows	70 Total	14,000.00
	Hardwood Flooring/Paper	4,500 SF	45,000.00
	Lab Counter Tops	14 Total	7,000.00
	Flexible Connecters	16 Total	3,200.00
	Chalkboards/Tackboards	42 Total	16,800.00
	Miscellaneous Hazardous Materials	Unknown	25,000.00
Exterior	Lintel Caulking	50 LF	2,500.00
	Old Doors	3 Total	1,500.00
	Expansion Joint Caulking	120 LF	3,600.00
	Transite Sewer Pipes	Unknown[1]	50,000.00
	Damproofing on Walls	2,500 Tons[1]	700,000.00
	Roofing Materials	Unknown	75,000.00
Estimated costs for NESHAP Inspection and Testing Services			17,500.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			155,900.00
		TOTAL:	***1,400,000.00***
		TOTAL:	***1,650,000.00***[2]

[1]: Part of total demolition and site work.
[3]: Work to be Performed by a C.M at Risk Contractor.

DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:
Asbestos:
Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA /600/R-93/116 method.

Airborne Mold:
The samples were analyzed by an EPA approved laboratory EMSL, Woburn, MA.

Radon:
Radon samples were analyzed by an EPA licensed laboratory AccuStar, Ward Hill, MA.

LIMITATIONS AND CONDITIONS:
This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state, and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

Inspected By:

_____

Jason Becotte
Asbestos Inspector

131200321

131200321

ENVIROTEST LABORATORY, Inc.

639 Washington Street, Dedham, MA 02026 Tel 781-329-1133 Fax 781-329-1177

SAMPLE SHEET

Project Name: Town of Wilmington

Project Address: North Intermediate School
Wilmington

Contact: George Hooper

TURN-AROUND TIME: ☐ RUSH ☒ 24 HOURS ☐ 48 HOURS ☐ > 48 HOURS

Sample Date	Sample Number	Sample Location	Sample Description	Layer
1/20	N-1	Hall outside gym	Ceiling Tile	
	N-2	Hall outside Room 207	Ceiling Plaster	
	N-3	Hall outside Room 211	Ceiling Plaster	
	N-4	Hall outside Room 104	Ceiling Tile	
	N-5	Hall outside Room 105	Ceiling Plaster	
	N-6	Hall outside Room 107	Ceiling Plaster	
	N-7	1st Floor Boys Bathroom	Ceiling Plaster	
	N-8	Hall outside Office	Ceiling Tile	

RECEIVED
JAN 20 2012
By AK 1445

Relinquished by:
Date:
Time:

Received By:
Date:
Time:

EMSL Analytical, Inc.
7 Constitution Way, Suite 107, Woburn, MA 01801
Phone: (781) 933-8411 Fax: (781) 933-8412 Email: bostonlab@emsl.com

Attn: **Mark Gorham**
Envirotest Laboratory
639 Washington Street
Dedham, MA 02026

Fax: (781) 329-1177 Phone: (781) 329-1133

Project: **Town of Wilmington; North Intermediate School; Wilmington**

Customer ID: ENVT56
Customer PO:
Received: 01/20/12 2:45 PM
EMSL Order: 131200321

EMSL Proj:
Analysis Date: 1/24/2012

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Type
N-1 *131200321-0001*	Hall Outside Gym - Ceiling Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-2 *131200321-0002*	Hall Outside Room 207 - Ceiling Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-3 *131200321-0003*	Hall Outside Room 211 - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-4 *131200321-0004*	Hall Outside Room 104 - Ceiling Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-5 *131200321-0005*	Hall Outside Room 105 - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-6 *131200321-0006*	Hall Outside Room 107 - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
N-7 *131200321-0007*	1st Fl Boys Bathroom - Ceiling Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Initial report from 01/24/2012 10:26:07

Analyst(s)

Kevin Pine (8)

Renaldo Drakes, Laboratory Manager
or other approved signatory

Due to magnification limitations inherent in PLM, asbestos fibers in dimensions below the resolution capability of PLM may not be detected. Samples reported as < 1% or none detected may require additional testing by TEM to confirm asbestos quantities. The above test report relates only to the items tested and may not be reproduced in any form without the express written approval of EMSL Analytical, Inc. EMSL's liability is limited to the cost of analysis. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available available upong request

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-10713 and VT AL357102

EMSL Analytical, Inc.
7 Constitution Way, Suite 107, Woburn, MA 01801
Phone: (781) 933-8411 Fax: (781) 933-8412 Email: bostonlab@emsl.com

Attn: **Mark Gorham**
Envirotest Laboratory
639 Washington Street
Dedham, MA 02026

Fax: (781) 329-1177 Phone: (781) 329-1133

Project: **Town of Wilmington; North Intermediate School; Wilmington**

Customer ID: ENVT56
Customer PO:
Received: 01/20/12 2:45 PM
EMSL Order: 131200321

EMSL Proj:
Analysis Date: 1/24/2012

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

			Non-Asbestos			Asbestos
Sample	Description	Appearance	% Fibrous		% Non-Fibrous	% Type
N-8 *131200321-0008*	Hall Outside Office - Ceiling Tile	Gray Fibrous Homogeneous	80%	Min. Wool	20% Non-fibrous (other)	None Detected

Initial report from 01/24/2012 10:26:07

Analyst(s)

Kevin Pine (8)

Renaldo Drakes, Laboratory Manager
or other approved signatory

Due to magnification limitations inherent in PLM, asbestos fibers in dimensions below the resolution capability of PLM may not be detected. Samples reported as <1% or none detected may require additional testing by TEM to confirm asbestos quantities. The above test report relates only to the items tested and may not be reproduced in any form without the express written approval of EMSL Analytical, Inc. EMSL's liability is limited to the cost of analysis. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available available upong request

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-10713 and VT AL357102

THIS IS THE LAST PAGE OF THE REPORT.

OrderID: 132306525

132306525

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM

24-hour TAT

Town/City: Wilmington, MA Building Name North Intermediate School

Sample	Description of Material	Sample Location
1	New Door Frame caulk	exterior door
2	" "	" "
3	old door caulk at Lintel	" "
4	" "	" "
5	window Frame Caulk	exterior window
6	" "	" "
7	" "	" "
8	window Glaze	" "
9	" "	" "
10	Unit vent Grill caulk	exterior vent Grill
11	" "	" "
12	" "	" "

Reported By: Jason Becotte Date: 10-9-23 Due Date: **24-Hours**

Received By: ---------- Date: ----------

REC'D EMSL-BOSTON OCT 09 2023 1300

wainin

EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

http://www.EMSL.com / bostonlab@emsl.com

EMSL Order:	132306525
Customer ID:	UEC63
Customer PO:	
Project ID:	

Attention:	Ammar Dieb	**Phone:**	(617) 984-9772
	Universal Environmental Consultants	**Fax:**	(508) 628-5488
	12 Brewster Road	**Received Date:**	10/09/2023 1:00 PM
	Framingham, MA 01702	**Analysis Date:**	10/10/2023
		Collected Date:	10/09/2023

Project: North Intermediate School; Wilmington, MA

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1 *132306525-0001*	Exterior Door - New Door Frame Caulk	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2 *132306525-0002*	Exterior Door - New Door Frame Caulk	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3 *132306525-0003*	Exterior Door - Old Door Caulk at Lintel	Tan Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
4 *132306525-0004*	Exterior Door - Old Door Caulk at Lintel	Tan Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
5 *132306525-0005*	Exterior Window - Window Frame Caulk	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6 *132306525-0006*	Exterior Window - Window Frame Caulk	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7 *132306525-0007*	Exterior Window - Window Frame Caulk	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8 *132306525-0008*	Exterior Window - Window Glaze	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
9 *132306525-0009*	Exterior Window - Window Glaze	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 *132306525-0010*	Exterior Vent Grill - Unit Vent Grill Caulk	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
11 *132306525-0011*	Exterior Vent Grill - Unit Vent Grill Caulk	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
12 *132306525-0012*	Exterior Vent Grill - Unit Vent Grill Caulk	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile

Initial report from: 10/10/2023 11:30:39

EMSL Analytical, Inc.
5 Constitution Way, Unit A Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order:	132306525
Customer ID:	UEC63
Customer PO:	
Project ID:	

Analyst(s)
John McCarthy (12)

Steve Grise, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-139, VT AL998919, ME LB-0039

Initial report from: 10/10/2023 11:30:39

OrderID: 132306392

UEC universal environmental consultants
12 Brewster Road
Framingham, MA 01702
Phone: 508.628.5486
Fax: 508.628.5488

132306392

CHAIN OF CUSTODY

BUILDING / SITE NAME: North Intermediate School
TOWN / CITY: Wilmington
WORK AREA:
STATE: MA

Analysis Type	Turnaround Time (x) 6-8 Hr	12 Hr	24 Hr	48 Hr	72 hr
TEM / AHERA					
TEM / Level II					
TEM / Dust					
TEM / Bulk					
TEM / Water					
PLM					
Mold			X		
Other:					

Specific Project Notes

SAMPLE ID	MATERIAL DESCRIPTION	SAMPLE LOCATION	START	STOP	TIME	L/MIN	VOLUME
1	3694 8309	Cafeteria	6:19	6:29	10	15	150
2	3694 8320	Mrs. Mangan's Office	6:20	6:30	10	15	150
3	3694 8310	Teachers Lounge	6:25	6:35	10	15	150
4	3694 8308	Library	6:31	6:41	10	15	150
5	3694 8305	Room 100 Art	6:35	6:45	10	15	150
6	3694 8306	Room 103	6:37	6:47	10	15	150
7	3694 8298	Room 102	6:43	6:53	10	15	150
8	3694 8304	Room 107	6:47	6:57	10	15	150
9	3694 8307	Room 104	6:49	6:59	10	15	150
10	3694 8316	Outside	7:23	7:33	10	15	150

SAMPLED BY: Sydney Faure DATE/TIME: 10/3/23 7:38 PM
RECEIVED BY: DATE/TIME:
RELINQUISHED BY: DATE/TIME:
RECEIVED IN LAB BY: DATE/TIME:

REC'D RHB 0830
EMSL-BOSTON OCT 04 2023
DMB Bry

EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 132306392
Customer ID: UEC63
Customer PO:
Project ID:

Attention: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date: 10/03/2023
Received Date: 10/04/2023 08:30 AM
Analyzed Date: 10/05/2023

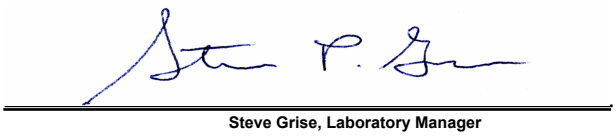
Project: North Intermediate School; Wilmington, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132306392-0001			132306392-0002			132306392-0003		
Client Sample ID:	1			2			3		
Volume (L):	150			150			150		
Sample Location:	Cafeteria			Mrs. Mangan's Office			Teachers Lounge		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	7	100	45.5	-	-	-
Basidiospores	84	1800	94.7	5	100	45.5	10	210	67.7
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	6	100	5.3	-	-	-	7	100	32.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	20	9.1	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**90**	**1900**	**100**	**13**	**220**	**100**	**17**	**310**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	2	40	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.



Steve Grise, Laboratory Manager
or other Approved Signatory

Skin Fragment and Fibrous Particulate ratings are based on the percent of non-fungal material they represent: 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%). Background ratings are based on the total area covered by non-fungal particles: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-99%), or 5 (100%; overloaded, prohibiting accurate detection and quantification). High levels of background will obscure spores and other particulates, leading to underestimation. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA AIHA LAP, LLC-EMLAP Accredited #180179

Initial report from: 10/05/2023 10:04 AM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.
5 Constitution Way, Unit A Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 132306392
Customer ID: UEC63
Customer PO:
Project ID:

Attention: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date: 10/03/2023
Received Date: 10/04/2023 08:30 AM
Analyzed Date: 10/05/2023

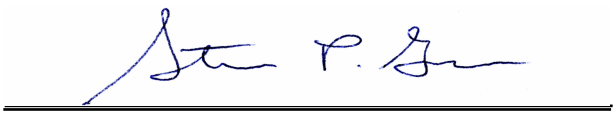
Project: North Intermediate School; Wilmington, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132306392-0004			132306392-0005			132306392-0006		
Client Sample ID:	4			5			6		
Volume (L):	150			150			150		
Sample Location:	Library			Room 100 Art			Room 103		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	2	40	30.8	4	90	60	-	-	-
Basidiospores	4	90	69.2	2	40	26.7	1	20	33.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	20	13.3	2	40	66.7
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**6**	**130**	**100**	**7**	**150**	**100**	**3**	**60**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.



Steve Grise, Laboratory Manager
or other Approved Signatory

Skin Fragment and Fibrous Particulate ratings are based on the percent of non-fungal material they represent: 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%). Background ratings are based on the total area covered by non-fungal particles: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-99%), or 5 (100%; overloaded, prohibiting accurate detection and quantification). High levels of background will obscure spores and other particulates, leading to underestimation. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA AIHA LAP, LLC-EMLAP Accredited #180179

Initial report from: 10/05/2023 10:04 AM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

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5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 132306392
Customer ID: UEC63
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Attention: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date: 10/03/2023
Received Date: 10/04/2023 08:30 AM
Analyzed Date: 10/05/2023

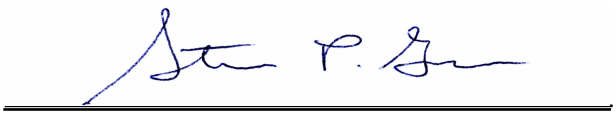
Project: North Intermediate School; Wilmington, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132306392-0007			132306392-0008			132306392-0009		
Client Sample ID:	7			8			9		
Volume (L):	150			150			150		
Sample Location:	Room 102			Room 107			Room 104		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	1	20	9.1	14	300	9.5	-	-	-
Basidiospores	7	100	45.5	129	2750	87.3	1	20	100
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	5	100	45.5	3	60	1.9	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	2	40	1.3	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**13**	**220**	**100**	**148**	**3150**	**100**	**1**	**20**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.



Steve Grise, Laboratory Manager
or other Approved Signatory

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Initial report from: 10/05/2023 10:04 AM

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EMSL Order: 132306392
Customer ID: UEC63
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Attention: Ammar Dieb
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Framingham, MA 01702

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date: 10/03/2023
Received Date: 10/04/2023 08:30 AM
Analyzed Date: 10/05/2023

Project: North Intermediate School; Wilmington, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	**132306392-0010**		
Client Sample ID:	**10**		
Volume (L):	**150**		
Sample Location:	**Outside**		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-
Ascospores	-	-	-
Aspergillus/Penicillium	-	-	-
Basidiospores	1190	25400	97.2
Bipolaris++	-	-	-
Chaetomium++	-	-	-
Cladosporium	22	470	1.8
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium++	-	-	-
Ganoderma	-	-	-
Myxomycetes++	11	240	0.9
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	1	20	0.1
Zygomycetes	-	-	-
Total Fungi	**1224**	**26130**	**100**
Hyphal Fragment	-	-	-
Insect Fragment	-	-	-
Pollen	-	-	-
Analyt. Sensitivity 600x	-	21	-
Analyt. Sensitivity 300x	-	7*	-
Skin Fragments (1-4)	-	-	-
Fibrous Particulate (1-4)	-	1	-
Background (1-5)	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other Approved Signatory

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Initial report from: 10/05/2023 10:04 AM

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Radon in Air

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Liquid Scintillation
NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Universal Environmental Consultant
12 Brewster Road
Framingham MA 01702

Property Tested:

North Intermediate School
320 Salem Street
Wilmington MA 01887

Log Number	Device Number	Test Exposure Duration:				Area Tested	Result pCi/L
8431175	4963395	10/03/2023	7:10 am	10/06/2023	10:52 am	Mrs. Manga i's Office	0.8
8431176	4963396	10/03/2023	7:11 am	10/06/2023	10:53 am	Teacher's Lounge	0.8
8431177	4963397	10/03/2023	7:06 am	10/06/2023	10:55 am	Library	1.4
8431178	4963398	10/03/2023	7:05 am	10/06/2023	10:56 am	Room 100 Art	0.8
8431179	4963399	10/03/2023	7:03 am	10/06/2023	10:57 am	Room 103	0.7
8431180	4963400	10/03/2023	6:58 am	10/06/2023	10:58 am	Room 102	1.5
8431181	4963401	10/03/2023	6:59 am	10/06/2023	10:59 am	Room 107	2.6
8431182	4963402	10/03/2023	7:01 am	10/06/2023	11:01 am	Room 104	1.6

Comment: Universal Environmental Consultant was emailed a copy of this report.

Test Performed By: Placed: Sydney Towne Retrieved: Sydney Towne

Distributed by: Universal Environmental Consultant

Date Received: 10/06/2023 Date Logged: 10/06/2023 Date Analyzed: 10/07/2023 Date Reported: 10/09/2023

Report Reviewed By: Elizabeth Negre Report Approved By:

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The counting uncertainty of this radon measurement is ~+/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Laboratory personnel were not involved in the placement or retrieval of the samples. Analytical results relate to the samples as received by the laboratory. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

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Est. 1978

25 Mall Road, Suite 206 • Burlington, MA 01803
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Engineers • Scientists • Planners

November 15, 2024

Rani Philip, Assoc. AIA
Project Manager
DORE + WHITTIER
260 Merrimac Street
Newburyport, Massachusetts 01950

Re: WILMINGTON – WILDWOOD SCHOOL @ NORTH INTERMEDIATE SCHOOL
320 Salem Street, Wilmington, MA 01887
Limited Subsurface Soil Investigation Memorandum

Dear Ms. Philip:

PEER Consultants P.C. (PEER) completed an initial review of the environmental laboratory analytical results for the initial eight (8) combined geotechnical/geo-environmental borings completed at the North Intermediate School location on October 28, 2024 and October 29, 2024. The weather on October 28, 2024 was partly cloudy to sunny, and the temperature ranged from 34°F to 51°F. The weather on October 29, 2024 was cloudy with haze (smoke), and the temperature ranged from 36°F to 40°F. PEER understands that Soil X was the drilling contractor on the project site, and utilized a Dietrich D70 Turbo Track-Mounted Drill Rig, with hollow stem augers (and no drive and wash) to complete the borings. Soil X was represented by a driller, and driller's assistance. Lahlaf Geotechnical Consulting, Inc., the geotechnical contractor, was represented by Mr. Berke Hatipoglu. PEER was represented by Mr. Dave Gorden, Board Certified Environmental Scientist and Certified Professional Soil Scientist.

During the limited subsurface soil investigation at the North Intermediate School, combined with limited recovery of soil within the split spoons, PEER collected nine (9) separate, composited soil samples from specific boring depths, and/or from across multiple nearby borings, and related to an investigation for the presence or absence of pesticides and/or herbicides in Topsoil (TS) material, and related to an investigation of soil conditions for disposal pre-characterization purposes in Dry Native / Reworked Native / Suspected Imported Similar (DRY) material, and related to an investigation of soil conditions for disposal pre-characterization purposes in Wet Native (WET) material.

Please note that PEER considered reworked native soil to be soil which visually appeared similar to soil on the project site, and soil which was suspected of having been excavated during the development of the existing school, and then redeposited on the surface of other areas of the project site.

PEER selected representative aliquots of soil from the top soil (TS) of each one of the borings B1 through B8, at a depth, in general, from 0-2' (or consisting of the dark brown to black portion of the top soil) to be analyzed for Pesticides and Herbicides [**B1B8 TS**]. Please note that on November 13, 2024, subsequent to PEER receiving the analytical results for the entire sample delivery group from the analytical laboratory, PEER also requested that the analytical laboratory determine the concentration of arsenic in the sample [**B1B8 TS**].

PEER selected soil from the dry (not within the groundwater table) native soil / reworked native soil / suspect imported similar soil to be analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs), Metals, Polychlorinated Biphenyls (PCBs), Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO) {C10-C28}, and TPH Gasoline Range Organics (GRO) {C6-C10}, and for General Chemistry parameters such as Percent Solids, Conductivity, Corrosivity (pH), Flashpoint/Ignitability, Reactive Cyanide, and Reactive Sulfide.

Due to the predominance of visually similar soil across the completed borings down to the boring termination depth, PEER collected analytical samples for the above parameters based on the following depth intervals:

- **B3B4B5 DRY** was composited (including representative aliquots of) soil from Boring B3 at depths of 0-2', 2-4', and 4-6'; from Boring B4 at depths of 0-2', 2-2.9', and 4-6'; and from Boring B5 at depths of 0-2' and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B1 DRY** was composited (including representative aliquots of) soil from Boring B1 at depths of 0-2' and 2-4'. This composited sample did not include the dark brown to black portion of the top soil.
- **B2 DRY** was composited (including representative aliquots of) soil from Boring B2 at depths of 0-2', 2-4', and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B6 DRY** was composited (including representative aliquots of) soil from Boring B6 at depths of 0-2', 2-4', and 4-6'. This composited sample did not include the dark brown to black portion of the top soil.
- **B8 DRY** was composited (including representative aliquots of) soil from Boring B8 at depths of 0-2', 2-4', 4-6', and 6-8'. This composited sample did not include the dark brown to black portion of the top soil.

PEER selected soil from the presumed wet (due to groundwater) native soil to be analyzed for VOCs, SVOCs, Metals, PCBs, TPH DRO, TPH GRO, and for General Chemistry parameters such as Percent Solids, Conductivity, Corrosivity (pH), Flashpoint/Ignitability, Reactive Cyanide, and Reactive Sulfide.

Due to the predominance of visually similar soil across the completed borings at or below the groundwater table, and down to the boring termination depth, PEER collected analytical samples for the above parameters based on the following depth intervals:

- **B6B8 WET** was composited (included representative aliquots of) soil from Boring B6 at depths of 9-11' and 14-16'; and from Boring B8 at depths of 9-11' and 14-16'.
- **B1B7 WET** was composited (including representative aliquots of) soil from Boring B1 at depths of 9-11' and 14-16'; and from Boring B7 at depths of 8-10', 10-12', and 14-16'.
- **B2 WET** was composited (included representative aliquots of) soil from Boring B2 at depths of 6-8', 9-11', and 14-16'.

PEER reviewed the textural and moisture conditions for each of the eight borings. PEER identified the following conditions in the subsurface soil:

- In general, soil from **Boring B1** consisted of material consisting of sand and gravel to at least 4 feet. The origin of this material (fill versus reworked native versus native) could be determined as the split spoon had no recovery for the 4-6' interval. However, soil from Boring B1 consisted of suspect native clayey silt to silty clay to clay from 6 feet to 11 feet, and suspect native sand and gravel to 19 feet, then suspect bedrock at 19 feet, and auger refusal at 19 feet. Groundwater indicators were observed at approximately between 8 feet and 9 feet.

- In general, soil from **Boring B2** consisted of suspect fill (sand) to 3 feet (with buried top soil observed at approximately 3 feet), then suspect native sand and gravel (with trace clay at depths) to 19.1 feet, then suspect bedrock at 19.1 feet, and auger refusal at 19.1 feet. Groundwater indicators were observed at approximately 6 feet.

- In general, soil from **Boring B3** consisted of suspect reworked native sand and gravel to 2 feet, then suspect native sand and gravel to 8 feet, then suspect bedrock at 9 feet, and auger refusal at 10.5 feet. Groundwater indicators were not observed.

- In general, soil from **Boring B4** consisted of suspect fill (sand) to 2.9 feet, then suspect native silty sand and a suspect weathered cobble to 9.7 feet, then suspect bedrock at 11 feet, and auger refusal at 11 feet. Remnant groundwater indicators (mottling) in a moist soil matrix were observed at approximately 6 feet.

- In general, soil from **Boring B5** consisted of suspect fill (sand) to 4 feet (with buried top soil observed at approximately 4 feet), then suspect native silty sand to 9 feet, then suspect bedrock at 9 feet, and auger refusal at 10 feet. Remnant groundwater indicators (mottling) in a moist soil matrix were observed at approximately 6 feet.

- In general, soil from **Boring B6** consisted of suspect fill (sand) to 2 feet, then suspect native sand and gravel to 19 feet, then suspect bedrock at 19 feet, and auger refusal at 19.7 feet. Groundwater indicators were observed at approximately 6.2 feet.

- In general, soil from **Boring B7** consisted of suspect fill (sand) to 4 feet (with buried organics observed between approximately 4 feet to 8 feet), then suspect native sand and gravel to 20.2 feet, then suspect bedrock at 20.2 feet, and auger refusal at 20.2 feet. Groundwater indicators were observed at approximately 8 feet.

- In general, soil from **Boring B8** consisted of suspect fill (sand) to 1 foot, then suspect native sand and gravel to 19.8 feet, and auger refusal at 19.8 feet. Groundwater indicators were observed at approximately between 8 feet and 9 feet.

PEER estimated and documented a global positioning system (GPS) point for each boring based on an open source electronic application; therefore, the location of each soil boring, as estimated in the below Google Earth image is considered approximate only.

Wildwood School @ North Intermediate School, Wilmington, MA
(North is Up)

PEER compared the laboratory analytical results to Massachusetts Department of Environmental Protection (MADEP) Policy # COMM-97-001, Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, August 1997. PEER also compared the laboratory analytical results to 310 CMR 40.00, the Massachusetts Contingency Plan (MCP) reporting category RCS-1 and reporting category RCS-2. General chemistry laboratory results were separately compared with RCRA Characteristics under 40 CFR 261. Additional discussions pertaining to the comparison of soil analytical results may be found in the paragraphs below.

The following information provides a summary of the laboratory analytical results from soil samples collected by PEER on October 28, 2024 and October 29, 2024. Please refer to Attachment A for a summary of the detected analytes, in surface and subsurface soil. The samples were kept under chain of custody by PEER, and in a cooler with ice packs, until Phoenix Environmental Laboratories, Inc. (Phoenix), of Manchester, CT couriered the samples back to their office on October 30, 2024. PEER received the Analysis Report from Phoenix with the test results on November 6, 2024. PEER received an updated Analysis Report from Phoenix which also included the test results for arsenic in sample **B1B8 TS** on November 14, 2024. Please refer to Attachment B for the November 14, 2024 Phoenix Analysis Report.

VOCs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were no detections of individual VOCs. In addition, there were no exceedances of the MCP RCS-1 Criteria for an individual VOC, and there were no exceedances of the MCP RCS-2 Criteria for an individual VOC. Furthermore, there were no exceedances of Total VOCs for acceptance at a lined landfill, and there were no exceedances of Total VOCs for acceptance at an unlined landfill. VOCs were not detected. VOCs were also not detected in the Trip Blanks for the day. **Refer to Table 1A** within Attachment A.

SVOCs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were no detections of individual SVOCs. In addition, there were no exceedances of the MCP RCS-1 Criteria for an individual SVOC, and there were no exceedances of the MCP RCS-2 Criteria for an individual SVOC. Furthermore, there were no exceedances of Total SVOCs for acceptance at a lined landfill, and there were no exceedances of Total SVOCs for acceptance at an unlined landfill. SVOCs were not detected. **Refer to Table 1B** within Attachment A.

Metals

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; and B1B7 WET, there were neither exceedances of the MCP RCS-1 Criteria for individual Metals nor exceedances of the MCP RCS-2 Criteria for individual Metals. In addition, there were neither exceedances of Metals for acceptance at a lined landfill nor exceedances of Metals for acceptance at an unlined landfill.

Of the 14 metals analyzed for in Samples B3B4B5 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, only eight metals were detected. Nine of 14 metals were detected in Sample B1 DRY.

For Samples B8 DRY; B6B8 WET; and B2 WET, there was each one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic). However, for Samples B8 DRY; B6B8 WET; and B2 WET, there were neither exceedances of Metals for acceptance at a lined landfill nor exceedances of Metals for acceptance at an unlined landfill.

For Samples B6 DRY; B6B8 WET; and B2 WET, there was each one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic).

For Sample B6 DRY, there was one exceedance of the MCP RCS-1 Criteria for one individual metal (arsenic) and one exceedance of the MCP RCS-2 Criteria for one individual metal (arsenic). In addition, for Sample B6 DRY, there was one exceedance of a metal (arsenic) for acceptance at a lined landfill and one exceedance of a metal (arsenic) for acceptance at an unlined landfill.

Based on the above exceedances of arsenic, PEER requested that Phoenix analyze Sample B1B8 TS for arsenic. Arsenic was detected, however, for arsenic in this sample, there were neither exceedances of the MCP RCS-1 Criteria nor exceedances of the MCP RCS-2 Criteria. In addition, for arsenic in this sample, there were neither exceedances for acceptance at a lined landfill nor exceedances for acceptance at an unlined landfill. **Refer to Table 1C** within Attachment A.

PEER notes that spatially, borings B2, B8, and B6 are oriented in a linear shape from north to south across the Property, with one additional boring each (proposed, yet not completed as part of the Geotechnical program) to the east and west of this linear shape.

PEER notes that according to an abstract for the publication “Arsenic In Central Massachusetts Bedrock And Groundwater”, 2010, Authors: McTigue, DF, Stein, CL, Brandon, WC, Kopera, JP, Keskula, AJ, Koteas, CG, the authors cite the following:

> Across the New England "arsenic belt," groundwater arsenic (As) concentrations often exceed the EPA's 0.01-mg/L drinking water standard. In overburden groundwater at a site within this belt in north-central Massachusetts, As has been reported at levels up to 7.6 mg/L. Bedrock at the site consists of Silurian Central Maine Terrane metasediments intruded by the Devonian Ayer granodiorite and Chelmsford granite. Exchange of hydrothermal fluids between these lithologies during intrusion and later deformation, faulting, and metamorphism resulted in crystallization of arsenic-bearing minerals, including arsenopyrite. Quaternary deglaciation and unloading dilated joint systems in the bedrock, allowing increased exposure of the

> mineralogy to meteoric water. Several arsenopyrite alteration products (e.g., scorodite), of varying solubilities, precipitated on fracture surfaces and along grain boundaries between major phases. In the emerging conceptual model for this site, groundwater is recharged in bedrock uplands and moves downgradient through the fracture network, becoming increasingly reducing as it moves along a flow path. Arsenic dissolved from arsenopyrite and arsenic-bearing alteration phases in bedrock remains in solution until the groundwater discharges to lowland areas hydraulically downgradient. In these adjacent lowlands, glacial sand and gravel overburden lies above the bedrock. When the reducing water reaches more oxidizing conditions, As-sorbing hydrous ferric oxides (HFO) precipitate out on the aquifer solids, resulting in accumulation of As in the deep overburden aquifer. A large landfill at this site, now closed and capped, imposed reducing conditions, and As is mobilized into groundwater by reductive dissolution of the HFO. The presence of elevated As in groundwater is consistent with arsenic-bearing phases generated in granitoids at depth during regional metamorphism, which were subsequently altered, and are being solubilized at present by the circulation of shallow groundwater through varying redox environments. This scenario is supported by geochemical and petrographic studies of the granitoids and the occurrence of the highest groundwater and soil arsenic concentrations in the adjacent deep overburden.

PEER notes that the abstract references the term “site”; however, the abstract referenced “site” should not be confused with the Wildwood School at North Intermediate School project location. PEER also notes that the study referenced above is referred to as occurring in the “Primary Study Area”.

PEER further notes that according to the publication "Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts - Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps", by the United States Geological Service, prepared in cooperation with the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health, and dated 2011, the authors cite the following:

> The study encompasses the east-central arsenic belt in Massachusetts, the location of nearly all contamination of bedrock wells in the State by arsenic from a natural source. Arsenic has long been known to be present in water from bedrock wells in east-central Massachusetts, and the State straddles an arsenic belt that extends from Connecticut to New Brunswick, Canada. The distribution of bedrock units of crystalline igneous and metamorphic rocks in the study area is complex. The study area is crossed by major faults that divide parts of three geologic terranes that include the Merrimack belt, the Nashoba zone and the Milford-Dedham zone. The Primary Study Area includes most of the Merrimack belt, which extends from the Connecticut Valley belt (indicated by the Merrimack belt western boundary) to the Clinton-Newbury fault, and the western half of the Nashoba zone, which extends from the Clinton-Newbury fault to the Bloody Bluff fault. The Secondary Study Area includes the remainder of the Nashoba zone and the western edge of the Milford-Dedham zone, which begins at the Bloody Bluff fault and extends to the east.

PEER also notes that the study referenced above is referred to as occurring both in the “Primary Study Area” and in the “Secondary Study Area”.

In addition, according to a Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts, a Map which accompanies / compliments the Publication above, Wilmington in general appears in the ORANGE highlighted Section, inferring that Wilmington has a 5-10% probability of exceeding the public drinking water standard (of 10 parts per billion) for Arsenic in its groundwater. Refer to Attachment C for a copy of this Map.

PEER notes that the slightly elevated concentration of arsenic occurred in two soil samples above the groundwater table and occurred in two soil samples within the groundwater, at locations associated with playing fields which also receive irrigation. PEER understands that Mr. Jamie Magaldi, Wilmington Public Works Director, has indicated that the irrigation system at the North Intermediate runs off of a deep bedrock well (and) the pump house is the brick building (along the western edge of the Property), with two irrigation well points, one near the pump house marked with an irrigation box, and the second along the northwestern edge of the Property, and suspected of being buried.

The presence of arsenic in soil (above the groundwater table), suspected of being formed (i.e., parent material) from the bedrock of the region; combined with the presence of arsenic in soil (above the groundwater table), suspected of being irrigated with groundwater from a deep bedrock well; combined with consideration of the proximity of the irrigation system sprinkler heads to the specific boring locations; and combined with the presence of arsenic in soil within the groundwater table – from this project site, which is located in Wilmington, (i.e., in an arsenic belt in east central Massachusetts), may lend itself to the rationale outlined in the two studies cited above.

Furthermore, the Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that the soil series of Deerfield loamy fine sand, 0 to 3 percent slopes, from parent materials consisting of sandy outwash derived from granite, gneiss, and/or quartzite occurs near boring B2 and B6. The NRCS Web Soil Survey also indicates that the soil series of Udorthents, sandy, from parent materials consisting of loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till occurs near boring B6 and B8.

The Surficial Materials Map of the Wilmington Quadrangle, Massachusetts (2018) indicates that the surficial material at this project site consists of:

> "coarse deposits which consist of gravel deposits, sand and gravel deposits, and sand deposits, not differentiated in this report. Gravel deposits are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to post depositional collapse related to melting of ice. Sand and gravel deposits occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to post depositional collapse. Sand deposits are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay."

PCBs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of the MCP RCS-1 Criteria for individual Aroclors nor exceedances of the MCP RCS-2 Criteria for individual Aroclors. There were neither exceedances of Total PCBs for acceptance at a lined landfill nor exceedances of Total PCBs for acceptance at an unlined landfill. PCBs were not detected. **Refer to Table 1D** within Attachment A.

TPHs

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of the MCP RCS-1 Criteria for TPH DRO nor exceedances of the MCP RCS-2 Criteria for TPH DRO. There were neither exceedances of TPH DRO for acceptance at a lined landfill nor exceedances of TPH DRO for acceptance at an unlined landfill. Individual DRO (such as Fuel Oil #2/Diesel Fuel, Fuel Oil #4, Fuel Oil #6, Kerosene, Motor Oil, Unidentified) were not detected. There are no comparison parameters for TPH GRO; however, TPH GRO was also not detected in the samples. **Refer to Table 1E** within Attachment A.

Pesticides

For Sample B1B8 TS, there were neither exceedances of the MCP RCS-1 Criteria for individual pesticides nor exceedances of the MCP RCS-2 Criteria for individual pesticides. COMM-97-001 does not provide regulatory criteria for pesticides. **Refer to Table 1F** within Attachment A.

Herbicides

For Sample B1B8 TS, there were neither exceedances of the MCP RCS-1 Criteria for individual herbicides nor exceedances of the MCP RCS-2 Criteria for individual herbicides. COMM-97-001 does not provide regulatory criteria for herbicides. **Refer to Table 1G** within Attachment A.

General Chemistry

For the following Samples: B3B4B5 DRY; B1 DRY; B2 DRY; B6 DRY; B6B8 WET; B1B7 WET; and B2 WET, there were neither exceedances of Conductivity for acceptance at a lined landfill nor exceedances of Conductivity for acceptance at an unlined landfill. There were no exceedances of RCRA Characteristics for flashpoint/ignitability. Flashpoint/ignitability passed. There were no exceedances of RCRA Characteristics for pH. There were no exceedances of RCRA Characteristics for reactivity. Reactivity was Negative. **Refer to Table 1H** within Attachment A.

The Massachusetts Contingency Plan: 310 CMR 40.00

According to 310 CMR 40.0317: Releases and Threats of Release Which Do Not Require Notification, PEER understands that notwithstanding the provisions of 310 CMR 40.0311 through 310 CMR 40.0315, the following releases and threats of release of oil and/or hazardous material are exempt from the notification requirements set forth in 310 CMR 40.0300:

(22) arsenic, beryllium or nickel in Boston Blue Clay or **arsenic in an area documented by the U.S. Geological Survey or in other scientific literature as an area of elevated arsenic measured in soil or groundwater** that -

(a) is consistently present in the environment at and in the vicinity of the sampling location;

(b) is solely attributable to natural geologic or ecologic conditions; and

(c) has not been mobilized or transferred to another environmental medium or increased in concentration in an environmental medium as a result of anthropogenic activities.

PEER understands that as of the date of this Memorandum, PEER is aware of a Fill Management Plan prepared by Parker Environmental Corporation on behalf of Lighthouse Environmental Management, LLC (LEM) in support of a **Fill Project** at the property located on Parcel 35-D 1.2-0 on Stafford Street in Leicester, Massachusetts.

PEER further understands that as of the date of this Memorandum, PEER is aware that anticipated sources of fill material for the **Fill Project** include large volumes of excess soil from excavation and construction projects in Massachusetts with elevated levels of naturally occurring arsenic. The intended fill materials include native and reworked sand, gravel, rock and clay with elevated levels of naturally occurring arsenic. It is anticipated that completion of the fill Project will involve importation of approximately 95,000 cubic yards of material, and take approximately 5 years to complete based on available sources of fill materials. Anticipated sources of fill material include large volumes of excess soil from excavation and construction projects in Massachusetts with elevated levels of naturally occurring arsenic.

Initial Recommendations

As described above, PEER shadowed the geotechnical contractor during the advancement of eight geotechnical soil borings located proximate to the location of the proposed Wildwood School at North Intermediate School, in Wilmington, MA, and collected geo-environmental soil samples concurrent with the geotechnical boring advancement. PEER understands that the eight borings which were advanced proximate to the location of the proposed Wildwood School at North Intermediate School may not necessarily be representative of other soil boring profiles which may be advanced at other locations on the project site during future phases of this proposed project.

Therefore, PEER recommends that additional pre-characterization sampling of the subsurface soil in borings and/or test pits be completed once the exact location of the proposed building is determined and/or once

the location of utility runs requiring excavation and soil management is determined, and/or once the depths and locations of any other excavations related to site infrastructure are known.

Furthermore, should it be determined that the existing North Intermediate School will be demolished as part of any future development of a new school, PEER recommends that additional pre-characterization sampling of the subsurface soil in borings and/or test pits be completed within the parking lot (and paved areas) associated with the building, and proximate to the existing footprint of the building nearest the boiler room, and beneath the current building.

In addition, as it relates to the potential need for project-based dewatering activities (based on the estimated groundwater elevation beneath the project site, and based on the observation of wetlands and waterways on and near the project site), should a construction general permit or a remediation general permit be required for this activity, PEER recommends considering the implementation of a sampling and analysis program for groundwater through the installation of temporary groundwater monitoring wells during any additional subsurface soil investigation, and prior to site redevelopment.

Please contact us directly at 781.238.8880, should you have any questions or require any clarification on this Limited Subsurface Soil Investigation Memorandum at the Wildwood School at North Intermediate School, in Wilmington, MA.

Sincerely,

PEER Consultants, P.C.

David Gorden, BCES
Environmental Science Program Manager

Attachment A

Table 1A - Volatile Organic Compounds
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Volatiles By SW8260D																							
Total VOCs	ug/Kg	NL	NL	10,000	4,000	NS		--		--		--		--		--		--		--		NS	

-- = Analyte not detected in soil sample.
NS = VOCs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were no detections of individual VOCs.
There were no exceedances of the MCP RCS-1 Criteria for an individual VOC.
There were no exceedances of the MCP RCS-2 Criteria for an individual VOC.
There were no exceedances of Total VOCs for acceptance at a lined landfill.
There were no exceedances of Total VOCs for acceptance at an unlined landfill.

Table 1B - Semivolatile Organic Compounds
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																			
Units	RCS-1	RCS-2	Landfill	Landfill		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Semivolatiles By SW8270E																							
Total SVOCs	ug/Kg	NL	NL	100,000	100,000	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = SVOCs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were no detections of individual SVOCs.
There were no exceedances of the MCP RCS-1 Criteria for an individual SVOC.
There were no exceedances of the MCP RCS-2 Criteria for an individual SVOC.
There were no exceedances of Total SVOCs for acceptance at a lined landfill.
There were no exceedances of Total SVOCs for acceptance at an unlined landfill.

Table 1C - Metals
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
		2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																		
Units		RCS-1	RCS-2	Landfill	Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Metals, Total																							
Antimony	mg/Kg	20	40	NL	NL	NS		--		--		--		--		--		--		--		--	
Arsenic	mg/Kg	20	20	40	40	15	0.78	14.5	0.69	8.41	0.68	6.45	0.71	54.3	0.72	20.3	0.69	26.6	0.73	16.5	0.84	20.2	0.80
Barium	mg/Kg	1,000	3,000	NL	NL	NS		22.8	0.35	23.1	0.34	9.43	0.35	16.1	0.36	21.6	0.35	19.3	0.37	18.9	0.42	15	0.40
Beryllium	mg/Kg	100	200	NL	NL	NS		0.28	0.28	0.62	0.27	0.33	0.28	0.29	0.29	0.4	0.28	< 0.29	0.29	< 0.34	0.34	< 0.32	0.32
Cadmium	mg/Kg	80	80	80	30	NS		--		--		--		--		--		--		--		--	
Chromium	mg/Kg	100	200	1,000	1,000	NS		16.6	0.35	13.8	0.34	16.2	0.35	13.4	0.36	23.2	0.35	10.4	0.37	14.4	0.42	12.3	0.40
Lead	mg/Kg	200	600	2,000	1,000	NS		5.27	0.35	10.2	0.34	5.15	0.35	10.2	0.36	8.14	0.35	3.58	0.37	4.65	0.42	3.55	0.40
Mercury	mg/Kg	20	40	10	10	NS		--		0.05	0.03	--		--		--		--		--		--	
Nickel	mg/Kg	700	1,000	NL	NL	NS		6.85	0.35	7.47	0.34	8.6	0.35	6.48	0.36	9.35	0.35	8.74	0.37	9.23	0.42	8.57	0.40
Selenium	mg/Kg	400	800	NL	NL	NS		--		--		--		--		--		--		--		--	
Silver	mg/Kg	100	200	NL	NL	NS		--		--		--		--		--		--		--		--	
Thallium	mg/Kg	8	70	NL	NL	NS		--		--		--		--		--		--		--		--	
Vanadium	mg/Kg	500	800	NL	NL	NS		12.6	0.35	15.7	0.34	10.2	0.35	11.7	0.36	14.7	0.35	12.4	0.37	12.2	0.42	10.4	0.40
Zinc	mg/Kg	1,000	3,000	NL	NL	NS		15.1	0.7	25.1	0.7	13	0.7	11	0.7	16.2	0.7	17.1	0.7	14.7	0.8	17.4	0.8

-- = Analyte not detected in soil sample.
NS = Metals were not sampled for in this sample.
NL = COMM-97-001 does not list a standard for this metal.
There were four exceedances of the MCP RCS-1 Criteria for individual Metals (arsenic) and four exceedances of the MCP RCS-2 Criteria for individual Metals (arsenic).
There was one exceedance of a metal (arsenic) for acceptance at a lined landfill and one exceedance of a metal (arsenic) for acceptance at an unlined landfill.

According to the publication "Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts—Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps", by the United States Geological Service, Prepared in cooperation with the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health, and dated 2011. The distribution of bedrock units of crystalline igneous and metamorphic rocks in the study area is complex. The study area is crossed by major faults that divide parts of three geologic terranes that include the Merrimack belt, the Nashoba zone and the Milford-Dedham zone. The primary study area includes most of the Merrimack belt, which extends from the Connecticut Valley belt (indicated by the Merrimack belt western boundary) to the Clinton-Newbury fault, and the western half of the Nashoba zone, which extends from the Clinton-Newbury fault to the Bloody Bluff fault. The secondary study area includes the remainder of the Nashoba zone and the western edge of the Milford-Dedham zone, which begins at the Bloody Bluff fault and extends to the east. According to a Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts, a Map which accompanies the Publication, Wilmington in general appears in the ORANGE highlighted Section, inferring that Wilmington has a 5-10% probability of exceeding the public drinking water standard (of 10 parts per billion) for Arsenic in its groundwater.

Table 1D - Polychlorinated Biphenyls
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
		2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																		
Units		RCS-1	RCS-2	Landfill	Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
PCBs By SW8082A																							
Total PCBs		NL	NL	<2,000	<2,000	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = PCBs were not sampled for in this sample.
NL = The MCP does not list a standard for this.
There were neither exceedances of the MCP RCS-1 Criteria for individual Aroclors nor exceedances of the MCP RCS-2 Criteria for individual Aroclors.
There were neither exceedances of Total PCBs for acceptance at a lined landfill nor exceedances of Total PCBs for acceptance at an unlined landfill.

Table 1E - Total Petroleum Hydrocarbons
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
TPH By SW8015D DRO																							
Total TPH	mg/kg	1,000	3,000	5,000	2,000	NS		--		--		--		--		--		--		--		--	
Gasoline Range Hydrocarbons (C6-C10) By SW8015D GRO																							
GRO (C6-C10)	mg/Kg	NL	NL	NL	NL	NS		--		--		--		--		--		--		--		--	

-- = Analyte not detected in soil sample.
NS = TPHs were not sampled for in this sample.
NL = The MCP and COMM-97-001 do not list a standard for this.
TPH DRO included Fuel Oil #2/Diesel Fuel, Fuel Oil #4, Fuel Oil #6, Kerosene, Motor Oil, Unidentified
GRO included gasoline range organics (C6-C10).
There were neither exceedances of the MCP RCS-1 Criteria for Total TPH DRO nor exceedances of the MCP RCS-2 Criteria for Total TPH DRO.
There were neither exceedances of TPH DRO for acceptance at a lined landfill nor exceedances of TPH DRO for acceptance at an unlined landfill.

Table 1F - Pesticides
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	2024 MCP	2024 MCP	COMM-97-001 Lined	COMM-97-001 Unlined																			
Units	RCS-1	RCS-2	Landfill	Landfill		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides By SW8081B																							
	ug/Kg			NL	NL	--		NS		NS		NS		NS		NS		NS		NS		NS	

There were no detections of Pesticides for the soil sample (B1B8 TS) analyzed.
-- = Analyte not detected in soil sample.
There were neither exceedances of MCP RCS-1 criteria for individual pesticides nor exceedances of MCP RCS-2 criteria for individual pesticides.
COMM-97-001 does not provide regulatory criteria for pesticides.
NS = Pesticides were not sampled for in this sample.

Table 1G - Herbicides
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id						CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date						10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id						B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix						Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
	Units	2024 MCP RCS-1	2024 MCP RCS-2	COMM-97-001 Lined Landfill	COMM-97-001 Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Chlorinated Herbicides By SW8151A																							
	ug/Kg			NL	NL	--		NS		NS		NS		NS		NS		NS		NS		NS	

There were no detections of Herbicides for the soil sample (B1B8 TS) analyzed.
-- = Analyte not detected in soil sample.
There were neither exceedances of MCP RCS-1 criteria for individual herbicides nor exceedances of MCP RCS-2 criteria for individual herbicides.
COMM-97-001 does not provide regulatory criteria for herbicides.
NS = Herbicides were not sampled for in this sample.

Table 1H - General Chemistry
(Detected Analytes)
North Intermediate Elementary School
320 Salem Street
Wilmington, Massachusetts

Lab Sample Id							CR96234		CR96235		CR96236		CR96237		CR96238		CR96239		CR96240		CR96241		CR96242	
Collection Date							10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024		10/29/2024	
Client Id							B1B8 TS		B3B4B5 DRY		B1 DRY		B2 DRY		B6 DRY		B8 DRY		B6B8 WET		B1B7 WET		B2 WET	
Matrix							Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
		2024 MCP	2024 MCP	RCRA	COMM-97-001	COMM-97-001																		
Units		RCS-1	RCS-2	Characteristics 40 CFR 261	Lined Landfill	Unlined Landfill	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Miscellaneous/Inorganics																								
Percent Solid	%	NL	NL	NL	NL	NL	89		94		94		93		97		94		90		80		89	
Conductivity - Soil Matrix	umhos/cm	NL	NL	NL	8,000	4,000	NS		25	5	31	5	27	5	24	5	33	5	34	5	27	5	30	5
Corrosivity	Pos/Neg	NL	NL	NL	NL	NL	NS		Negative		Negative		Negative		Negative		Negative		Negative		Negative		Negative	
Flash Point	Degree F	NL	NL	≤ 140	NL	NL	NS		>200	200	>200	200	>200	200	>200	200	>200	200	>200	200	>200	200	>200	200
Ignitability	degree F	NL	NL	≤ 140	NL	NL	NS		Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140	Passed	140
pH at 25C - Soil	pH Units	NL	NL	≤ 2 and ≥ 12.5	NL	NL	NS		7.58	1.00	6.37	1.00	5.67	1.00	6.71	1.00	6.77	1.00	7.08	1.00	6.6	1.00	6.77	1.00
Reactivity Cyanide	mg/Kg	NL	NL	40 CFR 261.23	NL	NL	NS		< 5	5	< 5	5	< 5	5	< 5	5	< 5	5	< 5	5	< 6	6	< 6	6
Reactivity Sulfide	mg/Kg	NL	NL	40 CFR 261.23	NL	NL	NS		< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20	< 20	20
Reactivity	Pos/Neg	NL	NL	40 CFR 261.23	NL	NL	NS		Negative		Negative		Negative		Negative		Negative		Negative		Negative		Negative	

NL = The MCP and COMM-97-001 do not list a standard for this constituent.
NS = Constituent was not sampled for in this sample.
There were neither exceedances of Conductivity for acceptance at a lined landfill nor exceedances of Conductivity for acceptance at an unlined landfill.
There were no exceedances of RCRA Characteristics for flashpoint/ignitability. Flashpoint/ignitability passed.
There were no exceedances of RCRA Characteristics for pH.
There were no exceedances of RCRA Characteristics for reactivity. Reactivity was Negative.

Attachment B

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	16:50
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	24 Hour	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96234

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1B8 TS

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	15.0	0.78	mg/Kg	1	11/14/24	TH	SW6010D
Percent Solid	89		%		10/30/24	CV	SW846-%Solid
Soil Extraction for Herbicide	Completed				11/01/24	X/A/D	SW3546
Soil Extraction for Pesticide	Completed				10/31/24	J/T	SW3546
Total Metals Digest	Completed				11/13/24	P/AG	SW3050B
Chlorinated Herbicides							
2,4,5-T	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
2,4,5-TP (Silvex)	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
2,4-D	ND	280	ug/Kg	10	11/05/24	JRB	SW8151A
2,4-DB	ND	1400	ug/Kg	10	11/05/24	JRB	SW8151A
Dalapon	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
Dicamba	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
Dichloroprop	ND	210	ug/Kg	10	11/05/24	JRB	SW8151A
Dinoseb	ND	140	ug/Kg	10	11/05/24	JRB	SW8151A
MCPA	ND	42000	ug/Kg	10	11/05/24	JRB	SW8151A
MCPP	ND	42000	ug/Kg	10	11/05/24	JRB	SW8151A
QA/QC Surrogates							
% DCAA	136		%	10	11/05/24	JRB	30 - 150 %
% DCAA (Confirmation)	138		%	10	11/05/24	JRB	30 - 150 %
Pesticides							
4,4' -DDD	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
4,4' -DDE	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
4,4' -DDT	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
a-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Alachlor	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aldrin	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
b-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Chlordane	ND	15	ug/Kg	2	11/04/24	AW	SW8081B
d-BHC	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Dieldrin	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan I	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan II	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endosulfan sulfate	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin aldehyde	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Endrin ketone	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
g-BHC	ND	1.5	ug/Kg	2	11/04/24	AW	SW8081B
Heptachlor	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Heptachlor epoxide	ND	7.3	ug/Kg	2	11/04/24	AW	SW8081B
Hexachlorobenzene	ND	3.7	ug/Kg	2	11/04/24	AW	SW8081B
Methoxychlor	ND	37	ug/Kg	2	11/04/24	AW	SW8081B
Toxaphene	ND	150	ug/Kg	2	11/04/24	AW	SW8081B
QA/QC Surrogates							
% DCBP	92		%	2	11/04/24	AW	30 - 150 %
% DCBP (Confirmation)	49		%	2	11/04/24	AW	30 - 150 %
% TCMX	71		%	2	11/04/24	AW	30 - 150 %
% TCMX (Confirmation)	65		%	2	11/04/24	AW	30 - 150 %

Massachusetts does not offer certification for Soil/Solid matrices.

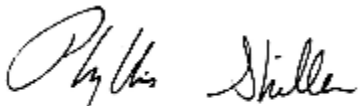
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Herbicide Comment:
Due to a matrix interference and/or the presence of a large amount of non-target material in the sample, a dilution was required resulting in an elevated RL.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:01
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96235

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B3B4B5 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	14.5	0.69	mg/Kg	1	11/01/24	TH	SW6010D
Barium	22.8	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.28	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	16.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	6.85	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	5.27	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	15.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	25	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	7.58	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	J/T	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.6	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	80		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	79		%	2	11/01/24	SC	30 - 150 %
% TCMX	79		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	72		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	52	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	99		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	101		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.54	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	27	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	27	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	270	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	95		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	97		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	91		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	550	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	690	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	76		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	77		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	66		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	67		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	66		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	71		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

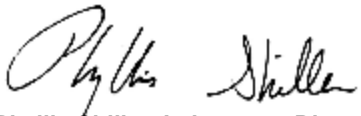
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:22
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96236

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	8.41	0.68	mg/Kg	1	11/01/24	TH	SW6010D
Barium	23.1	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.62	0.27	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	13.8	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	0.05	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	7.47	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Lead	10.2	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.4	3.4	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	15.7	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	25.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	31	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.37	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	93		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	69	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	72		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	69		%	2	11/01/24	SC	30 - 150 %
% TCMX	71		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	65		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	52	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	85		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	87		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	4.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.71	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	36	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	36	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	360	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	4.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	43	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	14	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	93		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	91		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	140	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	7.1	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	550	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	690	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	50		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	49		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	47		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	49		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

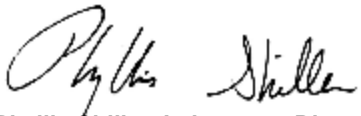
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	17:51
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96237

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B2 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	6.45	0.71	mg/Kg	1	11/01/24	TH	SW6010D
Barium	9.43	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.33	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	16.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.60	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	5.15	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.2	3.2	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	10.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	13.0	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	93		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	27	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	5.67	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	H/T	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	6.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	71	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	69		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	66		%	2	11/01/24	SC	30 - 150 %
% TCMX	66		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	60		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	53	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	94		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	94		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.66	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	33	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	330	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	39	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	13	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	94		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	96		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	130	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	6.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	560	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	700	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	49		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	52		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	47		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	50		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

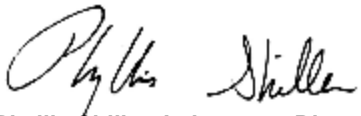
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:03
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96238

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B6 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.36	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	54.3	0.72	mg/Kg	1	11/01/24	TH	SW6010D
Barium	16.1	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.29	0.29	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.36	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	13.4	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	6.48	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Lead	10.2	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.6	3.6	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.2	3.2	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	11.7	0.36	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	11.0	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	97		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	24	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.71	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.6	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	68	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	82		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	87		%	2	11/01/24	SC	30 - 150 %
% TCMX	82		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	79		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	51	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	120		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	105		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.5	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.59	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	29	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	29	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	290	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.5	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	35	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	12	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	96		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	97		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	97		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	120	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.9	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	540	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	680	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	240	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	340	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	59		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	48		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	47		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	49		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	45		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	48		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:19
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96239

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B8 DRY

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	20.3	0.69	mg/Kg	1	11/01/24	TH	SW6010D
Barium	21.6	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	0.40	0.28	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	23.2	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	9.35	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Lead	8.14	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.5	3.5	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.1	3.1	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	14.7	0.35	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	16.2	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	94		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	33	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.77	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.7	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	95		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	70	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	72		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	71		%	2	11/01/24	SC	30 - 150 %
% TCMX	69		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	62		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	53	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	104		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	99		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.56	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	28	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	28	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	280	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	34	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	95		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	95		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.6	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	570	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	710	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	350	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	66		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	54		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	52		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	53		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	50		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	57		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

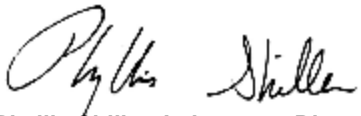
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:30
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96240

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B6B8 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.37	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	26.6	0.73	mg/Kg	1	11/01/24	TH	SW6010D
Barium	19.3	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.29	0.29	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.37	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	10.4	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.74	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Lead	3.58	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 3.7	3.7	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.3	3.3	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.4	0.37	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	17.1	0.7	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	90		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	34	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	7.08	1.00	pH Units	1	10/30/24 22:09	MW	SW846 9045D
Reactivity Cyanide	< 5	5	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				10/31/24	H/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	4.9	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1221	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1232	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1242	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1248	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1254	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1260	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1262	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
PCB-1268	ND	73	ug/Kg	2	11/01/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	81		%	2	11/01/24	SC	30 - 150 %
% DCBP (Confirmation)	80		%	2	11/01/24	SC	30 - 150 %
% TCMX	80		%	2	11/01/24	SC	30 - 150 %
% TCMX (Confirmation)	73		%	2	11/01/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	55	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	96		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	92		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	2.6	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.44	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	22	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	22	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	220	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	2.6	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	8.8	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	95		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	96		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	96		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	88	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	4.4	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	580	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	720	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	52		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	54		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	54		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	49		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	54		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

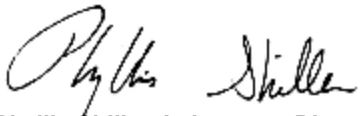
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	18:44
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96241

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B1B7 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	16.5	0.84	mg/Kg	1	11/01/24	TH	SW6010D
Barium	18.9	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.34	0.34	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.42	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	14.4	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	9.23	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Lead	4.65	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 4.2	4.2	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.7	1.7	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.8	3.8	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	12.2	0.42	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	14.7	0.8	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	80		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	27	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.60	1.00	pH Units	1	10/30/24 22:10	MW	SW846 9045D
Reactivity Cyanide	< 6	6	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Field Extraction	Completed				10/29/24		SW5035A
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				11/01/24	J/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	6.3	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	94		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1221	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1232	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1242	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1248	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1254	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1260	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1262	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
PCB-1268	ND	58	ug/Kg	1	11/05/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	63		%	1	11/05/24	SC	30 - 150 %
% DCBP (Confirmation)	71		%	1	11/05/24	SC	30 - 150 %
% TCMX	65		%	1	11/05/24	SC	30 - 150 %
% TCMX (Confirmation)	68		%	1	11/05/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	61	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	92		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	87		%	1	11/01/24	JRB	50 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.2	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.53	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
4-Chlorotoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	26	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	260	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.2	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	32	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Trichlorofluoromethane	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	11	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	11/01/24	JLI	70 - 130 %
% Bromofluorobenzene	94		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	92		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	92		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	110	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.3	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitrophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	1400	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetophenone	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	1800	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	700	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Pentachlorophenol	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	620	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	880	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	72		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	56		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	53		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	52		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	51		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	59		%	1	11/01/24	MR	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

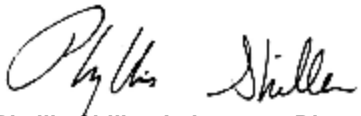
The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	19:02
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96242

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: B2 WET

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.40	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Arsenic	20.2	0.80	mg/Kg	1	11/01/24	TH	SW6010D
Barium	15.0	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Beryllium	< 0.32	0.32	mg/Kg	1	11/01/24	TH	SW6010D
Cadmium	< 0.40	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Chromium	12.3	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/31/24	AL1	SW7471B
Nickel	8.57	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Lead	3.55	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Antimony	< 4.0	4.0	mg/Kg	1	11/01/24	TH	SW6010D
Selenium	< 1.6	1.6	mg/Kg	1	11/01/24	TH	SW6010D
Thallium	< 3.6	3.6	mg/Kg	1	11/01/24	TH	SW6010D
Vanadium	10.4	0.40	mg/Kg	1	11/01/24	TH	SW6010D
Zinc	17.4	0.8	mg/Kg	1	11/01/24	TH	SW6010D
Percent Solid	89		%		10/30/24	CV	SW846-%Solid
Conductivity - Soil Matrix	30	5	umhos/cm	1	10/30/24	KG	SW9050A
Corrosivity	Negative		Pos/Neg	1	10/30/24	MW	SW846-Corr
Flash Point	>200	200	Degree F	1	11/04/24	G	SW1010B
Ignitability	Passed	140	degree F	1	11/04/24	G	SW846-Ignit
pH at 25C - Soil	6.77	1.00	pH Units	1	10/30/24 22:10	MW	SW846 9045D
Reactivity Cyanide	< 6	6	mg/Kg	1	11/04/24	E/N/G	SW846 7.3.3.1/90
Reactivity Sulfide	< 20	20	mg/Kg	1	11/04/24	EG/GD	SW846 CH7
Reactivity	Negative		Pos/Neg	1	11/04/24	EG/GD	SW846-React
Mercury Digestion	Completed				10/31/24	AC1/AC1	SW7471B
Extraction of ETPH	Completed				10/31/24	R/H/X/	SW3546
Soil Extraction for PCB	Completed				11/01/24	J/U	SW3546
Soil Extraction for SVOA	Completed				10/31/24	/U	SW3546

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Total Metals Digest	Completed				10/30/24	J/AG	SW3050B
Gasoline Range Hydrocarbons (C6-C10)							
GRO (C6-C10)	ND	5.3	mg/Kg	50	10/31/24	V	SW8015D GRO
QA/QC Surrogates							
% 2,5-Dibromotoluene (FID)	96		%	50	10/31/24	V	70 - 130 %
Polychlorinated Biphenyls							
PCB-1016	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1221	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1232	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1242	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1248	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1254	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1260	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1262	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
PCB-1268	ND	74	ug/Kg	2	11/05/24	SC	SW8082A
QA/QC Surrogates							
% DCBP	68		%	2	11/05/24	SC	30 - 150 %
% DCBP (Confirmation)	74		%	2	11/05/24	SC	30 - 150 %
% TCMX	59		%	2	11/05/24	SC	30 - 150 %
% TCMX (Confirmation)	61		%	2	11/05/24	SC	30 - 150 %
TPH DRO (C10-C28)							
Diesel Range Organics (C10-C28)	ND	55	mg/Kg	1	11/01/24	JRB	SW8015D DRO
QA/QC Surrogates							
% COD (surr)	97		%	1	11/01/24	JRB	50 - 150 %
% Terphenyl (surr)	92		%	1	11/01/24	JRB	50 - 150 %
Semivolatiles							
1,1-Biphenyl	ND	50	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,2-Diphenylhydrazine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
1,3-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
1,4-Dichlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dichlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dimethylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
2,4-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2,6-Dinitrotoluene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chloronaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Chlorophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylnaphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
2-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
2-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
3,3'-Dichlorobenzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
3-Nitroaniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4,6-Dinitro-2-methylphenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chloroaniline	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitroaniline	ND	580	ug/Kg	1	11/01/24	MR	SW8270E
4-Nitrophenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acenaphthylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Acetophenone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Aniline	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benz(a)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzidine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(a)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(b)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(ghi)perylene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzo(k)fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Benzoic acid	ND	730	ug/Kg	1	11/01/24	MR	SW8270E
Benzyl butyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Bis(2-ethylhexyl)phthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Carbazole	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Chrysene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dibenzofuran	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Diethyl phthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Dimethylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-butylphthalate	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Di-n-octylphthalate	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluoranthene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Fluorene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorobutadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Hexachloroethane	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Isophorone	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Naphthalene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Nitrobenzene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodimethylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
N-Nitrosodiphenylamine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Pentachloronitrobenzene	ND	360	ug/Kg	1	11/01/24	MR	SW8270E

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Pentachlorophenol	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
Phenanthrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Phenol	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyrene	ND	250	ug/Kg	1	11/01/24	MR	SW8270E
Pyridine	ND	360	ug/Kg	1	11/01/24	MR	SW8270E
QA/QC Surrogates							
% 2,4,6-Tribromophenol	62		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorobiphenyl	50		%	1	11/01/24	MR	30 - 130 %
% 2-Fluorophenol	52		%	1	11/01/24	MR	30 - 130 %
% Nitrobenzene-d5	51		%	1	11/01/24	MR	30 - 130 %
% Phenol-d5	48		%	1	11/01/24	MR	30 - 130 %
% Terphenyl-d14	53		%	1	11/01/24	MR	30 - 130 %

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The GRO (C6-C10) is quantitated using an gasoline standard.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96243

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 HI

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Field Extraction	Completed				10/29/24		SW5035A
Volatiles							
1,1,1,2-Tetrachloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	50	ug/Kg	50	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
1,4-Dichlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
2-Hexanone	ND	1300	ug/Kg	50	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Chlorotoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	400	ug/Kg	50	11/01/24	JLI	SW8260D
Acetone	ND	5000	ug/Kg	50	11/01/24	JLI	SW8260D
Acrylonitrile	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Benzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromochloromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Bromoform	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Bromomethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chlorobenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chloroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Chloroform	ND	200	ug/Kg	50	11/01/24	JLI	SW8260D
Chloromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	25	ug/Kg	50	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	50	ug/Kg	50	11/01/24	JLI	SW8260D
Dibromomethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Ethylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
m&p-Xylene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	3000	ug/Kg	50	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Methylene chloride	ND	100	ug/Kg	50	11/01/24	JLI	SW8260D
Naphthalene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
o-Xylene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Styrene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Toluene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Total Xylenes	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	25	ug/Kg	50	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	500	ug/Kg	50	11/01/24	JLI	SW8260D
Trichloroethene	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Trichlorofluoromethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
Vinyl chloride	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4 (50x)	97		%	50	11/01/24	JLI	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Bromofluorobenzene (50x)	95		%	50	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane (50x)	86		%	50	11/01/24	JLI	70 - 130 %
% Toluene-d8 (50x)	97		%	50	11/01/24	JLI	70 - 130 %

Oxygenates & Dioxane

1,4-Dioxane	ND	800	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	250	ug/Kg	50	11/01/24	JLI	SW8260D (OXY)

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

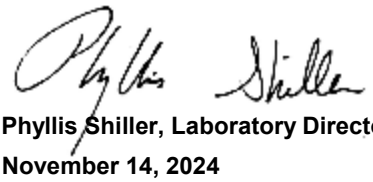
Comments:

TRIP BLANK INCLUDED.

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

Analysis Report

November 14, 2024

FOR: Attn: Mr Dave Gorden
PEER Consultants
25 Mall Road, Suite 206
Burlington, MA 01803

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		10/29/24	
Location Code:	PEER	Received by:	SR1	10/30/24	14:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	8593				

Laboratory Data

SDG ID: GCR96234
Phoenix ID: CR96244

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 LO

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Field Extraction	Completed				10/29/24		SW5035A
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,1-Trichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2,2-Tetrachloroethane	ND	3.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1,2-Trichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,1-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,3-Trichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2,4-Trimethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromo-3-chloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dibromoethane	ND	0.50	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,2-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3,5-Trimethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,3-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
1,4-Dichlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2,2-Dichloropropane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2-Chlorotoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
2-Hexanone	ND	25	ug/Kg	1	11/01/24	JLI	SW8260D
2-Isopropyltoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Chlorotoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
4-Methyl-2-pentanone	ND	25	ug/Kg	1	11/01/24	JLI	SW8260D
Acetone	ND	250	ug/Kg	1	11/01/24	JLI	SW8260D
Acrylonitrile	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Benzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromochloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromodichloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromoform	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Bromomethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon Disulfide	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Carbon tetrachloride	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chlorobenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloroform	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Chloromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,2-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
cis-1,3-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromochloromethane	ND	3.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dibromomethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Dichlorodifluoromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Ethylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Hexachlorobutadiene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Isopropylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
m&p-Xylene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl Ethyl Ketone	ND	30	ug/Kg	1	11/01/24	JLI	SW8260D
Methyl t-butyl ether (MTBE)	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Methylene chloride	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Naphthalene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
n-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
n-Propylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
o-Xylene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
p-Isopropyltoluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
sec-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Styrene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
tert-Butylbenzene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrachloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Tetrahydrofuran (THF)	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Toluene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Total Xylenes	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,2-Dichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,3-Dichloropropene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
trans-1,4-dichloro-2-butene	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Trichloroethene	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorofluoromethane	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
Trichlorotrifluoroethane	ND	10	ug/Kg	1	11/01/24	JLI	SW8260D
Vinyl chloride	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	97		%	1	11/01/24	JLI	70 - 130 %

Project ID: WILDWOOD @ NORTH INTERMED
Client ID: TB102924 LO

Phoenix I.D.: CR96244

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Bromofluorobenzene	98		%	1	11/01/24	JLI	70 - 130 %
% Dibromofluoromethane	82		%	1	11/01/24	JLI	70 - 130 %
% Toluene-d8	98		%	1	11/01/24	JLI	70 - 130 %
Oxygenates & Dioxane							
1,4-Dioxane	ND	100	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Diethyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Di-isopropyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
Ethyl tert-butyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)
tert-amyl methyl ether	ND	5.0	ug/Kg	1	11/01/24	JLI	SW8260D (OXY)

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

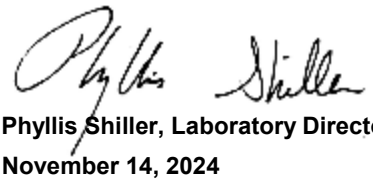
Comments:

TRIP BLANK INCLUDED.

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 14, 2024
Official Report Release To Follow

Sample Criteria Exceedances Report

GCR96234 - PEER

Criteria: MA: Com97-L, Com97-U, S1, S1G2, S2, S2G2

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CR96238	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / COMM 97 / Lined Landfills	54.3	0.72	40	40	mg/Kg
CR96238	AS-SM	Arsenic	MA / COMM 97 / Unlined Landfills	54.3	0.72	40	40	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	54.3	0.72	20	20	mg/Kg
CR96238	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	54.3	0.72	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	20.3	0.69	20	20	mg/Kg
CR96239	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	20.3	0.69	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	26.6	0.73	20	20	mg/Kg
CR96240	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	26.6	0.73	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / CMR 310.40.1600 / S1 (mg/kg)	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / CMR 310.40.1600 / S2 (mg/kg)	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	20.2	0.80	20	20	mg/Kg
CR96242	AS-SM	Arsenic	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	20.2	0.80	20	20	mg/Kg
CR96243	$8260MER	cis-1,3-Dichloropropene	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	25	10	10	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	50	5	5	ug/Kg
CR96243	$8260MER	trans-1,3-Dichloropropene	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	25	10	10	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	50	5	5	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / CMR 310.40.1600 / S2 (mg/kg)	ND	50	30	30	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / CMR 310.40.1600 / S2 (mg/kg)	ND	50	20	20	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	ND	50	20	20	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-2	ND	50	30	30	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	50	5	5	ug/Kg
CR96243	$8260MER	1,1,2,2-Tetrachloroethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	ND	50	20	20	ug/Kg

Sample Criteria Exceedances Report

GCR96234 - PEER

Criteria: MA: Com97-L, Com97-U, S1, S1G2, S2, S2G2

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CR96243	$8260MER	Dibromochloromethane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-2	ND	50	30	30	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / CMR 310.40.1600 / S1 (mg/kg)	ND	800	200	200	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	ND	800	200	200	ug/Kg
CR96243	$MCPADD-SM	1,4-Dioxane	MA / SOIL S-2 STANDARDS / S-2 Soil & GW-1	ND	800	200	200	ug/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Cooler: Yes ☑ No ☐
Coolant: IPK ☑ ICE ☐ No ☐

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 1.3 °C Pg 1 of 1

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☑ Email: gordon@peerepc.com

Customer: PEER Consultants
Address: 25 Mall Rd Suite 206
Burlington MA 01803
7812388880

Project: Wildwood@ North Intermed
Report to: d. gordon
Invoice to: d. gordon
QUOTE # Wilmington

Project P.O: 8593

This section MUST be completed with Bottle Quantities.

Sampler's Signature: _____ Date: 10/29/24

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hi level VOC	Lo level VOC	TPH GRO	Flashpt/Ignit	SVOC-TPH DRO, PCB (*)	Pest/Herb	TCLP 14 Metals (†)	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [✓] methanol [✓] H2O	GL Soil container (8) oz amber	GL Soil container (4) oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
96234	B1B8 TS	SD	10/29	1650						✓						1								
96235	B3B4B5 Dry	SD	10/29	1701	✓	✓	✓	✓	✓		†				5	2	1							
96236	B1 [redacted] Dry	SD	10/29	1722	✓	✓	✓	✓	✓		⊙				5	1	1							
96237	B2 Dry	SD	10/29	1751	✓	✓	✓	✓	✓		†				5	2	1							
96238	B6 Dry	SD	10/29	1803	✓	✓	✓	✓	✓		†				5	2	1							
96239	B8 Dry	SD	10/29	1819	✓	✓	✓	✓	✓		†				5	2	1							
96240	B6B8 Wet	SD	10/29	1830	✓	✓	✓	✓	✓		†				5	2	1							
96241	B1B7 Wet	SD	10/29	1844	✓	✓	✓	✓	✓		†				4.	2	1							
96242	B2 Wet	SD	10/29	1902			✓	✓	✓		†				2.	2	1							
96243	TB102924Hi	L	10/22	–	✓										1									
96244	TB102924Lo	L	10/22	–		✓									2									

Relinquished by: _____ Accepted by: _____

Date:	Time:
10/30/24	1145
10/30/24	14:37

Comments, Special Requirements or Regulations: ● missing lab BS
Ⓐ MCP 14 metals, pH, Corrosivity, Conductivity
Ⓣ only if exceeds 20x rule - call Client first to confirm Reactive
⊙ use any remaining soil from other

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☑ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ (Residential) Direct Exposure
☐ (Comm/Industrial) Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB-GW Objectives

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA mcpcomm 97-001
☐ MCP Certification
☑ GW-1 ☐ MWRA eSMART
☑ GW-2 ☐ S-1 10% CALC
☐ GW-3
☑ S-1 GW-1 ☑ S-1 GW-2 ☐ S-1 GW-3
☑ S-2 GW-1 ☑ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: MA

Data Format
☑ Excel
☑ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☑ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

Sarah Bell

Subject: FW: GCR96234

From: Dave Gorden <GordenD@peercpc.com>
Sent: Wednesday, November 13, 2024 11:31 AM
To: Sarah Bell <sarah@phoenixlabs.com>
Cc: Krystal Houle <Khoule@phoenixlabs.com>
Subject: RE: GCR96234

Sarah.

Please proceed with running that sample for total Arsenic at 24 hr TAT.

Cheers...

David

From: Dave Gorden <GordenD@peercpc.com>
Sent: Wednesday, November 13, 2024 10:16 AM
To: Sarah Bell <sarah@phoenixlabs.com>
Cc: Krystal Houle <Khoule@phoenixlabs.com>
Subject: GCR96234

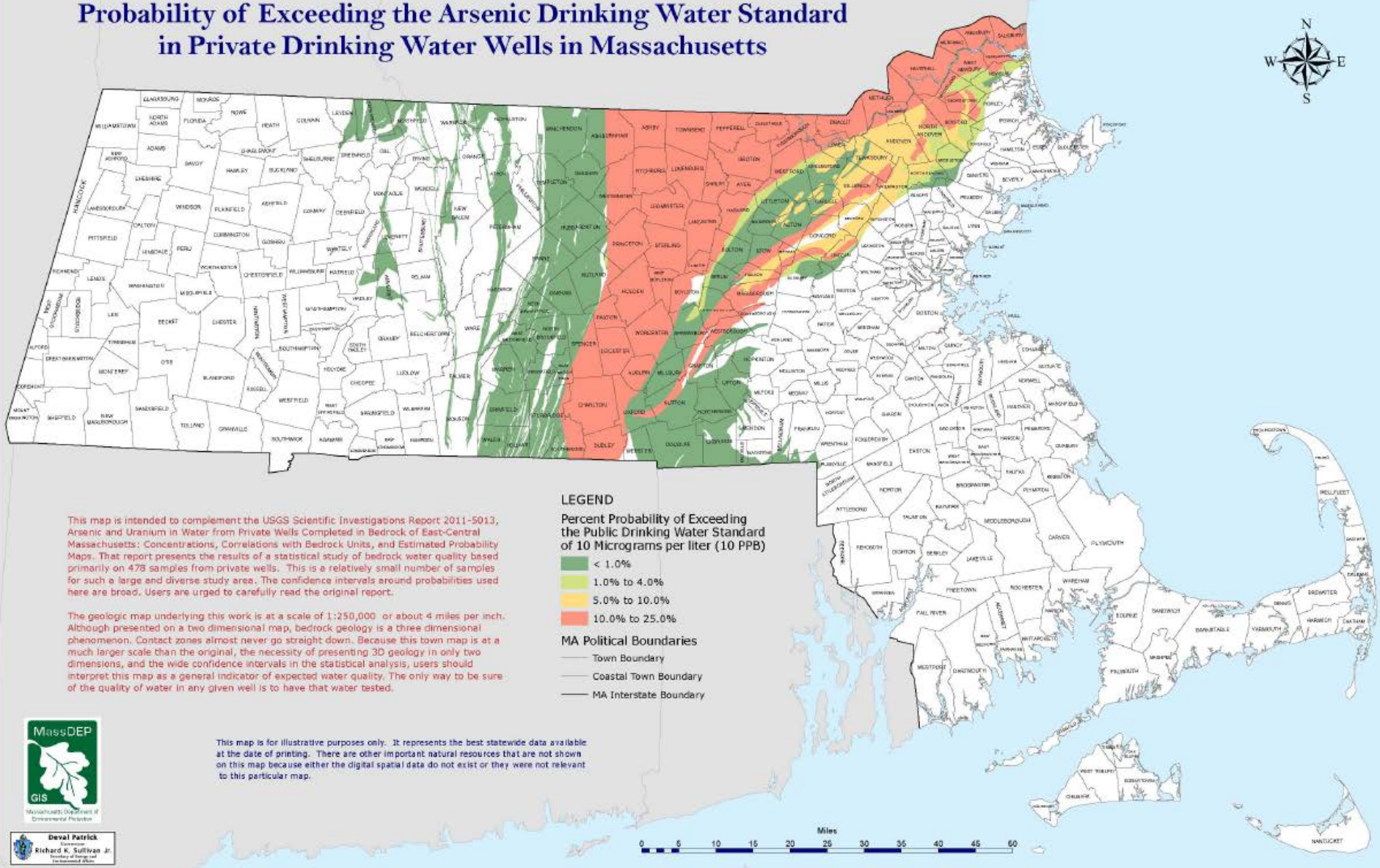
Sarah

For the B1B8 TS sample identifier (Lab ID CR96234), do you still have sufficient soil in this to run the metal arsenic?
If so, though I understand Standard TAT is running at 5 days, what would be the quickest TAT, and what would then be the cost?

Project ID:	WILDWOOD @ NORTH INTERMED
SDG ID:	GCR96234
Sample ID#s:	CR96234 - CR96244

Attachment C

Probability of Exceeding the Arsenic Drinking Water Standard in Private Drinking Water Wells in Massachusetts



This map is intended to complement the USGS Scientific Investigations Report 2011-5013, Arsenic and Uranium in Water from Private Wells Completed in Bedrock of East-Central Massachusetts: Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps. That report presents the results of a statistical study of bedrock water quality based primarily on 478 samples from private wells. This is a relatively small number of samples for such a large and diverse study area. The confidence intervals around probabilities used here are broad. Users are urged to carefully read the original report.

The geologic map underlying this work is at a scale of 1:250,000 or about 4 miles per inch. Although presented on a two dimensional map, bedrock geology is a three dimensional phenomenon. Contact zones almost never go straight down. Because this town map is at a much larger scale than the original, the necessity of presenting 3D geology in only two dimensions, and the wide confidence intervals in the statistical analysis, users should interpret this map as a general indicator of expected water quality. The only way to be sure of the quality of water in any given well is to have that water tested.

This map is for illustrative purposes only. It represents the best statewide data available at the date of printing. There are other important natural resources that are not shown on this map because either the digital spatial data do not exist or they were not relevant to this particular map.

MassDEP GIS
Massachusetts Department of Environmental Protection

Deval Patrick
Governor
Richard K. Sullivan Jr.
Secretary of Energy and Environmental Affairs

SECTION DC A
SUBSTRUCTURE CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Substructure comprises foundations, basements, floors on grade, and other substructure elements.

B. Foundations: Structures responsible for transferring dead loads, live loads and environmental loads of completed building to the earth in such a way that the building is supported evenly and without movement.

1. Based on the recommendations of the Geotechnical Engineer, the entire structure will be supported on reinforced concrete spread foundations.

C. Slabs on Grade: Structural slabs that are installed over fill or at excavated and compacted grade, including all depressions in the floor, such as trenches, pits and sumps; also equipment bases, under floor and perimeter drainage, thermal insulation at floor edge and moisture barriers installed integrally with floor system.

1. Based on the recommendations of the Geotechnical Engineer, the lowest level slab of the main portion of the proposed structure would be five inch thick concrete slab on grade reinforced with welded wire fabric over a vapor barrier on compacted structural fill. Housekeeping pads supporting mechanical equipment shall be cast directly on the concrete slab on grade or supported metal deck slabs.
2. Exterior approach slabs at entrances and exits, concrete pads supporting transformers, generators and dumpsters shall be concrete slabs on grade over crushed stone or compacted free draining structural fill.

PART 2 PRODUCTS AND METHODS

2.01 METHODS OF CONSTRUCTION

A. Use any of the following methods and techniques:

1. Excavation, backfill and compaction by machine or hand.

A10 FOUNDATIONS

2.02 A1010 – STANDARD FOUNDATIONS

A1010.10 WALL FOUNDATIONS

A. Cast-In-Place concrete foundations walls supporting exterior wall construction and interior wall bearing structure.

1. Based on the recommendations of the Geotechnical Engineer, the building structure can be supported on shallow, reinforced concrete foundations.
2. The exterior foundation walls would be 14 inch to 16 inch thick, reinforced cast-in-place concrete walls on 24 to 36 inches wide continuous reinforced concrete strip footings around the perimeter of the building extending a minimum of 4 feet below finished grade.
3. The reinforced masonry elevator shafts would be supported on 3 foot thick reinforced concrete pit slab with an integral sump pit.
4. Functional Requirements:
   a. Performance Requirements:
      1) 4500 pounds per square inch compressive strength concrete.
      2) Bottom of exterior footing to be minimum 4 feet below grade.
   b. Design Requirements:
      1) Sustainability or LEED requirements:
         1. Recycled Content shall not be less than 25 percent (flyash or slag).

5. Components:
    a. Concrete:
        1) Portland cement
        2) Aggregates
            (a) Normal Weight Fine Aggregate: Shall be washed, inert, natural sand conforming to ASTM C33.
            (b) Normal Weight Coarse Aggregate: Shall be well-graded crushed stone or washed gravel conforming to ASTM C33.
            (c) Light Weight Fine and Coarse Aggregate: Shall conform to ASTM C330.
        3) Potable Water
        4) Admixtures:
            (a) Water reducing Agent: ASTM C494, Type A. Water reducing agent shall be by same manufacturer as air-entraining agent.
            (b) Mid-Range Water Reducing Agent: ASTM C494, Type A.
            (c) High-Range Water Reducing Agent: ASTM C494, Type F or Type G.
            (d) Air entraining agent: ASTM C260.
    b. Reinforcement:
        1) Reinforcing Steel Bars: Shall be newly rolled billet steel conforming to ASTM A615 (Grade 60 unless noted). Bars shall be bent cold. Reinforcing bars being welded shall conform to ASTM A 706, Grade 60.
        2) Welded Wire Fabric ASTM A1064: All welded wire fabric shall be supplied in sheets and is to be used in slabs on grade and on deck as noted.

2.03 **A1010.30 – COLUMN FOUNDATIONS**

A. Based on the recommendations of the Geotechnical Engineer, the building structure can be supported on shallow, reinforced concrete foundations. The columns of the proposed structure would bear on reinforced concrete spread footings and the perimeter foundation walls would bear on continuous reinforced concrete strip footings extending at least 4 feet below grade. With the recommended bearing capacity of the soil of two tons per square foot, a typical interior footing would be 11 feet by 11 feet by 24 inches deep and the typical exterior footings would be 10 feet by 10 feet by 24 inches deep in the three story areas. In the two story areas a typical interior footing would be 9 feet by 9 feet by 24 inches deep and the typical exterior footings would be 8 feet by 8 feet by 24 inches deep. In one story areas a typical interior footing would be 7 feet by 7 feet by 24 inches deep and the typical exterior footings would be 6 feet by 6 feet by 24 inches deep. Typical interior and exterior footings at the Cafeteria and Gymnasium would be 8 feet by 8 feet by 24 inches deep. .

1. Functional Requirements:
    a. Performance Requirements:
        1) 4500 pounds per square inch compressive strength concrete.
        2) Bottom of exterior footing to be minimum 4 feet below grade.
    b. Design Requirements:
        1) Sustainability or LEED requirements:
            (a) Recycled Content shall not be less than 25 percent (flyash or slag).
2. Components:
    a. Concrete:
        1) Portland cement
        2) Aggregates
            (a) Normal Weight Fine Aggregate: Shall be washed, inert, natural sand conforming to ASTM C33.

(b) Normal Weight Coarse Aggregate: Shall be well graded crushed stone or washed gravel conforming to ASTM C33.

3) Potable water
4) Admixtures:
   (a) Water reducing Agent: ASTM C494, Type A. Water-reducing agent shall be by same manufacturer as air entraining agent.
   (b) Mid-Range Water Reducing Agent: ASTM C494, Type A.
   (c) High-Range Water Reducing Agent: ASTM C494, Type F or Type G.
   (d) Air entraining agent: ASTM C260.
5) Reinforcement:
   (a) Reinforcing Steel Bars: Shall be newly rolled billet steel conforming to ASTM A615 (Grade 60 unless noted). Bars shall be bent cold. Reinforcing bars being welded shall conform to ASTM A706, Grade 60.
   (b) Welded Wire Fabric ASTM A1064: All welded wire fabric shall be supplied in sheets and is to be used in slabs on grade and on deck as noted.

A1030 SLABS-ON-GRADE

2.04 **A4010 – STANDARD SLABS-ON-GRADE**

A. Based on the recommendations of the Geotechnical Engineer, the lowest level of the proposed building would be a five inch thick concrete slab-on-grade reinforced with welded wire fabric over a vapor barrier on 12 inches of compacted granular structural fill and a base course of eight inches of compacted gravel.

1. Functional Requirements:
   a. Performance Requirements:
      1) 4500 pounds per square inch compressive strength concrete.
      2) 5000 pounds per square inch compressive strength for site concrete structures exposed to weather.
   b. Concrete Slabs on Grade Partly or Completely Exposed to Freezing Conditions:
      1) Water-Cement Ratio: As recommended by ACI 302.1R.
         (a) Moderate to Severe Exposure: Maximum 0.50.
         (b) Exposure Subject to De-icing Chemicals: Maximum 0.45.
         (c) Exposure to Salt Water: Maximum 0.40.
      2) Air Content: In accordance with recommendations of ACI 201.2R.
   c. Design Requirements:
      1) Sustainability or LEED requirements:
         (a) Recycled content shall not be less than 25 percent (flyash or slag).
2. Components:
   a. Concrete:
      1) Portland cement
      2) Aggregates
         (a) Normal Weight Fine Aggregate: Shall be washed, inert, natural sand conforming to ASTM C33.
         (b) Normal Weight Coarse Aggregate: Shall be well-graded crushed stone or washed gravel conforming to ASTM C33.
      3) Potable water.
      4) Admixtures:
         (a) Concrete Moisture Vapor Reducing Admixture: volatile organic compound (VOC) free, liquid admixture formulated to react with hydroxide ions produced by cement hydration process, creating additional hydration process, creating

additional hydration products within capillary pores, blocking moisture vapor movement through concrete.

(1.) Physical Characteristics:

aa. Hydraulic Conductivity – project specific maximum of 6.0 E-8 CM/S per ASTM D5084.

(b) Water reducing Agent: ASTM C494, Type A. Water reducing agent shall be by same manufacturer as air-entraining agent.

(c) Mid-Range Water Reducing Agent: ASTM C494, Type A.

(d) High-Range Water Reducing Agent: ASTM C494, Type F or Type G.

(e) Air entraining agent: ASTM C260 at interior and exterior slabs.

b. Reinforcement:

1) Reinforcing Steel Bars: Shall be newly rolled billet steel conforming to ASTM A615 (Grade 60 unless noted). Bars shall be bent cold. Reinforcing bars being welded shall conform to ASTM A 706, Grade 60.

2) Welded Wire Fabric ASTM A1064: All welded wire fabric shall be supplied in sheets and is to be used in slabs on grade and on deck as noted.

c. Underslab Vapor Retarder: ASTM E1745 15 MIL Polyolefin sheet under all slab on grade areas at building, with all joints, penetrations and edges sealed.

PART 3 DESIGN CRITERIA

3.01 **BASIC FUNCTION**

A. Provide substructure to support the completed and occupied building safely and without uncontrolled subsidence or other movement.

B. Provide floors on grade to enclose habitable spaces and support interior functions without subsidence, structural cracking or other uncontrolled movement.

C. Where substructure is integral with elements defined within another element group, meet requirements of both element groups.

3.02 **AMENITY AND COMFORT CRITERIA**

A. Thermal Performance: Provide thermal resistance to maintain interior comfort levels specified and in accordance with code and the following:

1. R-value of 10.0 IP (1.76 SI), minimum, under exterior frost pads.

B. Water Penetration Resistance: Prevent ground water penetration into the interior of the building, under any circumstances.

1. Waterproofing: Provide permanent waterproofing at portions of foundation that enclose habitable space, using the following methods:
   a. Permanent, waterproof barrier on exterior of basement construction, protected against damage from backfill.
   b. Drainage: Provide method of collecting and draining water away from exterior surfaces and from underside of elements that enclose habitable space where water table observed in Geotechnical reports is within 24 inches of planned basement floor elevations.

C. Water Accumulation: Prevent accumulation of water in soils adjacent to basement retaining wall foundations and footings by providing continuous drainage system along footing.

D. Floor Flatness (FF): Provide floors on grade engineered and constructed to achieve degree of flatness as follows, when measured in accordance with ASTM E1155:

1. Specified Overall Value (SOV): 35; and 55 at areas of polished concrete slabs.
2. Minimum Localized Value (MLV): 24.

E. Floor Levelness (FL): Provide floors on grade engineered and constructed to achieve degree of levelness as follows, when measured in accordance with ASTM E1155:

1. Typical Specified Overall Value (SOV): 25.

2. Minimum Localized Value (MLV): 17.

3.03 **DURABILITY CRITERIA**

A. Concrete Durability:

1. Monolithic Concrete Floor Slabs on Grade: Composition and finishing as recommended by ACI 302.1R based on type of anticipated traffic and intended use.
   a. Concrete for elevated slabs shall be 4500 pounds per square inch mix.
   b. Concrete for slabs on grade shall be 4500 pounds per square inch mix.
2. Concrete Slabs on Grade Partly or Completely Exposed to Freezing Conditions:
   a. Water-Cement Ratio: As recommended by ACI 302.1R.
      1) Moderate to Severe Exposure: Maximum 0.50.
      2) Exposure Subject to De-icing Chemicals: Maximum 0.45.
      3) Exposure to Salt Water: Maximum 0.40.
   b. Air Content: In accordance with recommendations of ACI 201.2R
   c. Compressive Strength of 4,500 pounds per square inch.

END OF SECTION

SECTION DC B1
SUPERSTRUCTURE CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The superstructure comprises roofs and elevated floors and their supports.

B. Roofs: Roof construction, including canopies and roof equipment screens and elements required for their support, insulation, concrete pads supporting mechanical equipment fireproofing and firestopping.

C. Elevated Floors: Floor construction above grade, including mezzanine, ramp floors, stair construction if part of the structure and roof decks intended for occupant live load; and the elements required for their support, including insulation, fireproofing and firestopping, as well as finishing, if an integral part of the floor construction.

D. The typical lateral load resisting system for the structure would be concentric braced frames of structural steel members and reinforced masonry shear walls.

PART 2 PRODUCTS

2.01 SUPERSTRUCTURE

A. Use the following:

1. Structural steel frame and glulam wood framing, concrete-filled steel deck for floors and unfilled steel deck for roofs.
    a. Columns would be hollow structural steel columns and solid glulam columns. Typical columns would be HSS 8 inch by 8 inch columns, 16 inch by 16 inch glulam columns and the columns at the double story spaces at the Gymnasium and Cafeteria would be HSS 12 inch by 12 inch.

2.02 B1010 – ROOF SUPERSTRUCTURE

A. Structure Supporting Roofs:

1. Estimated weight of structural steel for various roof areas is as follows:
    a. Typical roof framing: 14 pounds per square foot.
    b. Areas of roof supporting mechanical units: 14 pounds per square foot.
    c. Roof framing for the Gymnasium supporting classrooms: 25 pounds per square foot.
    d. Canopies: 20 pounds per square foot.
2. All roof structures are to be designed to support future photovoltaic panel system.
3. Typical structural framing is composed of wide flange steel beams spanning between steel girders, supported by steel columns.
4. The roof construction for the Cafeteria and Library are composed of structural glue-laminated timber beams spanning between steel and glue-laminated girders, supported by steel and glue-laminated columns. The roof construction for the Gymnasium is composed of steel beams or trusses spanning across the width of the gymnasium.
5. Beams: Would be wide flange structural steel members and glue-laminated members.
6. Masonry will be supported on lintels that are supported from roof and floor framing members where the masonry opening dimension is greater than eight feet.
7. Columns: Columns would be hollow structural steel columns and solid glue-laminated columns. Typical columns would be HSS 8 inch by 8 inch columns, 16 inch by 16 inch glulam columns and the columns at the double story spaces at the Gymnasium and Cafeteria would be HSS 12 inch by 12 inch.
8. Lateral Load Resisting System: The typical lateral load resisting system would be concentric braced frames of structural steel members. The lateral load resisting system of the Gymnasium structure would be reinforced masonry shear walls or ordinary concentric braced frames comprised of HSS structural steel members.
9. Functional Requirements:
    a. Design Requirements:

1) Sustainability or LEED requirements:
   (a) All steel is to consist of a minimum of 95 percent recycled steel with over 80 percent post-consumer and 15 percent pre-consumer recycled content.

10. Components:
    a. All wide flange shapes shall be newly rolled steel conforming to ASTM A992, Grade 50 with a minimum yield point of 50 kips per square inch, unless noted otherwise on drawings.
    b. All bars, plates, channels, and angles shall conform to ASTM A36 unless otherwise indicated on the drawings.
    c. Structural tubing shall conform to ASTM A500, Grade C with a minimum yield point of 50 kips per square inch.
    d. Structural pipe shall conform to ASTM A53, Grade B.
    e. Anchor bolts shall conform to ASTM A307 or ASTM F1554 with a minimum yield point of 105 kips per square inch.
    f. High strength bolts ASTM F3125 with ASTM A563, Grade A Hex style nuts and compatible washers. Bolts shall be cold forged with rolled threads. Bolts with torque control snap-off ends may be used.
    g. Hot Dip Galvanizing shall conform to the latest ASTM specification.
    h. Filler metal for welding shall conform to AISC Code, 2005 Edition, Section I.4.5.
    i. Glue-laminated members shall be douglas fir-larch and shall conform to 24F-V4.

B. Roof Decks, Slabs, concrete pads supporting Mechanical Units and Sheathing
   1. The typical roof construction would be galvanized, corrugated, three inch deep Type ‘N’ metal roof deck and galvanized, corrugated three inch deep, Type ‘NAS’ acoustic metal roof deck at the Gymnasium and Cafeteria.
   2. Functional Requirements:
      a. Design Requirements:
         1) Sustainability or LEED requirements:
            (a) All structural steel and deck is to consist of a minimum of 95 percent recycled steel with over 80 percent post-consumer and 15 percent pre-consumer recycled content.
   3. Components:
      a. Type ‘N’, three inch deep, wide rib, 24 inch wide galvanized sheet carbon steel conforming to ASTM A653, Grade 40 with a minimum yield point of 40,000 pounds per square inch.
      b. Type ‘NCAS’, three inch deep, 24 inch wide galvanized sheet carbon steel conforming to ASTM A653, Grade 40 with a minimum yield point of 40,000 pounds per square inch. Bottom flat deck shall be perforated and filled with acoustic batts that fit into ribs. Minimum noise reduction coefficient of 0.90.

2.03 **B1020 – ELEVATED FLOOR SUPERSTRUCTURE**

A. Structure Supporting Floors:
   1. Typical structural framing is composed of wide flange steel beams and glulam beams spanning between steel girders and glulam girders supported by steel and glulam columns. The weight of the structural steel framing the floors is estimated to be 14 pounds per square foot at typical floors. Floor framing above the gymnasium is estimated to be 25 pounds per square foot.
   2. Beams: Would be wide flange structural steel members and glulam members.
   3. Columns: Columns would be hollow structural steel columns. Typical columns would be HSS 8 x 8 columns, 16 x 16 glulam columns and the columns at the double story spaces at the Gymnasium and Cafeteria would be HSS 12 x 12.
   4. Lateral Load Resisted System: The typical lateral load resisting system would be concentric braced frames of structural steel members. The lateral load resisting system of the

Gymnasium structure would be reinforced masonry shear walls or ordinary concentric braced frames comprised of HSS structural steel members.

5. Functional Requirements
   a. Design Requirements:
      1) Sustainability or LEED requirements:
         (a) All structural steel and floor deck is to consist of a minimum of 95 percent recycled steel with over 80 percent post-consumer and 15 percent recycled content.
6. Components:
   a. All wide flange shapes shall be newly rolled steel conforming to ASTM A992, Grade 50 with a minimum yield point of 50 kips per square inch, unless noted otherwise on drawings.
   b. All bars, plates, channels and angles shall conform to ASTM A36 unless otherwise indicated on the drawings.
   c. Structural tubing shall conform to ASTM A500, Grade C with a minimum yield point of 50 kips per square inch, unless noted otherwise on drawings.
   d. Structural pipe shall conform to ASTM A53, Grade B.
   e. Anchor bolts shall conform to ASTM A307 or ASTM F1554 with a minimum yield point of 105 kips per square inch, unless noted otherwise on drawings.
   f. High strength bolts ASTM F3125 with ASTM A563, Grade A Hex style nuts and compatible washers. Bolts shall be cold forged with rolled threads. Bolts with torque control snap-off ends may be used.
   g. Hot Dip Galvanizing shall conform to the latest ASTM specifications.
   h. Filler metal for welding shall conform to AISC Code, 2005 Edition, Section I.4.5.
   i. Glue-laminated members shall be douglas fir-larch and shall conform to 24F-V4.

B. Floor Decks, Slabs and Toppings
   1. Typical floor slab is five ¼ inch light weight concrete composite metal deck slab reinforced with welded wire fabric.
   2. Functional Requirements
      a. Design Requirements:
         1) Sustainability or LEED requirements:
            (a) All deck is to consist of a minimum of 95 percent recycled steel with over 80 percent post-consumer and 15 percent pre-consumer recycled content.
   3. Components:
      a. Floor deck shall be composite wide rib two inch deep sheet carbon, galvanized conforming to ASTM A1008 or A653 with a minimum yield point of 40,000 pounds per square inch. Deck shall be formed with deformations to provide a mechanical lock between concrete and steel.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Structural elements, above grade, capable of supporting all anticipated loads without failure or damage.

B. Where superstructure elements also must function as elements defined within another element group, meet requirements of both element groups.

3.02 HEALTH AND SAFETY CRITERIA

A. Fire Resistance: Design and select materials to provide fire resistance in accordance with code and the following:
   1. General Structure: the construction of the building is Type II-A – fire resistance of the general building structure, including columns, beams, floors, bearing walls or roof construction is needed, as noted below. The construction of the Library and Cafeteria is Type-IV.

2. Other Members Fire Resistance:
   a. Primary structural steel framing: One hour.
   b. Floor construction and associated secondary structural steel framing: One hour.
   c. Roof construction and associated secondary structural steel framing: One hour.
   d. Primary structural steel framing, floor construction, and associated secondary structural steel framing at Emergency Electrical Rooms: Two hour.

END OF SECTION

SECTION DC B2
EXTERIOR VERTICAL ENCLOSURES CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior enclosure consisting of the essentially vertical separation between exterior and interior conditioned space, including exterior walls, parapets, exterior windows, exterior doors, other openings, exterior wall fixtures, and other exterior enclosure elements.

B. Exterior Walls: The supporting structure; the exterior skin, vapor retarders, air barriers, and insulation; glazed walls; the interior skin if an integral part of the wall; exterior screens and railings; balcony walls and parapets; exterior soffits unless they do not form a weather barrier; firestopping and draft stopping within wall and between wall and floors; and other exterior wall elements.

1. Non-vertical-load bearing and vertical load bearing walls.

C. Exterior Windows: Windows, fixed glazing other than glazed walls, ventilation openings, protection devices for openings, and elements that form or complete the openings, unless an integral part of another element.

D. Exterior Doors and Grilles: Doors at every opening in the exterior wall that function to allow the entrance and exit of people, vehicles, and goods; including exterior doors of various sizes and uses, operable grilles and screens, gates, and other exterior door opening elements.

E. Exterior Louvers and Vents: Exterior louvers which are not an integral part of mechanical equipment, including louvers connected to ducts.

F. Exterior Wall Appurtenances: Elements attached to the outside of the exterior walls, unless consisting of equipment or services fixtures. Exterior wall appurtenances required are those defined in the project program and those made necessary by the design.

G. Horizontal sunshade devices: Modular, shop fabricated, fixed extruded aluminum sun screens to be mounted on structure.

H. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

PART 2 PRODUCTS

2.01 EXTERIOR WALL ELEMENTS

A. Exterior Skin of Exterior Walls:

1. Use the following:
    a. Face brick veneer at typical exterior walls indicated on the building elevations.
        1) Standard modular size; running bond.
        2) Brick Veneer Type 1:
            (a) Basis of Design: Glen Gery Rustic Red Flashed.
            (b) Watsontown Blair Molded Flashed.
            (c) Belden Brick Revere Blend.
        3) Brick Veneer Type 2:
            (a) Basis of Design: Glen Gery Bermuda Blue Glazed.
            (b) Belden Brick Wrangler Glazed.
            (c) Elgin Butler Dynamic Blue.
        4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. Cast Stone at areas surrounding curtainwall, mid-wall and roof water table / banding, as indicated on drawings.
    1) 2 foot by 4 foot panels.
        (a) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) Basis of Design: Custom Cast Stone: Masonry Veneer.
            (2) Hanover Architectural Products: Reconstructed stone all panels.
            (3) Fernandes Precast Company.
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
c. Metal composite panel siding at typical exterior walls, as indicated on building elevations.
    1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        (a) Basis of Design: 3A Composites USA; Alucobond: www.alucobondusa.com.
        (b) ALPOLIC Materials; ALPOLIC / fr (fire resistant core): www.alpolic-americas.com.
        (c) Fairview Architectural LLC; VitraBond FR: www.fairviewarchitectural.
        (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
d. Wall Panel System Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        (a) Centria Architectural Systems: global.centria.com/products. (Basis of Design)
        (b) Doralco Architectural Metal Solutions: www.doralco.com.
        (c) LYMO Architectural Panel Systems Inc.; Back-ventilated metal composite material panel rainscreen system: lymoconstruction.com.
        (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
e. Concrete Unit Veneer Masonry (CUVM) at typical exterior walls indicated on the building elevations.
    1) Size: 3-5/8 inches deep by 15-5/8 inch high by 23-5/8 inches wide.
    2) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        (a) Custom Cast Stone, CCS-SF 116 Light Buff. (Basis of Design)
        (b) Hanover Architectural Products, Reconstructed Stone M115 Tudor.
        (c) Shouldice, Texstone Pearl.
        (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2. Joint Sealers in Exterior Skin:
    a. Use the following:

1) Silicone sealant at all exterior masonry veneer and other building joints except for expansion and movement joints.
   (a) Manufacturers:
      (1) Dow Corning Corporation.
      (2) Pecora Corporation.
      (3) Tremoc Global Sealants- Tremco Spectrum 1. (Basis of Design)
      (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
2) Preformed compressible foam sealant at movement and expansion joints.
   (a) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      (1) Emseal Joint Systems, Ltd.: Seismic Colorseal. (Basis of Design)
      (2) Schul International.
      (3) Tremco Global Sealants.
      (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

3. Vapor Retarder / Air Barrier:
   a. Use the following:
      1) Two-component synthetic rubber, fluid applied air and vapor barrier membrane at areas of rigid insulation on exterior walls.
         (a) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) Carlisle; Fire-Resist Barritech NP. (Basis of Design)
            (2) Henry Company.
            (3) W.R. Meadows.
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

4. Insulation:
   a. Use the following:
      1) At exterior cavity walls with metal stud or CMU backup:
         (a) Rigid polyisocyanurate insulation, R-26 minimum, with spray-applied vapor-retarder/ air infiltration barrier exterior of the sheathing, continuous.
         (b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) Dow Chemical Company.
            (2) Dupont de Nemours, Inc.
            (3) Owens Corning.
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
         (c) Mineral fiber batt insulation between metal studs, R-21 minimum.
         (d) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:

(1) Certainteed.
(2) Johns Manville.
(3) Owens Corning.
(4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2) At exterior metal composite material wall panels rain screen:
(a) Mineral wool semi-rigid board insulation, R-29.4 minimum.
(b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(1) Johns Manville.
(2) Rockwool (ROXUL).
(3) Thermafiber.
(4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

3) Foamed-in-place insulation.
(a) Self-adhesive, rubberized asphalt/ polyethylene detail membrane at edges of wall construction to seal penetrations and edges of air barrier materials, including window, storefront, and curtainwall openings, louvers, and bridge transitions in differing materials within supporting structure of exterior walls.
(b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(1) Carlisle Spray Foam.
(2) Johns Manville; JM Corbond III. (Basis of Design)
(3) NCFI Polyurethanes.
(4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

B. Supporting Structure of Exterior Walls:
1. Use one of the following:
a. Load-bearing unit masonry assemblies at locations indicated on drawings.
b. Cold formed metal framing at locations indicated on drawings.
1) Vertical Spans up to 15 feet: 6 inch deep framing.
2) Vertical Spans over 15 feet: 8 inch deep framing.
c. Glazed aluminum curtain wall at locations indicated on drawings.

C. Exterior Ceilings and Soffits:
1. Use one of the following:
a. Metal composite material panel system soffits.
1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(a) 3A Composites USA Alucobond. (Basis of Design)
(b) Alcoa, Inc.; Reynobond Anodized.
(c) ALPOLIC Materials; ALPOLIC / fr.
(d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability,

performance, and appearance. Submit as substitutions.

D. Exterior Railings:
   1. Use one of the following:
      a. Stainless steel at all locations.

E. Horizontal sunshade devices: Modular, shop fabricated, fixed extruded aluminum sun screens to be mounted on structure.
   1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      a. Architectural Grilles & Sunshades, Inc.: www.agsshade.com.
      b. Construction Specialties: www.c-sgroup.com.
      c. Ruskin Company: www.ruskin.com.
      d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.02 EXTERIOR DOORS

A. Pedestrian Doors:
   1. Provide weatherstripping and thresholds.
   2. Use one of the following:
      a. Aluminum-framed glazed entrance doors at vestibule door locations, and at locations indicated on drawings.
      b. Hollow steel doors at utility and mechanical spaces.
      c. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) Ceco, an Assa Abloy Company.
         2) Curries, and Assa Abloy Company.
         3) Pioneer, an Assa Abloy Company.
         4) Republic, an Allegion Company.
         5) Steelcraft, an Allegion Company.
         6) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

B. Overhead Coiling Doors: at locations indicated on drawings.
   1. Use the following:
      a. Overhead coiling doors, operating hardware, and electric operation.
      b. Include wiring from electric circuit disconnect to operator control station.
      c. Curtain construction: interlocking steel slats.
      d. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) The Cookson Company: www.cooksondoor.com.
         2) Cornell Iron Works, Inc: www.cornelliron.com.
         3) Overhead Door Inc: www.overheaddoor.com.
         4) Raynor Door: DuraCoil Standard: www.raynor.com. (Basis of Design)
         5) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

C. Hardware for Swinging Doors:

1. Use satin, chrome or stainless steel finish at all locations.
2. Hinges: Ball-bearing butt hinges or continuous hinges.
3. Exit Devices: Unless specifically indicated as one type, mortise type, rim type, exposed vertical rod type, concealed vertical rod type, or recessed concealed rod at corridor doors.
4. Locksets: Unless specifically indicated as one type, mortise, bored (cylindrical), interconnected lockset and deadbolt, or unit type.
5. Door Closers: Unless specifically indicated as one type, surface overhead frame-mounted type, surface overhead door-mounted type, concealed overhead frame-mounted type, concealed overhead door-mounted type, or spring hinges.
6. Door Stops: Unless specifically indicated as one type, floor-mounted type, wall-mounted type, or overhead door/frame mounted type.
7. Door Hold-Opens: Unless specifically indicated as one type, floor-mounted type, wall-mounted type, or overhead door/frame mounted type.

D. Glazing in Doors: Glass and plastic.
1. Type: Triple pane insulated glass units.
a. SHCC = 0.31.
b. VLT / SHGC ratio = 1.84.
2. Type: Dual pane insulated glass units, where triple-pane cannot be used:
a. SHGC = 0.39.
b. VLT SHGC ratio = 0.
3. Use one of the following:
a. Fully tempered glass at all locations except where noted otherwise.
b. Security Glazing, double glazed: School Guard (SG4).
1) Locations: At all glazed entry doors.
2) SHGC = 0.33.
3) VLT / SHGC = 1.67.

2.03 WINDOWS

A. Windows (Operable and Fixed):
1. Window Operation: Use the following:
a. Casement outswinging or inswinging windows at locations indicated on drawings.
b. Projected outswinging awning windows at locations indicated on drawings.
c. Fixed non-operable windows at all locations not indicated to be casement or projected outswinging.
2. Glazing: Triple pane insulated units.
a. Security Glazing, double glazed: School Guard (SG4).
1) At all lower operable sash at Level 1.
2) SHGC = 0.33.
3) VLT / SHGC = 1.67.
3. Use one of the following:
a. Aluminum windows, thermally broken, at all locations indicated as type "W-#".
1) SHGC: 0.31.
2) VLT / SHGC ratio: 1.84.
3) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(a) EFCO; X-therm 325X. (Basis of Design)
(b) Kawneer; AA 4325.

(c) Graham; GT6800.
(d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

4. Provide extended perimeter mullions wrapped in composite metal panel as indicated on drawings.

B. Curtainwall Assemblies:
1. Thermally broken extruded aluminum curtainwall framing system with pressure plate glazing installation at large and continuous window installations.
a. Venting window assemblies integrated into curtainwall framing at locations indicated in drawings.
b. Depth: 4 inch minimum (structural tube dimension).
c. Width: 2-1/4 inch minimum (structural tube dimension).
d. Finish: 3-coat PVDF paint finish with 20-year finish warranty.
e. Basis of Design: 5600 X-Therm Series with Duracast pressure plates by EFCO Corp or equal.
f. Doors as specified above.
g. Glazing: insulated glazing, insulated spandrel glazing, and insulated security glazing, see Glazing below.

C. Glazing: Glass.
1. Use the following:
a. Fully tempered glass at locations indicated on drawings or required by code.
b. Low E glass at all locations.
c. Triple pane insulated glass units.
d. Spandrel Glazing to match sealed insulating glass units.

2.04 OTHER EXTERIOR OPENINGS

A. Ventilation Openings: Cover natural and mechanical ventilation openings.
1. Material: Aluminum or steel.
2. Use the following:
a. Stationary blade vents or louvers at locations indicated on mechanical drawings.

2.05 OTHER EXTERIOR ENCLOSURE ELEMENTS

A. Lintels:
1. Use the following:
a. Structural steel framing at openings in brick veneer and concrete masonry back-up wall construction over 10 feet wide.
b. Structural steel HSS framing at all openings in masonry load-bearing walls.

B. Sills:
1. 1/8 inch thick, extruded aluminum; sloped for positive wash; fit under sash leg to 1/2 inch beyond wall face; one piece full width of opening; jamb angles to terminate sill end.
a. Brick sills at window openings above grade.

C. Expansion Control: Provide covers for interior and exterior expansion joints in exterior wall construction that protect joints from debris and provide weather-resistant assembly integrated into wall construction.
1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
a. Architectural Art

b. Construction Specialties, Inc. (Basis of Design)
c. Inpro Corp.
d. MM Systems Corp.
e. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

D. Concealed Flashings:
1. Use the following:
a. Stainless steel flashing at head joints, below elevated sills, relieving angles, wall to roof transitions, and base of wall at all brick veneer locations.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Provide an essentially vertical separation between exterior and interior conditioned space, which keeps out weather, uninvited people, and animals and insects, without unusual action by occupants, while providing convenient movement of occupants between inside and outside, desirable natural light, and views from inside to outside.
B. Fill, cover, close, or otherwise protect every opening in the exterior walls (other than doors) so that the entire exterior enclosure functions as specified, using windows and other opening elements as specified, without using components that must be installed at changes of season.
C. Where exterior enclosure elements also must function as elements defined within another element group, meet requirements of both element groups.

END OF SECTION

SECTION DC B3
EXTERIOR HORIZONTAL ENCLOSURES CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roofing consisting of every element forming weather and thermal barriers at the sloped or essentially flat weather-proof enclosure over the entire "top-side" of building and over exposed floor superstructure, including plaza decks, balconies, and other exposed floors; including roof coverings, closures for roof openings, roof fixtures, and other roof elements, not including the structural supporting elements of the roof.
   1. Steep Slope Roofing: Lapped roofing shingles, shakes and roofing tiles, including fastening and flashing products and methods.
   2. Low-Slope Roofing: Includes membrane roofing of various types and protected membrane roofing, including fastening and flashing products.
   3. Canopy Roofing: Roofing of various types over canopies.

B. Roof Appurtenances: Every element attached to the roof, unless equipment or services or specified elsewhere, and mounting brackets or frames for roof mounted services and equipment; roof fixtures required are those required by the program, those made necessary by the design, and the following:

C. Horizontal Openings: Skylights, roof windows, ventilation openings, access openings such as hatches, vents, and other elements necessary to close roof openings, and elements associated with those openings.

D. Overhead Exterior Enclosures: Exterior ceilings, soffits, and bulkheads.

E. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. AAMA. American Architectural Manufacturers Association; www.aamanet.org.

B. ASTM. ASTM International; www.astm.org.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).

C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

PART 2 PRODUCTS

2.01 ROOF COVERINGS

A. Roof Coverings, General:
   1. Use the following:
      a. Product whose installation method is specified in the code, provided the material complies with specified requirements.

B. Low Slope Flat Roofs:
   1. Use the following:
      a. Elastomeric roofing membrane, EPDM.
         1) Installed over insulation and fully-adhered.

         OR

b. Thermoplastic roofing membrane, TPO.
   1) Installed over insulation and fully-adhered.
   2) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      (a) Carlisle Roofing Systems.
      (b) Xcel (Firestone), Ultra Ply Platinum. (Basis of Design)
      (c) GAF.
      (d) Johns Manville.
      (e) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

C. Concealed Deck Roofing/Waterproofing:
   1. Use the following:
      a. Thermoplastic sheet roofing/waterproofing membrane, TPO.
         1) Installed over insulation and fully-adhered.
         2) Provide secondary protective layer of membrane below all roof pavers and vegetative roof components.
         3) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (a) Carlisle Roofing Systems.
            (b) Xcel (Firestone), Ultra Ply Platinum. (Basis of Design)
            (c) GAF.
            (d) Johns Manville.
            (e) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

D. Insulation Over Roof Superstructure:
   1. Use the following:
      a. Low Slope Roofs: Preformed polyisocyanurate insulation board.
         1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (a) Atlas Roofing.
            (b) DuPont.
            (c) GAF.
            (d) Xcel (Firestone), ISOGard GL. (Basis of Design)
            (e) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
      b. Insulation to provide R-60 minimum, base insulation thickness, with built-up tapered insulation for crickets and over level rood framing areas.
      c. Installed in multiple layers with staggered joints, taped and sealed.
      d. Steep pitched and low slope roofs: Vented nailbase board with preformed polyisocyanurate insulation factory bonded to 1/2 inch thick OSB with 1-1/2 inch high spacer blocks to provide continuous ventilation cavity below OSB sheathing as top layer of insulation at steep slope roofs.

E. Flashing, Trim, and Accessories:

1. Use the following:
    a. Factory-finished aluminum-zinc alloy coated steel sheet metal.
        1) Sheet Steel: 40 ksi, galvalume coated per ASTM A792/A792M, and prefinished with PVDF 70 percent superior performance AAMA 2605 3-coat system, primed, with chrome conversion pre-treatment.
        2) 22 gage thickness for all roof edge fascia flashings.

2.02 ROOF OPENINGS

A. Roof Openings In General:
    1. Use the following:
        a. Product specified in the code, provided the material complies with specified requirements.
B. Access Openings:
    1. Use the following:
        a. Hinged roof hatches.
        b. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            1) The Bilco Company; F-50TB: www.bilco.com. (Basis of Design)
            2) Dur-Red.
            3) Milcor.
            4) Nystrom.
            5) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.03 ROOF APPURTENANCES

A. Screens:
    1. Provide permanent concealment of rooftop items using roof screens, as indicated on Drawings.
    2. Galvanized steel framed support structure, anchored to building and faces with prefinished corrugated 22 gage steel.
    3. Light-colored 70 percent PVFD coating.
B. Exterior Roof ladders:
    1. Provide ladders as indicated on drawings, or at a minimum to connect all low-slope roofs with the roof at a point of roof access.
    2. Fabricated ladders of painted galvanized steel construction.
    3. Provide ladder cages where height between roof levels or from ground to roof exceeds 24 feet.
C. Roof Walk Pads: Provide roof walk-way pads around all roof top mechanical equipment and from roof hatches to all such equipment.
D. Acoustic Screens: At Rooftop Chiller.
    1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        a. Acousticabs: SPS Acoustic Screen SPS/H.
        b. Parklane: AcoustaMod.
        c. RoofScreen: SoundGuard Acoustical Panels.
        d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and

appearance. Submit as substitutions.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Provide a weather-proof enclosure over the entire "top-side" of building that also excludes unwelcome people, animals, and insects without requiring specific action by occupants, while shedding water and preventing uncontrolled water infiltration, withstanding anticipated loading conditions, providing required access, and permitting the entry of desirable natural light.

B. Where roofing elements also must function as elements defined within another element group, meet requirements of both element groups.

3.02 AMENITY AND COMFORT CRITERIA

A. Convenience:

1. Provide a fixed ladder, stair, ship's ladder, or alternating tread stair leading to each hatch used for access to roof equipment or required by code.
2. Access Hatches: Openable from outside, provided user unlocked from inside before exiting.

B. Appearance:

1. Concealment of Services and Equipment: Provide permanent concealment of rooftop items using substantial construction other than screens.
2. Color: Compatible with energy efficiency design.

END OF SECTION

SECTION DC C2
INTERIOR FINISHES CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior finishes consisting of the following elements:
   1. Wall finishes, including those applied to the interior face of exterior walls and to the vertical faces of superstructure elements.
   2. Floor finishes.
   3. Ceiling and soffit finishes.
   4. Stair finishes, except for integral stair surfaces.
   5. Cubicle Curtains
   6. Finishes applied to other interior surfaces.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. ASTM. ASTM International; www.astm.org.

B. USDA. United States Department of Agriculture: www.usda.gov.

1.03 REFERENCED STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:

B. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

PART 2 PRODUCTS

2.01 C3030 CEILINGS AND CEILING FINISHES

A. Painted gypsum board ceilings at Extended Learning, soffit areas and underside of stairs, see drawings.

B. Direct-attached wood fiber acoustical panels: provide at areas indicated on drawings.
   1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      a. Armstrong Tectum Panels; www.armstrongceilings.com.
      b. Substitutions: The Awarding Authority has determined that use of the product listed is in the project's and public's best interests and will vote to designate the listed product as a proprietary bid product.

C. Integrated ceiling assemblies: provide at areas indicated on drawings.
   1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      a. Armstrong AcoustiBuilt Seamless Acoustical Ceiling System; www.armstrong.com.
      b. Substitutions: The Awarding Authority has determined that use of the product listed is in the project's and public's best interests and will vote to designate the listed product as a proprietary bid product.

D. Acoustical tile ceilings: Provide as indicated in drawings.
   1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:

a. Armstrong World Industries, Inc.; www.armstrongceilings.com.
b. CertainTeed Corporation; www.certainteed.com.
c. Hunter Douglas; www.hunterdouglasarchitectural.com.
d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2. ACP-1a (2 by 2 feet); Calla 15/16-inch grid; Armstrong. Typical for classrooms, educational spaces.
3. ACP-2: Not used.
4. ACP-3: Not used.
5. ACP-4a (2 by 2 feet): Kitchen Zone system. Typical for Kitchen.
6. ACP-5: Not used.
7. ACP6A (2 by 2 feet): Optima system, at Music, Flex, Instrumental, and acoustically sensitive spaces.
8. WD-1: Basis of Design: MetalWorks. Typical at exterior canopies, Extended Learning, Cafeteria balcony, as indicated on drawings.
9. WD-2: Basis of Design: Woodworks Canopies. Typical at exterior canopies, Extended Learning, Cafeteria balcony, as indicated on drawings.

2.02 C3010 WALL FINISHES

A. Refer to elevations and finish schedule in drawings for wall finishes, which include the following:
B. Use one of the following:
1. Glazed ceramic wall tile, TILE-1, at all corridor walls up to 42 inches above finish floor, and paint above.
a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) American Olean Corp.
2) Creative Materials Corp.
3) Dal-Tile. (Basis of Design)
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
b. 18-inch by 36-inch rectangular tile.
2. Glazed ceramic wall tile, TILE-2, at Toilet Rooms.
a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) American Olean Corp.
2) Creative Materials Corp.
3) Dal-Tile. (Basis of Design)
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
b. 12-inch by 24-inch rectangular tile.
3. Glazed ceramic wall tile, TILE-3, at Kitchen.
a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) American Olean Corp.

2) Creative Materials Corp.
3) Dal-Tile. (Basis of Design)
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. 48-inch by 48-inch square tile.

4. Quarry tile, TILE-5, at Kitchen.
   a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) American Olean Corp.
      2) Creative Materials Corp.
      3) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
   b. 8-inch by 8-inch square tile, and cove base.
5. Mortar:
   a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) ARDEX Engineered Cements.
      2) Bostik, Inc.
      3) Laticrete International. (Basis of Design)
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
6. Grout:
   a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) ARDEX Engineered Cements.
      2) Bostik, Inc.
      3) Laticrete International.
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
7. Non-ceramic trim: brushed stainless, style to suit application.
   a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) ARDEX Engineered Cements.
      2) Bostik, Inc.
      3) Schluter Systems.
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
8. Acoustical wall panel treatment at Music, Media Center (Library), Cafeteria, OT / PT, and Flex classrooms.
   a. Type AWP: Fabric-covered acoustical panels for walls.
      1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:

(a) Acoustical Resources.
(b) Armstrong World Industries.
(c) Decoustics; Fabric-Covered Acoustical Panels for Walls or Ceilings
(d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. Type WWP: Wood veneer sound-absorbing units for walls:
1) Medium density fiberboard core panels with prime grade finished face veneer and non-woven acoustic materials adhered to back of panels, at Media Center (Library) and Cafeteria.
2) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(a) RPG Acoustical Systems, Inc.
(b) CertainTeed.
(c) Murano; MDF core panels with prime grade finished face veneer and non-woven acoustic material adhered to back of panel.
(d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

c. Type DWP: Wrapped thermoformed fiberglass diffusing panels, at Music:
1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
(a) Conwed Designscape by CDC Corp.
(b) Golterman and Sabo.
(c) Kinetics: Geometric Diffusers - Offset Pyramidal. (Basis of Design)
(d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

9. Digitally Printed Wall Covering, DPW; for custom digital graphics provided by Architect:
a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) Astek Wallcoverings: www.astek.com.
2) Designtex; Design Studio www.designtex.com/digital-studio.
3) Dreamscape wall coverings, dreamscapewalls.com.
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

10. Interior paints (PT) at all rooms unless noted as a different finish herein.
a. Epoxy paint (EPT) at Kitchen, toilet rooms, and maintenance / service rooms for cleaning durability.

11. Concrete masonry units (CMU), painted.
a. Standard 16 by 8-inches.
b. Bullnose corners.
c. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) Genest.
2) Jandris. (Basis of Design)

3) Trenwyth.
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

12. Acoustic ACMU block at 25 percent of exposed CMU walls at Gymnasium.
    a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        1) Jandris; Acoustic "Soundcell" CMU. (Basis of Design)
        2) Trenwyth.
        3) Westbrook Concrete Block.
        4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
    b. NRC: 0.70 minimum.
    c. Running bond.
13. Polished ground-face concrete block (GCB-1), at Stair shafts.
    a. Basis of Design: Jandris.
    b. This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
14. Wall and corner guards: (CG).
    a. Type CG-1: Plastic-covered metal.
        1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (a) Construction Specialties, Inc.; Acrovyn SM-20N.
            (b) Inpro.
            (c) Koroseal Interior Products.
            (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
    b. Type CG-2: Stainless steel.
        1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (a) Construction Specialties; CO-8 90 degree, CO-8M custom angle, SCO-8M U-shaped. (Basis of Design)
            (b) Inpro.
            (c) Pawling Corp.
            (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
    c. Align with tile height of 4 feet, with 4-inch resilient base.

2.03 C3020 FLOOR FINISHES

A. Refer to finish schedule for floor finishes, which include:
    1. Ceramic floor tile TILE-6 at Toilets.
        a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            1) American Olean Corp.

2) Creative Materials Corp.
3) Dal-Tile. (Basis of Design)
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. 12-inch by 24-inch rectangular floor tile.

2. Resinous epoxy floor (EPX-1) and base at back of house and custodial areas, chair storage, receiving, trash and recycling, custodial workshop, custodial storage, and water service.
   a. High build, chemical resistant, self-leveling, high solids.
   b. 1/8-inch.
   c. Non-skid.
   d. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Dur-a-Flex.
      2) Crossfield Products.
      3) Sherwin Williams; Resuflor. (Basis of Design)
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
3. Wood athletic floor system (WAF):
   a. 2-1/2-inch thick system of hardwood strip flooring system on resilient cushions, including game line markings for full court and half-court basketball and volleyball.
   b. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Armstrong World Industries.
      2) Robbins Sports Surface. (Basis of Design)
      3) Somerset Hardwood Flooring.
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
   c. Maple, stained, tongue and groove.
4. Stage floor (ST-1) at Stage:
   a. Polymer board, vapor retarder, sleepers, and sub-flooring.
   b. 1/4 inch thick, four by 8 foot sheets, black.
   c. Basis of Design Product: Polyonyx+ Performance Flooring.
      1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
5. Resilient Athletic Flooring (RAF), at locations indicated on drawings:
   a. Vulcanized, natural and synthetic rubbers.
   b. Thickness: 6 mm minimum.
   c. Sheet width: 72 inches minimum.
   d. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Connor Sports Flooring; Control XT. (Basis of Design)
      2) Ecore; OSST SPORTS - Compact Marble; www.ecoreathletic.com.
      3) Mondo USA.

4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

6. Resilient sheet linoleum (LIN) flooring with rubber base at Classrooms, Classroom Corridors, and locations indicated on Drawings.
   a. Patterned flooring in multiple colors.
   b. Assume up to ten colors in each room or area.
   c. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Forbo Flooring, Inc., Marmoleum.
      2) GerFlor. (Basis of Design)
      3) Tarkett.
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
7. Resilient sheet flooring (RSF) at Art, Music, and Nurse's suite:
   a. 100 percent rubber.
   b. Smooth.
   c. Heat welded.
   d. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Roppe Corp.
      2) Mondo Contract.
      3) Nora Systems, Inc; Norament - Satura. (Basis of Design)
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
8. Rubber stair tread (RST):
   a. One-piece, full width and depth of tread.
   b. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Mannington.
      2) Nora Systems, Inc; Norament - Satura. (Basis of Design)
      3) Tarkett.
      4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
9. Resilient Base (RB).
   a. TS rubber, vulcanized thermoset, Style B, cove.
   b. Rolled, premolded corners, end stops.
   c. Basis of Design Product: Roppe Corp.; Wall Base.
10. Carpet Tile (CPT) with rubber base at offices and administration suite.
   a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Interface; Aerial Flying Colors. (Basis of Design)
      2) Shaw Contract.

3) Tarkett.
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

11. Walk-Off Grille (WOG):
    a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        1) Amarco.
        2) Construction Specialties.
        3) Matter Surfaces. Design Track. (Basis of Design)
        4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
12. Walk-Off Mats (WOM) at vestibules (50 percent):
    a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        1) Construction Specialties M1 Pedimat. (Basis of Design)
        2) Matter Surfaces.
        3) Reese Enterprises.
        4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
13. Walk-Off Carpet Tiles: at vestibules (50 percent):
    a. Manufacturers:
        1) Mannington Commercial.
        2) Matter Surfaces; Trilogy. (Basis of Design)
        3) Shaw Carpet.
        4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.04 CUBICLE CURTAINS

A. Provide cubicle curtains and tracks at Nurse's office.
    1. Surface mounted overhead tracks and curtain.
    2. Flame resistant or flameproofed close-weave polyester, anti-bacterial, self-deodorizing, sanitized, and pre-shrunk.
    3. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        a. Designtex.
        b. Knoll.
        c. Maharam; Immerse. (Basis of Design)
        d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Provide appropriately finished interiors for all spaces required by the program.

B. Where interior finishes are integral with elements defined within another element group, meet requirements of both element groups.

C. In addition to the requirements of this Section, comply with all applicable requirements of Section DC C - Interiors Criteria - Interiors Criteria.

3.02 HEALTH AND SAFETY CRITERIA

A. Flammability:

1. Ceilings in Exits and Corridors: Provide ceilings with indexes not greater than the following, when tested in accordance with ASTM E84.
2. Walls in Exits and Corridors: Provide wall surfaces with indexes not greater than the following, when tested in accordance with ASTM E84.
3. Ceilings in Primary Spaces: Provide ceilings with indexes not greater than the following, when tested in accordance with ASTM E84.
4. Walls in Primary Spaces: Provide wall surfaces with indexes not greater than the following, when tested in accordance with ASTM E84.
5. Floors in Primary Spaces: Provide floor surfaces with ratings not greater than the following:
   a. Critical Radiant Flux of 0.22 W/sq. cm, per ASTM E648.

B. Slip Resistance: For spaces subject to floor wetting, including entry lobbies, provide floor finishes with inherent slip resistance under wet conditions.

1. At building entries, provide means for reducing or minimizing moisture and debris on shoe soles.
2. At spaces such as kitchens, areas in retail spaces, treatment rooms, laboratories, steam rooms, and toilets, provide floor surfaces with minimum static coefficient of friction of 0.60 when dry, measured in accordance with ASTM D2047.
3. At stairs and corridors, provide floor finishes with minimum static coefficient of friction of 0.60, measured in accordance with ASTM D2047.

C. Cleanliness:

1. For kitchens, provide wall, ceiling, and floor surfaces that are USDA approved.

END OF SECTION

SECTION DC C3 1
INFORMATION FIXTURES CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Information specialties consist of the following:
   1. Identifying devices, such as signs, dimensional letters, plaques, and directories.
   2. Visual display surfaces, such as marker boards, tack boards, smart boards, projection screens and other projection surfaces.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. CFR. Code of Federal Regulations; www.gpo.gov.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:
   a. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.

PART 2 PRODUCTS

2.01 C 1030 FITTINGS - IDENTIFYING DEVICES

A. Identifying Devices:
   1. Use the following:
      a. Lighted dimensional characters at building exterior at each main entrance and at other locations indicated on drawings.
      b. Vinyl applique letters adhered to the interior and exterior face of each exit door
      c. Vinyl applique letters adhered to the exterior of each window, for emergency response purposes.
      d. Adhesive signage for concealed cavity locations.

B. Identifying Devices using the following methods and techniques:
   1. Prefinished sign systems for surface mounting throughout the project.

C. Interior Wall-Mounted Signs:
   1. Use the following:
      a. Dimensional letter signs using aluminum letters.
      b. Wall or door mounted room identification signs with raised text and braille characters, and pictograms where required by barrier free codes.
      c. Cast bronze commemorative dedication plaques at exterior at Administration Suite / Cafeteria / Entry Vestibule.
      d. Cast aluminum and glass LEED plaque at exterior at Administration Suite / Cafeteria / Entry Vestibule.
      e. Cast bronze time capsule plaque.

D. Directional Signs:
   1. Use one of the following:
      a. Individual, 3-dimensional metal characters at entrances to Gym, Auditorium, Media Center, Cafeteria, and Administrative Offices.

2.02 C1030 FITTINGS - VISUAL DISPLAY SURFACES

A. Erasable Surfaces (Marker Boards):

1. Use one of the following:
    a. Porcelain enameled steel in metal frames.
2. Location and sizes of Marker Boards:
    a. Administration - one 8 foot wide board in metal frame at each conference room. One 6 foot wide board in metal frame at Principals Office, Assistant Principals Office, and Open Office area. One 4 foot wide board in metal frame at Coach's Office, and all other Offices.
    b. Typical Classrooms, and Special Ed Classrooms - Two 6 foot wide boards in frames and with chalk tray, cork map rail, flanking either side interactive smart board. One 12 foot wide board in frame with chalk tray, cork map rail and flag holder at rear of each classroom.
    c. Art and Music Classrooms - Two 8 foot wide boards in frames with chalk tray, cork map rail and flag holder.
    d. Gymnasium - One 6 foot wide board in frame with chalk tray, cork map rail and flag holder, at each teaching station. Two total.
    e. Kitchen - One 4 foot wide marker board in Kitchen area
    f. Small Group - One 4 foot wide board in frame with chalk tray, and smart board
    g. Typical Teacher Collaboration: One 6 foot wide marker board in frames with chalk tray.

B. Tackable Material (Tack Boards):
1. Use one of the following:
    a. Wood fiberboard with linoleum visible surface in metal frames.
2. Location and sizes of Tack Boards:
    a. Lobbies and Corridors - Tackboards at selected locations. Minimum one 6 foot wide board in frame outside each classroom
    b. Administration - two 4 foot wide boards in metal frames at Open Office area.
    c. Typical Classrooms - two 6 foot wide boards per classroom.
    d. Art and Music Classrooms - two 6 foot wide boards.
    e. Gymnasium - two 6 foot wide tack boards
    f. Typical Teacher Collaboration - one 6 foot wide board.

C. Projection Screens:
1. Use the following:
    a. Front projection screens manufactured for the purpose, powered operation for concealed installation above ceilings.
2. Location and Sizes:
    a. Library / Media Center - one 16 foot wide by 9 foot high screen
    b. Platform - one 16 foot wide

C1030 FITTINGS - INTERACTIVE SMART BOARDS WITH INTEGRAL SHORT-THROW WALL MOUNTED LCD PROJECTORS

A. Typical Classrooms - 8 foot wide smart board and LCD projector at teaching wall
B. Library/ Media Center - 8 foot wide smart board and LCD projector. One Ceiling mounted LCD projector.
C. Art and Music Classrooms - 8 foot wide smart board and LCD projector at teaching wall
D. Administration Conference Room -8 foot wide smart board and LCD projector
E. Staff Dining- 8 foot wide smart board and LCD projector

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Signage:
   1. Room or function labels applied to doors or walls immediately adjacent to doorways.
      a. Room Label Signs: Provide room label signs for all spaces.
B. Where information specialties are integral with elements defined within another element group, meet requirements of both element groups.

3.02 AMENITY AND COMFORT CRITERIA

A. Accessibility:
   1. Provide identification devices that comply with ADA Standards for accessible design.
B. Convenience of Visual Display Surfaces:
   1. Except as otherwise indicated, required surface area must be accomplished within the "usable" areas as follows:
      a. Erasable Surfaces: Not less than 36 inches above floor; not more than 84 inches above floor.
      b. Tackable Surfaces: Not less than 36 inches above floor; not more than 84 inches above floor.
      c. Projection Surfaces: Not less than 36 inches above floor; not more than 84 inches above floor.
   2. Projection Surface Access: Either permanently exposed in locations required or easily assembled or lowered without the use of tools.
      a. Surfaces Concealed When Not in Use: Access by up/down controls conveniently located near space entrance(s) and to session presenter location, if any, but minimizing likelihood of tampering by audience members.
C. Appearance:
   1. Provide signage for entire project that is consistent in design with other interior features and coordinated with overall color scheme.

END OF SECTION

SECTION DC C3 2
STORAGE FIXTURES CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storage specialties consisting of the following elements:
   1. Manufactured casework, such as storage base and wall cabinetry, open bookcases, tall storage cabinets, open mailbox slots, and wardrobe units.
   2. Custom built casework, including display cases, reception desk, circulation desk, and seating benches with storage.
   3. Temporary lockable storage, including metal lockers.
      a. Finished end and filler panels.
      b. Benches.
   4. Fixed and adjustable wall-mounted shelving.
   5. Closet specialties, such as hanging rods and closet specialties.
   6. Accessories, fasteners, and appurtenances for a complete installation.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

PART 2 PRODUCTS

2.01 C1030.09 - BUILT-IN WOOD CABINETRY AND CASEWORK:

A. Use the following:
   1. All casework and cabinetry shall be AWI Premium Grade.
   2. All wood products shall be FSC Certified Wood meeting LEED requirements for chain of custody.
   3. All wood products shall be plain sliced Maple veneer with transparent stain finish.
      a. Doors at teacher wardrobe units in classrooms to feature marker board laminate exterior finish at doors.
   4. Custom-made wood cabinets with stain finish.
      a. ELA window seat with upholstered cushion.
         1) In every ELA and special education classroom.
         2) Upholstered seats.
         3) Quantity: 12.
      b. Admin reception desk.
         1) One 13-foot long linear desk, and one 15-foot long L-shaped reception desk with plastic laminate countertop with hardwood edge.
         2) Solid wood edge.
         3) Solid surface transaction counters.
      c. Under-stair built-in seat:
         1) Built-in seating under Stairs 2 and 5, curving up toward underside of stair. See drawings.
      d. Built-in trash receptacles, at Cafeteria.
         1) Cabinet doors with false base for three trash cans in the countertop.
         2) Quantity: Four.
      e. Media Center built-in window seats with upholstered cushions.
         1) Quantity: two.
      f. Circulation desk: See drawings for location and approximate dimensions.

1) Transaction shelf, knee wall, and base cabinets, with book drop.
2) Plastic laminate countertop.
3) Solid wood edge.
4) Solid surface transaction counter.
5) Built-in book return.

g. Student cubbies.
1) Open-faced cubbies, with name plates.
2) Storage above cubbies, with hinged doors.
3) Student cubbies with doors, facing circulation, and storage above, facing classroom, recessed in walls.

h. Custodial work bench.
1) Custom millwork work bench, L-shaped.

i. Lobby
1) Display case cabinets with base storage and sliding glass doors with glass shelves and mirror at back panel at upper cabinet. Internal lighting within cabinet.
2) Display case cabinets and benches recessed at side of Gym wall-bleachers, facing corridor and exit.

j. Classrooms
1) Student seat benches at windows with reinforced top seat panel 1 inch thick.
2) Veneer plywood "back splash" panels at all surfaces above bench up to height of windowsill trim and splash height of adjacent bookcases.
3) Veneer and finish to match adjacent fabricated bookcase units.

5. Manufactured wood casework, to match Clear Maple, with stain finish:
a. Upper cabinets, with double or single doors, as indicated on drawings.
b. Upper cabinet: narcotics cabinet.
c. Mailbox cubbies at Admin.
d. Base cabinets, with double or single doors, as indicated on drawings.
e. Open sink base cabinets.
f. Closed sink base cabinets.
g. Base cabinets, open, with adjustable shelves.
h. Open base cabinets, with portfolio drawers.
i. Base cabinets with file drawers.
j. Tall storage cabinets, with full doors, or with doors that extend only partway up height of cabinet, as indicated on Drawings.
k. Teacher wardrobe cabinets.
l. Upper cabinets for microwaves.
m. Deep adjustable open tall storage cabinets, at Music.
n. Freestanding bookcases.
o. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
1) CIF Lab Solutions; E Line: www.cifsolutions.com.
2) Institutional Casework Inc: Campbell-Rhea Signatures Series: www.iciscientific.com. (Basis of Design)
3) Kewaunee Scientific; Signature Series: www.kewaunee.com.
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability,

performance, and appearance. Submit as substitutions.

6. Cabinet Hardware
    a. All doors mounted on five knuckle hinges.
    b. All drawers on heavy duty 100-pound capacity full extension glides with "quiet close" feature.
    c. 4 inch wire pulls.
    d. All doors and drawers to include locks.
    e. US-32 finish hinges.
    f. Coat rod and mirror within teacher wardrobe units.

2.02 MUSIC STORAGE CASEWORK

A. Use the following:
1. Modular instrument storage casework with integral bases, adjustable levelers, and through-bolted fastening, enabling Owner reconfiguration of unit layout.
    a. Acoustically enhanced instrument storage casework finished with interior lining of sound-absorbent material providing sound absorption and noise reduction properties.
2. Uniform storage casework with integral bases, adjustable levelers, and through-bolted fastening, enabling Owner reconfiguration of unit layout.
3. Sheet music storage casework in wheeled retractable units, providing high-density storage, adjustable to fit most sizes of published sheet music, enabling Owner reconfiguration of unit layout.
4. Accessories for a complete installation, including filler panels and finished end and back panels where visible.
5. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    a. Bradford Systems: www.bradfordsystems.com.
    b. Stevens Advantage: www.stevensadvantage.com.
    c. Wenger Corp; AcoustiCabinets: www.wengercorp.com. (Basis of Design)
    d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.03 C1030.08 - COUNTERTOPS

A. Horizontal grade high pressure decorative laminate finish countertops (CNTR-PL:) with matching back- and end-splashes 4 inches high.
1. 1-1/2 inch high beveled hardwood nosing at front edge with transparent stain finish; laminate flush with top of nosing.
2. Matte or suede finish.
3. Chemical resistant formulation at Art rooms.
4. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    a. Formica Corporation: www.formica.com.
    b. Panolam Nevamar: www.panolam.com.
    c. Wilsonart, LLC: www.wilsonart.com. (Basis of Design)
    d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

B. Solid surface countertops (CNTR-SSM), at upper transaction counters at reception desk and circulation desk.

1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    a. DuPont USA; Corian: www.corian.com
    b. Panolam Nevamar: www.panolam.com.
    c. Wilsonart, LLC: www.wilsonart.com. (Basis of Design)
    d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

C. Wood countertops (CNTR-WOOD), maple, clear grade; 1.25 inch minimum thickness.

2.04 C1030.08 - CLOSET SPECIALTIES

A. Use the following:
1. Fixed wood shelving on metal bracket supports with metal hanger rod at closets as indicated in plans.
    a. Maple veneer plywood and solid hardwoods.

2.05 C1030.08 - SHELVING

A. Wall mounted adjustable wood shelving on metal standards at locations as indicated in drawings.
1. Plastic laminate finish on 1 inch thick plywood with hardwood edge reinforcing.
2. Heavy duty surface applied enameled steel standards with dual-prong brackets with seismic attachment of shelving to brackets.

B. Metal library shelving, at locations indicated on drawings.
1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    a. Aurora Storage; MJ System 30 Library Shelving: www.aurorastorage.com. (Basis of Design)
    b. BCI; Uniflex-B Shelving System: www.bcilibraries.com
    c. Biblo XPO: Model Shelving and Display Systems: www.bibloxpo.com.
    d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.06 C1030.05 - LOCKERS

A. Use the following:
1. Metal frame and panel lockers with baked enamel finish at Kitchen and Custodial.
    a. Kitchen: Twelve two tier. 12 inches wide by 12 inches deep by 72 inches high.
    b. Custodial: Ten single tier. 18 inches wide by 15 inches deep by 72 inches high.
    c. "Knock-down" construction with side integral frame.
    d. Continuous sloped tops to be provided at all lockers.
    e. Lockers to be mounted on concrete curb.
    f. Hasp for padlocks.
    g. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        1) Art Metal Products; AMP KD Wardrobe: www.artmetalproducts.com. (Basis of Design)
        2) List Industries, Inc: www.listindustries.com.
        3) Penco Products, Inc: www.pencoproducts.com.

4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Provide storage specialties attached to interior construction that are necessary for proper functioning of spaces required by the project program.

B. Closed Material and Utensils Storage: Provide modular storage cabinets and countertops with capacity adequate to accommodate required functions in spaces designated in the program.

C. Where storage specialties are integral with elements defined within another element group, meet requirements of both element groups.

3.02 AMENITY AND COMFORT

A. Accessibility:
   1. Amounts of Storage: Provide accessible storage comprising not less than 10 percent of available storage specialties of each type, but in no case less than one of each type.
   2. Countertops: Where work surfaces or countertops over storage specialties are required, provide wheelchair access to not less than 10 percent of surface at maximum height of 34 inches from the floor.

B. Noise Control: Provide closed storage specialties equipped with hardware or fittings that minimize the sound generated by door slamming.

C. Stored Item Security:
   1. Locks: Provide locking capability at storage specialties as follows:
      a. Lockers: Dial combination locksets.
      b. Cabinets: Dial combination locksets.
      c. Casework: Dial combination locksets.
      d. Casework Key Cabinet: Provide wall-mounted key cabinet of sheet steel construction, with piano hinged door and lock.
         1) Capacity: Actual quantity of keys, plus 25 percent additional capacity.

D. Ventilation: For lockers, provide for air circulation through fixture by means of door louvers, gaps at head and sill, perforations, or expanded metal panels.

END OF SECTION

SECTION DC C
INTERIORS CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior construction consisting of interior partitions, interior windows, interior doors, interior grilles and gates, raised floor construction, suspended ceiling construction, and interior specialties, except for elements classified as equipment or services fixtures.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. AWI: American Wood workers Institute; www.awinet.org

B. AWMAC: Architectural Woodwork Manufacturer's Association of Canada; www.awmac.com.

C. UL. Underwriters Laboratories: www.ul.com.

D. WI: Woodwork Institute; www.woodworkinstitute.com.

1.03 REFERENCED STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:

1. AWI/AWMAC/WI - Architectural Woodwork Standards, 2nd Edition, 2014, with Errata (2016).

B. UL. Underwriters Laboratories: www.ul.com.

1. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

PART 2 PRODUCTS AND METHODS

2.01 C1010 - PARTITIONS

A. Use the following:

1. Unit masonry.
    a. Unit masonry: standard concrete masonry units at fire separation walls, mechanical room, elevator shafts, Gymnasium, and other locations indicated on drawings.
        1) Acoustic concrete masonry units for 25 percent of the wall area of the Gymnasium:
            (a) NRC not less than 0.70.
            (b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
                (1) A Jandris & Sons; Soundcell CMU. (Basis of Design)
                (2) Trenwyth.
                (3) Genest.
                (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
    b. Polished ground-face concrete masonry units at interior face of enclosed egress stairs.
2. Gypsum wallboard on metal framing and furring: partition types at Kitchen, Cafeteria, and other locations as indicated on drawings.
    a. Bullet resistant fiberglass panels rated to UL 752 Level 3 resistance at partitions scheduled to be bullet resistant.
    b. Acoustic sealant at all penetrations and edges, and penetrations of non-fire-rated partitions
3. Operable partitions.
    a. Paired panel systems at shared walls at locations indicated on drawings.

1) Manually operated.
2) Ceiling-suspended.
3) 3 inch thick system, with minimum STC-50 rating.
4) Full-height steel markerboard surfaces for operable partitions at classrooms, teacher collaboration and Quiet Cafe rooms.
5) Manufacturers:
   (a) Hufcor, Inc.
   (b) Modernfold; 932 series. (Basis of Design)
   (c) Panelfold.
   (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. Acoustic paired panel system at shared walls at Stage.
1) Manually operated.
2) Ceiling-suspended.
3) Minimum 3 inch thick system, with a minimum STC-55 rating.
4) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
   (a) Kwik-Wall, by Hufcor, Inc.
   (b) Modernfold; Acousti-Seal Encore, Single Panel. (Basis of Design)
   (c) Panelfold.
   (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

4. Partial height partitions:
a. Design and construct partitions using the following:
1) Gypsum board on metal framing, with floor-mounted steel support posts and hardwood cap trim, at general interior areas as indicated on drawings.
b. Toilet partitions:
1) Floor mounted, overhead braced solid color-through plastic partitions, with tamper-resistant hardware:
   (a) Zero sightline ship lap doors.
   (b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      (1) Ampco Products.
      (2) Bradley Corp.
      (3) Scranton Products; Hiny Hiders. (Basis of Design)
      (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

B. Interior Railings and Handrails:
1. Use the following:
a. Pipe and tube railings with mesh infill, Maple wood top caps on railings, and stainless steel handrail grip surfaces, at egress stairs and classrooms corridor floor openings.
1) 1-1/2 inch diameter round pipe supports with mesh guard infill. Mesh to be rotated 45 degrees.

b. Glass guard, laminated with custom graphics, and handrail system at open stairs and connected Level 2 balconies.
    1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
        (a) CR Laurence Co.
        (b) VIVA Railing Shoe System. (Basis of Design)
        (c) Wagner Architectural Glass Systems.
        (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

C. Mesh Partitions:
    1. Use the following:
        a. Standard weight steel mesh at locations indicated on drawings.

2.02 C1010 - INTERIOR WINDOWS

A. Interior Windows (Borrowed Lites):
    1. Window Operation: Use the following:
        a. Fixed non-operable windows as indicated on drawings.
    2. Glazing: Single pane glazing.
        a. Single pane fully tempered safety glass at door vision panels and borrowed lites in non-acoustic-rated partitions.
        b. Dual-glazed laminated safety glass at borrowed lites and vision panels in acoustically rated partitions and at acoustic door openings at music and practice rooms.
        c. Bullet-resistant and forced entry resistance rated glazing at transaction windows into Principal's secretary and general waiting, with Level 3 bullet resistance.
    3. Use one of the following:
        a. Hollow metal borrowed lite windows at typical interior borrowed lite locations except as stated below.
        b. Aluminum storefront borrowed lites at as indicated on drawings.
            1) Provide hardwood sill trim at aluminum borrowed lite openings.

B. Lintels at interior windows:
    1. Use the following:
        a. Unit masonry at concrete masonry walls where lintels would be exposed to view.
        b. Steel at concrete masonry walls where lintels will be concealed from view.

2.03 INTERIOR STOREFRONT

A. Provide aluminum storefront borrowed lites as indicated on drawings.
    1. 2 inch by 4-1/2 inch frame dimension; center glazed.
    2. Bullet resistant storefront frames at Vestibule, or other locations as indicated on drawings.

2.04 C1020 INTERIOR DOORS AND FRAMES

A. Interior Pedestrian Doors:
    1. Use the following:
        a. Hollow steel doors and frames at locations subject to high humidity or abuse including the following:
            1) Maintenance Rooms
            2) Mechanical Equipment Rooms
            3) Boiler rooms
            4) Storage rooms (where not accessed from finished public areas).

b. Flush wood doors with hollow steel frames at all locations not specifically identified herein as otherwise.
    1) Quality Level: Premium Grade with A grade veneer, in accordance with AWI/AWMAC/WI (AWS) Section 1300.
    2) 5-ply wood veneer faced doors only. 7- or 9-ply face veneers are not acceptable.
    3) Finish Veneer to be Premium White Maple, plain sliced (flat cut) and bookmatched.
    4) Clear and/or stained Factory finish
    5) Acoustic specialty doors at Music classroom and practice room: STC-53.
c. Glazed aluminum (interior) entrance doors with or without borrowed lites.
    1) Administration suite entrances.
    2) Media Center entrance doors.
    3) Gymnasium entrance doors.
    4) Doors to Stair (Fire Rated).

2. Overhead non-insulated coiling grilles, at kitchen locations indicated on drawings.
    a. Opening sizes: As indicated on door schedule.
3. Glazing in Doors:
    a. Use one of the following:
        1) Fully tempered glass.
        2) Glass Ceramic safety glazing at fire rated openings.
4. Hardware for swinging doors:
    a. Use satin, chrome finish.
    b. Use fire-rated hardware at fire-rated doors.
    c. Door hinges: ball-bearing butt hinges or continuous hinges.
    d. Locksets: Mortise, unless specifically indicated as another type.
    e. Door closers: Surface overhead frame-mounted type, unless otherwise noted.
    f. Door Stops: Floor-mounted type, wall-mounted type, or overhead door/frame mounted type.
    g. Door Hold-Opens: Overhead door/frame mounted type.
    h. Automatic door bottoms: Fully recessed plunger actuated bottoms with seals at all (doors between adjacent classrooms.
5. Lintels at interior windows:
    a. Use the following:
        1) Unit masonry at concrete masonry walls where lintels would be exposed to view.
        2) Steel at concrete masonry walls where lintels will be concealed from view.

2.05 C1010 - OTHER INTERIOR OPENINGS

A. Access Doors:
1. Use the following:
    a. Manufactured metal doors at typical locations in walls and hard-surface ceilings.
        1) At gypsum board ceilings, provide access doors with taping flanges intended for "mudding" into gypsum board finish.
        2) Self-closing rated and non-rated doors with cylinder locks.

B. Expansion Joint Covers:
1. Use one of the following:
    a. Manufactured all-metal cover at all covers at walls and floors.
    b. Manufactured metal covers with resilient filler at ceilings.

c. Provide fire rated backing materials at expansion joints in rated construction and at rated separations.

2.06 C1030 - TOILET, BATH, AND LAUNDRY ACCESSORIES

A. Reflective Surfaces or Mirrors.

B. Toilet, Bath, and Laundry Accessories:

1. Use the following:

a. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:

1) American Specialties, Inc: www.americanspecialties.com.

2) Bobrick Washroom Equipment, Inc., www.bobrick.com. (Basis of Design manufacturer, except where otherwise noted.)

3) Bradley Corporation: www.bradleycorp.com.

4) Rubbermaid Commercial: www.rubbermaidcommercial.com. (Basis of Design manufacturer for freestanding waste receptacles.)

5) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

b. Stainless steel accessories:

1) Combination Paper Towel Dispenser and Waste units (PTDWR): include one for every three sinks (or portion thereof) at gang toilets.

(a) Basis of Design: Bobrick B-3944.

(b) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

2) Paper towel dispensers (PTD): include one at single user toilet room.

(a) Basis of Design at classrooms: Bobrick B-2621.

(b) Basis of Design at toilet rooms: Bobrick B-29744.

(c) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

3) Mirrors (MIR or CLD-MIR or PK-MIR): Safety glass in stainless steel frame; provide one at each lavatory.

(a) Basis of Design: Bobrick B-165 series.

(b) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

4) Wall mounted soap dispensers (SD): include one soap dispenser at each single or pair of lavatories.

(a) Basis of Design: Bobrick 818615.

(b) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

5) Toilet paper dispensers (TPD): include one per each toilet shown.

(a) Basis of Design: Bobrick B-2888.

(b) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

6) Grab bars (GB, CLD-GB, GB-PK): include two 42 inch grab bars and one 24 inch vertical grab bar at each toilet.
   (a) Basis of Design (GB or CLD-GB): Bobrick B-6806.
   (b) Basis of Design (GB-PK): Bobrick B-6861.99.
   (c) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
7) Sanitary napkin disposal units (SND): provide one at each toilet in single user female toilet rooms.
   (a) Basis of Design: Bobrick B-254 at walls.
   (b) Basis of Design: Bobrick B-354 at Toilet Partitions.
   (c) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
8) Sanitary napkin vendors: provide one in each female gang toilet.
   (a) Basis of Design: Bobrick B-370639.
   (b) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
9) Waste Receptacles (WR).
   (a) Basis of Design: Bobrick B-3644.

c. Baby changing tables, wall-hung, at Family Toilet and Pre-K and K Classroom toilets.
   1) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      (a) Basis of Design: Koala Care KB310-SSRE.
      (b) Bradley Corporation.
      (c) American Specialties.
      (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

C. Utility Room Accessories:
   1. Combination utility shelf / mop and broom holders.
      a. Basis of Design: Bobrick B-239 X 34.
      b. This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

D. Healthcare Accessories
   1. Hand sanitizer dispensers at all entry vestibules, nurse's suite, and at each toilet room.
      a. Basis of Design: B2013.
      b. This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
   2. Sharps containers: one at nurse's office.
      a. Basis of Design: Bobrick; B-35016.
      b. This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

2.07 C2010 - STAIRS AND RAMPS

A. Use the following:

1. Poured-in-place concrete stairs and ramps at floor level transitions in slab-on-grade construction.
2. Fabricated metal stairs with poured-in-place concrete treads at all stairs above slab on grade level (elevated).
3. Pipe railings and guards of painted steel pipe construction with vertical steel pickets and stainless steel handrail grip surface at all interior stairs and ramps.

2.08 TIME CAPSULE

A. Provide time capsule, to be located at the building, as indicated on the drawings.
   1. Include installation and sealing of capsule.
   2. Provide accessories including archival quality storage bags, and desiccant packets.
   3. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      a. Erie Landmark Co; Rectangular Capsule. (Basis of Design)
      b. Heritage Time Capsules.
      c. Future Packaging and Preservation.
      d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Interiors: Provide finished interiors for all spaces indicated in the program, equipped with interior fixtures to function properly for specific occupancies.
B. Interior Partitions: Provide physical separation between spaces, constructed to achieve fire ratings required by code, required security between adjacent spaces, and visual, acoustic, olfactory, and atmospheric isolation as necessary to maintain desirable conditions in each space.
C. Interior Doors: Provide doors between adjacent spaces where required by the program or where proper functioning of adjacent spaces requires movement of people or objects between them.
D. Interior Windows: Provide interior windows between adjacent spaces where required by the program or where proper functioning of adjacent spaces requires limited visual or physical connection between them.
E. Other Interior Openings:
   1. Access Openings: Provide interior openings where required for maintenance access to mechanical services and other concealed systems, designed to be as unobtrusive as possible.
   2. Joint Covers: Provide covers for interior expansion joints that protect joints from debris and provide safe and durable support for anticipated traffic.
F. Interior Finishes: Provide finishes for interior surfaces that are appropriate for the functions of each space.
   1. See Section DC C2 - Interior Finishes Criteria for criteria.
G. Interior Specialties: Provide interior specialties that are necessary for the proper functioning of each space.
   1. Other Interior Fixtures: Provide other interior fixtures to accomplish the design per code requirements and as indicated in the project program.
H. Where interiors elements also must function as elements defined within another element group, meet requirements of both element groups.

3.02 AMENITY AND COMFORT CRITERIA

A. Accessibility: Provide interior specialties that are easily usable by disabled persons without outside assistance.
   1. Provide interior fixtures that comply with state barrier free requirements and ADAAG and MAAB.

B. Doors:
   1. Dimensions: Provide interior doors that are sized appropriately for people likely to move between adjacent spaces.
   2. Height: Not less than 84 inches in height.
   3. Width: Not less than 36 inches in width.

3.03 HEALTH AND SAFETY CRITERIA

A. Fire Safety: Protect door openings in fire-rated walls and partitions in accordance with the code and the following:
   1. Hold-Open Function: At locations indicated in program; any method that allows the door to swing freely and that automatically closes door upon detection of local fire or smoke.
   2. Closers: Sufficient closing force to close and latch door despite drafts and wind, but not more than that specified by code.

B. Emergency Egress: Where doors must be latched or locked, comply with the code and the following:
   1. Locking Devices Requiring a Key for Egress: Not allowed.
   2. Exit Doors Having Occupant Load of 50 or More (Regardless of Occupancy): Use exit hardware that releases the locking/latching mechanism upon the application of a force in the direction of egress travel.

3.04 DURABILITY CRITERIA

A. Expected Life Span of Operating Components: Remaining operable for 10 years under normal exposure conditions for the project site.

B. Wear Resistance:
   1. Door Surfaces: Scuff-resistant in areas where foot impact is likely; highly scratch-resistant in areas where hand contact is likely; applied protective surfaces for vulnerable areas are acceptable.
   2. Door Handles and Knobs: Highly scratch-resistant and of finish that will minimize appearance changes due to wear; satin or brushed finish.

C. Flexible Seal Materials: Minimize deterioration due to operation of doors and aging.

D. Swinging Doors: Control door swing to prevent damage due to impact, to either door or element impacted.

E. Humidity Endurance: At interior spaces exposed to high humidity, such as swimming pool enclosures, provide interior construction that will withstand continuous or intermittent exposure without significant changes in dimension.

END OF SECTION

SECTION DC D1 1
PEOPLE-MOVING EQUIPMENT CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. People-moving equipment includes conveying systems and devices that are primarily intended to move people between levels, comprising the following elements:
   1. Elevators: Every component for passenger and service elevators, including items such as shaft rails, pit ladders, exhaust louvers, and car and hoistway doors.
      a. Passenger Elevators: Rated for passenger service and generally wider than deep.
      b. Complete electric traction elevator systems.
         1) Passenger type.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. ADA. Americans with Disabilities Act; www.ada.gov.

B. ASME. American Society of Mechanical Engineers; www.asme.org.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:

B. ADA Standards - 2010 ADA Standards for Accessible Design.

C. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices.

PART 2 PRODUCTS

2.01 D1010 PEOPLE-MOVING EQUIPMENT TYPES

A. Use the following:
   1. Passenger elevators at locations indicated on drawings.

2.02 ELEVATORS AND LIFTS

A. Passenger Elevators:
   1. Use the following:
      a. Holeless hydraulic type with telescoping masts in hoistway.
      b. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) Canton Elevator, Incorporated: www.cantonelevator.com.
         2) Schindler Elevator Corporation: www.schindler.com.
         3) TK Elevator; Endura Above-Ground: www.tkelevator.com.
         4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
      c. Capacity: 4500 pounds.
      d. Speed: 100 feet per minute.
      e. Travel Distance: 80 feet maximum.
      f. Door configuration: Dual speed offset doors at front of cab.
      g. Finishes:
         1) Front: Stainless Steel.

2) Wall panels: Plastic laminate.
3) Floor: Linoleum, by Resilient Flooring Trade-Contractor.
4) Ceiling: Stainless steel panel and frame system, with recessed light fixtures.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Passenger Elevators: If the project has more than one level, provide passenger elevators to provide access to every habitable floor.

3.02 AMENITY AND COMFORT CRITERIA

A. Accessibility:
   1. Elevators: Provide passenger elevators that comply with the ADA Standards for accessible design.

3.03 HEALTH AND SAFETY CRITERIA

A. Fire Resistance: Where vertical people-moving equipment must pass through fire resistant floor construction, provide fire resistance in compliance with code.
   1. Shaft Enclosure: Not less than two hour fire resistance rating at elevators, shafts, hoistway and control rooms.
   2. Doors: Not less than one hour labeled fire protection rating, or minimum allowed by code for rating of space, whichever is higher.

3.04 STRUCTURAL CRITERIA

A. Comply with structural requirements of code and the following:
   1. Elevator Car Frames: Fully-welded construction.

3.05 DURABILITY CRITERIA

A. Expected Service Life Span: Provide people-moving equipment with functional service life of 25 years, assuming that they will have continuing professional maintenance and periodic replacement of wearing parts.

3.06 OPERATION AND MAINTENANCE CRITERIA

A. Elevators: Comply with provisions of ASME A17.1, unless otherwise indicated.
B. Passenger Elevator Operating System: As follows:
   1. Single Elevators: Selective collective operation.
C. Operating Features for Every Elevator:
   1. Key switch in each elevator car for emergency operating service.
   2. Key-controlled out of service feature.
   3. Emergency power operation of one designated car in accordance with code.
D. System Maintenance: Provide equipment designed to require minimum maintenance.
   1. Substantiation:
      a. Construction Documents: Proposed maintenance contract, for Owner's review.

END OF SECTION

SECTION DC D2
PLUMBING CRITERIA

PART 1 GENERAL

1.01 GENERAL DESIGN CONSIDERATIONS

A. Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design. The Plumbing Systems shall be designed and constructed for ***LEED v4 for Schools*** were indicated on this narrative.

B. All work installed under Section DC D2 shall comply with the MA Building Code, MA Plumbing Code 248 CMR and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

C. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

D. The building will be serviced by Municipal water and Municipal sewer system.

E. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

PART 2 RODUCTS

2.01 D2010 PLUMBING FIXTURES

A. Fixtures:

1. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.

2. Number of plumbing fixtures will be added in the facility to accommodate population of male students and female students and shall be in accordance with 248 CMR Paragraph 10.10, Table 1.

3. Plumbing fixtures will be equipped with the following water conserving features (for 30 percent indoor water use reduction-LEED-V4, Credit 2).

4. Fixtures shall bear the manufacturer's guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.

5. Vitreous China and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, or Toto. Supports shall be Zurn, Smith, or Josam. All fixtures shall be white. Faucets shall be Toto, Speakman, Symmons, or Chicago.

6. Fixtures shall be as scheduled on drawings and as follows:

   a) Water Closet: High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallon per flush-flush valve. Floor mount Water closets are required in PreK Toilets.

   b) Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated

0.13 gallon per flush-flush valve.

c) Lavatory: Wall mounted 22 inches by 21-1/4 inches vitreous china lavatory, single hole, punched for concealed armchair carrier. Regenerating hard-wired, single hole, sensor faucet, 0.35 GPM metering mixing faucet programmed for 10 second run-time cycle located under lavatory complete with in-line check stops.

d) Mop Receptor: 24 inches by 24 inches by 10 inches, mop service basin with stainless steel rim guard on exposed sides, 3 inches caulk connection, stainless steel strainer. Include caulking and sealant to seal between unit and finished wall and floor. Furnish and install service sink fitting.

e) Electric Water Cooler: Barrier Free Hi-Lo Electric Water Cooler with bottle filler, 8.0 GPH capacity, tandem mounting, #4 satin finish stainless steel bowls, flex-guard bubbler, push button actuator, ADA compliant. Furnish and install cane touch skirt.

f) Stainless Steel Sinks: Single bowl, 19 inches by 21 inches by 5-1/2 inches deep self rimming countertop mounted, 18 GA type 304 stainless steel sink with offset rear outlet; three-hole punched faucet ledge and quick clip mounting system, sound deadening underside. Concealed deck faucet with 8 inches swing gooseneck spout, 4 inches wrist blade handles, 0.5 GPM aerator.

g) Art room stainless steel counter with backsplash equal to Just Manufacturing Co. SPDT 6130-42, one compartment, 16-gauge, type 304 stainless steel, 18-gauge 304 stainless steel sink fully coated underside insulates for sound and condensation reduction.

h) Provide under sink plaster trap. Pedestal mounted eyewash with stainless steel bowl, dual aerated spray heads with automatic flow controls and flip top dust covers. The eye saver shall be equal to Speakman Model SE-584.

2.02 D2020 DOMESTIC WATER DISTRIBUTION

A. Piping and Fitting: Potable and Non-Potable cold and hot water system water piping shall be Type 'L' hard tempered copper tubing with wrought copper fittings and silver Brite lead-free solder joints.

1. Copper tubing shall be made according to the manufacturer's specifications using sweat fitting and lead-free solder and a noncorrosive flux or press-fit system. Copper flanges will conform to ANSI B16.5, standard.

B. Domestic Cold-Water Service

1. New 4-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer will be provided. A new reduced pressure backflow preventer will be installed at the main domestic water supply to protect the service (per the DEP regulation 310 CMR 22).

2. A new triplex, variable speed water Booster Pump System (5 HP ea.) shall be provided to maintain flow and pressure operation requirements at the remote fixtures. A full line by-pass shall be provided so only the fixtures requiring boosted pressure are served by the booster pump.

3. Boiler water feed and make-up, and any other mechanical take-offs will branch off through a reduced pressure -backflow preventer. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

4. Potable water will meet both the NSF 61 and NSF 372 standards for lead-free safe drinking water Act.

5. Domestic cold water inside the building will be “L” type copper tube with wrought or cast copper fittings.

6. All cold-water piping will be insulated to prevent condensation.

C. Domestic Hot Water Service

1. Domestic hot water supply will be generated through central hot water heaters in mechanical room. Two electric water heaters (80KW), 120-gallon tank storage will be manifolded to supply hot water distribution. The water heater will be a modulating type and will be capable of providing fixture hot water flow throughout the facility.

2. The kitchen hot water demand will be generated through one 50 KW electric hot water heater manifold with 120-gallon buffer tank. The hot water will maintain dual system and operate at 140°F to serve the pre-rinse and 3-Compartment sink.

3. The other system will operate at 120-degrees F and will serve the other kitchen appliances, hand sinks, and custodian room sink.

D. The hot water (HW) and re-circulating (HWC) piping will be insulated per IECC2015.

E. All lavatories qualifying as “public” lavatories will be provided with individual mixing valves below the fixture to reduce hot water discharge temperatures to 110-degrees F maximum per code.

F. Valves: Locate all valves so as to isolate all parts of the system. Shutoff valves 3 inch and smaller shall be ball valves, solder end or screwed. Valves shall be by Apollo, Nibco, or Watts.

G. Water meter**:** Type and style as required by the local water department, and sized for the peak intermittent demands of the building. The piping arrangement at meter installation to be as required by the local water department.

H. Cross Connection Protection:

1. Protect potable water piping outlets and connections to equipment or machinery against backflow with an air-gap or approved backflow preventer. The reduced pressure backflow preventer shall be lead-free equal to Watts model 909LF.

2. Backflow preventer type, application, and installation shall comply with the Commonwealth of Massachusetts, Department of Environmental Protection (DEP) Drinking Water Regulations 310 CMR 22.00.

I. Insulation:

1. Insulation for all water piping and all horizontal roof leaders whether concealed or exposed shall be 1-inch thick, heavy density, preformed snap-on insulation equal to Johns Manville Micro-Lok HP, 850 degrees snap-on system, Owens Corning or Knauf.

2. Insulation for cold water piping shall have a factory applied vapor barrier with ends and butts sealed with overlapping 4-inch sealing strips.

3. Valves, fittings, and the underside of roof drain bodies shall be insulated with pre-formed fiberglass fitting insulation cut from dense fiberglass blanket and covered with pre-molded P.V.C. fitting covers.

4. All insulation shall have self-sealing type, all service jacket (ASJ-SSL) factory applied. At exposed piping areas in locker room or gymnasium cover jacket with continuous P.V.C. jacket.

I. Wall Hydrant and Hose Bibb:

1. Wall hydrants shall be Zurn Series Z-1310-PB Ecolotrol cast brass 3/4-inch non-freeze wall hydrant with integral backflow preventer, 3/4-inch hose connections, polished nickel bronze face, loose key handle, brass wall sleeve, and fitted with brass locknut.

2. Hose bibb shall be T and S Brass or equal model #B-720 modified, chrome plated, 3/4-inch hose end, integral stop, vacuum breaker, modified with lock shield and loose tee handle.

J. Water Sub Meters:

1. The domestic water supply system will have water sub meters at a strategic location to record water consumption of fixtures on weekly basis. The following location were determined for remote analysis and trending of water consumption.
   a. Main domestic water supply. (Whole building)
   b. Submeter at domestic hot water supply to plumbing fixtures.
   c. Submeter at cold water supply to plumbing fixtures.

2.02.1 DOMESTIC WATER DISTRIBUTION SUPPLEMENTARY COMPONENTS

A. Workmanship and Installation Methods: All work shall be installed in a first-class manner consistent with the best current practices. All piping shall be installed true to line and grade, shall be grouped together, be parallel to each other. Utilize gang hangers wherever feasible. Group all valves together where feasible.

B. Cleaning and Protection: Protect all materials and equipment during shipment and installation, and properly handle and store at the job site so as to prevent damage, and upon completion of this work, clean all fixtures and equipment and replace damaged parts.

C. Sleeves and Escutcheons: Furnish and install in masonry walls and floors, galvanized steel sleeves.

D. Testing: Test all work in the presence of the Architect and/or Engineer and required by local codes.

E. Chlorination: Upon completion of the plumbing work, thoroughly chlorinate the entire domestic water system before putting same in service.

F. Access Doors: Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

2.03 D2030 SANITARY DRAINAGE SYSTEM

A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. System runs from 10 feet outside building and terminates with stack vents through the roof.

B. A separate Grease Waste System starting with connection to an exterior concrete grease interceptor running through the kitchen and servery area fixtures and terminating with a vent terminal through the roof. Point of use grease interceptors are to be provided at designated kitchen fixtures. The exterior grease interceptor of 5,000-gallon capacity will be provided under Sitework scope.

C. Grease Interceptor: Furnish and install fully recessed grease Interceptor at 3 bay sink and dishwasher. The Interceptor shall be equal to Jay R. Smith 8450 integral with extension, 75 GPM flow rate, 150 lbs capacity, 4-inch inlet and outlet.

D. Oil Interceptor: Provide oil interceptors connected at the floor drain of outdoor equipment storage, receiving area, and from elevator sump pump discharge. The floor drain to be rated for 50 gpm flow and shall be equal to Zurn 1186.

E. Piping and Fitting: Soil, Waste and Vent, Kitchen Waste and Vent, and Storm drainage piping to 10 feet outside shall be hub less cast-iron pipe and fittings for 2 inch and above and shall be Type 'L' copper with cast D.W.V. type fittings for 1-1/2 inch and smaller.

F. Art room sinks will be provided with solid interceptors

G. A floor drain will be provided in all toilet rooms where more than one water closet/urinal is present. Floor drains will be of cast iron body construction, heavy duty grade, PDI approved. Those for use in toilet rooms and other finished spaces will have rough bronze exposed finishes. Floor drains in Toilet rooms will require automatic trap primer systems. Those for use in mechanical rooms and other unfinished spaces will all be cast iron. All trap primers are to be electric, timer type..

H. Cleanouts: Cleanouts shall be full size up to 4 inches; threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes. Cleanouts for Special Waste System shall be Zurn #Z9A-C04 polypropylene cleanout plug with Zurn #ZANB-1463-VP nickel bronze scoriated floor access cover.

I. Floor sink shall be equal to Zurn Z-1950

2.03.1 SANITARY DRAINAGE SUPPLEMENTARY COMPONENTS

A. Sleeves and Escutcheons: Furnish and install in masonry walls and floors, galvanized steel sleeves.

B. Testing: Test all work in the presence of the Architect and/or Engineer and as required by local codes.

C. Access Doors: Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

2.04 D2040 STORM DRAIN SYSTEM

A. Storm Drainage system is provided to drain all roofs with roof drains piped through the building to a point 10 feet outside the building.

B. The surface of the roof deck will be drained with dual-level promenade drains with the lower drain bodies flashed into the waterproofing membrane. The rainwater system will be sized to handle a rainfall rate of 4 inches per hour, with a total runoff from the main roof and the roof deck of just under 1 cubic foot per second.

C. A roof with parapet wall will have overflow drains. Overflow drains will be piped down to level 1 and extended to the exterior wall with a nozzle.

D. The storm system will be installed in cast iron piping with all horizontal piping insulated to prevent condensation. The storm system will exit at various locations of the building and connect to the rainwater collection system.

E. The roof drain shall be large general purpose with cast iron dome. The product equal to Jay R Smith 1010DEK. The overflow drain shall be equal to Jay R Smith 1070 with down spout nozzle to the exterior wall.

PART 3 EXECUTION

3.01 TESTING OF PIPING SYSTEMS

A. General

1. Test all piping systems with water at the pressure head stated for the time interval required without adding water. While any system is being tested, required head pressure shall be maintained until all joints are inspected.

a. All tests shall be witnessed by the inspector having jurisdiction with 48-hour notice given these authorities.

2. Sanitary and Rainwater Leader Systems

a. Test all drainage systems either in their entirety or in sections, after rough piping has been installed. Each section shall be filled with water but no section shall be tested with less than a ten-foot head of water. In testing successive sections at least, the upper ten feet of the next preceding section shall be tested so that no joint of piping in the building except the upper most ten feet of the systems shall be submitted to a test of less than a ten-foot head of water. The water shall be kept in the system for at least 15 minutes before the inspection starts, the system shall than be made tight at all points.

3. Interior Water Piping Systems

a. Upon completion of the entire water supply system or a section of it, it shall be tested and proved tight under water pressure of 150 psi. Gauge should be located on the lowest point in the system and pressure shall hold for a period of 24 hours without introducing additional water. The water used for testing shall be from a potable source of supply.

B. DISINFECTION OF WATER SYSTEM

1. All water piping shall be filled with a solution of chlorine and water (0.5-1.5 ppm) and allowed to stand for at least 48 hrs. After the system has been drained and flushed, and refilled, a sample of the water shall be taken to the local health department for testing. If it has been that all impurities have not been removed, the above shall be repeated until the system is free of all impurities and has been approved by the Department of Health. A copy of said certificate shall be turned over to the Architect and Inspectional Services for record.

3.02 COMMISSIONING REQUIREMENTS

A. The building project shall include commissioning of all Plumbing equipment; commissioning specifications will be prepared by the Commissioning Agent once that entity has been hired by MSBA.

END OF SECTION

SECTION DC DC3
HVAC CRITERIA

PART 1 - GENERAL

1.01 TIME, MANNER AND REQUIREMENTS FOR FILING TRADE BIDS

A. Trade Bid shall be submitted in accordance with the provisions of General Law, Chapter 149A, inclusive, as amended.

B. Sub-Bids for Work under this Section shall be received at the location indicated on the Invitation for Bids.

C. All Trade Bids shall be submitted on the “Form of Trade Bid” furnished by the Awarding Authority complying with Chapter 149A of the General Laws, as amended. The Bid Forms attached herein are for information only and shall not be detached, filled in, or executed. Trade Bids which are incomplete, conditional, obscure, or which contain additions not called for will be rejected.

D. Trade Bids for work under this Section shall be for the complete work required as specified and as shown on the Drawings. Work to be performed under this Trade Bid is included in the Contract Documents as indicated in the Trade Bid Coordination document included in the Bidding and Contract Requirements of this Project Manual.

E. Sub-Bidders must comply with all provisions of Division 01 General Requirements, in the same manner as the Construction Manager.

1.02 GENERAL REQUIREMENTS

A. The following outline specifications are intended to supplement the HVAC system design narratives. The outline specifications below include equipment product data and installation requirements. Refer to narratives for the specific equipment that will be required.

1.03 CODES

A. All work installed under this section shall comply with the State of Massachusetts Building Code and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

1.04 DESIGN INTENT AND SYSTEM DESCRIPTION

A. The work of this Section is shown on the drawings and described within the basis of design narrative and these specifications. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

B. Capacities of systems and equipment are indicated in the HVAC system narrative.

1.05 GENERAL

A. Materials and equipment furnished under this section shall be new, unused, first quality of a manufacturer of established reputation.

PART 2 - PRODUCTS

2.01 D3030 HEATING AND COOLING GENERATING SYSTEMS

A. Air Source Heat Pump Hot and Chilled Water Generator

1. Provide and install a factory assembled, charged, air source six-pipe standard, simultaneous heat pump chiller, which shall produce 130 degrees F heating hot water to serve terminal heating devices, and ventilation heating coils throughout the building. The unit shall similarly produce chilled water to serve terminal cooling and ventilation cooling coil loads. Equipment shall be completely assembled, piped, internally wired, fully charged with refrigerant, and test operated at the factory.
2. Available Manufacturer: Subject to compliance with the requirements of the contract documents provide liquid chiller unit of the following manufacturer:
    a. WaterFurnace
    b. ClimaCool
    c. Trane
    d. Multistack
    e. Or equal

2.02 D3050 FACILITY HVAC DISTRIBUTION SYSTEMS

A. Hydronic Piping and Fittings

1. Hydronic piping shall be Schedule 40 ASTM A-53, black steel pipe with butt welded ends and fittings on 3 inch and above and threaded ends and fittings on 2-1/2 inch and smaller. At the HVAC Trade Contractor's option type "L" copper may be used on all 2-1/2 inch and smaller.

B. Refrigerant Piping and Fittings
1. Refrigerant Piping: Refrigerant piping shall be copper tube; Type ACR, hard-drawn temper; wrought-copper, solder-joint fittings; brazed joints.

C. Valves
1. All valves shall be bronze, brass, or cast iron as system design requires. Locate all valves so as to isolate all parts of the system for normal system operation.
2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide valves of the following manufacturer:
   a. Milwaukee
   b. Stockham
   c. Nibco
   d. Or equal

D. Pumps
1. Base mounted bronze fitted with high efficiency electric motor. Provide primary and stand-by pump for each system.
2. Available Manufacturers: Subject to compliance with the contract documents provide pumps of the following manufacturer:
   a. Bell & Gossett
   b. Taco
   c. Armstrong
   d. Or equal

E. Insulation
1. All piping shall be insulated with snap-on fiberglass insulation (min. 1-1/2 inch thick) with all service jacket. Fittings shall be insulated with snap on pre-molded covers with loose fill fiberglass insulation.
2. All HVAC supply and return ductwork shall be insulated with fiberglass blanket with a foil vapor barrier. All outside air intake ductwork and exhaust ductwork between inline fans or equipment and the point of building exit shall be insulated with 2 inch rigid fiberglass with foil vapor barrier.
3. All Refrigerant piping shall be provided with closed-cell foam insulation.
4. Piping insulation thickness shall meet or exceed energy code requirements.

2.03 AIRSIDE DISTRIBUTION SYSTEMS

A. Ductwork
1. All ductwork shall be galvanized steel with all seams sealed. Entire ductwork system shall be fabricated and installed per SMACNA standards and IMC code requirements.
2. Ductwork shall be insulated in accordance with energy code requirements.

B. Diffusers, Registers And Grilles
1. All devices shall be steel welded construction with diffusing vanes and baked enamel finish.
2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide diffusers, registers, and grills of the following manufacturer:
   a. Price
   b. Nailor
   c. Titus
   d. Metalaire
   e. Or equal

C. Displacement Diffusers:
1. All devices shall be steel welded construction with perforated face and intermittent baffle for equalization and shall have a baked enamel finish.
2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide displacement diffusers of the following manufacturer:
   a. Price
   b. Metalaire
   c. Titus

d. Or equal

D. Indoor and Rooftop Air Handling Units (HVAC 100 percent O.A.)
   1. All units shall be of the draw thru 100 percent outdoor air design and shall be provided with hot water heating coil, chilled water cooling coil, hot water total energy recovery section, reheat section, filters (MERV-14), dampers, and centrifugal supply and return air fan with motor.
   2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide rooftop air handling units of the following manufacturer:
      a. Nagas
      b. Haakon
      c. Bousquet
      d. Or equal

E. Make-Up Air Units:
   1. All units shall be of the draw thru 100 percent outdoor air design and shall be provided with filters (MERV-13), dampers, and centrifugal supply and return air fan with motor.
   2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide rooftop air handling units of the following manufacturer:
      a. Daikin
      b. Valent
      c. Greenheck
      d. Or equal

F. Fin Tube Radiation
   1. Commercial slope top fin-tube with steel tube and steel fin. Cover shall be 14 ga. with baked enamel factory finish. All units shall be provided with full backplate, damper, end covers, and splice pieces for a complete installation.
   2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide fin-tube radiation of the following manufacturer:
      a. Sterling
      b. Vulcan
      c. Ritling
      d. Or equal

G. Unit Heaters
   1. Horizontal or cabinet type with exact location to be determined. All units shall be provided with fan and aquastat control.
   2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide unit heaters of the following manufacturer:
      a. Trane
      b. Daikin
      c. Sterling
      d. Rittling
      e. Or equal

H. Radiant Heating Panels
   1. General: The radiant panels will have a minimum heating output of 190 Btu/Hour/Linear Foot at 120 degrees F mean water temperature when the room air temperature is 70 degrees F. Panels' widths shall be as indicated or scheduled on the drawings; in general the panels will be 36-48 in width to support lower hot water supply temperatures in the range of 110- 130 degrees F
   2. Radiant panel shall be manufactured utilizing extruded aluminum strips of approximately 0.115 overall thickness. The strips shall have a minimum 0.495 I.D. copper tube firmly attached to aluminum extrusion under all operating temperature conditions. Ends of tubes shall be swaged to 0.569 I.D. for proper soldering fit of ½ inch Type "L" soft copper tubing.
   3. Manufacturer: Subject to compliance with requirements, provide coils of one of the following:
      a. Price
      b. Sterling
      c. Rittling
      d. Or equal

I. Wall Mounted Radiators
1. Commercial radiators are manufactured of cold rolled low carbon steel, fully welded and consisting of header pipes at each end, connected by flat oval water tubes. Radiator shall have a baked enamel factory finish. All units shall be provided with end covers, and splice pieces for a complete installation.
2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide fin-tube radiation of the following manufacturer:
   a. Sterling
   b. Runtal
   c. Rittling
   d. Or equal

J. VAV (Variable Air Volume) Terminal Boxes
1. VAV Terminal Boxes shall be single duct style with sound trap as manufactured by one of the following:
   a. Price
   b. MetalAire
   c. Nailor
   d. Or equal

2.04 D3060 VENTILATION

A. Exhaust Fans
1. Exhaust fans shall be galvanized steel construction with centrifugal fan and belt drive motor. Each roof fan unit shall be provided with 24 inch high pre-fab curb with motor operated damper in curb.
2. Available Manufacturers: Subject to compliance with the requirements of the contract documents provide exhaust fans of the following manufacturer:
   a. Greenheck
   b. Cook
   c. Twin City
   d. Or equal

2.05 D3070 SPECIAL PURPOSE HVAC SYSTEMS

A. HVAC Instrumentation AND CONTROLS
1. Automatic Temperature Controls – Building Management System
   a. System shall be web accessible, open protocol (BACnet based) direct digital control (DDC) and building energy management system (EMS) to control and monitor building HVAC and lighting systems. Energy metering shall be installed to monitor the energy usage of building HVAC systems and utilities (electricity and water).
   b. Available Manufacturers: Subject to compliance with the requirements of the contract documents, provide automatic temperature controls of the following manufacturer:
      1) Johnson Controls
      2) Siemens
      3) Honeywell
      4) Delta
      5) Schneider Electric
      6) Or equal

B. Systems Testing and Balancing
1. Requirements include measurement and establishment of the quantities of the mechanical systems to meet specifications, and recording and reporting the results. Test, adjust and balance the following mechanical systems:
   - Supply air systems.
   - Return air systems.
   - Exhaust air systems.
   - Outside air systems.
   - Hydronic heating systems.
   - Verify temperature control system operation.
2. Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms

complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders.

3. An independent testing, adjusting, and balancing agency certified by the AABC or NEBB as a Test and Balance Engineer in those testing and balancing disciplines required for this project.

PART 3 - EXECUTION

3.01 SYSTEM IDENTIFICATION

A. Provide markers on all piping, equipment, and ductwork. Tag all valves in system with corresponding valve lists.

3.02 WORKMANSHIP AND INSTALLATION METHODS

A. All work shall be installed in a first-class manner consistent with the best current practices.

1. All piping shall be installed with slope for proper drainage shall be grouped together, and be parallel to each other. Utilize gang hangers wherever feasible. Group all valves together where feasible.

3.03 CLEANING AND PROTECTION

A. Protect all materials and equipment during shipment and installation, and properly handle and store at the job site so as to prevent damage, and upon completion of this work, clean all fixtures and equipment and replace damaged parts.

3.04 Sleeves And Escutcheons

A. Furnish and install in masonry walls and floors, galvanized steel sleeves. Provide escutcheons where sleeves and pipe penetrations are exposed to view.

3.05 FIRESAFING

A. At all sleeved walls and floors provide firesafe caulking, packing, blanket, for a completely tight system to prevent the passage of smoke and fire.

3.06 OPERATION MANUALS AND MAINTENANCE MANUALS:

A. Refer to the contract specifications for a complete outline of all requirements of operations and maintenance data.

3.07 RECORD DRAWINGS AND CONTROL DOCUMENTS:

A. Refer to the contract specifications project record documents for a complete description of all requirements of recording as built record documents.

3.08 COMMISSIONING:

A. The project shall be commissioned per the project Commissioning Agent’s (CxA) specifications.

END OF SECTION

SECTION DC D4

FIRE SUPPRESSION CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire suppression comprises the following elements:

1. Fire Sprinkler Systems: Automatic fire suppression is required for the entire building per MA state Building Code CMR 780, 10th edition and NFPA 13-2019.
2. Standpipe and Hose Systems: Elements that deliver adequate supplies of water to locations in the building for manual fire-fighting per MA state Building Code CMR 780, 10th edition and NFPA 14-2019.

PART 2 PRODUCTS

2.01 FIRE SUPPRESSION SYSTEM TYPES

A. Use one or more of the following:

1. Wet pipe sprinkler system.
2. Standpipe system.

2.02 D4010 - FIRE SPRINKLER AND EXTINGUISHING SYSTEM COMPONENTS

A. Pipe, fittings, hangers and supports:

1. Schedule 40 black steel pipe for 1-1/2 inch and smaller and Schedule 10 for 2 inch and larger.
2. All pipes passing through floors, walls, or partitions shall be provided with sleeves having an internal diameter of approximately one inch larger than the outside diameter of the pipe or insulation on covered lines. Sleeves through floors and through exterior, structural and fire-rated construction shall be hot-dipped galvanized Schedule 40 steel pipe
3. Fittings on fire service piping, 2 in. and larger, shall be Victaulic Fire Lock Ductile Iron Fittings conforming to ASTM A-536 with integral grooved shoulder and back stop lugs and grooved ends for use with Style 009-EZ or Style 005 couplings. Branch line fittings shall be welded or shall be Victaulic 920/920N Mechanical Tees. Schedule 10 pipe shall be roll grooved. Schedule 40 pipe, where used with mechanical couplings, shall be roll grooved and shall be threaded where used with screwed fittings. Fittings for threaded piping shall be malleable iron screwed sprinkler fittings.
4. Welding Materials: Comply, with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials appropriate for the wall thickness and chemical analysis of the pipe being welded.

   Brazing Filter Metals: AWS A5.8, Classification Bag1 (Silver).

   Solder Filter Metals: ASTM B 32, 95-5 Tin Antinomy.
5. Gasket Materials: Thickness, material, and type suitable for fluid or gas to be handled, and design temperatures and pressures.
6. Hangers for piping of sizes 4 inches and smaller shall be Carpenter & Paterson figure no. 800 adjustable swivel ring, Tolco Company or approved equal, black steel and hanger rods with machine threads.

7. Hangers for piping of sizes larger than 4 inches shall be the adjustable clevis hanger type, steel with extension rod to structure, Carpenter & Paterson figure no. 100.

B. Sprinklers

1. Upright sprinkler heads in areas with no ceilings shall be Reliable Model "F1FR" Quick Response, upright natural bronze finish heads.
2. Sidewall heads shall be Reliable Model "F1FR" Quick Response with chrome plated head and escutcheon.
3. Concealed heads shall be Reliable Model "G4A" Quick Response concealed type, 1-1/2 inch adjustment white cover plate. In special areas, as may be noted on the Drawings, provide alternate cover plate finishes.
4. Pendant dry sprinkler heads shall be chrome plated with adjustable escutcheon.

C. Sprinkler system equipment

1. Double check valve assembly shall be State approved, U.L./F.M. approved, with iron body bronze mounted construction complete with supervised OS and Y gate valves and test cocks. Double check valve assembly shall be Watts Series 757-OSY, Wilkins 350A-OSY, Ames 2000SS, or approved equal
2. Fire pump shall be 40 HP, 750GPM@60PSI with controller and all accessories. The Fire pump system also includes a 2HP, 10GPM@65 PSI Jockey pump with controller and accessories.
3. Gate valves, 2 inches and smaller shall be outside screw and yoke, bronze, rising stem, wedge disc type, threaded, conforming to MSS SP-80. Gate valve 2-1/2 inches and larger shall be iron body, bronze trim, outside screw and yoke, flanged, UL/FM listed conforming to MSS SP-70. All valves shall be UL listed for at least 175 psi working water pressure (wwp).
4. Globe and angle valves may be used as auxiliary valves (drain valves, test valves, trim valves and valves on compressed air piping) for diameters not over 2 in. They shall be bronze, rising stem, with bronze disc, threaded, conforming to MSS SP-80 Class 150.
5. Check valves shall be swing type except as noted. Valves 2 inches and smaller shall be bronze, regrinding type with renewable disc, screwed caps, threaded, class 150 conforming to MSS SP-80. Check valves 2-1/2 inches and greater shall be iron body, bronze trim, bolted cover, flanged, conforming to MSS SP-71, UL listed for 175 psi wwp.
6. Wet riser check valves shall be approved vertical type for wet systems, complete with drain valve and glycerin filled pressure gauges. Valve internal components shall be replaceable without removing valve from the installed position. UL/FM Global approved.
7. Fire Department connection shall be flush mount cast brass Storz inlet body with drop clappers, 4 inch in size. Polished brass plate lettered with the approved signage. The connection’s lettering and threads shall match Local Fire Department requirements. Confirm finish with Architect prior to ordering.
8. Fire protection test connection shall be polished brass plate with lettering to read “TEST”. Polished brass double female snoot with rigid end N.P.T. x pin lug hose thread swivel, pin lug plug and chain.
9. Water Flow Indicators: Vane type waterflow detector, rated to 250 psig; designed for horizontal or vertical installation; have 2-SPDT circuit switches to provide isolated alarm and auxiliary contacts, 7 ampere 125 volts AC and 0.25 ampere 24 volts DC; complete with factory-set, field-adjustable retard element to prevent false signals, and tamper-proof cover which sends a signal when cover is removed.
10. Electric Alarm: Electrically operated, red enameled gong with pressure alarm switch.

11. Supervisory Switches: SPST, normally closed contacts, designed to signal valve in other than full open position.

2.03 D4020 - STANDPIPE AND HOSE SYSTEM COMPONENTS

A. Fire Department Valves shall be Croker Series 5015 Fire Department Valves fitted with 2-1/2 inch national standard by 1-1/2 inch iron pipe reducer, caps and chains all conforming to Local Fire Department thread standard. Valves shall be polished chrome plated and shall be mounted in a recessed cabinet as indicated on Drawings.

B. Cabinets for the Fire Department Valves shall be Croker #2700 - Modified 18 inches by 18 inches by modified 10 inches deep. cabinet, fully recessed, solid door, prime painted steel. Include graphic and door catch.

C. Provide 24 inches by 24 inches access panels at floor control locations or recessed cabinets as appropriate to the wall construction. Provide graphic.

D. Fire Hose Cabinets located in the stage area shall be Croker Series 2100 full recessed mounted, prime painted steel door with graphic equipped with 2-1/2 inch valve with 1-1/2 inch fire hose rack containing 50 feet of 1-1/2 inch Pr. Superflex hose and nozzle conforming to local fire department standards.

2.04 D4090 - GENERAL

A. All materials and equipment furnished under this Trade Contract shall be new, unused, first quality of a manufacturer of established reputation. Each valve, fitting, section of pipe, piece of equipment, shall have cast or indelibly stamped thereon the manufacturer's name, pressure rating and where applicable, type.

B. Drains and test connections shall be provided in the systems.

C. Protect all materials and equipment during shipment and installation, and properly handle and store at the job site so as to prevent damage, and upon completion of this work, clean all fixtures and equipment and replace damaged parts.

D. All work shall be installed in a first-class manner consistent with the best current practices.

E. All piping shall be installed true to line and grade, shall be grouped together, be parallel to each other. Utilize gang hangers wherever feasible. Group all valves together where feasible.

END OF SECTION

SECTION DC DC5
ELECTRICAL CRITERIA

PART 1 - GENERAL

1.01 TIME, MANNER AND REQUIREMENTS FOR FILING TRADE BIDS

A. Trade Bid shall be submitted in accordance with the provisions of General Law, Chapter 149A, inclusive, as amended.
B. Sub-Bids for Work under this Section shall be received at the location indicated on the Invitation for Bids.
C. All Trade Bids shall be submitted on the “Form of Trade Bid” furnished by the Awarding Authority complying with Chapter 149A of the General Laws, as amended. The Bid Forms attached herein are for information only and shall not be detached, filled in, or executed. Trade Bids which are incomplete, conditional, obscure, or which contain additions not called for will be rejected.
D. Trade bids for work under this Section shall be for the complete work required as specified and as shown on the Drawings. Work to be performed under this Trade Bid is included in the Contract Documents as indicated in the Trade bid Coordination document included in the Bidding and Contract Requirements of this Project Manual.
E. Trade Bidders must comply with all provisions of Division 01 General Requirements, in the same manner as the Construction Manager.

1.02 GENERAL

A. The General Conditions and Supplementary General Conditions of these contract documents are hereby made a part of this Section.
B. Refer to drawings for further definition of location, extent, and details of work described herein.
C. Cooperate and coordinate with other trades in executing work as described in this Section.
D. Where referred to, Standard Specifications, Recommendations of Technical Societies, and/or Manufacturer's Associations, plus Codes of Federal, State, and Local Agencies shall include all amendments current as of date of issue of these specifications.
E. Product specifications are written in such a manner so-as-to specify what materials may be used in a particular location or application and therefore do not indicate what is not acceptable or suitable for a particular location or application. As an example: non-metallic sheathed cable is not specified; therefore, it is not acceptable.
F. All material shall be new and shall be UL listed.

1.03 SUMMARY

A. Work described herein shall be interpreted as work to be done by the Electrical Trade Contractor. Work to be performed by other trades will be referenced to a particular contractor.
B. Provide all labor, materials, tools, and equipment, including scaffolding, to complete the installation of the electrical system. Install, equip, adjust, and put into operation the respective portions of the installation specified, and so interconnect various items or sections of work in order to form a complete and operating whole. The work shall consist of, but shall not necessarily be limited to, the following:
    1. Primary, Secondary and low tension ductbanks, manholes and handholes.
    2. Secondary distribution equipment, including secondary switchboard and metering, motor controls, dry-type transformers, distribution panels, and panelboards, including feeders and subfeeders.
    3. Fire alarm and mass notification system, addressable type.
    4. Emergency power system, including diesel fueled emergency generator, emergency lighting and exit signs.
    5. Lighting systems exterior and interior, including lamps, fixtures, occupancy sensors, controls.
    6. Theatrical lighting system including all track, track heads, DMX controller(s), racks and controls.
    7. All raceway systems, including boxes, couplings, and fittings.
    8. All branch circuit wiring systems, including wiring devices, plates.
    9. Excavation and backfill within building foundation walls for any underground raceways.
    10. Connections and coordination for all building equipment, including mechanical, plumbing, fire protection, elevator.
    11. All testing of equipment installed.

12. Any other item of work hereinafter specified or indicated on electrical drawings.
13. Drilling, coring, and cutting of holes (where the largest dimension thereof does not exceed 12 inches) for electrical conduit systems, and equipment.
14. Systems Identification.
15. Scaffolding, Rigging, and Staging required for all Electrical Work.
16. Hardware – coordinate with Finish Hardware.
17. Fire stopping.
18. Provide Seismic Restraints for all Electrical Systems conforming to the requirements of State Code.
19. Coordination Drawings.
20. Provide cable tray, 120-volt power sources, raceways and backboxes for Paging System, Clock System, Voice, Data and Video Systems and Security System as specified in Section DC D7 and Section DC D8.
21. Lightning Protection System.
22. Temporary Power and Lighting.
23. Electronic Scoreboards and Shot Clocks. Wall mounted, 6-foot by 8-foot multisport scoreboard. Basis of design Daktronics BB2153.
24. Alternates affecting this Section.
25. Distributed Antenna System (DAS).
26. Two-way Communication Call Box System.
27. Photovoltaic System provisions

1.04 DEFINITIONS

A. Most terms used within the documents are industry standard. Certain words or phrases shall be understood to have specific meanings as follows:
   1. Provide: Furnish and install completely connected and in operable condition.
   2. Furnish: Purchase and deliver to a specific location within the building or site.
   3. Install: With respect to equipment furnished by Construction Manager or other Trade Contractors, install means to receive, unpack, move into position, mount, and connect, including removal of packaging materials.
   4. Conduit: Raceways of the metallic type which are not flexible. Specific types as specified.
   5. Connect: To wire up, including all branch circuitry, control and disconnection devices so item is complete and ready for operation.
   6. Subject to Mechanical Damage: Equipment and raceways installed exposed and less than eight feet above finished floor in mechanical rooms or other areas where heavy equipment may be in use or moved.

1.05 ITEMS TO BE FURNISHED ONLY

A. Furnish the following items for installation under designated sections.
   1. Duct smoke detectors and duct carbon monoxide detectors installed under Section DC D4 HVAC Criteria.

1.06 ITEMS TO BE INSTALLED ONLY

A. Install the following items furnished under designated sections.
   1. Technology system specialty back boxes.

1.07 RELATED WORK

A. The following related work is to be performed under designated sections.
   1. Excavation and Backfill: DC G – Sitework Criteria (except within building foundation).
   2. Concrete Bases, Pads and Duct Envelopes: DC A Substructure Criteria.
   3. Finish Painting: DC C2 – Interior Finishes Criteria.
   4. Automatic Temperature Control: DC D4 HVAC Criteria.
   5. Payment for energy for temporary light and power shall be made by the Construction Manager.

1.08 CONTRACT COST BREAKDOWN

A. Submit a breakdown of contract price to aid Architect in determining value of work installed as job progresses.

1.09 INSPECTION OF SITE

A. Electrical bidders will be permitted to inspect the site. Failure to inspect existing conditions or to fully understand work which is required shall not excuse Electrical Subcontractor from his obligations to supply and install work in accordance with specification and drawings and under site conditions as they exist.

1.10 CONTRACTOR'S REPRESENTATIVE

A. Retain a competent representative on the project.

1.11 COOPERATION

A. Work shall be carried out under usual construction conditions, in conjunction with other trade Contractors' work. Cooperate with other Trade Contractors, coordinate work, and proceed in a manner so as not to delay progress.

1.12 CODES, ORDINANCES, AND PERMITS

A. Codes and Ordinances:
   1. NFPA 70 – National Electrical Code – (NEC) 2023
      NFPA 101 – Life Safety Code
      NFPA 72 – National Fire Alarm Code
      Underwriters Laboratories, Inc. UL Standards
      National Electrical Manufactures Association (NEMA) standards
      Institute of Electrical and Electronic Engineers (IEEE), applicable publications
      Illuminating Engineering Society of North America (IESNA), applicable publications
      LEED V4
   2. Code Design Requirements:
      Main service shall be designed per NEC Article 230 – Services.
      Grounding shall be in accordance with NEC Article 250 – Grounding
      Lighting, Electrical Distribution, Receptacles, General Power, Telephone, Fire Alarm, Data Network, Intrusion, Lightning Protection, and Photovoltaic Systems shall be designed in accordance with the National Electrical code (NEC) 2017 and all local codes that may apply.
      Fire Alarm Systems shall be designed per NFPA 70, 101, 72, 25.
      All wiring shall be in compliance with the National Electrical Code – (NEC) 2017

B. Permits: Be responsible for filing documents, payment of fees, and securing inspections and approvals. Owner will pay for backcharges for utility company work in conjunction with the permanent electric service.

1.13 ELECTRICAL ROOMS OR SPACES

A. Be responsible for ensuring that the dedicated space and clearances required in the NEC, Sections 110-16 and 384-4 are maintained for all electrical equipment.

1.14 SUBMITTALS

A. Refer to Supplementary General Conditions for information relative to submission of shop drawings. Six copies are required. No equipment for which review is required shall be installed prior to review, except at the Construction Manager or Trade Contractor's own risk.

1.15 GUARANTEE

A. Keep work in repair without expense to Owner as far as concerns defects in workmanship or materials for a period of not less than one year from date of substantial completion.

1.16 ELECTRICAL CHARACTERISTICS

A. In general, and unless specifically indicated otherwise, all building service, heating, ventilating, air conditioning, and plumbing equipment shall be of the following characteristics.
   1. Motors up to and including 1/3 HP shall be suitable for 120 volts, one phase operation.
   2. Motors larger than 1/3 HP shall be suitable for 480 volts, three phase operation.
   3. Electric heating equipment 4 KW and less shall be suitable for 277-volt single phase operation. Over 4 KW shall be 480-volt three phase.

B. Power Factor: All equipment provided rated greater than 1,000 watts and lighting equipment greater than 15 watts with an inductive reactance load component shall have a power factor of not less than 90 percent under rated load conditions.

1.17 RECORD DRAWINGS

A. Provide two sets of black or blue line, on white drawings to maintain and submit record drawings, one set shall be maintained at site, and which shall be accurate, clear, and complete showing actual location of all equipment as installed.
B. Any addenda sketches and supplementary drawings issued during course of construction shall be attached to drawings.
C. At completion, submit an accurate checked set of drawings.
D. After approval of these drawings, photo reproductions of original tracings shall be revised to incorporate changes, including addenda sketches and supplementary drawings.

1.18 TEMPORARY LIGHT AND POWER

A. Refer to Division 01 General Requirements.

1.19 TEMPORARY ELECTRICAL SUPPORT FACILITIES

A. Refer to Division 01 General Requirements.
B. Provide Electrical Trade Contractor field office and/or storage facilities which shall be located at the direction of the Construction Manager and in accordance with local regulations. Provide all tools, equipment, ladders, and temporary construction required for execution of the work.
C. All scaffolding, ladders, and other temporary construction shall be rigidly built-in accordance with all local and state requirements and shall be removed upon completion.

1.20 INSPECTIONS AND TESTS

A. Inspection: If inspection of materials installed shows defects, such defective work, materials, and/or equipment shall be replaced, and inspection and tests repeated.
B. Tests: Make reasonable tests and prove integrity of work and leave electrical installation in correct adjustment and ready to operate. All panels and switchboards shall have phases balanced as near as practical. A consistent phase orientation shall be adhered to all terminations.

1.21 ENERGY REBATE PROGRAM

A. This project has been designed to incorporate equipment approved for energy rebate such as fixtures, and lighting controls. This project will be designed in compliance with the “Mass Save” Program.

1.22 OWNER FURNISHED EQUIPMENT

A. The owner will furnish certain materials which will be installed and wired under this Section of the specifications. Owner furnished equipment will be specified under the Product Sections of these Specifications.

1.23 INSTRUCTIONAL TECHNOLOGY SYSTEM (I.T.S.)

A. Electrical Contractor shall work closely with the I. T.S. Contractor to assure a first-class installation. Coordinate all back boxes and conduits required prior to installation. In general, the electrical contractor shall provide outlet boxes and conduits from (I.T.S. equipment) outlets to accessible ceiling space.

1.24 WORK COORDINATION AND JOB OPERATIONS

A. Equipment shall not be installed in congested and possible problem areas without first coordinating installation of same with other trades. Relocate electrical equipment installed in congested or problem areas should it interfere with the proper installation of equipment to be installed by other trades.

1.25 PLANS AND SPECIFICATIONS

A. Plans:
    1. Drawings showing layout of electrical systems indicate approximate location of raceways outlets and apparatus. Runs of feeders and branch circuits are schematic and are not intended to show exact routing. Final determination as to routing shall be governed by structural conditions and other obstructions.
B. Specifications:
    1. Specifications supplement drawings and provide specifics pertaining to methods and material to be used.

1.26 IDENTIFICATION

A. Equipment shall be marked for ease of identification as follows.
    1. Provide screw-on nameplates on switchboards, panelboards, F.A. terminal cabinets, starters, and disconnect switches. Nameplates to be of black phenolic with white engraving. For starters and disconnect switches lettering shall be minimum of 1/4 inch high.

2. Space neatly typed directory cards listing circuit designations shall be fastened inside the cover of panelboards. Spare circuits shall be penciled.
3. Wiring device plates on devices connected to normal-emergency circuits shall be red in color.
4. All conductors in boxes larger than standard outlet boxes, in all wireways, trench headers shall be grouped logically and be identified.
5. Grounding conductors and neutrals shall be labeled in panels, wireways as to circuits associated with.

1.27 PROTECTION AND CLEANUP

A. Protection:
   1. Materials and equipment shall be suitably stored and protected from the weather.

1.28 PORTABLE OR DETACHABLE PARTS

A. Retain possession of and be responsible for spare parts, portable and detachable parts, and other removable portions of installation including fuses, keys, locks, blocking clips, inserts, lamps, instructions, drawings, and other devices or materials that are relative to and necessary for proper operation and maintenance of the system until final acceptance, at which time such parts shall be installed or turned over to the Owner, as the case may be.

1.29 SAFETY PRECAUTIONS

A. Provide proper guards, signage, and other necessary construction required for prevention of accidents and to ensure safety of life and property. Remove any temporary safety precautions at completion.

1.30 MOUNTING HEIGHTS

A. All electrical equipment shall be mounted at the following heights unless noted or detailed otherwise on drawings. Notes on architectural drawings shall supersede those noted below or detailed on the electrical drawings. If mounting height of an electrical component is questionable, obtain clarification from Architect before installation.
   1. Duplex convenience outlets, microphone outlets, and telephone outlets - 18 inches.
   2. Light switches, pushbutton stations, HOA switches, and all other toggle or control switches for the operation of heating, ventilating, and air conditioning, plumbing, and general service - 48 inches.
   3. Clock outlets - 84 inches.
   4. Fire alarm pullstations - 48 inches.
   5. Fire alarm audio visual signals - 80 inches or six inches below ceiling, whichever is lower.
   6. Panelboards for lighting, power, telephone, and other auxiliary systems – 78 inch to top.
B. Mounting heights given are from finished floor to centerline. In the case of a raised floor, the surface of the raised floor is the finished floor.

1.31 WORKMANSHIP AND INSTALLATION METHODS

A. Fastenings:
   1. Fasten electric work to building structure in accordance with the best industry practice.
B. General Raceway Installation:
   1. Install the various types of raceways in permitted locations as previously specified. All raceways shall be run concealed. Consult Architect for instruction for raceways which must be exposed in public spaces.

1.32 BRANCH CIRCUITS

A. Provide all branch circuit wiring and outlets for a complete and operational system. The system shall consist of insulated conductors connected to the panelboards and run in raceways, or as cable systems if permitted under the products section, to the final outlet and shall include outlet boxes, supports, fittings, receptacles, plates, fuses.

1.33 FIREPROOFING AND WATERPROOFING

A. Fireproof and waterproof all openings in slabs and walls to maintain the original rating of same.

1.34 CUTTING AND PATCHING

A. All cutting of surfaces, including core drilling of walls and slabs, shall be done by Electrical Subcontractor. Openings through new wall surfaces will be provided by Construction Manager if Electrical Subcontractor gives suitable notice as erection of surface proceeds. If suitable notice is not given, Electrical Subcontractor shall then be responsible for the cost of corrective work required.

1.35 ELEVATOR COORDINATION

A. Elevator Electrical Work:
   1. Several items pertaining to elevator electrical system shall be provided by Electrical Subcontractor as follows:
      a. Power source to elevator machine room including fused disconnect switch and wiring between disconnect switch and controller for each elevator fused disconnect switch (120 volt) for elevator signal system and cab light for each cab light, switch, and GFCI receptacle in each pit and machine room.
      b. Control modules from fire alarm system for elevator recall are to prevent the cab from opening on a fire floor.
      c. Junction box in machine room for cab telephone and paging system.

1.36 MECHANICAL SYSTEM COORDINATION

A. The Mechanical System Subcontractor will be providing various items of mechanical services equipment and control apparatus. In general, Electrical Subcontractor shall connect power wiring to this equipment. Equipment provided by Mechanical System Subcontractors will include built-in disconnecting means and overcurrent protection unless shown otherwise on drawings. This does not include terminal boxes.

1.37 DISTRIBUTION EQUIPMENT TESTING

A. All dry-type transformers, individual motor starters, switchboard and main distribution panels, motor controls, motor control centers, feeder conductors, and emergency systems shall be tested in accordance with the following. In general, all tests shall be done in accordance with the 1995 Acceptance Testing Specifications of the International Electrical Testing Association.
B. Grounding Grids or Electrodes: Measurement of resistance from ground grids or electrodes to earth to determine adequacy of grounding system in building and compliance with specifications and/or electrical code.
C. Settings of Adjustable Devices: Using the result of the fault current and coordination study specified hereinafter, the Testing Contractor shall set all adjustable devices.

1.38 COMMISSIONING REQUIREMENTS

A. The building project shall include commissioning of all Electrical equipment, the building Fire Alarm System, Emergency Lighting System, Security System, and Lighting Control System; commissioning specifications will be prepared by the Commissioning Agent once that entity has been hired by MSBA.

PART 2 - PRODUCTS

2.01 D5020 - ELECTRIC SERVICE

A. Coordinate and cooperate with Utility Company, with respect to providing service and metering. See allowances section for backcharges by utility company with respect to permanent service.
B. Provide all primary system raceways, elbows, pull wires and all pad grounding. The utility company will provide pad mounted transformer and primary conductors including making up of all terminations and connections.
C. Metering: All usage will be on one secondary meter. The utility Company will furnish current transformers and potential transformers to be installed in the switchboard by the Construction
D. Manager. An empty raceway with pull wire from the C/T compartment to the meter backboard shall be provided.

2.02 D5020 - RACEWAYS AND FITTINGS

A. Raceways - General:
   1. No raceway shall be used smaller than 3/4 inch diameter and shall have no more than four 90 degrees bends in any one run, and where necessary, pull boxes shall be provided. Only rigid metal conduit or intermediate metal conduit is allowed for in-slab work. Cable systems, if allowed to be used by other sections of this specification, shall not be used exposed or in slabs, whether listed by "UL" for such use or not.
   2. Rigid metal conduit may be used for service work, exterior work, slab work, and below grade level slab, wet locations, and in penthouse for drops down to equipment from elevations above eight feet and where raceway may be subject to mechanical damage.
   3. Electrical Metallic Tubing (EMT) may be used in masonry block walls, stud partitions, above furred ceilings, where exposed but not subject to mechanical damage, and shall be used for fire alarm work.
   4. Surface metal raceways shall be used where raceways cannot be run concealed.

5. Flexible metal conduit shall be used for final connections to recessed lighting fixtures from above ceiling junction boxes and for final flexible connections to motors and other rotating or vibrating equipment. Liquid tight flexible metal conduit shall be used for the above connections which are located in moist locations. All flexible connections shall include an insulated grounding conductor.
6. Rigid non-metallic conduit may be used at the Construction Manager's option for underground electric and telephone services outside the foundation wall and shall be polyvinyl chloride (PVC) schedule 40, 90 degrees Celsius. If the option of rigid non-metallic conduit is exercised, underground runs outside the foundation wall shall be concrete encased at electrical contractors expense.
7. PVC Schedule 40 may also be used for below slab circuits within building confines and site lighting branch circuits. Below slab rigid non-metallic conduits do not require concrete encasement. Rigid non-metallic conduits shall not be used for exterior feeders, in slabs, nor for elbows which penetrate slabs. Raceways and fittings shall be produced by the same manufacturer.
8. Acceptable manufacturers:
   Pittsburgh Standard Conduit Company
   Republic Steel and Tube
   Youngstown Sheet and Tube Company
   Carlon

B. Outlets, Pull and Junction Boxes:
   1. Outlets:
      a. Each outlet in wiring or raceway systems shall be provided with an outlet box to suit conditions encountered. Boxes installed in normally wet locations or surface mounted shall be of the cast-metal type having hubs. Concealed boxes shall be cadmium plated or zinc coated sheet metal type. Old work boxes with Madison clamps are not allowed in new construction. Through the wall boxes are not permitted.
      b. Acceptable manufacturers:
         Appleton
         Crouse Hinds
         Steel City
         RACO
   2. Pull and Junction Boxes: Where indicated on plans, and where necessary to terminate, tap off, or redirect multiple raceway runs or to facilitate conductor installation, furnish, and install appropriately designed boxes. Boxes shall be fabricated from code gauge steel assembled with corrosion resistant machine screws. Box size shall be in accordance with the Code.
      a. Acceptable Manufacturers:
         Brasch
         Hoffman
         Keystone
         Lee Products Co.
         McKinstry Inc.
         Eldon Inc.

2.03 D5020 - CONDUCTORS

A. All conductors shall be a minimum size of #12 AWG except for control wiring and fire alarm wiring where #14 AWG may be used. For all exit sign circuits, normal/emergency and/or emergency only circuits, exterior lighting circuits, and also where distance from panelboard to first outlet exceeds 80 feet for 120 volts and 150 feet for 277 volts, #10 AWG shall be minimum size wire allowed. All feeder and branch circuit conductor shall be color coded as follows:

1.	208Y/120V	Phase A	Black
2.	208Y/120V	Phase B	Red
3.	208Y/120V	Phase C	Blue
4.	480Y/277V	Phase A	Brown
5.	480Y/277V	Phase B	Orange
6.	480Y/277V	Phase C	Yellow
7.	Grounded Conductor		
		120/208	White
		277/480	Grey

8. Equipment Ground

120/208	Green
277/480	Green with Yellow Trace

B. All conductors not installed in accordance with color scheme shall be replaced. All conductors larger than #6 AWG must be identified with colored tape.

C. Connections throughout the entire job shall be made with solderless type devices.
1. For #10 AWG and smaller: spring type.
2. For #8 AWG and larger: circumferential compression type.
3. Acceptable manufacturers:
3M "Scotchlock"
IDEAL "Wingnut"
BURNDY
MAC
4. Any splices made up in ground mounted pull boxes shall be resin cast waterproof type or waterproof pressure type, as manufactured by King Technology, St. Louis, MO.

D. Conductors shall be copper, soft drawn, and annealed of 98 percent conductivity. Conductors larger than #10 AWG shall be stranded; #10 AWG and smaller shall be solid. Conductors shall be insulated for 600 volts and be of following types:
1. All conductors shall have heat/moisture resistant thermoplastic insulation type THHN/THWN (75 degree Celsius) except as follows:
a. In sizes #1 AWG and larger: Crosslinked polyethylene insulation type XHHW (75 degrees Celsius – 90 degrees Celsius) may be used.
b. Fire alarm system conductors shall be #14 AWG, type THHN, solid. Color-coding of fire alarm conductors shall be in accordance with fire codes.
c. Fixture whips #16AWG type "SF".

E. Stranded conductors for all wiring systems except fire alarm will be allowed if installed and terminated as specified under Execution Section.

F. Mineral-Insulated Metal-Sheathed Fire-Resistive Cables (Type MI) - Cables shall consist of a factory assembly of one or more solid copper conductors insulated with highly-compressed magnesium oxide and enclosed in a seamless, liquid-and-gas-tight continuous copper sheath. Cables shall be rated for 600 volts or less. Cables shall comply with Article 330 of the National Electrical Code. Cables shall be classified by Underwriters Laboratories, Inc. as having a 2-hour fire resistive rating. Cable terminations shall be made with UL listed mineral-insulated cable fittings. Approved Manufacturer - Pyrotenax USA, Inc.

G. Type MC cable may be used for concealed branch circuits in hollow spaces where allowed by code if installed and terminated as specified under Execution Section. Armor to be galvanized steel and shall be UL listed for 2 hour thru-wall fire penetration.

H. Acceptable manufacturers:
American Cable Systems
American Wire & Cable
Cerro
Cornish
Cresent
General Cable
Okonite

2.04 D5020 MEDIUM VOLTAGE CABLE

A. TRXLP Power Cable, 15 KV, one third Concentric Neutral Underground cable, 100 percent insulation thickness compressed stranding and solid conductors:

B. Medium Voltage cable shall be Hendrix power cable no exceptions.
1. (RMLD) Reading Municipal Light Department shall review and approve the submitted cable prior to release. The electrical contractor shall not release the cable until formal approval is granted by (RMLD). Where the electrical contractor releases the equipment prior to formal approval from (RMLD) it will be done so at their own risk and any costs associated with resubmittal, restocking and replacement of the cable including all labor will be the responsibility of the electrical contractor.

C. Description:
1. 4/0 AWG 19XFS AL 15kV 0.175 TRXLP EZ 11#14BC 1/3N LLDPE 1C CTO ICEA S-94-649
2. Cable Weight shall equal 0.72553 lbs/ft

D. Specifications:
   1. Conductor: Aluminum 4/0 AWG 19X filled Compressed Round with a nominal diameter of .512 inches
   2. Conductor Shield: XSC Conventional Semi con
   3. Insulation: 0.175 TRXLP with a minimum diameter of 0.865, Nominal diameter of 0.905 and maximum diameter of 0.950 inches.
   4. Insulation Shield: XSC EZ strip insulation shield with a minimum diameter of 0.925, Nominal diameter of 0.990 and maximum diameter of 1.050 inches.
   5. Metallic Shield: 14 AWG BC 11 Wire 1/3 Neutral with a minimum diameter of 1.055, Nominal diameter of 1.115 and maximum diameter of 1.180 inches.
   6. Jacket: 0.045 LLDPE with a minimum diameter of 1.145, Nominal diameter of 1.245 and maximum diameter of 1.340 inches.

E. Electrical Trade Contractor shall provide all splicing and terminations per manufacturers specifications. All splices shall be made using Elastimold splice kits.

2.05 D5020 - MAIN BUILDING SWITCHBOARD

A. Main building switchboard shall be constructed in accordance with UL 891 and ANSI standards and of the required number of vertical sections bolted together to form one metal enclosed rigid structure. The front shall be accessible. Buses shall be copper.

B. Switchboard shall be arranged for operation as follows:
   Voltage - 480Y/277 volts
   Frequency - 60 cycles
   Service - 3 phase, 4-wire, ampere capacity as indicated on drawings.
   Neutral - full capacity
   Available short circuit current at line terminals - 65,000 RMS amperes symmetrical.
   Integrated equipment rating - 65,000 AIC
   Copper ground bus, full length
   UL service entrance label

2.06 D5020 - PANELBOARDS

A. Panelboards shall be dead-front, door in door safety type equipped with single or multi-pole circuit breakers suitable for 120/208 volt or 277/480 volt, 3 phase, 4 wire operation.

B. Buses shall be copper. Panelboards shall have a circuit directory card mounted in a frame with plastic cover on the inside of door. Panelboards to have a copper ground bus with terminals for each circuit. Panelboards serving isolated ground receptacles shall have a separate ground bus for terminations of the isolated grounds. The isolated ground bus shall be mounted to the panel tub via non-conducting means with a separate grounding conductor run to the normal panel ground bus.

C. Panelboards and distribution panels shall be of the same manufacturer as the switchboard.

2.07 D5020 - DRY-TYPE TRANSFORMERS

A. Dry-type transformers shall be 480-volt, 3 phase, delta connected primary and 120/208 volt, 3 phase, 4 wire wye connected secondary with grounded neutral. They shall be of the KVA size, voltage rating, and characteristics as shown on the drawings. Transformers 75KVA and larger shall have minimum impedance of 4-1/2 percent. Transformers feeding panels with surge suppressors shall be K-13 rated.

B. Provide grounding of separately derived systems in accordance with Code Article 250-26.

C. Transformers shall meet DOE 2016 efficiency standards.

2.08 D5020 - ELECTRICAL POWER EQUIPMENT

A. Motors: Each motor shall have disconnect switches and starters provided under this section. Starters which are a part of "factory assembled" control panel will be provided under section supplying equipment to be controlled but connected under this section.
   1. Provide motor terminal boxes for each motor not furnished with same.

B. Disconnect Switches:
   1. Disconnect (safety) switches shall conform to industrial standards of NEMA, be UL listed and shall be heavy duty type, quick-make, quick-break type with interlocking cover mechanism and provisions for padlocking switch handle in "OFF" position. Three pole toggle switches are not acceptable as substitute for disconnect switches.

2. Acceptable Manufacturers:
   General Electric
   Westinghouse
   Square D/Groupe Schneider
   Siemens
   Allen Bradley

C. Fuses:
1. Provide a complete set of fuses for each item of fusible type equipment. Fusible equipment furnished by the Construction Manager or other Trade Contractors will be complete with fuses, unless noted otherwise on electrical drawings.
2. Acceptable Manufacturers:
   Bussmann, Division of McGraw
   Gould/Shawmut
   GEC-ALSTHOM

2.09 D5020 - ELECTRICAL SYSTEM CONTROLS AND INSTRUMENTS

A. Provide a complete power system consisting of branch circuits, motor disconnect switches, pushbutton stations, motor starters, and other devices to connect and leave in operating condition each piece of electrically operated equipment provided either under this section or other Divisions.
B. All control wiring not indicated in the electrical specifications or not shown on electrical drawings will be provided by Automatic Temperature Control Subcontractor.

2.10 D5020 – SURGE PROTECTION

A. Furnish and install surge protection devices with ratings of 120,000 amperes on the secondary side of the main service overcurrent device and panelboards feeding computer equipment.

2.11 D5020 - AUTOMATED LIGHTING CONTROL SYSTEM

A. General: Summary
1. Section Includes:
   a. Addressable Networked Light Management System.
B. System Description
1. Lighting Control System includes computer-based software that provides control, configuration, monitoring, and reports. System includes the following components:
   a. Central Control Unit
   b. System Server
   c. 0-10V Dimming, Fixed Output Ballasts or 0-10V LED Drivers
   d. System Field Devices (Input and Output Modules)
   e. Lighting Control System Software
   f. Lighting Controllers
   g. Communication Wire
   h. Occupancy sensors
   i. Photo sensors
   j. Power packs
   k. Lighting control panels
   l. Interface to audio visual equipment
   m. Interface to BACnet
C. Basis of Design Products
1. Controls: ENCELIUM Energy Management System by OSRAM SYLVANIA
2. Sensors: ENCELIUM Sensors by OSRAM SYLVANIA and Hubbell Building Automation, Inc.
D. Acceptable Alternate Manufacturers
1. Controls: Lutron, Sensor Switch, Crestron, Philips, Cooper.
2. Sensors: Lutron, Sensor Switch, Watt Stopper, Leviton, Cooper.
E. Field Quality Control
1. Manufacturer’s Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
2. Perform the following field tests and inspections with the assistance of a factory-authorized service representative:
   a. Operational Test: After installing lighting controllers and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.

b. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Lighting control devices will be considered defective if they do not pass tests and inspections.
4. Prepare test and inspection reports.

2.12 D5020 - FLOOR OUTLETS (FLUSH TYPE)

A. Section includes flush floor boxes equal to Wiremold RFB Series. Provide an appropriate floor box model that meets the intent of what is shown on the drawings.
B. Quality Assurance
1. Electrical Raceways and Components: Comply with requirements of applicable local codes, NEC, UL, and NEMA Standards pertaining to raceways and components. Listed and labeled in accordance with NFPA 70, Article 100.
C. Floor Boxes
1. RFB4, RFB4-4DB Series Floor Boxes.
D. Activation Covers
1. FloorPort FPCT, FPBT, and FPFFT Series Covers.
2. The covers shall have been evaluated by UL to meet the applicable U.S. and Canadian safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
E. Communication Modules Mounting Accessories
1. The floor box manufacturer shall provide a complete line of faceplates and bezels to facilitate mounting of UTP, STP (150 ohm), fiber optic, coaxial, and communication devices. The box shall provide a series of device mounting plates that will accommodate Ortronics workstation connectivity outlets and modular adapters, and other open system devices.
F. Installation
1. Strictly comply with manufacturer's installation instructions and recommendations and approved shop drawings. Coordinate installation with adjacent work to ensure proper clearances and to prevent electrical hazards.
2. Mechanical Security: Raceway systems shall be mechanically continuous and connected to all electrical outlets, boxes, device mounting brackets, and cabinets, in accordance with manufacturer’s installation sheets.
3. Accessories: Provide accessories in accordance with manufacturer’s direction for a complete installation, including insulated bushings and inserts where required by manufacturer.
4. Unused Openings: Close unused box openings using manufacturer's recommended accessories.
5. Provide a minimum concrete pour depth of 3-7/16-inch [87mm] plus 1/16-inch [1.6mm] above the top of the box for the RFB4, RFB4-4DB, RFB2, and the RFB2-OG Series Boxes; 2-7/16-inch [62mm] plus 1/16-inch [1.6mm] for the RFB4-SS and RFB2-SS Series Boxes; and 3-7/16-inch [87mm] plus 13/16-inch [21mm] above the top of the box for the RFB4-CI-1, RFB6, and RFB6-OG Series Boxes; and 4-1/16-inch [103mm] above the top of the RFB4E and RFB4E-OG Series Boxes; and 4-inch [102mm] above the top of the RFB6E and RFB6E-OG Series Boxes. Provide the box with four locations to accommodate leveling for pre-concrete pour adjustment and include four leveling screws for the pre-pour adjustment.
G. Cleaning and Protection
1. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer.
2. Protect boxes and fittings until acceptance.

2.13 D5030 - WIRING DEVICES

A. Receptacles: Receptacles shall be flush mounted. All standard 20 ampere devices to be of the same manufacturer.
B. Acceptable Manufacturers:
Twenty ampere duplex grounding type NEMA 5-20R,
Arrow Hart 5739SI,
Thirty amperes, 250-volt NEMA 10-30R complete with plate,
Arrow Hart 9344,
C. Cord Reels:
Two 20A Hubbell HBLI45123GF220M1

D. Switches: 20 amperes,
Arrow Hart 1991 series,
E. Composition material of wiring devices to be nylon with white finish.
F. Coverplates: Brushed US 302 stainless steel.
1. Provide gaskets on all wiring device plates where devices are on walls separating conditioned and non-conditioned spaces.
G. Blank coverplates shall be steel, paintable.
H. Dimmer Controls:
1. All devices shall be UL listed specifically for the required loads (i.e., incandescent, fluorescent, magnetic low voltage, electronic low voltage). Manufacturers shall provide file cards upon request. Universal dimmers are not acceptable.

2.14 D5040 - LIGHTING FIXTURES

A. Provide lighting fixtures complete with LED, drivers, and other devices in accordance with manufacturer's specifications for a first-class installation. Furnish Ceiling Subcontractor with instructions concerning openings necessary and provide frames for NEMA standard ceiling types or special mounting frames, as may be required. Fixtures shall be supported independently of hung ceiling construction.
B. Provide universal arrows on all exit signs and punch out directions as shown on floor plans.
C. Pendant mounted fixtures shall be suspended by means of aircraft cable with aligner and canopy in finished areas or threaded rods in non-public areas. Length of suspension method to be in accordance with manufacturer's recommendations and at the elevations called for as shown on drawings or architectural elevations.
D. Fixture types shall be as scheduled.
E. LED Assemblies
1. LED luminaires shall conform to UL 1598 and to UL 8250 – Safety Standard for Light-Emitting Diode (LED) Light Sources for Use in Lighting Products.
2. Products shall be lead and mercury free.
3. Photometric characteristics shall be established using IESNA LM-79-08, IESNA Approved Method for the Electrical and Photometric Measurement of Solid-State Lighting Products.
4. Site lighting shall utilize LED with dimming drivers.

2.15 D5080 - ACCESS PANELS

A. Provide access panels for access to concealed junction boxes and to other concealed parts of system that require accessibility for operation and maintenance. In general, electrical work shall be laid out so access panels are not required.
B. Access panels shall be prime painted and equipped with screwdriver operated cam locks.
C. Acceptable manufacturers:
Inland Steel Products Company - Milcor
Miami Carey
Walsh-Hannon-Gladwin, Inc. - Way Locator
Specific types:
1. Acoustical Tile Ceiling "Milcor Type AT"
2. Plastered Surfaces "Milcor Type K"
3. Masonry Construction "Milcor Type M"
4. Drywall Construction "Milcor Type DW"

2.16 D5080 - SLEEVES, INSERTS, AND OPENINGS

A. Sleeves: Provide sleeves of proper sizes for all openings required in concrete floors and walls. Sleeves passing through floors shall be set with top of sleeve one inch above finished floor. Core drilling will also be acceptable if in accordance with any structural standards. Any unsleeved openings shall be waterproofed.

2.17 D5080 - GROUNDING SYSTEM

A. All equipment and systems shall be grounded. Refer especially to NEC Section 250 Requiring Connections to Building Steel, Foundation, Water Service, and Interior Piping. Provide transformer pad grounding to be in accordance with utility company standards.

2.18 D5090 - TELEPHONE/DATA SYSTEM PROVISIONS

A. Telephone system instruments and interconnecting wiring will be provided by the ITS Contractor. Data system outlets and interconnecting wiring will be provided by the ITS Contractor.

B. For each telephone outlet or data outlet indicated on the drawings, provide a 4 inch square flush outlet box. In insulated partitions, provide a 1 inch raceway stub up terminating with bushing to above nearest accessible hung ceiling.

2.19 D5010 - STANDBY ELECTRICAL SYSTEM

A. Provide one 350KW, 437.5KVA at .8 PF standby power rated diesel gen. set with 72-hour reserve tank with alarms, integral load bank, and mounted in perfect alignment on an all welded, fabricated steel sub-base which shall allow for attachment of all necessary engine and generator accessories.
Acceptable Manufacturers:
Caterpillar
Onan
Kohler
Generac
Onsite Energy

B. Generator: 350KW, 437.5KVA, 277/480 volt, 3 phase, 4 wire, 60 Hz, 1800 RPM revolving field type main generator with brushless exciter.
Voltage regulation ±1 percent.

C. Generator Control Panel:
1. To completely control operation of engine generator set. Panel to have automatic start control, AC voltmeter, AC ammeter, pointer type frequency meter, voltmeter, ammeter, and selector switch.

D. Automatic Transfer Switch:
1. Provide automatic transfer switches for operation on 277/480 volts, 3-phase, 4-wire operation. Unit to be housed in a NEMA 1 enclosure.
Entire switch shall be listed under UL 1008.
Acceptable Manufacturers:
Russ Electric RMTD (4-Pole)
ASCO (with overlapping neutral contacts)
Onan
Kohler

E. Remote Annunciator Panel: A flush mounted panel shall include a visual signal that battery charger is functioning properly and both audible and visual signals. Annunciator shall meet NFPA 110 Standards.

F. The generator shall be housed in a weatherproof sound attenuated aluminum enclosure.

2.20 D5090 - FIRE ALARM AND DETECTION SYSTEM

A. Work Included:
1. Furnish and install a 24 VDC closed circuit non-code, continuous ringing, supervised, addressable fire alarm system in accordance with the following specifications, to be wired, connected, and left in first class operating condition. All equipment shall be listed by Underwriters Laboratories or approved by Factory Mutual.
2. General Requirements
a. The system shall include but not be limited to all control panels, power supplies, initiating devices, audible (Voice Evac) and visual alarm devices, and all accessories required to provide a complete operating fire alarm system in accordance with code and local fire department.

2.21 D5090 - LADDER TRAY

A. Provide 12-inch wide aluminum ladder tray with 9 inch rung spacing with 6 inch side rail. Ladder tray shall be as manufactured by B-Line. “Ladder Type”. Provide all hangers required.

2.22 D5090 - LIGHTNING PROTECTION SYSTEM

A. General:
1. Provide all labor, material, equipment, and services required for the complete lightning protection system in accordance with NFPA 780, UL96A and applicable contract drawings for the Building. System shall receive UL Master Label.

B. Standards of Quality:
1. All materials shall be the product of a manufacturer regularly engaged in the production of lightning protection equipment.
2. All material shall be manufactured by Heary Bros. Lightning Protection Co, Thompson Lightning Protection, Harger, or East Coast Lightning Equipment.

C. Master Label:
   1. Submit factory certified tests.
   2. Submit guarantee for installation and range of lightning protection.

2.23 D5090 DISTRIBUTED ANTENNA SYSTEM (DAS)

A. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, cover antennas, coax cable, coax connectors, splitters, combiners, and couplers shall be provided. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

2.24 D5090 TWO WAY COMMUNICATION CALL BOXES

A. Two-way communication call boxes shall be provided adjacent to each elevator that is above or below grade level. The base station shall be located at a control point on the first floor.

END OF SECTION

SECTION DC D6
COMMUNICATIONS CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structured Cabling System: for supporting voice and data network communications and equipment.

B. Distributed Communication System: for making public address announcements.
   1. Whole School Public Address System with flush mount ceiling speakers throughout hallways, and all instructional and administrative spaces.
   2. Master and Secondary Clock System: clocks shall be included in all instructional learning and administrative areas including the cafeteria, gymnasium and media center.

C. Data Communications Systems
   1. Building-Wide Local Area Network Switches – Cisco as Proprietary
   2. Wireless Access Points – Meraki as Proprietary
   3. Uninterruptible Power Supply – APC as Proprietary

D. Audio-Video Systems:
   1. For the support of local communications within large group assembly spaces (Gym and Cafeteria.)
   2. Pathways and AV boxes/conduit with coordinated power: for interactive projectors and flat panel displays to be purchased during the equipment phase of the project.
   3. Speech Reinforcement System: for enhancing teacher instruction in all instructional learning spaces. – Lightspeed Topcat as Proprietary
   4. Digital Signage Displays: for paperless communication to staff and visitors in strategic areas.

E. A Voice Over Internet Protocol, VoIP, telephone system shall be provided throughout the project. The telephone system equipment required for this building shall be housed in the MDF room (NET/TELE). – Zoom IP phone service with Yealink handsets as Proprietary

F. The project shall result in an infrastructure to support both wired and wireless network throughout the school. The wired locations shall support network equipment such as computers, phones, and printers.. Wireless network connectivity shall be provided as part of the technology equipment phase. The project shall support the district's continued movement toward virtualized desktop computing and mobile network access.

G. Provisions shall be made for the termination and demarcation of utility cables such as utility telephone service cables, and cable TV. Appropriate space shall be provided to allow organized interconnection between utility feeds and internal systems.

H. The MDF is the main communications room for the building and shall include cable demarcations and the core network equipment and switches. Building riser cables shall be terminated in this room.

I. The IDF rooms are the intermediate wiring rooms and shall be in three strategic areas to ensure that the station cable lengths remain within the distance standards. These rooms shall house the racks and patch panels for the cable termination and shall provide space, power and cooling for the network electronics.

J. The technology cabling system shall consist of fiber optic backbone cables and Category 6A station cables.

K. Pathways: the project shall provide sufficient access, flexibility, and capacity for cable routing throughout the life of the building. Access to cable tray and pathways shall be provided.

L. A Public Address and Master Clock system shall be provided for the entire school. Secondary clocks in all academic spaces including the Gymnasium, Cafeteria, shall be connected to and synchronized by the Master Clock System.

M. Code compliance with NEC NFPA 70, State, and Local codes and AHJ

N. Field Quality Control
   1. Testing with documented test results for submission
   2. Final cleaning, adjustment, and preparation of system components for acceptance by Owner
   3. System training

O. Warranty
   1. Communications System
      a. UTP Warranty Period: 20 years from date of Substantial Completion.

2. Audio - Video System
    a. Manufacturer certified installation firm capable of honoring factory warranties
    b. System warranty period minimum one year

1.02 QUALITY ASSURANCE

A. Installer Qualifications: Project Manager, layout, installation supervision and testing by BICSI certified personnel.

PART 2 PRODUCTS

2.01 COMMUNICATION SYSTEM TYPES AND COMPONENTS

A. Structured Cabling Support Systems
    1. Backboards: Plywood, fire-retardant treated.
    2. Cable Supports: Support brackets, lacing bars, spools, J-hooks, and D-rings.
    3. Cable Trays: Metal, electroplated zinc galvanized.
        a. Basket cable trays.
    4. Conduit and boxes. Flexible metal conduit shall not be used.

B. Structured Cabling System
    1. UTP Cabling:
        a. Horizontal: Category 6A, Communications Plenum Rated, 100-ohm, four-pair cable.
        b. Backbone: Category 5e, Communications Riser Rated, 100-ohm, multi-pair cable.
        c. Classrooms and instructional spaces shall be equipped with one data drop for wall telephone, two data drops for the teacher location, two data drops at the projector, and two data drops for the wireless access point in the ceiling.
        d. Offices and administration areas shall each be equipped with three data drops, one for telephone and two for computer and/or printer equipment.
        e. Work area outlet cords and patch cords.
    6. UTP Cable Hardware:
        a. Connecting Blocks: 110-style IDC for Category 6.
        b. Patch Panels.
        c. Telecommunications Outlet/Connectors: Eight-position modular.
        d. Workstation Outlets: Multi-port-connector assemblies mounted in single or multigang faceplate.
    7. Optical Fiber Cabling:
        a. Singlemode, OS2 9/125.
        b. Patch cords.
    8. Optical Fiber Hardware:
        a. Connectors: Duplex, Type LC.
        b. Patch Panels.
    9. Racks:
        a. Floor-mounted 2-post racks.
        b. Floor-mounted 4-post eequipment racks.
        c. Floor-mounted server cabinets
    10. Horizontal and Vertical Cable management for racks.
    11. Uninterruptable Power Supplies: NEMA L5-30P input, multiple NEMA 5-20R output.
    12. Grounding:
        a. Connectors: Solderless compression type.
        b. Conductors: Per ANSI/J-STD-607-A.
    13. Identification: Preprinted or computer-printed labels for Class 2 level of administration.
    14. Installation - Structured Cabling System.
    15. Approved Wiring Methods and cable terminations
    16. Provisions required by ELECTRICAL to support Structured Cabling System
        a. Conduits and sleeves;
        b. Cable tray;
        c. Cable support and pathways;

   d. 4-inch square flush outlet box with single gang reducer and a one 1 inch conduit stub-up with bushing to above nearest accessible hung ceiling for all data and voice outlets. 4 inch square flush outlet box, with two 1-1/4 inch conduit stub-ups with bushings to above nearest accessible hung ceiling for all AV box locations.
   e. Firestopping

C. Distributed Communications System
   1. Distributed Communication System shall be provided for making paging announcements to classrooms, zoned areas, or on a whole school basis, including designated outside areas
   2. Functionalities include:
      a. Whole school paging and general announcements from a dedicated public address system microphone located in the main administrative area.
      b. Whole school paging and general announcements through any telephone handset located throughout the school through a connection between the telephone system and the Distributed Communication System.
      c. Automated Whole school announcements in the case of an emergency.
      d. Initiating calls from classroom to main office through the use of a classroom call switch.
      e. Hands free communications between main office personnel and teachers in classrooms over talk back speakers.
      f. Volume controlled speakers in all conference rooms, offices and smaller administrative and academic spaces.
      g. Automatic muting of large assembly sound system equipment during emergency announcements.
      h. Analog Secondary wall clocks in all spaces, which are controlled and synchronized by a Master Clock System.
   3. Distributed Equipment
      a. Speakers: flush mount ceiling in all rooms, offices, and corridors; wall mounted flush mount horn speakers in the gym.
      b. Classroom Call-in Switches: flush mount wall in all instructional learning spaces on the far side of the room for imitating hands free communication with office personnel.
      c. 12-inch and 16-inch Analog Secondary Wall Clocks. (12 inches in classrooms and instructional learning spaces, 16 inches in larger assembly spaces)
   4. Main Equipment:
      a. Public Address Main Control Boards.
      b. Power Amplifiers.
      c. Various Interface and Distribution cards/boards.
      d. Integrated Master Clock System.
      e. Floor mounted cabinet.
      f. Uninterruptable Power Supply.
      g. Horizontal and Vertical Cable management for racks.
   5. Speaker and Device Cabling
   6. Grounding:
      a. Connectors: Solderless compression type.
      b. Conductors: Per ANSI/J-STD-607-A.
   6. Identification: Preprinted or computer-printed labels
   7. Installation – Distributed Communication System
   8. Conduits and sleeves
   9. Cable support, bundling, and raceway
   10. Cable terminations
      a. Terminals
      b. Connectors
      c. Labeling

D. Data Communications Systems

1. Network switches and wireless access equipment for providing network connectivity for building systems, telephone system, and Owners provided equipment including but not limited to projectors, computers, tablets, and printers.
2. The specific functionalities shall include:
    a. Chassis or stackable GbE Layer 3 switches in the MDF and IDF's with 1 GbE and PoE ports to support all networked equipment in the building plus.
    b. Minimum of dual 10GbE SFP+ or 25GbE SFP28 optics and uplinks between each IDF closet and MDF.
    c. SFP and SFP+ optics for connecting the school's LAN to the Wide Area Network.
    d. Furnish and install network switches into data racks in MDF and IDF locations.
    e. VLAN configuration of switches to meet the needs of the Owner
    f. Patching of network switch ports to patch panel ports
3. Wireless Access Points with related licensing, ceiling and wall mounts.
4. Data outlet cabling and jacks for future wireless access points.
5. Data outlet cabling and jacks for digital messaging and signage system including large wall mounted flat panel displays with networked signage players.

E. Voice Communication System
1. Building wide enterprise class VoIP telephone system to be furnished and installed for all offices, classrooms, and instructional spaces, with interface to telephone services and the Distributed Communication System, so that paging can be facilitated from any telephone handset.

F. Audio-Visual Communication Systems
1. Audiovisual systems shall be provided for large venue assembly spaces including the cafeteria/stage and gymnasium, and for all classroom and instructional spaces.
2. The specific functionalities that shall be common to each large venue assembly spaces include:
    a. Audio systems configured to provide the appropriate sound levels;
    b. Amplification of program audio and voices.
    c. Loudspeaker systems.
    d. Digital signal processing.
    e. Assistive listening systems.
    f. Wireless microphones with multiple microphones per space to support lectures, presentations, and panel discussions.
    g. Portable audio source inputs (Smartphone, iPod, iPad, and computer or Chromebook).
    h. Touch screen control panels and processors that allow the faculty to select sources and volume without leaving the space.
    i. Override connections from the public address system and the fire annunciation system so that in the case of an emergency message, the local audio system is shut off and the emergency announcement is heard;
    j. Large projection screen and permanently installed large venue projector and lens, with appropriate controls and inputs to support anticipated uses.
3. Speech Reinforcement System:
    a. Classrooms and Classroom size Instructional spaces shall be equipped with a local voice and audio reinforcement system that enhances teacher's speech while also providing program audio playback of any and all multimedia source material. This system shall also be connected to the Owner provided classroom projection system.
    b. Teacher Lapel wireless Microphone
    c. Student wireless Microphone
    d. Ceiling mounted main amplifier and speaker assembly
    e. Wireless media connector
    f. Connections to the audio output of Owner's provided projector
4. Digital Signage Systems include:
    a. 55 inch and 65 inch Flat Panel Displays.
    b. Wall mount brackets.

   c. Signage Player.
   d. Cable connections to power and Structured Cabling System.
5. Wiring, connectors, custom jack plates, power supplies, racks, and hardware
6. Installation – Audio Visual Systems
7. Conduits and sleeves
8. Cable tray
9. Cable support, bundling, and raceway
10. Cable terminations
    a. Terminals
    b. Connectors
    c. Labeling
11. System power
12. System programming
    a. Functions
    b. Touch panel pages and templates
    c. Pushbutton assignments
    d. Feedback control
    e. EDID recognition and resolution management
    f. Optimization of audio signal transmission

2.02 OWNER-FURNISHED PRODUCTS

A. The following items are to be provided by Owner: Performance requirements of the equipment do not apply; only requirements for accommodating items within the project apply.
   1. Computer network hardware and software including but not limited
      a. Servers.
      b. Storage.
      c. Firewall.
      d. Teacher, administrative and student computers.
      e. Tablets.
      f. Chromebooks.
      g. High Speed Copier/Printers.
      h. Workgroup, personal and color laser printers.
   2. Internet, Telephone and CATV Services, including interface hardware.
   3. Instructional Interactive Projectors with mounts, cabling, and connections
   4. Classrooms Document Cameras
   5. Collaborative Flat Panel Displays with mounts, cabling, and connections
   6. Interactive Flat Panel Displays, with mounts, cabling, and connections
   7. Portable Large Venue Projection Cart for Gym
   8. Portable interactive projection system for Gym Teacher
   9. Cafeteria POS System
   10. School Visitor Management System

END OF SECTION

SECTION DC D7
ELECTRONIC SAFETY AND SECURITY CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic safety and security services comprise:
   1. Access Control System. – Genetec as Proprietary
   2. Intrusion Detection and Alarm System. – Proprietary
   3. Video Surveillance and Management System. – Axis Communications camera as Proprietary, Genetec as proprietary VMS and NVX
   4. Video Intercom and Door Control System. – AiPhone as Proprietary

B. The Awarding Authority has determined use of the products listed as proprietary to be in the project's and public's best interest, and will vote to designate the listed products as proprietary bid products. See Section 01 10 00.

PART 2 PRODUCTS

2.01 ACCESS CONTROL SYSTEM AND COMPONENTS

A. An Access Control System shall be provided to facilitate and control individuals to the facility. The Access Control System shall provide:
   1. Control of access to the facility and specific areas and services via Proximity Card or Key Fobs.
   2. An audit trail of which door have been accessed.
   3. The means to immediately lockout use of an access credential if it is lost or if the credential holder is to be denied access.
   4. Remote Control of electrified doors at selected locations.
   5. Unified control of electrified doors, in order that groups of doors or all entry doors may be unlocked and locked together, either manually or on a time schedule, or according to an event like a school lockdown.
   6. Local control of doors or door groups via proximity card or key fob reader
   7. Local control of elevator(s).

2.02 INTRUSION DETECTION SYSTEM AND COMPONENTS

A. System elements as required to detect unauthorized entry by persons into the building either through locked doors or windows on the first floor.
   1. Building Intrusion Alarm System
      a. The building shall be equipped with an alarm system to detect unauthorized intrusion into the building when the school is not occupied.
      b. Motion detectors shall be located in all exterior rooms and spaces on the first floor that have windows.
      c. Door position switches shall be included in all exterior door openings and interior security doors.
      d. The alarm system shall report to an Owner’s contracted central station.
   2. Video-Intercom System
      a. Dedicated video intercom devices shall be designed for selected entry points that receive deliveries and/or visitors. Devices shall provide office administrative personnel with the ability to remotely view and communicate with visitors and to permit access to the school by remotely unlocking entry doors.

2.03 VIDEO SURVEILLANCE SYSTEM AND COMPONENTS

A. System elements as required to provide remote visual and audible monitoring, as well as video recording of areas within and around the facility.
   1. Security Cameras
      a. Cameras shall be Internet Protocol (IP) signal transmission format
      b. Interior cameras shall Super Dynamic Full HD 3 megapixel or higher fixed varifocal lens cameras.
      c. Interior and exterior 360-degree cameras shall be 9-megapixel cameras.
      d. Exterior fixed focal length cameras shall be HD 3 megapixel or higher varifocal lens cameras
      e. Cameras shall be located to view:
         1) Perimeter areas surrounding the facility;
         2) All entry ways to the building.

3) Main Lobby and administration offices.
4) Corridors.
5) Service entry and loading docks.
6) Large assembly spaces like the Gymnasium and Cafeteria.

f. High-Definition full motion video Images from cameras shall be transmitted from cameras using H.264 video compression format.

2. Video Management System (VMS) and Network Video Recorder (NVR)
   a. Full motion video from security cameras shall be stored and managed on a Video Management Server platform with software licensing and storage sized to provide a minimum of 30 days of video sstorage capacity. Preference shall be given to systems not requiring yearly renewable camera licensing fees.
3. Network Switches
   a. Cameras shall be connected to the Video Management System through dedicated GbE PoE Network Switches with 10GbE uplinks from IDF closets to the main Video Management Server Location at the MDF (NETWORK) Room.

2.04 VIDEO INTERCOM AND DOOR CONTROL SYSTEM AND COMPONENTS

A. System elements as required to provide remote visual and intercom communications with visitors at various entrances, as well as provide remote control of exterior and interior door locks.
   1. Door Video Intercom System
      a. Flush mounted video-intercom device at main entrance doors.
      b. Desk mounted management consoles with display, handset, and door control at various administrative office locations.
      c. Cabling, programing, and configuration with door hardware.

PART 3 DESIGN CRITERIA

3.01 SECURITY

A. A comprehensive access control, intrusion detection and surveillance system shall be developed and implemented through this project. The systems shall be connected to the appropriate networks to allow reporting and monitoring by the public safety personnel.

B. Access Control:
   1. Doors to be controlled: multiple exterior and interior doors shall be equipped with access control card readers to electronically control electric door hardware.
   2. Door intercom systems: A video intercom system shall be provided with video intercom door devices at various entry door locations to the building and the service entrance. A video intercom master station shall be located at the main reception desk. The master station shall be programmed to release door locks at the areas equipped with video intercom door Devices.

C. Intrusion Detection:
   1. Detector types and coverage: Motion detectors shall cover the interior common areas and hallway intersections of the first floor. All exterior rooms and spaces with windows or doors shall be equipped with motion sensors.
   2. Intrusion system arming and disarming keypads: Keypads with local zone arming and disarming capabilities shall be located at primary door entrance locations.

D. Surveillance, CCTV:
   1. Approximately 80 interior and exterior cameras shall be furnished and installed. Cameras shall be mounted to the exterior of the building, at main entrances, main lobby, corridors, stairwells, main office, receiving, cafeteria, kitchen, and gymnasium.
   2. Camera types and mounts: Digital dome cameras with interior and exterior surface mounts. All cameras shall be IP based; no cameras shall utilize coaxial cables.
   3. Monitoring: No dedicated security command console or dedicated viewing room is envisioned.

END OF SECTION

SECTION DC E1
EQUIPMENT CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Equipment comprises mechanized, plumbed, and electrical devices, other than equipment that is part of a service system (such as HVAC and electrical), and permanently installed fixtures not covered by another section.
   1. The necessity for some equipment is based on design criteria for either the equipment or the facility itself.
   2. The following equipment is to be included in the contract whether explicitly listed or not:
      a. Permanently installed equipment.
      b. Electrically operated equipment with a permanently wired connection.
      c. Items requiring a water supply or drainage connection.
      d. Items requiring an air distribution or exhaust connection.
      e. Items requiring a special services connection.
      f. Items NOT indicated as Not in Contract (NIC).
      g. Items required by the code.

B. Vehicle and Pedestrian Equipment: Includes dock levelers and bumpers.

C. Institutional Equipment: Includes fire extinguishers, fire extinguisher cabinets, "KnoxBox" type rapid entry systems, automatic defibrillators (AEDs) and cabinets, and education equipment.

D. Appliances consisting of the following elements:
   1. Built-in devices and appliances, including dishwashers.
   2. Large freestanding appliances such as refrigerators, washing machines, clothes dryers, and ice machines.

E. Entertainment and Recreational Equipment: Equipment of types listed below:
   1. Theater and Stage Equipment: Includes equipment for support of theatrical programs consisting of cycloramas, stage curtains, and rigging systems and tracks.
   2. Athletic and Recreational Equipment: Includes interior equipment used in athletic and exercise activities consisting of basketball systems, divider curtains, wall padding, floor sleeves, pull-up bars, climbing walls and PT platform swings.

F. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. ADA. Americans with Disabilities Act.

B. ANSI. American National Standards Institute; www.ansi.org.

C. CFR. Code of Federal Regulations; www.govinfo.gov.

D. FDA. Food and Drug Administration; www.fda.gov.

E. MAAB. Massachusetts Architectural Access Board: www.mass.gov/orgs/architectural-access-board.

F. NFPA. National Fire Protection Association; www.nfpa.org.

G. UL. Underwriters Laboratories; www.ul.com.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced:

B. 29 CFR 1910 - Occupational Safety and Health Standards.

C. ADA Standards - 2010 ADA Standards for Accessible Design.
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
E. NFPA 10 - Standard for Portable Fire Extinguishers.
F. UL 437 - Standard for Key Locks.
G. UL 1037 - Antitheft Alarms and Devices.
H. UL 1332 - Standard for Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment.
I. UL 1610 - Central-Station Burglar-Alarm Units.

PART 2 PRODUCTS

2.01 INSTITUTIONAL EQUIPMENT

A. Fire Extinguishers:
   1. Use the following:
      a. Dry chemical type extinguisher, UL-rated, 4A-80B: stainless steel type with gage, at all locations indicated on code plans except as otherwise noted.
         1) Include one fire extinguisher in the elevator machine room, whether indicated on drawings or not.
      b. Wet chemical type 2A:K: stainless steel type with gage; provide one with associated signage per NFPA 10 at commercial kitchen cooking lines.
      c. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) Activar Construction Products Group, Inc. - JL Industries; Cosmic Extinguisher - Multipurpose Chemical: www.activarcpg.com.
         2) Larsen's Manufacturing Co.: www.larsensmfg.com. (Basis of Design)
         3) Potter-Roemer: www.potterroemer.com.
      d. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

B. Fire Extinguisher Cabinets:
   1. Use the following:
      a. Painted steel cabinets with stainless steel doors and frames with vertical glass panel, for semi-recessed installation, with rounded profile at edge of frame.
      b. Provide fire-rated cabinet assemblies where installed within fire-rated partitions, to match the rating of the partition.
      c. Provide accessories including fire extinguisher brackets and graphic identification.
      d. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) Activar Construction Products Group, Inc. - JL Industries; Ambassador Series: www.activarcpg.com.
         2) Larsen's Manufacturing Co: www.larsensmfg.com. (Basis of Design)
         3) Potter-Roemer: www.potterroemer.com/#sle.
         4) Substitutions: The Awarding Authority has determined that use of the product listed is in the project's and public's best interests and will vote to designate the listed product as a proprietary bid product.

C. "KnoxBox" Type Rapid Entry Systems
   1. Use the following:
      a. Manufacturers:

1) Subject to meeting requirements of this specification, provide rapid entry systems from the following:
   (a) Knox Company; KnoxBox 3200; www.knoxbox.com. (Basis of Design)
   (b) Substitutions: The Awarding Authority has determined that use of the product listed is in the project's and public's best interests and will vote to designate the listed product as a proprietary bid product.

b. Product shall comply with UL 437, UL 1037, UL 1610, and UL 1332.
c. Provide key tags and key rings. Capacity: 10 keys.
d. Lock: UL listed. Double-action rotating tumblers and hardened steel pins accessed by bias cut key.
e. Tamper Alert: connect to building's alarm system. Coordinate with Electrical Criteria section.
f. Quantity: Provide total of four.

D. Automated External Defibrillators (AEDs)
1. Use the following:
   a. Automated External Defibrillators (AEDs) - General: FDA approval required.
      1) Provide automated external defibrillators (AEDs) as indicated on drawings.
   b. Fully automatic battery powered units meeting American Heart Association's current guidelines for performing CPR and use of AED units, self-charging with audible alert when unit is malfunctioning or lacking charge.
   c. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      1) Cardiac Science Powerheart AED G3 Plus.
      2) Defibtech Lifeline View AED.
      3) Philips Medical Systems; Heartstart FR3: www.usa.philips.com.
      4) Stryker Corporation: www.stryker.com.
      5) ZOLL Medical Corporation: www.zoll.com.
      6) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

E. Educational Equipment:
1. Use the following:
   a. Audio-Visual Equipment:
      1) Projections screens at Cafeteria, Gymnasium and Stage.
         (a) Electric operation.
         (b) Use the following front-projection matte screens:
            (1) Plain white, with backing.
         (c) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) BEI Audio-Visual Products: www.beionline.com.
            (2) Da-Lite Screen Co: Professional Electrol: www.da-litescreenstore.com. (Basis of Design)
            (3) Draper, Inc: www.draperinc.com.
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2.02 APPLIANCES

A. Use the following:

1. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    a. Bosch USA; www.bosch-home.com/us.
    b. GE (General Electric Company); www.geappliances.com. (Basis of Design, except where otherwise noted)
    c. Hotpoint; www.hotpoint.com.
    d. KitchenAid; www.kitchenaid.com.
    e. Maytag; www.maytag.com.
    f. Summit Appliance; www.summitappliance.com.
    g. Whirlpool; www.whirlpool.com.
    h. Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
2. Freestanding refrigerator / freezers at locations indicated on drawings.
    a. 23.6 cubic square feet capacity.
    b. Basis of Design Product: General Electric / PYE22KYNFS.
        1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
3. Freestanding refrigerator / freezers with door locks at Nurse's Office.
    a. Basis of Design Product: Summit Appliance / FF1088W.
        1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
4. Undercounter refrigerators at locations indicated on drawings.
    a. Basis of Design Product: Summit appliances / FF63BKBISSHVADA.
        1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
5. Ice makers.
    a. Undercounter 32.56 inches high by 14.5 inches wide by 23.5 inches deep.
    b. Basis of Design Product: Summit Appliances; / BIM44GADA.
        1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
6. Undercounter dishwashers at locations indicated on drawings.
    a. Top Hidden controls.
    b. 32 inches high by 24 inches wide by 24 inches deep, nominal.
    c. Basis of Design Product: General Electric / GLDT696JSS.
        1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
7. Separate, side-by-side washer and dryer sets at locations indicated on drawings.
    a. Front-loading high-efficiency washer
        1) 4.8 cubic feet capacity, with multiple load and soil settings.
        2) ENERGY STAR rated.
        3) Basis of Design Product: General Electric / GFW850SPNDG.
            (a)
    b. Front-loading dryer:

1) Smart front load electric dryer.
2) 7.8 cubic foot capacity.
3) Multiple cycles including, at a minimum: delicate, fluff, and sanitize.
4) Basis of Design Product: General Electric / PFD95GSPTDS.
   (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

B. Do not use the following:
1. Combination washer/dryers.
2. Stacking washer/dryer sets.

2.03 ENTERTAINMENT AND RECREATIONAL EQUIPMENT

A. Use the following:
1. Theater and stage equipment.
   a. Stage curtains.
      1) Main dead-hung traveler curtain, battens, track, and drapery.
      2) Rear dead-hung traveler curtain, battens, track, and drapery.
      3) Cycloramas: Provide rigging and fabric for one cyclorama at back of performance stage.
      4) Stage curtain fabrics. Polyester velour, 25 ounce minimum, inherently flame-retardant synthetic fabric.
         (a) Fabrics treated with fire retardants shall not be allowed.
         (b) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) Beck Studios Inc: www.beckstudios.net.
            (2) Fred Krieger & Company: www.fredkriegerfabrics.com.
            (3) Limelight Productions; www.limelightproductions.com. (Basis of Design)
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
      5) Stage curtain track support systems: Applicable types for specified curtain types. 14-gage galvanized construction.
         (a) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (1) Automatic Devices Company: www.adctracks.com. (Basis of Design for stage tracks)
            (2) J.R. Clancy, Inc.: www.jrclancy.com. (Basis of Design for stage rigging equipment, head blocks, and loft blocks.)
            (3) Tru-Roll Theatrical Rigging & Hardware; www.truroll.com.
            (4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
2. Athletic equipment.
   a. Manufacturers for athletic equipment, except where otherwise noted: Subject to compliance with these specifications, provide products of one of the following:
      1) Draper, Inc: www.draperinc.com.
      2) IPI by Bison www.ipibybison.com.

3) Porter Athletic Equipment Company: www.porterathletic.com.
4) Southpaw Enterprises: www.southpaw.com.

b. Gymnasium divider curtains.
   1) Use wall-mounted fold-up motorized divider curtains.
      (a) Self-extinguishing.
      (b) Polyester-reinforced solid vinyl at lower 8 foot sections.
      (c) VCP mesh, woven vinyl-encapsulated polyester yarns with 50 percent grid for air circulation, at upper sections.
      (d) Top tube batten: supporting curtain shall be suspended from each drive pipe support assembly with adjustable 2/0 chain.
      (e) Curtain hoist: electrically operated, recessed keyed switch.
      (f) Basis of Design Product: IP850 Fold-Up Gym Divider Curtain.
         (1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

c. Basketball backboards, goals, and support framing.
   1) Use ceiling-suspended backstop assemblies, at locations indicated on drawings.
      (a) Basis of Design System: IPI1360-FF.
         (1)
   2) Use Tempered glass rectangular backboards, at locations indicated on drawings.
      (a) Basis of Design Product: IPI Bison VB26.
         (1) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

d. Climbing ropes:
   1) Heavy-duty rope, hung vertically from ceiling, unsecured at bottom.
   2) Hemp, 1-1/2 inch nominal diameter, with knotted ends.
   3) Quantity: Provide total of six.
   4) Basis of Design: Porter Athletics; Climbing Ropes.
      (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

e. Panelized climbing wall.
   1) Climbing wall dimensions: 8 feet high by 20 feet wide.
   2) Climbing wall system shall provide modular climbing hold attachment locations compatible with 3/8 inch 16-thread fasteners for surface mount. Handhold Fasteners shall be securely anchored to the sub-surface with adhesive. Handhold fasteners shall be placed at minimum of one per sq ft of climbing wall surface area.
   3) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
      (a) SOLIDRock™ Panels/ Eldorado Wall Company; eldowalls.com. Basis of Design
      (b) Superior Rock-Climbing Wall; Everlast Climbing; http://everlastclimbing.com/products/standard-climbing-wall/.
      (c) Easy Wall/ Nicrose; http://www.nicros.com/climbing-wall-systems/easywall/.
      (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability,

performance, and appearance. Submit as substitutions.

f. Floor sleeves for net and goal posts.
   1) Metal sleeve, with latch cover, cast into concrete subfloor to hold poles for nets and goals, installed flush with finish floor surface.
   2) Quantity: Provide total of six.
   3) Basis of Design: IPI by Bison; Product: VB26.
      (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

g. Wall mounted protection pads.
   1) Wall Padding: Foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
   2) Fire Certification: ASTM E84 Class A.
   3) Basis of Design: Porter Athletic; Product: 650 Impact Safe.
      (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

h. PT pull-up bar.
   1) Quantity: One.
   2) Basis of Design: Porter Athletic; Adjustable Chinning Bar.
      (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

i. PT platform swing:
   1) Dimensions: 31 inches by 31 inches, nominal.
   2) Carpet surface.
   3) Adjustable height.
   4) Provide rotational safety attachment.
   5) Quantity: One.
   6) Basis of Design: Southpaw; Advantage Line Platform Swing 120040.
      (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Design the facility to accommodate the equipment required by the Owner, which are specified in the project program.

B. General Equipment: Provide general building equipment of the type and in the quantity required and in accordance with the code.

C. Vehicle and Pedestrian Equipment: Provide equipment associated with the following facility functions identified in the project program and required to be furnished by Construction Manager:

D. Appliances: Provide residential equipment per the project program, which is adequate in size and capacity for the performance of functions typical for the type of residential application and the characteristics of the intended user population.
   1. Appliances shall be ADA and MAAB compliant.
   2. Appliances shall meet project's LEED requirements.

E. Where equipment elements also must function as elements defined within another element group, meet requirements of both element groups.

F. In addition to the requirements of this Section, comply with all applicable requirements of Section DC E1 9 - Other Equipment Criteria, and Section DC E2.

3.02 AMENITY AND COMFORT CRITERIA

A. Accessibility:

1. Comply with the ADA Standards for accessible design.
2. Provide accessible controls in every item of commercial and institutional equipment.

3.03 HEALTH AND SAFETY CRITERIA

A. Accident Prevention:

1. Comply with the requirements of 29 CFR 1910, regulations of Occupational Safety and Health Administration.
2. Prevent accidental pinching, crushing, and cutting of operator limbs, fingers, and toes in or by moving parts of equipment by using intelligent design or guards or other protection, without reliance on self-protective operation by operator.
3. Appliances:
    a. Electrical Shock: Provide residential equipment that is safe from electrical shock hazard.

3.04 DURABILITY CRITERIA

A. Impact Resistance:

1. Loading Docks: Prevent accidental damage to building elements caused by trucks backing up to loading dock.

3.05 OPERATION AND MAINTENANCE CRITERIA

A. Capacity:

1. Loading Dock Levelers and Lifts: to serve loading conditions, with minimum 20 percent extra capacity based on manufacturer's rating.
2. Loading Dock Levelers: 25,000 pounds minimum.

B. Ease of Use: Provide easy access to and working clearances around equipment.

C. Ease of Operation:

1. Dock Lifts and Levelers: Easily adjusted without the use of tools.

D. Ease of Maintenance: Not requiring any routine measures to maintain operation or finishes, other than washing with soap and water.

END OF SECTION

SECTION DC E1 1
FOODSERVICE CRITERIA

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The Conditions of the Contract and General Requirements of the Project Manual apply to the Construction Manager, Trade Contractor, material suppliers, and all other persons furnishing labor and materials under this Section. General Conditions and applicable parts of Division 1 are included as part of this Section.

B. Examine all Project Specifications and Drawings for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

E. When open-flame or spark producing tools such as blower torches, welding equipment, and the like are required in the process of executing the work, the Construction Manager shall be notified not less than twenty-four hours in advance of the time that the work is to begin and the location where work is to be performed. Provide fire protective covering and maintain constant non-working fire watch where work is being performed and until it is completed.

F. Sustainable Design Intent: Comply with project requirements intended to achieve a LEED SilverRating, with a goal of Gold rating measured and documented according to the LEED Green Building Rating System, of the US Green Building Council (USGBC).

1. Comply with LEED (Leadership in Energy and Environmental Design) Green Building Rating System for New Construction, Version V4 / V4.1

2. Refer to LEED Checklist/Scorecard attached at the end of Section 01 81 13.

1.02 SCOPE

A. Attention is directed to the detailed Item Specifications, which provide for minimum acceptable products. Item Specifications paragraphs may indicate materials or components that exceed the manufacturer's standards and are required for this project.

B. Cooperate and coordinate with others engaged on the project in order that work will progress on schedule.

C. Work to be performed under this Section is shown on Foodservice Equipment Drawings.

D. Install materials furnished under this Section, other than materials that are expressly noted for installation under other Sections. Installation work shall be performed by workmen compatible with that existent on the project site. Equipment shall be of the latest design; new and unused, unless indicated otherwise in the Item Specifications, complete with all standard parts for normal operations and including such accessories or materials as may be required to comply with these Specifications.

E. This Specification is to further describe and supplement the applicable Drawings. What is called for by either the Drawings and/or these Specifications shall be furnished and installed as part of this work. Any questions relative to discrepancies or omissions shall be submitted to the Architect.

F. Provide neatly punched openings or cutouts required to permit passage of plumbing and electrical services by related trades and to accommodate mounted switches and receptacles in the equipment.

G. Work in this Section shall include but shall not be limited to the following:

1. Catalog items of equipment.

2. Fabricated equipment other than catalog items.

3. Plumbing trim consisting of mechanical system components required for standard operation of equipment items such as faucets and waste outlets. Vacuum breakers shall be furnished for equipment where water is introduced less than 2 inch. above flood level.

4. Electrical equipment forming an integral part of equipment items such as electric motors, heating elements, controls, switches, starters, temperature regulators and internal wiring to a control panel or switch, if mounted on the equipment.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Finished floor and walls, structural supports for all ceiling supported equipment, acoustical ceilings and related building.

B. Connecting piping, waste lines, traps and vent piping, complete with shut-off valves to all the equipment, and the rough-in for sanitary waste, domestic water, floor drains and plumbing fixtures except those provided under this Section, and related mechanical work.

C. Exhaust ventilating systems complete with blowers, ductwork, hangers, access panels, and insulation between the exhaust collars and the exhaust blowers.

D. External wiring; the mounting and wiring of motor starters, solenoid valves, switches and receptacles not integral with the equipment; mounting and wiring of walk-in refrigerated room ceiling mount light fixtures; wiring of walk-in refrigerated room interior evaporator coils; connecting conduit, and external connections to equipment to the building electrical distribution system.

1.04 SUBMITTALS

A. Submit Shop Drawings for approval in accordance with the General Conditions.

B. Stub-in drawings shall indicate the layout of equipment and dimensioned locations of all services to the equipment.

1. Hand drawn scale: 1/2 inch equals 1 ft., 0 inch
2. CAD drawn scale: 1/4 inch equals 1 ft., 0 inch
3. Stubbed services shall include electrical, hot and cold water, floor drains or floor sinks, solid wastes and exhaust collar connections. Point of connection services shall include steam supply, condensate return, and indirect waste connections. Service dimensions shall include height measured from finish floor.
4. Electrical and plumbing services shall be indicated and coordinated on the same drawing.
5. Call-outs for each stub point indicated at the point, or clearly keyed to a schedule on the same drawing.
6. Special conditions plan shall include all floor recesses, curbs and special wall construction indicated and dimensioned

C. Fabrication drawings shall be furnished for non-catalog items, showing plans, elevations and full construction details with gauges, components, fasteners, erection and connections. Drawings shall be to the minimum scale of 3/4 inch equals 1 ft., 0 inch

D. Standard items of equipment, not built-in or part of other assemblies shall be submitted for approval in the form of bound catalog cuts. Each cut shall include a clearly marked item number, a listing of all optional accessories and finishes, and connection data.

E. Catalog Cuts shall include letters of approval, under a separate binder, indicating compliance with M.G.L. c. 142 and 248 CMR. Only products and materials that have been listed by the Board as Product-approved shall be used for plumbing work performed in the Commonwealth of Massachusetts.

1. Catalog Cuts shall include operation manuals for all existing foodservice equipment that is scheduled for reuse and that requires plumbing work performed in the Commonwealth of Massachusetts.

F. Mechanical refrigeration system submittal shall include the firm name and address of the installation contractor and name of the qualified installer.

G. Energy Star - Specified Energy Star rated equipment and appliances shall serve as the standard for all types of equipment and appliances whenever possible. Kitchen Equipment Contractor shall clearly indicate that items are Energy Star rated both on the submittal cover sheet and manufacturer cut sheets.

H. Failure to comply with approved shop drawings shall be cause for rejection of an improperly built assembly.

1.05 SAMPLES

A. If the bidder's proposed equipment fabricator is unknown to the Architects or Consultant's office, immediately after award of contract, submit the following samples for selection and approval:

1. Section of table showing edge, bullnose, framing, fasteners, gusset, leg, and foot, all assembled.
2. Drawer assembly (will be returned for use on this project).

B. Work delivered to the job shall match approved samples.

1.06 GUARANTEES AND WARRANTEES

A. New equipment furnished for this facility shall be guaranteed for a period of not less than one calendar year beginning on the date of final acceptance of the work of this Section. In the case of a manufacturer whose standard warranty exceeds this period the longer period shall apply. Self-contained refrigeration units for reach-in refrigerators, freezers, ice cream chests and ice machines shall carry a five-year replacement warranty for the sealed unit. The guarantee shall protect against defective material, design and workmanship.

B. In addition to the guarantee called for under the General Conditions, this Construction Manager shall further agree that in the event of failure of any system or item of equipment or improper functioning of specified work during the guarantee period, he shall have "on call" competent service personnel available to make the necessary repairs or replacements of specified work promptly at no cost to the Owner. In the event that replacement of an entire item is required, the Owner shall have the option of full use of the defective equipment until a replacement has been delivered and completely installed.

C. Furnish manufacturer's warrantees for each item of standard equipment and a warranty on fabricated equipment. Submit guarantees and warrantees to the Architect in accordance with conditions found in "Demonstration and Operating Instructions" paragraphs, contained in Part 3, this Section.

1.07 REGULATORY AGENCIES

A. Work shall be in accordance with the governing health, building and safety, and fire protection codes and regulations.

B. Standards of the National Sanitation Foundation (NSF) shall serve as guidelines for the work of this Section.

C. Electric equipment and accessories shall conform to the standards of the National Electric Manufacturers Association (NEMA), Underwriters Laboratories, Inc. (UL) or Electrical Testing Station (ETS).

D. Steam generating equipment and accessories shall conform to the standards of the American Society of Mechanical Engineers (ASME).

E. Energy Star - Specified Energy Star rated equipment and appliances shall serve as the standard for all types of equipment and appliances whenever possible.

F. BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS

Board Required Product-approval. Only products and materials that have been listed by the Board as Product-approved shall be used for plumbing work performed in the Commonwealth and governed by M.G.L. c. 142 and 248 CMR.

1.08 EQUALITY OF MATERIALS AND EQUIPMENT

A. The words "or equal" are understood to follow the name of any maker, vendor, or proprietary product, any trade name, plate or catalog number, and any detailed description used in the plans or specifications to define the material, article, assembly or system required. An item shall be considered equal to an item named or described in the plans or specifications if in the opinion of the Architect, it is at least equal in quality, durability, appearance, strength and design, it will perform at least equally the function imposed by the general design for the work, it conforms substantially, even with deviations, to the detailed requirements for the item in the plans and

specifications, and it does not result in increased cost to the Owner. The words "or equal" shall not be construed to permit substantial departure from the detailed requirements of the plans and specifications for any material, article, assembly or system, or of any component parts hereof. Procedures for determining whether an item complies with the standards of this paragraph shall be those set forth in the Supplementary General Conditions amending AIA Document A-201.

PART 2 - PRODUCTS

2.01 MATERIALS AND FINISHES

A. General

1. Metals shall be free from defects impairing strength, durability or appearance, made of new materials with structural properties to withstand strains and stresses to which normally subject.
2. Stock materials, patterns, products and methods of fabrication shall be approved provided that they conform to the requirements specified under Item Specifications.

B. Stainless Steel

1. Stainless steel shall be non-magnetic corrosion resistant chromium-nickel steel, Type 302 or 304 (18-8 Alloy), polished to a Number 4 finish where exposed, unless otherwise noted. Minimum gauges shall be as specified under Item Specifications.

C. Galvanized (Galvannealed) Steel

1. Galvannealed steel shall be commercial quality with tight coat of zinc galvanizing metal applied to a soft steel sheet, subsequently passed through a 1200 degree F. oven, resulting in a spangle free paintable surface. Minimum gauges shall be as specified under Item Specifications.

D. Plastic Laminate Materials

1. The laminate facing shall be GP-50, .050 inch thick, general purpose, high pressure, decorative plastic laminate that meets or exceeds the requirements of NEMA Publication LD3-1985, and NSF Standard 35. The plastic laminate exposed surfaces shall be provided in accordance with the specified manufacturer, finish and color. Balancing sheet shall be backing grade GP-28 in matching color at semi-exposed and BK-20 unfinished where hidden.
2. Plastic laminate covered surfaces shall be factory fabricated with 3/4 inch thick core having plastic laminate facing on both faces and all edges, laminated with waterproof glue under pressure in accordance with the plastic laminate manufacturer's specifications.
3. The core shall be medium density phenolic resin particleboard conforming to ANSI A208.1, Type 2-M-2, 45 pound per cubic foot density minimum.
4. Provide veneer core plywood or solid hardwood edge banding for doors and vertical dividers or panels where hardware is attached to casework.
5. Hinges shall be articulated, spring loaded type equal to Grass CST65-170-F or Stanley, with quantity adequate to support the door without deformation. Do not provide handles on plastic laminate clad doors.

E. Components:

1. Refrigeration:
   a. Fabricated walk-in rooms
   b. Refrigerated display cases
   c. Commercial refrigerators
   d. Mobile milk coolers
2. Freezers:
   a. Fabricated walk-in rooms
   b. Commercial freezers

3. Food Storage Shelving:
   a. Stainless steel wire
   b. Open grid polymer mats on enamel steel wire supports
   c. Aluminum dunnage racks
4. Work Tables and Preparation:
   a. Stainless steel tables and sinks
   b. Food slicer
   c. Food processor
5. Cooking Equipment:
   a. Ranges
   b. Ovens
   c. Kettles
   d. Steamers
   e. Braising pans
   f. Exhaust hood
6. Serving Equipment:
   a. Drop-in mechanical cold-pans
   b. Drop-in hot wells
   c. Food shields
   d. Stainless steel counters
   e. Hot holding cabinets
7. Sinks:
   a. Hand washing sinks
   b. Three compartment wash sink
   c. Mop sink
8. Miscellaneous:
   a. Staff lockers
   b. Trash bins
   c. Mobile carts
   d. Condiment counters
   e. Mobile cash registers

2.02 CONSTRUCTION

A. General

1. Flat metal work items of equipment, such as tables, sinks, or counter tops, and other non-catalog items described under Item Specifications, shall be manufactured by a food service equipment fabricator who has the plant, personnel and engineering facilities to properly design, detail and manufacture high quality food service equipment.
2. The equipment fabricator shall be subject to the approval of the Architect, Owner and Foodservice Consultant. Refer to Paragraph 1.05, Samples.
3. Fabricated foodservice equipment shall be manufactured by one manufacturer, of uniform design, material and finish.
4. Equipment shall conform to the applicable requirements of current Federal, State, and Local Codes and Regulations.

B. Welding

1. The words "weld", "welded" or "welding" as used in this Section of the Specification shall mean that metal joints shall be continuously welded and the exposed parts ground smooth and polished to match adjoining surfaces. Welding electrodes shall match the material being welded.
2. Where spot welding is specified, the welds shall be a maximum spacing of 3 inch on center.
3. Where tack welding is specified, the pieces welded shall have 1/2 inch minimum lengths of welding material at 4 inch on center maximum spacing.

C. Grinding, Polishing and Finishing

1. Exposed welding joints shall be ground flush with the adjoining material and neatly finished to harmonize therewith. Wherever material has been depressed or sunken by a welding operation, such depressions shall be suitably hammered and peened flush with the adjoining surfaces and, if necessary, again welded and ground to eliminate low spots. Ground surfaces shall be polished or buffed to a degree consistent with good workmanship. Coves shall be ground and polished to match adjoining material.
2. Care shall be exercised in grinding operations to avoid excessive heating of metal and discoloration. Abrasives, wheels, and belts used in grinding stainless steel shall be iron free and shall have not been used on carbon steel. The texture of the final polishing operation shall be uniform and smooth. Grain direction shall be uniform, uni-directional for a total length of material. Cross grains and random polishing are not acceptable.
3. The general finish of equipment shall be consistent throughout the job. Brake ends shall be free of open texture or orange peel appearance, and where brake work mars the uniform finish of the material, the marks shall be removed by grinding and polishing, and finishing. Sheared edges shall be free of burrs, projections or fins to eliminate all danger of laceration. Mitered or bullnosed corners shall be neatly finished with the underedge of the material neatly ground to a uniform condition and in no case will overlapping material be acceptable. The equipment surfaces, where exposed, shall be finished to a grained Number 4 (satin) finish unless otherwise specified. An exposed surface shall include an inside surface, which is exposed to view when a swinging or sliding door is opened. Underside of shelves need not be satin finish unless otherwise specified.
4. Excessive distortion caused by welding shall be cause for rejection for that item of equipment.

2.03 BUY-OUT COMPONENTS

A. CASTERS: 5 inch diameter polyurethane tired, swivel, plate or stem mount to suit application, 300 pound capacity, brakes only if specified, NSF approved; Component Hardware C-21-3050 (plate/no brake), C21-3051 (plate/brake) C23-3350 (stem/no brake) or C23-3351 (stem/brake).

B. COUNTER LEGS: Stainless steel, 6 inch to 7-3/4 inch height adjustment; Component Hardware A72-0811, or A77-5048.

C. DOOR AND DRAWER PULLS: Stainless steel, full grip type with beveled edge, NSF approved for stud mounting in device, in horizontal attitude to meet NSF requirements; Component Hardware P63-1012.

D. DOOR HINGES: Stainless steel, lift off type, swedged knuckle for minimum clearance, nylon bearings; Component Hardware M75-1002.

E. DRAWER PANS: Molded plastic or fiberglass, 20 inch by 20 inch by 5 inch deep, NSF approved; Component Hardware S80-2020.

F. DRAWER SLIDES: Stainless steel, NSF approved, full extension, 200 pound capacity with stainless steel ball bearing wheels; Component Hardware S-52 series.

G. FAUCET SETS, DECK MOUNTED: Chrome plated cast bronze with 1/2 inch IPS eccentric flanged female inlets on 8 inch centers, removable cartridges, lever handles, and aerator tip on swivel nozzle or swivel gooseneck to suit the application; T&S Brass B-0221 or B-0321, or equal by Component Hardware, Chicago, or Fisher.

H. FAUCET SETS, POTWASHING SINK: Chrome plated cast bronze with removable cartridges, 3/4 inch passages, eccentric flanged female inlets on 8 inch centers with LL street EL inlets with locknuts, four prong handles, 12 inch swing spout; T&S Brass B-290.

I. FAUCET SETS, SPLASH MOUNTED: Chrome plated cast bronze with 1/2 inch IPS eccentric flanged female inlets on 8 inch centers, removable cartridges, lever handles, and aerator tip on 12 inch swing spout; T&S Brass, B-0231 or equal by Component Hardware, Chicago, or Fisher. Provide each with a mounting kit.

J. GUSSETS: Stainless steel, stepped side, fully closed, NSF approved, mild steel interior reinforcement, wide flange for welding to framing, set screw anchor for leg; Component Hardware A20-0206C.

K. LEG AND BULLET FOOT ASSEMBLIES: Stainless steel tubing, 16 gauge, number 4 finish, adjustable bullet foot with minimum of 3 inch vertical travel, 2,000 pound capacity, top designed for mounting in gusset, length to suit application; Component Hardware A46-6272-C.

L. LEG AND FLANGED FOOT ASSEMBLIES: Stainless steel tubing, 16 gauge, number 4 finish, adjustable bullet foot with 3-1/2 inch diameter flange and two holes for securing to floor, minimum of 3 inch vertical travel, 2,000 pound capacity, top designed for mounting in gusset, length to suit application; Component Hardware A46-4272-C.

M. NUTS: Zinc plated "Pal Nuts" with integral cap and lockwasher; Component Hardware Q-34-1024.

N. SEALANT: Silicone type sealant for sealing equipment to walls or filling crevices between components, TRANSLUCENT, NSF approved; Component Hardware M90-1010, or Dow Corning 732-RTV.

O. SOUND DEADENING BASINS: Component Hardware Q75-1366

P. SOUND DEADENING TOPS AND SHELVES: Component Hardware Q85-5225 "Tacky Tape" installed between all channel or angle reinforced tops, drainboards or undershelves.

Q. WASTE OUTLETS, CRUMB CUP: Stainless steel body, removable crumb cup stopper, gasket, coupling nut and sealing washer, 1-1/2 inch IPS, and optional 4 inch long nickel plated brass tailpiece with gasket; Component Hardware E38-1010.

R. WASTE OUTLETS, LEVER OPERATED: Cast stainless steel rotary type with 1-1/2 inch NPS and 2 inch NPS threads, and removable beehive crumb-cup; Component Hardware DSS-8000.

S. WELD STUDS: Copper flashed steel with 10-24 threads, length to suit; Component Hardware Q-36l.

T. GFCI RECEPTACLES: Pass & Seymour 2095-W, 115 volt, 20 amp GFCI Duplex Receptacle.

2.04 FABRICATED COMPONENTS

A. Box Type Cabinet Construction

1. Sheet metal cabinet bases of box type construction shall be fabricated without general interior framing. Structural strength shall be achieved by the gauge of the metal and the formed angle and channel edges and corners. Vertical sections shall be closed. Cabinet base shall be fabricated of 18 gauge minimum of material specified at Item Specifications. Mount on counter legs or base as specified.

2. Intermediate shelf shall be fabricated of 16 gauge stainless steel with rear and sides turned up 1-1/2 inch tight to the cabinet sides. The front edge of shelf shall be turned down 1-1/2 inch and in 1/2 inch at 45 degrees and shelf spot welded in place. Reinforce underside with longitudinal 14 gauge channel on the centerline.

3. Bottom shelf shall be fabricated of 16 gauge stainless steel similar to the intermediate shelf except that the front edge shall be formed into a full width 1-1/2 inch by 4 inch welded in boxed channel. Rear edge shall be fitted with a full width channel. Underside shall be reinforced.

B. Counters and Drainboards

1. Counters, table tops and drainboards shall be 14 gauge stainless steel, of NSF construction, with edges per Item Specifications. Metal tops shall be made of the largest pieces available and shall appear as one piece with all field and shop joints reinforced and welded, ground and polished. Short pieces of metal will not be acceptable. Counter bends shall be not less than 1/8 inch radius. Wherever a fixture has a waste or drain outlet, the surface shall pitch toward the outlet.

2. Counters, table tops and drainboards shall be reinforced with channel or angle frame as specified in the Item Specifications. Framing shall be secured to the underside with sound deadening material sandwiched between the surfaces, weld studs, and nuts.

3. Wherever bolts or screws are welded to the underside of trim or tops, neatly finish the reverse side of the weld uniform with the adjoining surface of the trim or top. Depressions at these points will not be acceptable. Raise dimples and depressions by peening, or heating and shrinking, and grind and polish to present a flat surface.

C. Crossrails

1. Crossrails shall be not less than 1-1/4 inch outside diameter 16 gauge stainless steel tubing welded, ground and polished to a Number 4 finish. Crossrails shall be welded to legs at a height of 10 inch above finished floor, and shall extend from left to right between front legs, unless otherwise specified, and from front to back between all legs.

D. Drawer Assembly

1. Drawer assemblies shall consist of a removable drawer pan set in a removable 16 gauge stainless steel channel shaped drawer support frame with gusset plate reinforced corners.
2. Support frame shall have double pan front cover consisting of boxed 18 gauge stainless steel outer shell with welded corners, flush mounted recessed stainless steel pull, 20 gauge stainless steel back shell tack welded to outer shell with fiberglass sound deadening between. Drawer shall be provided with rubber bumpers to quiet closing. Support drawer frame on full extension drawer slides.
3. Drawer shall be suspended from table in a three-sided, 16 gauge stainless steel enclosure with flanged-in bottom edges, banded lower front, flanged-out front side and top edges. All sharp corners shall be broken and any exposed exterior threads of slide mounting bolts shall be provided with solid metal acorn nuts.
4. Component Hardware S91-0020 with thermoplastic pan is considered as equivalent to the above specified construction.

E. Edges

1. Marine: Bumped up 1/2 inch at 45 degrees and turned down 1-1/2 inch and in 1/2 inch at 45 degrees; corners welded and square.
2. Raised roll: Coved up and rolled 180 degrees on a 1-1/2 inch diameter with 3 inch height; corners welded and rounded or coved.
3. Rolled: Rolled 180 degrees on a 1-1/2 inch diameter; corners welded and bullnosed.
4. Short (6 inch) splash on counters and tables: Coved up 6 inch, turned back to wall or equipment 1 inch and down 1/2 inch; ends welded closed. Secure tight to face of wall with clips unless specified otherwise and seal joint.
5. Tall (10 inch) splash on preparation sinks, dishtables, counters, and tables: Coved up 8-1/2 inch, turned back to wall or equipment 1-1/2 inch at 45 degrees and down 1/2 inch; ends welded closed. Secure 3 inch off face of wall with brackets unless specified otherwise.
6. Turn down: Turn down 2 inch and in 1/2 inch at 45 degrees; corners welded and square.

F. Framing of Tops, Drainboards, Undershelves

1. Channel: Reinforce with 1 inch by 4 inch by 1 inch 14 gauge galvannealed steel channels; stainless steel if exposed to view. Channels shall run front-to-back at all legs and longitudinally on the centerline. Cross and longitudinal members shall be welded into a single assembly at intersections and sharp corners shall be broken. Framing shall be secured to underside of tops with pairs of weld studs. Framing shall be installed maintaining NSF required clearance to adjacent vertical surfaces and edges of top. The following specified angle framing is considered superior to channel framing and may be used in its place.
2. Angle: 1-1/2 inch by 1-1/2 inch by 1/8 inch perimeter angle frame with crossmembers not over 30 inch on center. Framing shall be secured to top with weld studs, 18 inch on center maximum with three minimum studs on any single face of a table. Perimeter angle frame that is exposed to normal view, shall be stainless steel. Crossmembers and framing not unexposed to normal view shall be iron. Corners of angle frame shall be mitered, or notched and brake formed to form a closed corner. Corner gusset plates used for mounting

of leg gussets shall be 1/8 inch thick and sealed to underside of the top. Iron framework joints shall be ground smooth, and shall be painted with a minimum of two coats of aluminum lacquer after degreasing. Framing shall be installed maintaining NSF required clearance to adjacent vertical surfaces and edges of top. Channel framing shall not be considered equal to specified angle framing.

3. Sound deaden all horizontal framed surfaces with material sandwiched between the framing and the bottom of the surface.

G. Hinged Doors

1. Hinged doors shall be double pan type stainless steel construction with 18 gauge exterior and 20 gauge interior, welded corners, and 1/2 inch fiberglass insulation for sound deadening. Each door shall be provided with a stainless steel recessed handle, and an adjustable tension door catch equal to Component Hardware M22-2430. Doors shall close against the bottom shelf and flush with body of equipment.
2. Louvered hinged doors for ventilation shall be fabricated of the same components and provided with a full perimeter 3 inch wide channel reinforcing frame on the interior face. Remaining face shall be die punched with drip-proof louvers fully utilizing the remaining flat metal or a stainless steel flattened expanded metal grille per Item Specifications.

H. Sinks and Sink Inserts

1. Unless otherwise specified, sinks including sink inserts built into tops of fixtures, shall be made of 14 gauge stainless steel with all vertical and horizontal corners rounded to a radius of approximately 3/4 inch with the intersections meeting in a spherical section. Sinks shall be integrally welded to fixture tops.
2. Sinks with two or more compartments shall have full height, 1 inch thick double wall partitions consisting of two pieces of stainless steel back-to-back so fabricated that each compartment will be a deep bowl with coved corners. Partitions shall be welded in place to the bottom, front and back of the sink with smooth rounded coved corners. Top edges of the partitions shall be continuously welded. The front of the sinks shall consist of a stainless steel smooth, flush apron, same gauge as the sinks. Bottom and rear of partitions shall be closed. Sink dimensions contained in Item Specifications are inside dimensions.
3. Sinks shall be provided with integral 14 gauge stainless steel drainboards when specified. Drainboards and sink basins shall be pitched toward waste outlets and shall be self draining. The underside of all sink basins shall sound deadened. Sink units shall be provided with an integral splash at walls. Provide the necessary holes for the mounting of faucet sets.

I. Sliding Doors

1. Sliding doors shall be double pan type stainless steel construction with 18 gauge exterior and 20 gauge interior, welded corners, and 1/2 inch fiberglass insulation for sound deadening. Each door shall be provided with a stainless steel recessed handle. Provide sliding doors with nylon roller bearing sheaves and overhead track components equal to Component Hardware B58-5523 and 5513 sheaves, B57 track, B62-1093 nylon door guides and B60-1086 door stops.

J. Undershelves

1. Undershelf in an open type table shall be 16 gauge stainless steel unless otherwise noted. Edges shall be turned down 1-1/2 inch and in 1/2 inch at 45 degrees with corners notched out to fit legs to which shelf shall be welded from underside. Line up all edges of shelf with centerline of legs. Reinforce underside with longitudinal 14 gauge channel on the centerline.

K. Wall Brackets

1. Dish tables, sinks and counters with sinks shall be securely anchored 3 inch off the face of the wall unless specified otherwise. Brackets shall be "Z" shaped and fabricated of 3 inch wide, 14 gauge stainless steel. Brackets shall be secured in a vertical attitude to the rear of equipment backsplash with weld studs, and to the wall with appropriate fasteners.

2. Counters that are specified tight-to-wall shall be secured in a hidden manner with steel clips, and the wall/fixture joint shall be sealed.

L. Wall Shelves

1. Wall shelves shall be fabricated of 16 gauge stainless steel, size per Item Specifications, with back and ends raised 1-1/2 inch, front edges of ends angled back, all corners broken, and front turned down 1-1/2 inch, and in 1/2 inch at 45 degrees. Shelf corners shall be welded, ground and polished. Mount shelf 1 inch off face of wall with suitable fasteners on 14 gauge stainless steel flag brackets, 48 inch on center maximum. Flag brackets shall have a web angle of 30 degrees, measured from horizontal.

2.05 ELECTRICAL EQUIPMENT AND WIRING

A. Under this Section, items of equipment having mounted electrical motors, electrical heating units, lighting fixtures, controllers, control stations, switches, receptacles and the like shall be internally wired as specified herein, terminating at a junction box mounted on the equipment and left ready for connection to the building electrical distribution system by the Electrical Trade Contractor. Extra ceiling mount light fixtures for refrigerated rooms shall be delivered to Electrical Trade Contractor for field installation and wiring. Connections to evaporator coils mounted inside refrigerated rooms shall be wired by the Electrical Trade Contractor.

B. Provide openings or cutouts required to accommodate the switches and receptacles in the specified work, and the wiring in conduit from terminal blocks in junction boxes.

C. Electrically operated equipment and fabricator wiring shall conform to the requirements of Underwriter's Laboratories, Inc. Motors over one horsepower shall be equipped with overload protection.

D. Furnish wiring diagrams for equipment as requested by the Architect or Construction Manager, or Electrical Trad Contractor.

PART 3 - EXECUTION

3.01 SANITATION REQUIREMENTS

A. Equipment specified herein shall be fabricated to conform to the "Food Service Equipment Standards" of the National Sanitation Foundation prepared by the Committee on Food Service Standards, and published by the National Sanitation Foundation, Ann Arbor, Michigan. Any differences of opinion on sanitation shall be referred to the State Department of Health for a ruling.

B. Equipment shall be installed in accordance with the manufacturer's instructions and the best practices of the food service industry, with careful attention to eliminating all cracks, crevices and concealed spaces in wet areas that would be difficult to clean or keep free of vermin and soil.

3.02 EXAMINATION AND ACCEPTANCE

A. Determine whether the Construction Manager will furnish and provide temporary power and light, openings and storage space to permit scheduled delivery of equipment. Verify water pressure and provide necessary reducing valves.

B. Examine space in which specified work is to be installed to assure that conditions are satisfactory for the installation of specified work. Report in writing to the Architect, any deficiency in the work of other contractors affecting specified work. Commencement of specified work shall be construed as acceptance of space conditions.

C. Obtain and verify all measurements and conditions on the job, and assume responsibility in respect to same.

D. Inspect flooring and raised concrete bases, wall finishes, painting, ceiling installation and all related work for readiness to commence installation of foodservice equipment. Verify the existence of required mechanical and electrical rough-ins.

3.03 CLEANING UP

A. Debris and surplus materials resulting from installation work shall be removed promptly as work progresses, to a location indicated by the Construction Manager.

B. Following completion, and before final acceptance by the Owner, clean finished surfaces in accordance with the manufacturer's instructions, and leave specified work free of imperfections.

3.04 DEMONSTRATION AND OPERATING INSTRUCTIONS

A. Before final acceptance, and by appointment with the Owner and his representatives, completely demonstrate with power, the correct operation of each new item of operating equipment.

B. Prior to the demonstration, turn on all mechanical and electrical foodservice equipment. Test for leaks, poor connections, and inadequate or faulty performance and correct if necessary. Adjust for proper operation. Thermostatically controlled equipment and equipment with automatic features shall be operated for a sufficient length of time with proper testing equipment to prove controls are functioning as intended. Recalibrate thermostats if necessary.

C. Provide Architect or Foodservice Consultant with a loose leaf bound manual of operating data and maintenance instructions containing complete description, wiring diagrams, operating data, maintenance requirements and other information pertaining to the proper operation and upkeep of the various items of electrical or mechanical equipment. Include names, addresses and telephone numbers of authorized service agencies for all items. Arrange all material in alphabetical order by Manufacturer. Book shall be turned over to Owner after review and approval.

D. Submit guarantees and warranties to the Architect in the above specified manual with all warranty cards completed and becoming effective at the time the equipment was satisfactorily demonstrated.

3.05 PROTECTION OF WORK

A. Protect specified work from damage during transportation to the project site, storage at the site, during installation, and after completion until acceptance by the Owner.

B. Protect adjacent work under other contracts during installation until completion of specified work. After completion, the Trade Contractor for other work shall be responsible for the protection of his work until acceptance by the Owner.

C. Damaged work as determined by the Architect, shall be repaired or replaced as determined by and to the satisfaction of the Architect.

END OF SECTION

SECTION DC E1 9
OTHER EQUIPMENT CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Other equipment consisting of the following elements:
   1. Art Room equipment, including:
      a. Kilns and accessories.
      b. Kiln ventilation systems.
      c. Accessories for a complete installation.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Art Room equipment:
   1. Use the following:
      a. Kilns: Freestanding general-purpose kilns, 27 inch diameter nominal, cone 10, with electronic firing and management control; 208 volts.
         1) Quantity: One.
         2) Include manufacturer's recommended kiln furnishing accessory kit.
         3) Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
            (a) L&L Kilns: www.hotkilns.com.
            (b) Paragon Industries: www.paragonweb.com.
            (c) Skutt Kilns; KN-1027: www.skutt.com (Basis of Design)
            (d) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
      b. Downdraft ducted fume removal system:
         1) Basis of Design Product: Skutt Envirovent-II Fume Removal System.
            (a) This item is included in the Schematic Design for purposes of clarifying the scope of the work for cost estimating but is not intended to be proprietary in the final design.
   2. Heat rejection hood over kilns, ducted to roof, with dedicated exhaust fan.
   3. Kiln controls interconnected to exhaust fan, to sequence exhaust on when kiln is powered on, and sequence fan off when room reaches ambient room design set point.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Design the facility to accommodate the equipment required by the Owner.

B. Where elements of this section also must function as elements defined within another element group, meet requirements of both element groups.

C. In addition to the requirements of this section, comply with applicable requirements of:
   1. Section DC E1 - Equipment Criteria.

END OF SECTION

SECTION DC E2
FURNISHINGS CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fixed Furnishings.
   1. Window Treatment: Fixed, non-furnishing accessories for control of light, solar heat gain, privacy, and view at interior and exterior windows, including shades.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. CFR. Code of Federal Regulations: www.govinfo.gov.

B. MGL. Massachusetts General Laws; www.malegislature.gov/Laws/GeneralLaws.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced.

B. 16 CFR 1112 and 1260 - Safety Standard for Operating Cords on Custom Window Coverings, a Rule by the Consumer Product Safety Commission.

C. 29 CFR 1910 - Occupational Safety and Health Standards.

D. MGL, Part 1, Title II, Chapter 21A, Section 28 - Protection from Harmful Flame Retardants.

PART 2 PRODUCTS

2.01 WINDOW TREATMENTS

A. Use the following:
   1. Window shades throughout the project, at glazed vision panels at interior doors, sidelights, borrowed light openings, transoms, and storefronts in classrooms and other educational spaces, at corridors, and at exterior window and storefront openings.

B. Do not use:
   1. Window blinds.

C. Window Shades:
   1. Use the following:
      a. Top-mounted fabric roller shades at all exterior window and storefront openings at occupied spaces, except for lobby, gymnasium, service and utility spaces, and corridor.
      b. Top Mounted fabric roller shades at all interior windows, glazed vision panels at doors, sidelights, borrowed light openings, transoms, and storefronts, except for gymnasium.
      c. Manual light-filtering shades (WS1) at all classrooms and educational spaces except as otherwise noted on drawings and specifications.
         1) Light-filtering shades shall feature 1 percent transparency of fabric.
      d. Motorized light-filtering shades (WS2) at high transom window at extended learning areas.
      e. Motorized combination light filtering and blackout shades (WS3) at Library / Media Center, and Cafeteria.
      f. Manual blackout shades (WS4) at interior sidelights and storefronts, except where otherwise indicated on drawings.
      g. Installation: Surface-mount, with finished valance.
      h. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
         1) Draper, Inc.: www.draperinc.com (Basis of Design)

(a) Light-filtering shades for exterior windows: Draper; Flexshade with Green Screen Revive:
(b) Light-filtering shades for interior windows; Draper; Techmatic with Green Screen Revive.
(c) Black out shades: Draper; Sunbloc SB900 or SB9100.

2) Rollease Acmeda Contract; Contract Series: www.rolleaseacmedacontract.com.
3) InPro Architectural Products: www.inprocorp.com.
4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2. Do not use:
   a. Bottom-mounted fabric roller shades.
   b. Top-mounted pleated fabric shades.
   c. Bottom-mounted pleated fabric shades.
   d. Louvered fabric shades.
   e. Roman fabric shades.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION

A. Design the facility to accommodate the furnishings required by the Owner.
B. Provide window treatments attached to interior construction that are necessary for adequate control of light, glare, privacy, and views for spaces with interior and exterior windows.
C. Where window treatments are integral with elements defined within another element group, meet requirements of both element groups.

3.02 HEALTH AND SAFETY CRITERIA

A. Window Treatment:
   1. Provide window treatments that comply with the requirements of 29 CFR 1910, regulations of Occupational Safety and Health Administration.
   2. Safety Standard for Operating Cords: Products of the section shall comply with Safety Standard for Operating Cords: Products of this section shall comply with 16 CFR 1112 and 1260.
   3. Protection From Harmful Flame Retardants: Products of this section shall comply with requirements of MGL, Part 1, Title II, Chapter 21A, Section 28.

END OF SECTION

SECTION DC E2 1
FIXED MULTIPLE SEATING CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fixed seating consisting of single and multiple seating that is attached to the building, including:
   1. Audience / Gymnasium Seating:
      a. Application: In Gym.
   2. Bleachers:
      a. Electrically-operated telescoping bleacher seating system for approximately 600 people, in three sections of 18 seats and 11 rows per section. Multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.
         1) Wall-attached telescoping stands**:** Forward-folding system with the rear of the understructure permanently attached to the floor and to the rear wall. Rear wall provides structural support and must support loads imposed by the bleacher.
      b. Accessory items including scorer's table, flexrow barrier-free seating, and end curtains.
      c. Electric motor operators, controls, and internal wiring
      d. Accessories for a complete installation.

B. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

1.02 ABBREVIATIONS AND ACRONYMS

A. ASTM: ASTM International; www.astm.org.
B. AWS. American Welding Society; www.aws.org.
C. ICC. International Code Council; www.iccsafe.org.
D. MGL. Massachusetts General Law; www.
E. NFPA: National Fire Protection Association; www.nfpa.org.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
C. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
D. ASTM D3597 - Standard Performance Specification for Woven Upholstery Fabrics—Plain, Tufted, or Flocked.
E. ASTM E1352 - Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies.
F. ICC 300 - Bleachers, Folding and Telescopic Seating, and Grandstands.
G. MGL, Part 1, Title II, Chapter 21A, Section 28 - Protection from Harmful Flame Retardants.
H. NFPA 70 - National Electrical Code.
I. NFPA 261 - Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes.

PART 2 PRODUCTS (NOT USED)

2.01 AUDIENCE / GYMNASIUM SEATING

A. Use the following:
   1. Bleachers:

a. Telescoping bleachers with molded plastic, individually formed seats.
    1) Integrally molded end caps at aisle end locations.
    2) Integrally molded recess pockets to accept seat number and row letters.
    3) Integrally molded rear closure panel at back of seat to allow for continuous clean sweep of debris at deck level and minimized visibility of structural ribbing.
b. Motorized bleachers to be operated from remote wall-mounted key-switched control.
c. Include front row "flex seating" to permit creation of barrier-free viewing locations in quantities required by applicable codes and accessibility standards.
d. Include aisle railings and collapsible guards at ends of bleachers.
e. Operation:
    1) Integral Power: Keyed wall switch.
        (a) Limit Switches: Automatically stop integral power system when telescoping stands reach fully opened or closed positions.
        (b) Motion Monitor: Flashing light with self-contained warning horn, rated at 85 dB, activates when stands are in motion.
f. Handrails and railings:
    1) Aisle handrails: Single post folding railing segment mounted in center of aisle at every other row beginning at row 2.
    2) End of row guardrails: Self-storing, at open ends of sections beginning at row 2.
    3) Top row seat-level rear guardrail: Non-removable self-storing, mounted behind rear seat with tubular supports, running full width of section.
    4) Railing construction: Round steel or aluminum pipe or tube, with formed elbows at corners and caps at ends of straight runs.
g. Skirt Panel: On first row, provide galvanized steel front skirt panel to prevent players/objects from sliding underneath the first row.
h. Manufacturers:
    1) Hussey Seating Company; MAXAM Telescopic Gym Seat System, with Courtside XCS12 seats: www.husseyseating.com. (Basis of Design)
    2) Interkal LLC; www.interkal.com.
    3) Irwin Seating Company; www.irwinseating.com.
    4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.

2. Accessories:
    a. Scorer's tables: 6 feet wide by 15 inches deep; relocatable to any row of any sections without mounting brackets.
        1) Quantity One.
    b. End curtains: Vinyl.
3. Materials:
    a. Cast Aluminum: AA-380, free of air holes and casting imperfections, all edges ground smooth.
    b. Sheet Steel: ASTM A879/A879M, Commercial Steel (CS) or Drawing Steel (DS) electrogalvanized sheet, 04Z (12G) coating class on both surfaces; chemically treated for baked enamel finish.
    c. Steel Plates, Bars, and Tubes: ASTM A36/A36M.
    d. Fiberglass: Molded plastic material with not less than 30 percent glass fiber reinforcement and integral color pigments.

e. Polypropylene Sheet: Molded high density plastic with minimum tensile strength of 3300 psi, integral color pigments, and textured, scuff-resistant surface finish.
f. Polyurethane Foam: Density not less than 1.8 lb/cu ft, fire retardant, non-hardening and non-oxidizing, with high resistance to alkalis, oils, moisture, and mildew.
g. Upholstery Fabric: ASTM D3597 Heavy-duty woven Polyester fabric. Greenguard gold Certified, Stain repellent to be PFOA & PFOS Free, minimum of 100,000 Double Rubs, Water Soluble cleaning Code. Up to three colors from same pattern to be evenly distributed on Fixed Seating Chairs throughout the Auditorium and Balcony above. Fabric is subject to compliance w/ requirements from awarded Fixed Seating Manufacturer.
h. Manufacturers: Subject to compliance with these specifications, provide products of one of the following:
    1) Maharam; Product: Messenger: www. maharm.com.
    2) Mayer Fabrics; Product: Spectrum; Pattern: Theory; www.mayerfabrics.com. (Basis of Design)
    3) Pallas; Product: Panache: www.https://www.pallastextiles.com.
    4) Or equal: Other manufacturers' products accepted by the Awarding Authority as equal to the specified products in terms of construction, quality, durability, performance, and appearance. Submit as substitutions.
i. Color: Up to three colors, to be selected from manufacturer's standard color offerings.

PART 3 DESIGN CRITERIA

3.01 BASIC FUNCTION:

A. Provide seats for occupants and visitors of the type and in the quantity required by the project program and in accordance with the code.
B. Where fixed seating also must function as elements defined within another element group, meet the requirements of both element groups.
C. Electrical components, devices, and accessories shall be listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application. Below standard may be more stringent than applicable building code requirements. Coordinate with local building code requirements for telescoping stands.

3.02 AMENITY AND COMFORT

A. Comfort:
    1. Seating Layout: Provide telescoping stands to comply with ICC 300 Standard for Bleachers, Folding and Telescopic Seating, and Grandstands, except where additional requirements are indicated or imposed by authorities having jurisdiction.
    2. Seat Width: 18 inches long.
        a. Standard: 20 inches center-to-center, 17 inches minimum seat width.
    3. Seat Depth: 12 inches.
        a. Standard: 17 inches deep, minimum front edge to most forward point of back.
    4. Seat Height: 16-1/8 inch from deck to top of seat, plus or minus 1/2 inch.
        a. Standard: 17 inches.
    5. Seat Contour: Accomplished using seat base.
        a. Other Seating: Molded, shaped, or contoured front-to-back and side-to-side, to fit body, with rounded or padded front edge.
    6. Back Height: Measured from top of seat at point at which straight line projection of surface of back intersects with seat; plus or minus 1/2 inch.
        a. Standard: 17 inches.

7. Back Pitch: Slope back from seat, allowing minor contour of back, measured from intersection of straight line projection of surface of back with seat to top front edge of back.
    a. Standard: 20 degrees.
8. Back Contour: Accomplished using seat base or padding.
    a. Molded: Contoured side-to-side, to fit body.
9. Back Resilience:
    a. Extra: Equivalent to 3 inches of polyurethane foam.
10. Arm Height: 7 to 8 inches above seat.
    a. Audience: Level arms.
11. Arm Resilience:
    a. Padded: Equivalent to 3/4 inch of polyurethane foam.

3.03 HEALTH AND SAFETY

A. Fire Retardance:
    1. Seats and Backs: Self-extinguishing when mock-up is exposed to smoldering cigarettes in accordance with ASTM E1352 or NFPA 261.
    2. Exception: Obviously non-combustible materials such as metals and stone.
B. Flame Retardant Chemical Content:
    1. Soft furnishings shall comply with MGL, Part 1, Title II, Chapter 21A, Section 28.

3.04 STRUCTURAL CRITERIA:

A. Structural Performance: Engineer, fabricate and install telescopic gym seating systems to the following structural loads without exceeding allowable design working stresses of materials involved, including anchors and connections. Apply each load to produce maximum stress in each respective component of each telescoping stand unit according to ICC 300.
B. Gymnasium seat assembly: Design to support and resist, in addition to its own weight, the following forces:
    1. Live load of 120 pounds per linear foot on seats and decking
    2. Uniformly distributed live load of not less than 100 pounds per square foot of gross horizontal projection.
    3. Parallel sway load of 24 pounds per linear foot of row combined with sub-paragraph 2. above
    4. Perpendicular sway load of 10 pounds per linear foot of row combined with uniformly distributed live load above.
    5. Parallel and Perpendicular sway loads are not applied concurrently.
C. Hand Railings, Posts and Supports: Engineered to withstand the following forces applied separately:
    1. Concentrated load of 200 pounds applied at any point and in any direction.
    2. Uniform load of 50 pounds per foot applied in any direction.
D. Guard Railings, Post and Supports: Engineered to withstand the following forces applied separately:
    1. Concentrated load of 200 pounds applied at any point and in any direction along top rail.
    2. Uniform load of 50 pounds per foot applied in any direction at top rail.
    3. Uniform load of 50 pounds applied on an area equal to 1 square foot applied on all guardrail infill panels.
E. Manufacturer shall be a current Certified Welding Fabricator as defined by either AWS. The manufacturer shall comply with structural welding codes that are applicable to their products or materials. These welding codes shall be produced by AWS.

F. Product to be supplied shall have a current evaluation report issued by ICC Evaluation Services (ICC-ES) certifying that it meets all structural design requirements of the current ICC 300 Standard for Bleachers, Folding and Telescopic Seating, and Grandstands, including all specified load combinations.

END OF SECTION

SECTION DC F
DEMOLITION CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The work required under this section shall include, but is not limited to the following:
   1. General demolition of structures, including removal of sub-surface foundations and footings completely, as identified in the drawings, and excluding removal of hazardous materials and toxic substances.
   2. Selective demolition of building elements for alteration purposes, excluding removal of hazardous materials and toxic substances.
      a. See Civil and Landscape specifications and drawings for additional information.
   3. Salvage.
   4. Abandonment and removal of existing utilities and utility structures.

B. All demolition work shall be coordinated and phased to comply with the Phasing Plans.

1.02 ABBREVIATIONS AND ACRONYMS

A. CFR. Code of Federal Regulations: www.govinfo.gov.

B. CMR. Code of Massachusetts Regulations: www.mass.gov/code-of-massachusetts-regulations-cmr.

C. DEP. Massachusetts Department of Environmental Protection: www.mass.gov/orgs/massachusetts-department-of-environmental-protection.

D. NFPA. National Fire Protection Association: www.nfpa.org.

1.03 REFERENCE STANDARDS

A. Editions of listed standards as referenced by applicable codes, or most current edition if not referenced.

B. 29 CFR 1926 - Safety and Health Regulations for Construction.

C. 310 CMR 7.00 - 310 CMR 7.00 "Policy Concerning Non-Friable Asbestos Containing Materials".

D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination per Section 01 31 14 - Coordination and as follows:
   1. Coordinate schedules of operations with Owner prior to starting work.
      a. Schedule demolition and dismantling to cause no interference with the use of the existing buildings.
      b. Cooperate with the Owner to reduce to a minimum all interference with normal use of the building.

B. Preconstruction Meeting required per Section 01 70 00 - Execution and Closeout Requirements.

1.05 EXISTING UTILITY SERVICES:

A. Arrange and pay for disconnecting, removing, and capping utility services within areas of demolition.
   1. Utility company back charges will be paid by Owner.

B. Place markers to indicate locations of disconnected services. Identify service lines and capping locations.

1.06 FIELD CONDITIONS - GENERAL DEMOLITION

A. Occupancy: Structures and parts of structures to be demolished will be vacated and use will be discontinued prior to start of work.

B. Condition of Structures: Owner assumes no responsibility for actual condition of structures to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of demolition work.
2. Construction Manager shall note and be aware that asbestos-containing roofing materials are present in residual form on the existing roofs.
    a. Abatement of these materials by a licensed Asbestos Abatement Contractor is not required under this Contract. See PART 3 below and the following: for additional requirements.
        1) Section 02 28 20 - Asbestos Abatement.
3. Construction Manager, Trade Bid Contractors, and subcontractors shall be aware that asbestos-containing materials exist within the building. Comply with 29 CFR 1926 regulations concerning protection of employees when performing this work, and 310 CMR 7.00.

C. Salvaged Materials: Items of salvageable value to the Construction Manager may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
1. Exceptions: See SALVAGE paragraph, in PART 3 of this section, for list of items to be salvaged and turned over to Owner or to be re-installed in new construction or renovation areas.
2. Storage or sale of removed items will not be permitted on site.

D. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from Authority Having Jurisdiction (AHJ) and Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
2. Maintain safe access around demolition to occupied building areas for Owner, building users, service, fire and police vehicles.
3. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities and injury to persons.
4. Erect temporary covered passageways if directed to do so by Owner or AHJ.

E. Damages: Promptly repair damage caused to adjacent facilities by demolition operations.

F. Utility Services: Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.
1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by AHJ and Owner. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
2. Arrange for disconnecting and sealing utilities serving structures to be demolished, prior to start of demolition work.
3. Shut off and cap water service to building areas to be demolished.

G. Utility Services: See Division 26 for disconnection of electrical services. Do not start demolition work until utility disconnections have been completed and verified in writing.

H. Do not start demolition work until utility disconnections have been completed and verified in writing.

I. Remove and legally dispose of freon and glycol that are contained within building systems and fixed equipment.

J. Remove and legally dispose of oil, propane, and associated tanks.

1.07 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.

1. Minimum of five years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: See Section DC G - Sitework Criteria.

PART 3 DESIGN CRITERIA

3.01 DEMOLITION

A. Remove that portion of the existing building as designated on the drawings, additional removals not identified on drawings but necessary to complete the work, and as follows:
   1. Demolition and remedial site work at the North Intermediate School site, 320 Salem Street, Wilmington, MA 01887 to include hazardous material abatement of the existing school building, demolition of the school building and selected site appurtenances, and remedial site work of the resulting vacant lot.
   2. Remove one stand-alone irrigation pump house of approximately 12 feet by 12 feet square.
   3. Remove baseball fields, tennis & basketball courts with surrounding chain link fence, approximately 980 linear feet.
   4. Relocate all playground equipment as shown on drawings.
B. Remove stairs, concrete sidewalks, paving and curbs required to accomplish new work.
C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section DC G - Sitework Criteria.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   6. Do not close or obstruct roadways or sidewalks without permits from AHJ.
B. Do not begin removal until receipt of notification to proceed from Owner.
C. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
D. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Dismantle existing construction and separate materials.
   2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
E. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without obtaining permits from Authority Having Jurisdiction.
D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least seven days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least three days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site and building daily. Burning of materials from demolished structures is not permitted on site.

B. Remove materials not to be reused on site.

C. Transport materials removed from demolished structures and legally dispose off-site.

D. Leave site in clean condition, ready for subsequent work.

E. Clean up spillage and wind-blown debris from public and private lands.

3.05 PROTECTION OF EXISTING BUILDING

A. Use all means and precautions necessary to ensure the safety of the occupants of the building and the good condition of materials, finishes, and systems scheduled to remain.

1. Construction Manager shall maintain the required exits, where indicated or required for code compliance, from all occupied portions of the building.

3.06 SALVAGE

A. Salvage items listed below or indicated on drawings. Consult with Owner for items not listed nor indicated on drawings. Take precautions to ensure that salvaged items are not damaged. For items to be re-used, care and effort shall be taken to preserve mounting and other hardware.

B. Where practicable, salvage sufficient quantities of cut or removed material to replace damaged components of existing construction, when material is not readily obtainable on current market.

END OF SECTION

SECTION DC G1

SITE IMPROVEMENTS CRITERIA

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Site improvements comprise the following elements:

1. Pavements and Surfacing: Finished surfaces for pedestrian, sports, and recreational traffic, other than turf, comprising the following elements:
   a. Exterior paved or surfaced areas such as walkways, plazas, outdoor classrooms, and sports surfaces for hardcourt play and basketball courts.
   b. Exterior steps and ramps that are not connected to buildings, including handrails and stair nosings.

B. Refer to the Civil Engineer Section G2010 'Roadway Pavement' for bituminous concrete/asphalt paving along roadways, driveways, and parking lots.

C. Refer to the G Civil Engineer Section G2013 'Curbs, Gutters and Drains' for granite or precast curbs along roadways and driveways.

1. Site Fixtures and Equipment: Fixtures, equipment, and miscellaneous structures located out-of-doors, except those located on the roof or mounted on walls of buildings. Site fixtures and equipment that are required include:
   a. Flagpoles:
      1) Two Ground-Mounted Flagpoles:
         a) Each with one flag.
         b) Flag size: Owner provided.
         c) Each includes one solar downlight.

   b. Fences and Barriers:
      1) Steel crash-test rated ornamental fencing and gates (4-foot heights) for:
         a) Fencing around outdoor play areas.
      2) Chain link fencing (4-foot heights) for:
         a) Perimeter of soccer field and play area to the east.
      3) Chain link fencing (10-foot heights) for:
         a) Fencing around basketball court area.
      4) Wood Privacy Fence; 6-foot high; to provide screening (visual and sound) for property abutters.
      5) Vehicular Gates (three locations)
         a) To close off any potential vehicular traffic during school play hours.

   c. Athletic fixtures and fixed equipment, including:
      1) Soccer goals.
      2) Basketball goals, player's benches, and sport fence.
      3) Playground equipment in three locations per age group.

   d. Site furnishings, including:
      1) Benches for seating areas as shown on the plans.
      2) Litter and recycling-combined receptacles.

3) Bicycle racks.
4) Ornamental and traffic control steel bollards.
5) Vehicular swing gate.
6) Raised garden beds.
7) Monolithic granite seatwall.
8) Outdoor seating and tables.
9) Outdoor chalkboards.
10) Outdoor learning tables.

e. Minor site structures, including:
1) Circular seatwall at outdoor classroom.
2) Outdoor dining terrace.
3) Storage shed for recess equipment (10’-0” by 12’-0”).
4) Shade sails with concrete engineered footings (three locations).

2. Landscaping: Outdoor plants and elements supporting plants. Landscape planting features that are required are:
a. Turf areas for specific activities as described in the project program.
1) Sports and athletic surfaces at soccer fields, hard court play, and basketball courts.
2) Within portions of the children's play areas.
3) In all lawn areas in front and around the school buildings.
4) Within all parking islands.
5) At main entry plaza.
6) At pick/up and drop-off zones (bus and parent).
7) Screening vegetation to property abutters.

b. Turf for ornamental or erosion-control purposes.
1) Long slopes and hillsides.
2) Adjacent to wetlands, as indicated by permitting agencies.

c. Visual screening
1) As Foundation plantings.
2) Trees for shade to building areas.
3) Inside planters in plazas and outdoor gathering areas.
4) Utility areas.
5) Mixed Deciduous and Evergreen screen planting for property abutters.

d. Shade for outdoor activities.

e. Ornamental plantings at main entry, outdoor gathering areas, outdoor classrooms, outdoor dining plazas, playgrounds, sport courts, and athletic fields.

f. Erosion control plantings in accordance with Section G1010.1 ‘Erosion and Sedimentation Controls’.

D. Products: Where specific products are required or allowed, use products complying with the additional requirements specified elsewhere.

E. Refer to the Civil Engineering Section G1010.1 ‘Erosion and Sedimentation Controls’ for permanent erosion control on long slopes and hillsides.

F. Refer to the G Electrical Section G4020 ‘Site Lighting’ for site lighting for safety and egress.

G. Refer to the G Electrical Section G4020 'Site Lighting' for recessed retaining wall lighting for safety and egress.

H. Refer to the G Electrical Section G4010 'Electrical Distribution' for underground tunnels carrying electrical power or telecommunications comply with requirements for buildings.

1.02 REFERENCE STANDARDS

A. 40 CFR 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.

B. AASHTO GDPS - Guide for Design of Pavement Structures.

C. AASHTO GDHS - A Policy on Geometric Design of Highways and Streets.

D. American National Standards Institute (ANSI): Z60.1 American Standard for Nursery Stock, latest edition, published by American Horticulture Industry Association d/b/a AmericanHort.

E. A.O.A.C.: Association of Official Agricultural Chemists.

F. ASTM A36 Structural Steel.

G. ASTM A53 Pipe, Steel, Black and Hot-dipped, Zinc-coated welded and seamless steel pipe.

H. ASTM A153 Zinc Coating (Hot-dip) on Iron and Steel Hardware.

I. ASTM D 75 Practice for Sampling Aggregates

J. ASTM D 6913 Standard Test Method for determining the Particle-Size Distribution (Gradation) of Soils using Sieve Analysis.

K. ASTM D 7928 Standard Test Method for Particle-Size Distribution (Gradation) of Fine-grained Soils using the Sedimentation (Hydrometer) Analysis.

L. ASTM D1557 Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb Rammer and 18-in. Drop

M. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

N. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.

O. CPSC Pub. No. 325 - Public Playground Safety Handbook.

P. Massachusetts Department of Agricultural Resources (MDAR) - Massachusetts Prohibited Plant List, most recent issued list.

Q. MUTCD – Manual of Uniform Traffic Control Devices, US Highway Administration.

R. NAAMM FP 1001 - Guide Specifications for Design of Metal Flagpoles.

S. Professional Management Guide for Insects, Diseases and Weeds of Trees and Shrubs in New England, UMASS Press Series; https://www.umass.edu/agriculture-food-environment/landscape/publications-resources/umass-extensions-professional-management-guide-for-diseases-of-trees-shrubs.

T. SSHB – Standard Specifications for Highways and Bridges, the Commonwealth of Massachusetts, MassHighway, latest edition.

1.03 FIELD CONDITIONS

A. The following existing elements must be preserved:
   1. Sons of Italy Playground Donation Plaque on Granite Podium, Memorial Benches, and Soccer Field Memorial shall be preserved to be relocated onsite; locations to be determined.
   2. Adjacent existing roads, utilities, street trees, walks, walkways, and connections to the site and other school-related facilities, including the pedestrian access route to Arlene Avenue to the west and the pedestrian woodland connection to the Avalon Apartments to the northwest.

B. The following existing elements must be removed to accomplish new construction:
   1. All existing pavement and curbs are depicted on the Civil Engineering Site Preparation Plans.
   2. All existing trees and shrubs not noted to be protected “Protect and Remain”
   3. All bollards, site signs, timbers, walks, and other site appurtenances located within the limits of work, unless noted to “remain”.

PART 2 - PRODUCTS

2.01 PAVEMENTS AND SURFACING

A. Pavements and Surfacing:

   1. Use the following:
      a. Rigid paving throughout project shall consist of cast-in-place concrete walks, stairs, ramps, plazas and pads for utilities and structures, as depicted on Drawings.
      b. Resilient sports surfacing throughout project shall be used for the final surfacing, above a bituminous concrete base for the hard court play areas and basketball courts.
      c. Gravel Drip strip with aluminum edging at building foundation between foundation wall and planting bed.
      d. Synthetic lawn shall be used at one outdoor learning area and one gathering area with a nailer-board and cast-in-place concrete curb edging.

B. Pedestrian Paving:

   1. Use the following:
      a. Bituminous Concrete | Asphalt play areas and basketball courts shall consist of the following: 8-inch Gravel Borrow for Aggregate Base complying with MHD Specifications Section M1.03.0 Type “B”, 2-inch (minimum) Type I-1 Bituminous Concrete Binder, and 1-inch (minimum) Type I-1 Bituminous Concrete Top Course,
      b. Cast-in-Place Concrete pavement for all pedestrian walks adjacent to the school building, for all plazas and access/egress pads and as otherwise shown on the design plans. Concrete sidewalks shall consist of the following: 6-inch Gravel Borrow for Aggregate Base complying with MHD Specifications Section M1.03.0 Type “B”,

4-inch (minimum) poured-in-place air-entrained, reinforced, 5,000 pounds per square inch (PSI) at 28 days concrete.

1) Concrete Sidewalks shall be a minimum of 6-feet wide and abut the roadway vertical granite curb, precast concrete landscape curbs and/or include an integral cast-in-place curb.
2) Sidewalks and walkways have varied scoring patterns, tooled edges, and medium broom finishes perpendicular to the path of travel.
3) Concrete Sidewalks shall be a minimum of 5-feet wide and abut the roadway vertical granite curb, precast concrete landscape curbs, and/or include an integral cast-in-place curb.

c. Cast-in-Place Concrete paving with scoring pattern at entry plazas to building and along major travel routes through and around the site, also at the main entry, outdoor learning areas, and dining plaza.
d. Synthetic Lawn at one outdoor learning area and one gathering area with a nailer-board and cast-in-place concrete curb edging.

C. Exterior Sports Surfacing:

1. Use the following:
   a. Bituminous Concrete | Asphalt paving at hard court play areas and basketball courts.
   b. Acrylic topping over asphalt at hard court play areas and basketball courts.
   c. Pavement markings for play to include six separate colors – to be further developed.

2.03 SITE FIXTURES AND EQUIPMENT

A. Barriers:

1. Use the following:
   a. Crash Test Rated Steel Ornamental Fences at playground areas (4-foot high).
   b. Evergreen Planting with Wood Privacy Fence (6-foot high) to provide visual and sound barriers for property abutters.
   c. Vinyl Coated Chain-link Fences at basketball courts (10-foot high).
   d. Vinyl Coated Chain-link Fences at soccer field and play area (4-foot high).
   e. Cast-in-Place Concrete Seatwalls at outdoor classrooms.
   f. Monolithic Granite Seatwalls at Bus Drop-Off/Outdoor Dining Plaza areas.
   g. Bollards at bus and parent drop-offs.
   h. Gates at pedestrian access routes to playgrounds and basketball courts.
   i. Vehicular gates block access into roadways.
   j. Metal Louver screen fencing and gates around dumpsters and utilities (8-foot high).

B. Fences:

1. Use the following:
   a. Crash-Test Rated Steel Ornamental Fence at playground areas.
   b. Vinyl-coated chain link fencing (10-foot high) perimeter fence for basketball courts.
   c. Vinyl Coated Chain-link Fences at soccer field and play area (4-foot high).
   d. Wooden Privacy Fence adjacent to property abutters.
   e. Metal Louver screen fencing and gates around dumpsters and utilities (8-foot high).

C. Permanent Site Fixtures:

1. Use products made of the following:
   a. Cast-in-place concrete.
   b. Stainless steel for exterior, non-building stair railings.

c. Aluminum for flagpole.
d. Granite for monolithic seatwalls.
e. Powder-coated steel and aluminum for site furnishings.

2. Do not use products made of:
   a. Terracotta.
   b. Bronze
   c. Fiberglass.

D. Site Furnishings:

1. Use products made of one of the following:
   a. Cast-in-place concrete for pads and foundations for benches, litter receptacles, bicycle racks, traffic control bollards, vehicular swing gate, and monolithic granite seatwalls.

   b. Powder Coated aluminum for:
      1) Backed Benches with armrests; surface mount.
         a) Quantity: 12.
      2) Litter and recycling combined receptacles; surface mount.
         a) Quantity: Eight.
      3) Bicycle racks; embedded.
         a) Quantity: 14.

   c. Powder Coated steel for :
      1) Sculptural Benches; surface mount.
         a) Quantity: Three.

   d. Stainless steel for:
      1) Pedestrian Crash-Test Rated Bollards (with LED light).
         a) Quantity: 18.
      2) Pedestrian Crash-Test Rated Bollards (non-lit).
         a) Quantity: 19.

   e. Reinforced plastic composite for:
      1) Raised garden beds.
         a) Quantity: Six.
      2) Play structures.
         a) Quantity: Three Systems (per age group).

   f. Steel for:
      1) Vehicular swing gate.
         a) Quantity: Three.

   g. Stone masonry for:
      1) Monolithic granite seatwalls.
         a) Quantity: Five.
      2) Natural Stonewall Panel Retaining Wall.
         a) At perimeter of basketball court.

E. Flagpoles: fixed.

1. Provide sheathed metallic flag snaps.
2. Use internal halyard and cam cleat pulley system.

3. Aluminum flagpoles at parent drop-off.
4. Clear Anodic Finish.
5. Including solar downlight.
6. Quantity: Two.

7. Do not use:
   a. Flagpoles with shafts that are constructed of more than one piece.
   b. Fiberglass flagpoles.
   c. Tilting flagpoles.

2.04 LANDSCAPING

A. Landscape Plants:

1. Use the following:

   a. Evergreen types.
      1) Upright, columnar evergreens like White Spruce and Eastern Red Cedar.
      2) Broad, spreading evergreens for foundation plantings and buffers like Junipers and Yews.
      3) Broadleaf evergreens for foundation plantings and landscape features like Rhododendrons.
   b. Deciduous types.
      1) Flowering shrubs provide seasonal interest such as Sweetspire, Lilac and Spirea.

2. Feature Plants.

   a. Upright, columnar evergreens like arborvitae or cedars.
   b. Broad, spreading evergreens for foundation plantings and buffers like junipers and yews.
   c. Broadleaf evergreens for foundation plantings and landscape features like rhododendrons, mountain laurel and holly.

3. Do not use:
   a. Evergreen types.
      1) Hemlocks.
      2) White Pine.

   b. Deciduous types.
      1) Norway Maples as they are an invasive species.
      2) Poplar species because they are weak-limbed.
      3) Gooseberries or Currents.
      4) Species that are categorized as invasive or deleterious.

4. Use the following:
   a. Outdoor plants in all courtyards.

5. Do not use:
   a. Species that are categorized as invasive or deleterious.

B. Turf:

1. Use a combination of the following:
   a. General Lawn Seed Mix; (Northeast Nursery or equal) for general lawn areas.

b. Shade Lawn Seed Mix (Northeast Nursery or equal) for shade lawn areas.
c. Slope | Sustainable Seed Mix; Slopes >3:1 with Erosion Control Blanket; Northeast Nursery or equal) for sloped lawn areas.
d. Multi-Use Athletic Field Seed Mix; (Northeast Nursery or equal) for multi-use or athletic field areas.
e. Black Beauty Turf Type Tall Fescue (SODCO or equal) for general sod lawn areas.
f. Microclover Black beauty/Players Best (SODCO or equal) for high use sod lawn areas.
g. Erosion Control/Restoration Mix for Detention Basins and Moist Sites Seed Mix; Slopes > 3:1 with Erosion Control Blanket; (New England Wetland Plants or equal) for wet restoration grass areas and bioswales.
h. Erosion Control/Restoration Mix for Detention Basins and Moist Sites Seed Mix; (New England Wetland Plants or equal) for wet restoration grass areas and bioswales.
i. Erosion Control/Restoration Mix for Detention Basins and Dry Sites Seed Mix; Slopes > 3:1 with Erosion Control Blanket; (New England Wetland Plants or equal) for dry restoration grass areas and bioswales.
j. Erosion Control/Restoration Mix for Detention Basins and Dry Sites Seed Mix; (New England Wetland Plants or equal) for dry restoration grass areas and bioswales.
k. FACW Wetland Meadow Mix; ERNMX-122; (Ernst Seed or equal) for wildflower seed.
l. Mesic to Dry Native Pollinator Mix; ERNMX-105 (Ernst Seed or equal) for pollinator wildflower seed.
m. Retention Basin Floor Mix; ERMNX-126; (Ernst Seed or equal) for native grass rain garden and bioswale areas.
n. New England Native Warm Season Grass Mix (New England Wetland Plants or equal) for native grass areas.
o. New England Conservation/ Wildlife Mix (New England Wetland Plants or equal) for conservation restoration grass areas.
p. New England Roadside Matrix Upland Seed Mix (New England Wetland Plants or equal) for erosion control and restoration grass areas.

2. Do not use:
   a. Non-specified plant species.
   b. Any seed or sod mixture containing invasive species.

3. Use one of the following methods of installation:
   a. Sodding may be used in lieu of seeding, if approved by Architect.
   b. Seeding, hand or mechanical at rates specified.
   c. Plugging is acceptable only for perennial, non-grass species (bio basins, swales).
   d. Hydroseeding is mandated for areas more than one acre, steep or long slopes or as indicated due to seasonal requirements.

4. Do not use:
   a. Plugging for any grass species or large area coverage.
   b. Hydroseeding for non-grass seed plantings.

C. Evergreen Ground Covers:

1. Use the following:
   a. Juniper.
   b. Prostrate Plum Yew.
   c. Vinca.
   d. Liriope.

2. Do not use:
    a. Invasive plant species.

D. Deciduous Ground Covers:

1. Use the following:
    a. Ajuga.
    b. Daylily.
    c. Ferns.
    d. Hosta.
    e. Ornamental clumping grasses.
    f. Ornamental mixed perennials.

2. Do not use:
    a. Invasive plant species.

E. Evergreen Shrubs:

1. Use the following:
    a. Azalea.
    b. Holly.
    c. Juniper.
    d. Mugo pine.
    e. Rhododendron.
    f. Yew.

2. Do not use:
    a. Non-specified plant species.
    b. Invasive plant species.

F. Deciduous Shrubs:

1. Use the following:
    a. Clethra.
    b. Fothergilla.
    c. Hydrangea.
    d. Lilac.
    e. Ninebark.
    f. Sweetspire.
    g. Spirea.
    h. Viburnum.
    i. Winterberry.
    j. Witchhazel.

2. Do not use:
    a. Invasive plant species.

G. Vines:

1. Use one of the following:
    a. Clematis.
    b. Trumpet vine.
    c. Wisteria.

2. Do not use:
    a. Invasive plant species.

H. Shade Trees:

1. Use the following:
    a. Honeylocust (thornless).
    b. Linden.
    c. Red Maple (Red Sunset).
    d. Swamp White Oak.
    e. Sweetgum.
    f. Tuliptree.
    g. White oak.

2. Do not use:
    a. Invasive plant species.

I. Specimen Trees:

1. Use the following:
    a. Flowering cherry.
    b. Flowering crabapple.
    c. Fringe tree.
    d. Hornbeam.
    e. Kousa Dogwood.
    f. Magnolia.
    g. Paperbark maple.
    h. River Birch.
    i. Stewartia.
    j. White Spruce.

2. Do not use:
    a. Invasive plant species.

J. Street Trees:

1. Use the following:
    a. Hackberry.
    b. Honeylocust (Thornless).
    c. Red Maple (Red Sunset).
    d. Swamp oak.
    e. White oak.

2. Do not use:
    a. Invasive plant species.

K. Mulch:

1. Use one of the following:
    a. Well-rotted shredded hardwood.
    b. Well-rotted leaf mulch.

2. Do not use:
    a. Peanut, pecan, or cocoa-bean shells.
    b. Peat moss.

c. Rounded riverbed gravel.
d. Crushed or chipped marble or granite.
e. Processed wood fiber.

L. Edgings for Beds:

1. Use the following:
   a. Shovel cut edge.

2. Do not use:
   a. Brick.
   b. Concrete.
   c. Redwood.
   d. Western red cedar.
   e. Polyethylene plastic.

M. Irrigation Systems:
   a. Total square footage for sprinkler irrigation of the three natural turf playing fields, for a total of 31,306 +/- square feet.
   b. Domestic water will be provided from the building as the primary water supply for irrigation. The cost of plumbing a separate domestic service to the irrigation system shall be included by the Construction Manager, including:
      1) Licensed Trade Project Plumbers Carrying Indoor Irrigation Work.
         a) Work must be carried to 10 feet outside building walls per Code.
      2) Sewer Abatement (Irrigation) Water Meter for Billing.
      3) Reduced Pressure Zone (RPZ) Backflow Preventer.
      4) Copper Pipe and Valves.
      5) Floor Drains.
      6) Winterization.
   c. Applying potable water judiciously requires the use of a “smart” irrigation controller that can calculate the correct amount of water to apply based on real-time climate conditions (i.e.: rain, temperature, soil moisture) and automatically adjust the running time, or suspend daily irrigation if moisture conditions are met, for each customized zone. Irrigation will only be applied to supplement rainfall, not serve as a substitute. Generally, irrigation is applied overnight in the early hours of the morning to prevent irrigation water from staying on plant leaves too long and to not interfere with general maintenance and site operation. Quick-coupling valves at-grade will be in lockable valve boxes for various hand-watering and winterization practices. The irrigation system shall have a winterization port to force compressed air through the mainline and laterals in October to prevent pipes cracking from ice. A qualified irrigation service provider is recommended for annual maintenance and commissioning for optimal performance.
   d. Internet-based controls will further enhance system management to notify the end-user of leaks, breaks, faults, and overall water use for commissioning. The Construction Manager shall provide ethernet data to the irrigation controller and/or pump station for remote management and system push notifications, emails, and text alerts on flow sensing, automatic system shutdown with leaks and breaks, harvested water versus domestic water consumption, and weather advisories (e.g., incoming rain, temperatures).
   e. The Construction Manager shall only subcontract qualified contractors with experience using these products:
      1) Irrigation Controller:
         a) Baseline BaseStation3200 with BaseManager 2.0.
         b) Rain Bird ESP-LXD with IQ v4.0.
         c) Hunter ACC2 with Centralus.

2) Two-Wire Based System (for Expandability).
3) Internet Based Controls:
    a) Construction Manager to Purchase Tablet and Stylus for Irrigation Management.
4) PVC Mainline.
5) Stainless Steel Rotor Sprinklers for Athletic Fields.
6) Pressure Regulating Valves and Sprinklers.

f. Electrically, the irrigation controller only requires a 120-Volt, 1-Phase, 20-Amp GFCI Supply. The controller shall be grounded to the building earth ground system. An internal transformer shall convert to 24-Volt AC for direct-burial valve wire in the field. Electrical Trade Contractor shall provide power and conduit for irrigation from inside of the building to the landscape for the irrigation contractor to begin work.
g. It is presumed that downstream of all plumbing equipment such as the backflow preventer, meter, and various valves, a dynamic pressure of 60 pounds per square inch (psi) at 30 gallons per minute (gpm) flow rate can be achieved. If pressure is too low, a booster pump will be required to sufficiently irrigate the athletic fields. The booster pump will require a separate power supply and coordination for space (indoors or outdoors, in enclosure).
h. Booster pump station power at this point is to be determined but currently our assumptions are for a 3-Phase (Voltage to be determined), 2-horsepower booster pump to adequately increase pressure for athletic field irrigation.

END OF SECTION

SECTION DC G

SITEWORK CRITERIA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Site work comprises the following elements:

1. Site Clearing: Furnish all labor, materials, and equipment required and perform all site preparation, complete as indicated and as specified herein. Unless otherwise indicated, the areas to be cleared, grubbed and stripped shall consist of the entire Worksite, with the exception of those areas specifically designated to remain in an undisturbed, natural condition.
2. Earth Moving: Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, fill and grading required to complete the Work as indicated on the Contract Drawings and as specified herein. The Work shall include excavation for drain manholes, drain pipes, and paving; all backfilling, compaction and fill; embankment and grading; disposal of waste and surplus materials; temporary support of excavation, excavation dewatering and surface water control during excavation. All materials not re-used on-site shall be disposed of by the General Contractor. Materials required in the Work which are not available from on-site excavated materials shall be imported from approved off-site sources.
3. Erosion and Sedimentation Controls: Erosion and sedimentation control shall be provided as shown on the attached Contract Drawings with materials and procedures as specified herein. If the General Contractor varies construction activities from those shown on the contract drawings, the General Contractor must, at no additional cost to the Owner, prepare and implement an Erosion and Sedimentation Control Plan (hereinafter called The Plan) to prevent storm water, soil erosion and air pollution due to project construction activities. The Plan shall implement erosion and sedimentation control prevention and treatment procedures such that stormwater runoff discharged from the site shall meet the following general requirements:
    a. All work shall be performed in accordance with the erosion control measures shown on The Plan.
    b. Best management practices (BMPs) shall be used to address storm water pollution prevention in accordance with MADEP Stormwater Management Guidelines and EPA NPDES Regulations.
    c. The Plan shall be implemented and installed prior to commencement of earthwork activities.
    d. The EPA NPDES Stormwater Pollution Prevention Plan Shall be kept on-site at all times and review / project inspections shall take place as specified therein.
4. Asphalt Pavement: Furnish labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
    a. Hot-mix asphalt pavement at all excavations made in any existing pavement.
    b. Pavement-marking paint.
5. Curbs: Furnish all labor, materials, equipment, and supervision to construct the various types of granite curbing, in accordance with the Drawings and Specifications.
6. Water Utilities: Furnish all labor, tools, equipment and materials and perform all operations necessary to install buried ductile iron pipe, valves, fittings, polyethylene services, and appurtenances as shown on the drawings and as specified herein. All materials are to conform to the requirements of the Town of Wilmington Water Department.
7. Sanitary Sewerage Utilities: Furnish all labor, materials, equipment and incidentals required to install and test polyvinyl chloride (PVC) sewer pipe, fittings and appurtenances as indicated and as specified herein.

8. Precast Concrete Drainage and Sanitary Sewerage Structures: Furnish all labor, materials, equipment and incidentals required to install and test precast concrete manholes, catch basins, stormwater pretreatment separator, frames and covers, frames and grates, and appurtenances as indicated on the drawings and as specified herein.
9. Storm Drainage Utilities: Furnish all labor, materials, equipment and incidentals required to install high density polyethylene pipe, fittings and appurtenances as indicated and as specified herein.

PART 2 PRODUCTS

2.01 G1010 – CLEARING AND GRUBBING

A. Clearing

1. Cut and remove all roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground in the area of construction, as indicated on the Contract Drawings as the Limit of Work.

B. Grubbing

1. Grub and remove all stumps, roots in excess of 1 1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble and other debris encountered to a depth of 30 inches below original grade or 18 inches beneath the bottom of excavations, whichever is deeper.

C. Stripping

1. Strip topsoil and subsoil from all areas to be excavated as detailed on the contract drawings. Topsoil shall be free from brush, trash, stones larger than 2 inches in diameter and other extraneous material. Avoid mixing topsoil with subsoil. Stockpile and protect topsoil in area.

D. Disposal

1. General Contractor shall dispose of rubbish and debris from site preparation operations by hauling such materials and debris to an approved offsite disposal area. No rubbish or debris of any kind shall be buried on the site.

E. Protection

1. Trees and other vegetation not indicated to be removed in the contract drawings shall remain and shall be protected from damage by all construction operations. Provide protection to prevent damage to surrounding trees, not within the limit of work or specified to be removed, from the felling operations. Clearing operations shall be conducted in a manner so as to provide for the safety of employees and others.

2.02 G1010.1 – EROSION AND SEDIMENTATION CONTROLS

A. In order to minimize erosion, the natural vegetation of the area shall be preserved at locations adjacent to and outside the limits of work as indicated on the Contract Drawings. All earthwork, grading, moving of equipment and other operations likely to cause disturbed soil conditions and erosion and siltation and tracking of sediments, shall be planned and performed in a sequence as to avoid sedimentation and erosion of disturbed soil.

B. Furnish all labor, materials, equipment and incidentals required to perform installation, maintenance, temporary pumping, removal and area cleanup related to erosion and sedimentation control work as indicated and as specified herein.

C. Crushed Stone

1. For temporary access ways, staging areas, stone filter boxes, stone filter berms, setting bed for riprap, and sediment filtration devices, crushed stone shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, M2.01.3.

D. Geosynthetic Materials

1. Drainage Fabric, Silt Fence, Filter Fabric and Filter Cloth shall be Mirafi Envirofence; American Excelsior “Siltstop” fence or DGIP series siltfence, or approved equal.
2. Erosion control blanket shall be constructed of a porous, biodegradable geotextile matting specifically manufactured to retain soil moisture, to hold soil temperatures and to generally

stabilize soils where stormwater flows in channels, swales or on recently planted slopes such as Mirafi 100X; Curlex Excelsior, North American Green Bionet 575BN, or approved equal. Erosion control blanket shall be installed to protect soil and seedlings where specified. The erosion control fabric shall be 'stapled' to the surface which it is installed in accordance with the recommendation of the selected manufacturer. All materials used in the construction of and installation of the fabric must be biodegradable and require no maintenance by the Owner.

E. Sediment Fence:

1. Wooden stakes shall be 4-ft in length, 2 in by 2 in oak.
2. Sediment fence fabric shall be a woven, polypropylene, ultraviolet resistant, selected to provide a barrier to prevent the transport of sediment laden water with fines and debris, yet provide the passage of water.
3. Prefabricated commercial sediment fence may be substituted for built in field fence.
4. 1/4-in woven wire mesh shall be galvanized steel or hardware cloth.
5. Temporary mulch:
   a. Wood chip mulch or bark chip mulch: Chipped material shall have a uniform consistency and be free of rock and soil. Material shall be stockpiled on the site in approved areas at the direction of the Owner.
   b. Straw mulch shall be comprised of threshed straw of oats, wheat, barley, or rye that is free from noxious weeds, mold or other objectionable material. The straw mulch shall contain a minimum of 50 percent by weight of material to be 10 in or longer. Straw shall be in an air dry condition and suitable for placement with blower equipment.
6. Hay bales shall be bales made of straw of oats, wheat, barley, rye or natural hay and shall be utilized to control sediment runoff during construction activities. Each bale shall be either wire-bound or string tied. Bales shall be placed with bindings oriented around the bale rather than over and under. Furnish oak wood stakes 2-in by 2-in by 4-ft long or 1/2-in by 4-ft long rebar as indicated.
7. Tackifier for use on straw mulch areas shall be a latex acrylic copolymer emulsion specifically manufactured for use as a tackifier. Asphalt tackifier shall not be used.
8. Temporary seeding for erosion control
9. Dust Control
10. Cloth Filters: Cloth filters at catch basins shall be The Dandy Bag as manufactured by Dandy Products, Inc. or equal; Siltsack as manufactured by Jennian Enterprises; Drainpac as manufactured by Drainworks.

2.03 G1070 – EARTH MOVING

A. Structural Fill

1. Structural Fill shall be gravel, sandy gravel, or gravelly sand free of organic material, wood, trash, snow, ice, frozen soil and other materials which may be compressible or which cannot be compacted as specified herein and shall be graded within the following limits:

Sieve Size	Percent Finer by Weight
4 in	100 percent
No. 4	30 to 90 percent
No. 40	10 to 50 percent
No. 200	0 to eight percent

B. Controlled Density Fill

1. Controlled Density Fill shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M4.08.0.

C. Common Fill

1. Common Fill shall consist of mineral soil free from organic materials, topsoil, wood, trash and other objectionable materials which may be compressible or which cannot be properly compacted. Common Fill shall not contain stones that are greater than 2/3 the lift thickness of common fill being placed. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice and frozen soil will not be permitted. Soil excavated as part of the Work which meets the above requirements in this paragraph, as shown by a certified sieve analysis may be used in the Work.

D. Select Common Fill

1. Select Common Fill shall be as specified above for Common Fill, except that the material shall contain no stones larger than 2-in in diameter. Soil excavated as part of the Work which meets the requirements of this paragraph, as shown by a properly executed and certified sieve analysis may be used in the Work.

E. Riprap

1. Riprap shall be sound, durable rock which is angular in shape. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from over-burden, spoil, shale and organic material, and meet the following Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended:

   a. Type 1: M2.02.2 (Dumped Riprap)

   b. Type 2: M2.02.4 (Modified Rockfill)

   c. Type 3: M2.06.0 (Slope Paving)

F. Crushed Stone

1. Crushed stone for temporary access ways, construction entrances, walkways, setting bed for riprap, and sediment filtration devices shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M2.01.3.

2. Dense-graded crushed stone for subbase material in project pavement sections shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M2.01.7.

G. Screened Gravel

1. Screened gravel shall be used for drainage pipe and drainage structures bedding as indicated or if standing water is observed in the pipe trench prior to installation and at other locations as specified on the Contract Drawings.

2. Screened gravel shall consist of hard, durable, rounded or subangular particles of proper size and gradation and shall be free from sand, loam, clay, excess fines and deleterious materials. The gravel shall be graded within the following limits:

Sieve Size	Percent Finer by Weight
3-in	100 percent
No. 4	40 to 75 percent
No. 50	8 to 28 percent
No. 200	0 to ten percent

H. Sand

1. Sand shall conform to ASTM C33 for fine aggregate.

2.04 G2010 – ROADWAY PAVEMENT

A. Hot-mix Asphalt Pavement Bituminous Concrete Paving shall be Class I, as specified in Sections 460 and M3.11.0 of the reference standard indicated in Paragraph 1.04 of this Specification.

B. Asphalt Tack coat shall consist of either emulsified asphalt, Grade RS 1 conforming to Section M3.03.0, or cutback asphalt, Grade RC 70 or RC 250 conforming to Section M3.02.0 of the reference standard indicated in Paragraph 1.04 of this Specification.

C. Pavement-Marking Paint: Acrylic/latex type, low VOC, traffic marking paint.

2.05 G2013 – CURBS

A. Granite curb: Granite curb required to complete the work of this Section shall be a structural granite conforming to ASTM C 615, Class I Engineering Grade, suitable for curbstone use.

1. Curb shall be light grey, free from seams which impair structural integrity, and with percentage of wear less than 32 percent, as determined by ASTM C 131.
2. Curb materials shall conform to MHD Specifications Section M9.04.0 and shall meet requirements specified in the subsection of Division III, Materials of the MHD Specifications.
3. Provide split vertical face and sawn top for all curb sizes. Provide thermal finish on exposed pavement/paver side only.

B. Precast Concrete Curb: Provide precast concrete curbs with a minimum compression strength of 5,000 pounds per square inch. Castings shall have plane smooth surfaces, true to line and face, free from defects, sharp arises, and with curved surfaces accurately reproduced. Overall dimensions for each casting shall not vary more than 1/16 inch from those indicated.

1. Curb units shall be cast at the manufacturers plant. Job site castings will not be permitted.
2. Curbing to be set on a radius of 100 feet or less shall be cast to the curve required. Ends shall be formed or sawed on radial lines.
3. Curb Foundation: One part of Portland cement to six parts No. 1A coarse aggregate dry mix.

2.06 G2020 – PARKING LOT PAVEMENT

A. Hot-mix Asphalt Pavement Bituminous Concrete Paving shall be Class I, as specified in Sections 460 and M3.11.0 of the reference standard indicated in Paragraph 1.04 of this Specification.

B. Asphalt Tack coat shall consist of either emulsified asphalt, Grade RS 1 conforming to Section M3.03.0, or cutback asphalt, Grade RC 70 or RC 250 conforming to Section M3.02.0 of the reference standard indicated in Paragraph 1.04 of this Specification.

C. Pavement-Marking Paint: Acrylic/latex type, low VOC, traffic marking paint.

2.07 G3010 – WATER UTILITIES

A. Ductile Iron Pipe

1. All ductile iron pipe shall conform to AWWA C151, Class 52.
2. All ductile iron pipe shall have a bituminous outside coating in accordance with AWWA C151.
3. All ductile iron pipe shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

B. Ductile Iron Fittings

1. Ductile iron fittings shall conform to AWWA C110 or C153, Class 350.
2. All ductile iron fittings shall have a bituminous outside coating in accordance with AWWA C110.
3. All ductile iron fittings shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

C. Joints

1. Joints for pipe and fittings shall be restrained push-on or restrained mechanical joints conforming to AWWA C111. Gaskets shall be of SBR. Un-restrained joints may not be used.
2. Joints shall be suitable for 250 psi working pressure and be fabricated of heavy section ductile iron casting.

3. Bolts and nuts shall be low carbon and conforming to ASTM A307, Grade B.

D. Solid Sleeves
   1. Solid sleeves shall be long body type, ductile iron with mechanical joints and retainer glands shall be of the solid type, long laying length.
   2. Solid sleeves shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

E. Flexible Couplings: Flexible Couplings shall be cast iron with rubber gaskets.

F. Retainer Glands: Retainer glands shall be Ebba Iron Sales Inc. – Mega Lug or Ford Co. – 1400 Series.

G. Valves: Valves shall be resilient seated gate valves for buried service, and be manufactured in accordance with AWWA C509. Valves shall be provided with a minimum of two O-ring stem seals. Valves shall be epoxy coated, 8mm thick, interior and exterior.

H. Valve Boxes and Covers: Valve Boxes and covers shall be cast iron, tar coated, two-piece adjustable sliding type which include cast iron covers.

I. Water Services
   1. Corporation Cocks shall be ball valves, open left, with compression fittings.
   2. Curb Stops shall be ball valves, open left, with compression fittings.
   3. Curb stops shall have service boxes which shall be tar coated, cast iron, sliding type with inlaid covers. Shaft shall be 2 ½ inches diameter with extension rods.
   4. Service pipes shall be high density polyethylene copper tube size for use with compression fittings. The pipe shall be polyethylene #4508, SDR-9 rates for 200 psi.
   5. Compression fittings shall be used for joining polyethylene tubing.
   6. Coupling shall be straight coupling, three part, both ends pack joints for polyethylene pipe with a split locking clamp with stainless steel screw.
   7. Cut and remove all roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground in the area of construction, as indicated on the Contract Drawings as the limit of work.

J. Hydrants
   1. Break flange type, (AWWA C502, latest revision), designed for 250 psi working pressure, steamer connection 4 inch, 2-2¼ inch side hose connections, national standard threads, positive drain, open left with pentagon operating nut, inlet 6 inches, 7 inch diameter barrel and mechanical joint hub. Hydrants shall be restrained back to main, thrust block behind, 3/4 inch stone from bottom of hydrant boot to 8 inches over drain port, and 5-1/4 inch valve opening. All hydrants shall be set with steamer facing the street or parking lots with a minimum of 15 inches from finish grade to bottom of steamer connection. All hydrants shall be painted per local municipality Water Department requirements.

2.08 G3020 – SANITARY SEWERAGE UTILITIES

A. Polyvinyl Chloride (PVC) Gravity Pipe and Fittings
   1. PVC solid wall gravity pipe and fittings shall be Type PSM, PVC SDR 35 and conform to ASTM D3034.
   2. Pipe shall be furnished in standard laying lengths in accordance with ASTM D3034 and fittings shall be furnished in lengths of not more than 3 feet.
   3. PVC pipe and fittings shall have bell and spigot push-on ends. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly.

B. Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

1. PVC pressure pipe shall be SDR 21 PVC with rubber ring joints and shall conform to ASTM D2241, ASTM D1784, and ASTM F477.
2. PVC pipe and fittings shall have bell and spigot push-on ends. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly.
3. Restrained joints, where required, will be restraining glands. Restraining glands shall be EBAA Iron Series 2000 PV or Series 1500 by Uni-Flange or equal.
4. PVC perforated pressure pipe shall be Schedule 40 PVC with all solvent welds.

C. Testing
1. All PVC pipe shall be field tested. Supply all labor, equipment, material, gauges, pumps, meter, and incidentals required for testing.
2. Gravity pipe shall be visibly inspected for leakage.
3. Pressure test each pressure pipe upon completion of the pipe laying and backfilling operations.

D. Cleaning: Prior to final completion of the Work, thoroughly clean all the new pipelines and remove all dirt, stones, pieces of wood or other materials.

2.09 G3030 – STORM DRAINAGE UTILITIES

A. High Density Polyethylene (HDPE) Pipe
1. High Density Polyethylene (HDPE) Pipe resins shall be high molecular weight, high density polyethylene with a cell classification number of 345434C in accordance with ASTM D3350.
2. All polyethylene pipe shall meet the requirements of ASTM F714.
3. Pipe shall be furnished in standard laying lengths not exceeding 25-ft.
4. All high density polyethylene pipe and fittings shall be made from the same resin.

B. Pipe Identification: The following shall be continuously indent printed on the pipe and spaced at intervals not exceeding 5-ft.:
1. Name and/or trademark of the pipe manufacturer.
2. Nominal pipe size.
3. Dimension ratio.
4. The letters PE followed by the polyethylene grade in accordance with ASTM D1248, followed by the hydrostatic design basis in 100's of psi, e.g., PE 3408.
5. Manufacturing standard reference, e.g., ASTM F714.
6. A production code from which the date and place of manufacture can be determined.

C. Testing
1. All HDPE pipe shall be field tested. Supply all labor, equipment, material, gauges, pumps, meter, and incidentals required for testing. Pressure test each pipe upon completion of the pipe laying and backfilling operations.

D. Cleaning: Prior to final completion of the Work, thoroughly clean all the new pipelines and remove all dirt, stones, pieces of wood or other materials.

2.10 G3030.4 – PRECAST CONCRETE DRAINAGE AND SANITARY SEWERAGE STRUCTURES

A. General
1. Cement shall conform to ASTM C150, Type II cement or equal unless otherwise stated.
2. Provide lifting lugs or holes in each precast section for proper handling.
3. Like items of material/equipment shall be end products of one manufacturer.
4. Precast sections shall be properly cured prior to shipping.

B. Precast Concrete Manhole Sections and Catch Basins: Precast concrete base sections, riser sections, transition top sections, flat slap tops and grade rings shall conform to ASTM C478 and meet the following requirements:
   1. Design precast concrete base and flat slab for their own weight, weight of soil, and a live load equal to AASHTO H-20 truck loading applied at finish grade.
   2. Bottom slab thickness shall equal the riser wall thickness or flat slab thickness, whichever is greater.
   3. Construct precast concrete base as shown on the drawings.
   4. Base, riser, and transition top sections shall have tongue and groove joints.
   5. Top section shall be eccentric cone where cover over pipe exceeds 4-feet and as shown on the Drawings. Top section shall be flat slab where cover over pipe is 4-feet or less.
   6. Provide integrally cast knock out panels in precast concrete manhole sections at locations, and with sizes shown on the drawings. Knock out panels shall have no steel reinforcing.

C. Stormwater Pretreatment Separator
   1. Design Criteria: Performance objective of 80 percent TSS to recharge system at design flow.
   2. The stormwater pretreatment separator shall be capable of containing spills of floatable substances such as oil and gasoline.
   3. The manhole risers and frames and covers for the stormwater pretreatment separator shall be provided by the manufacturer.
   4. Design precast concrete base and flat slab for their own weight, weight of soil, and a live load equal to AASHTO H-20 truck loading applied at finish grade.
   5. The particle separator shall be easy to maintain.

D. Brick Masonry
   1. Bricks for channels and shelves shall conform to ASTM C32, grade SS.
   2. Brick for raising frames to finished grade shall conform to ASTM C62.
   3. Mortar shall be composed of one part Portland cement, two parts sand, and hydrated lime not to exceed ten-pounds to each bag of cements. Portland cement shall be ASTM C150, Type II; hydrated lime shall conform to ASTM C207.
   4. Sand shall be washed, cleaned, screened, well graded with all particles passing a No. 4 sieve and conform to ASTN C33.
   5. Frames and Covers and Frames and Grates:
   6. Frames and covers and frames and grates shall be cast iron. Cast iron shall conform to ASTM A48, Class 30.
   7. Frames and covers shall have a 24-inch diameter clear opening unless otherwise indicated on the drawings.
   8. Frames and grate shall have a 24-inch square clear opening unless otherwise indicated on the drawings.

E. Jointing Precast Concrete Sections
   1. Seal tongue and groove joints of precast sections with either rubber O-ring gasket or preformed flexible joint sealant.
   2. Completed joint shall withstand 15 psi internal water pressure without leakage or displacement of gasket or sealant.

F. Pipe Connections: Connect pipe to precast concrete structures using the following methods:
   1. Flexible sleeve- integrally cast sleeve in precast section or install sleeve in a formed or cored opening.
   2. Compression gasket – integrally cast compression gasket in precast concrete section.
   3. At the discretion of the Engineer, grout in place using non-shrink and waterproof mortar.

G. Manhole Rungs: Manhole rungs shall be steel reinforced, copolymer polypropylene, 14-inch wide, M.A. Industries Inc. Type PS2-PF-SL, or equal.

H. Damp proofing: Sanitary precast structures shall have two coats of bituminous waterproofing applied to the exterior surfaces by brush or spray and in accordance with the manufacturer's recommendations. Damp proofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A. C. Horn Inc., RIW Marine Liquid by Toch Brothers or equal.

END OF SECTION

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Wilmington Elementary School.

B. Owner's Name: Town of Wilmington - Wilmington Public Schools.

C. Architect's Name: Dore & Whittier Architects Inc.

D. The project consists of the construction of a new elementary school including educational spaces, assembly spaces including a Library, Gymnasium, Cafeteria, and related support spaces.

1. Project area: 165,125 square feet.
2. Preliminary opinion of probable construction cost: $187,000,000.

1.02 CONTRACT DESCRIPTION

A. Contract type: Construction Management contract with Trade Contract sub-bids as defined by Massachusetts General Law Chapter 149A.

1.03 PREVAILING WAGES

A. Pursuant to M.G.L. c.149, s.26-27H, Massachusetts prevailing wages are applicable to this project and shall be paid to all contractors' field labor. See requirements in General Conditions.

1.04 WORKFORCE DIVERSITY REQUIREMENTS

A. See Section 00 21 13.02 - Workforce Diversity for project's diversity requirements, including: definition; goals for minority and women workforce participation; liaison committee; reports and records; access to work site; solicitations for subcontracts, and for the procurement of materials and equipment; sanctions; severability; Construction Manager's certification, and subcontractor requirements.

1. All Trade Contractors and non-trade-bid subcontractors shall implement a program to meet these workforce diversity goals for their scope of work. Within four weeks of award, Construction Managers shall develop and submit a workforce diversity plan that outlines the Construction Manager’s program and specific plan of action for achieving the goals. This program shall include a commitment of effort, resources and intentions to achieve the goals.
2. Recruitment efforts: If any Construction Manager, Trade Contractor, or non-trade-bid subcontractor cannot meet the goals due to lack of appropriate employees, said contractor shall be required to diligently exercise each of the following procedures:
    a. Newspaper advertisement.
    b. Assistance from local hiring agency.
    c. Union hall contact / response.
    d. Radio ad notices.
    e. Documentable recruitment efforts.
3. In the event that the work is progressing, and the goals are not being met, any or all of the following may occur, at the discretion of the Owner:
    a. Written notification from Owner to contractor of areas of shortcomings.
    b. Weekly on-site meeting attended by Construction Manager project team and senior management to review plan implementation and areas for improvement.
    c. Withholding payment due to Construction Manager, equal to ten percent of total outstanding payment due.
4. Failure to meet goals may result in sanctions by the Awarding Authority.

5. In the case of blatant disregard of these goals, Construction Manager may be subject to contract termination and associated damages for breach of contract.
6. A reduction of the goals may be allowed, but only after good faith efforts have been demonstrated that the maximum achievable outcome is being realized.

1.05 PRODUCT/ ASSEMBLY/ SYSTEM SUBSTITUTIONS

A. Where the Bid Documents stipulate particular acceptable products, utilization of one of the listed products is encouraged. In accordance with MGL Chapter 30, § 39M, products of other manufacturers not listed in the specifications shall be submitted as substitutions with accompanying comparison to specified product and will be evaluated by the Awarding Authority for equality to the specified product. The submitting contractor shall prepare sufficient data to enable review and comparison of submitted products for conformance to specification requirements, and comparison to listed products in terms of construction, quality, strength, performance, durability, and/or appearance. Allow for 30 days review time for Substitution Requests. The Awarding Authority shall make final determination of acceptance.

1.06 PROPRIETARY PRODUCTS

A. Where the Bid Documents stipulate a particular product with a designation as a "Proprietary Product" the Awarding Authority has undertaken a reasonable investigation of the specified product and competing products, if any, and determined that, for sound reasons in the public interest, the product has been voted as proprietary by the Awarding Authority. In accordance with MGL Chapter 30, §39M, the Awarding Authority will consider products of other manufacturers for equality to the specified product under the criteria defined in the statute. The submitting contractor shall submit a Substitution Request Form per the paragraph above and Section 01 25 00 - Substitution Procedures and 01 25 01 - Substitution Request Form, with sufficient data and supporting literature to enable review and comparison of submitted products for conformance with statutory requirements, and allowing the Awarding Authority to evaluate if the proposed substitution:
   1. Is at least equal in quality, durability, appearance, strength, and design.
   2. Will perform at least equally the function imposed by the general design for the public work being contracted or material being purchased.
   3. Conforms substantially, even with deviations, to the detailed requirements for the item specified as proprietary.
B. The Awarding Authority will make final determination of acceptance.
C. Proprietary products include the following, inclusive of accessories, sealants, and other items required per manufacturer to meet terms of warranties and for a complete installation:
   1. Section 07 21 00 - Thermal Insulation:
      a. Cellular Glass Insulation: Pittsburgh Corning FOAMglas Perinsul SIB.
   2. Section 08 71 00 - Door Hardware:
      a. Schlage Primus locks, cylinders, and keying.
   3. Section 08 80 00 - Glazing:
      a. School Guard laminated security glazing.
         1) Where School Guard glazing is used, sealant and accessories shall be of types approved by School Guard manufacturer.
   4. Section 09 21 16 - Gypsum Board Assemblies.
      a. Cementitious tile backing board products for wet areas:
         1) PermaBASE Building Products, LLC provided by National Gypsum Company; PermaBase Cement Board.
         2) USG Corporation; Durock Brand Glass-Mat Tile Backerboard.

5. Section 09 51 00 - Acoustical Ceilings:
    a. Direct-attached wood fiber acoustical panels: Armstrong Tectum Panels.
6. Section 09 58 00 - Integrated Ceiling Assemblies:
    a. Armstrong AcoustiBuilt Seamless Acoustical Ceiling System.
7. Section 10 44 00 - Fire Protection Specialties:
    a. Knox; Rapid Entry System.
8. Division 27 - Communications:
    a. Network Switches: Cisco.
    b. Wireless: Meraki.
    c. VOIP Phone: Yealink - Zoom.
    d. Distributed Communication: Bogen Hybrid IP / Analog System.
    e. Classroom Audio Systems: Lightspeed Technologies TopCat.
9. Section 28 10 00 - Electronic Building Security Systems:
    a. Door access control systems, including door hardware, control electronic hardware, and operating system software: TO BE DETERMINED IN A LATER DESIGN PHASE.
    b. Video surveillance equipment, including closed circuit video cameras, control electronic hardware, and operating system software: Axis Communications.
    c. Intrusion Detection:TO BE DETERMINED IN A LATER DESIGN PHASE.

1.07 CORI REQUIREMENTS

A. CORI requirements apply to all contractors working on the site.

1.08 OSHA REQUIREMENTS

A. Pursuant to M.G.L. C. 30, SEC. 39S (A)(2), all employees to be employed on the project site shall have successfully completed a course in construction safety and health approved by OSHA and of at least ten hours in duration.

1.09 CRISIS-RELATED RESPONSE REQUIREMENTS

A. Contractors shall be prepared to comply with crisis-related provisions of federal, state, or local mandates or laws currently enacted or enacted in the future throughout the life of the project, without additional compensation. In addition, crisis-related provisions shall be accommodated by contractors without claim for schedule extensions.

1.10 OWNER OCCUPANCY

A. Owner intends to continue to occupy the existing North Intermediate School building during the construction of the new building. Owner will occupy the new building during demolition of the existing North Intermediate School.
B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
C. Schedule the work to accommodate Owner occupancy.

1.11 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
B. Arrange use of site and premises to allow:
    1. Owner occupancy of adjacent portions of the existing building during the construction period.
C. Provide access to and from site pursuant to requirements of local authorities, fire department and emergency responder agencies, law, and Owner.
D. Emergency Building Exits During Construction: Keep all exits open during construction period; provide temporary access paving as indicated on phasing plans. Review any unanticipated temporary closure of exits or rerouting of egress paths with local authorities to obtain approval prior to closing exits. Provide temporary exit signs when exit routes are altered.
E. Existing building spaces may not be used for storage.

F. Time Restrictions:
   1. Comply with Town of Wilmington ordinances.
G. Utility Outages and Shutdown:
   1. Utility interruptions shall be limited to momentary disconnect-connect switchovers scheduled in advance and approved in advance by Owner. To the extent possible, limit disruption of utility services to hours the building is unoccupied.
      a. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without seven days' notice to Owner and authorities having jurisdiction.
   2. Prevent accidental disruption of utility services to other facilities.

1.12 WORK SEQUENCE

A. Construct work in multiple phases with separate Dates of Substantial Completion.
   1. Phases are generally described as the following: See drawings and project phasing drawings for additional information related to the activities of each phase.
      a. Phase 1: Site enabling and partial site demolition. Sitework and Building Completion.
      b. Phase 2: Demolition of existing building and site. Sitework and Project Completion.

1.13 LIQUIDATED DAMAGES

A. Liquidated damages apply to each project phase, and to the overall completion of the project.
   1. See Section 00 52 00 - Owner-Contractor Agreement Form (A101, Article TO BE DETERMINED IN A LATER DESIGN PHASE) for liquidated damages.

1.14 LEED CERTIFICATION

A. This project is intended to obtain LEED for Schools v4 certification, LEED "Gold" level, as a sustainable project. The Basis of Design products listed in this Specification were selected by the design team to provide the credits described in Section 01 81 13.10 - LEED for Schools Version 4 Project Scorecard.
B. The Construction Manager and subcontractors shall be responsible for evaluating and making product selections for content that would assist in obtaining LEED credits, and to document LEED construction phase credits to the LEED Manager, and to evaluate product selections for potential LEED credits, and to maintain the minimum number of Construction Phase credits required in order to obtain the listed certification level.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

LEEDv4 BD+C: Schools (LEEDv4 SC)
Project Scorecard

Project: Wilmington Wildwood

Date: 3/14/25

The Green Engineer
Sustainable Design Consulting

Y	?	N			
1	0	0	**INTEGRATIVE PROCESS**		**1**
1			IPc1	Integrative Process	1
4	0	11	**LOCATION & TRANSPORTATION**		**15**
		N	LTc1	LEED for Neighborhood Development Location	15
1			LTc2	Sensitive Land Protection	1
1		1	LTc3	High Priority Site	1-2
1		4	LTc4	Surrounding Density and Diverse Uses	1-5
		4	LTc5	Access to Quality Transit	1-4
		1	LTc6	Bicycle Facilities	1
		1	LTc7	Reduced Parking Footprint	1
1			LTc8	Green Vehicles	1
8	3	1	**SUSTAINABLE SITES**		**12**
Y			SSpr1	Construction Activity Pollution Prevention	Required
Y			SSpr2	Environmental Site Assessment	Required
1			SSc1	Site Assessment	1
2			SSc2	Site Development - Protect or Restore Habitat	1-2
1			SSc3	Open Space	1
2	1		SSc4	Rainwater Management	2-3
	2		SSc5	Heat Island Reduction	1-2
1			SSc6	Light Pollution Reduction	1
		1	SSc7	Site Master Plan	1
1			SSc8	Joint Use of Facilities	1
8	2	2	**WATER EFFICIENCY**		**12**
Y			WEpr1	Outdoor Water Use Reduction	Required
Y			WEpr2	Indoor Water Use Reduction	Required
Y			WEpr3	Building-Level Water Metering	Required
2			WEc1	Outdoor Water Use Reduction	1-2
3	2	2	WEc2	Indoor Water Use Reduction	1-7
2			WEc3	Cooling Tower Water Use	2
1			WEc4	Water Metering	1
23	8	0	**ENERGY & ATMOSPHERE**		**31**
Y			EApr1	Fundamental Commissioning and Verification	Required
Y			EApr2	Minimum Energy Performance	Required
Y			EApr3	Building-Level Energy Metering	Required
Y			EApr4	Fundamental Refrigerant Management	Required
6			EAc1	Enhanced Commissioning	2-6
16			EAc2	Optimize Energy Performance	1-16
1			EAc3	Advanced Energy Metering	1
	2		EAc4	Demand Response	1-2
	5		EAc5	Renewable Energy	1-5
	1		EAc6	Enhanced Refrigerant Management	1

Y	?	N			
3	5	5	**MATERIALS & RESOURCES**		**13**
Y			MRpr1	Storage and Collection of Recyclables	Required
Y			MRpr2	Construction and Demolition Waste Management Planning	Required
	1	4	MRc1	Building Life-Cycle Impact Reduction	2-5
1	1		MRc2	Building Product Disclosure and Optimization - EPD	1-2
	1	1	MRc3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	1-2
1	1		MRc4	Building Product Disclosure and Optimization - Material Ingredients	1-2
1	1		MRc5	Construction and Demolition Waste Management	1-2
9	7	0	**INDOOR ENVIRONMENTAL QUALITY**		**16**
Y			IEQpr1	Minimum Indoor Air Quality Performance	Required
Y			IEQpr2	Environmental Tobacco Smoke Control	Required
Y			IEQpr3	Minimum Acoustic Performance	Required
2			IEQc1	Enhanced Indoor Air Quality Strategies	2
3			IEQc2	Low-Emitting Materials	3
1			IEQc3	Construction Indoor Air Quality Management Plan	1
1	1		IEQc4	IAQ Assessment	2
1			IEQc5	Thermal Comfort	1
1	1		IEQc6	Interior Lighting	2
	3		IEQc7	Daylight	3
	1		IEQc8	Quality Views	1
	1		IEQc9	Acoustic Performance	1
6	0	0	**INNOVATION**		**6**
1			INc1.1	Innovation: O+M - Green Cleaning + IPM	1
1			INc1.2	Innovation: Local Food Production	1
1			INc1.3	Innovation: Purchasing - Lamps	1
1			INc1.4	Exemplary Performance Credit: Optimize Process Water Use (100% reduction)	1
1			INc1.5	Pilot Credit: Integrative Analysis of Building Materials	1
1			INc2	LEED Accredited Professional	1
2	2	0	**REGIONAL PRIORITY** (underlined)		**4**
	1		RPc1	Regional: Renewable Energy (2 pts)	1
	1		RPc2	Regional: Building Lifecycle Impact Reduction (2 pts)	1
1			RPc3	Regional: Protect or Restore Habitat (2 pts)	1
1			RPc4	Regional: Optimize Energy Performance (8 pts)	1

64	27	19	**PROJECT TOTALS (Certification Estimates)**	**110**

Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

WILMINGTON ELEMENTARY SCHOOL

D&W PROJECT # 23-0847

320 SALEM STREET
WILMINGTON, MA 01887

DORE + WHITTIER

OWNER

TOWN OF WILMINGTON
WILMINGTON PUBLIC SCHOOLS
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WILMINGTON, MA 01887
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OWNER'S PROJECT MANAGER

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212 BATTERY STREET
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TRAFFIC + SITE SURVEY CONSULTANT

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CIVIL + SITE CONSULTANT

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LANDSCAPE CONSULTANT

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HVAC + ELECTRICAL CONSULTANT

GGD CONSULTING ENGINEERS, INC.
375 FAUNCE CORNER ROAD, SUITE D
DARTMOUTH, MA 02747
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PLUMBING + FIRE PROT. CONSULTANT

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510 COTTAGE STREET
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F: 413.734.1881

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ANDOVER, MA 01810
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FOODSERVICE CONSULTANT

CRABTREE MCGRATH ASSOCIATES, INC.
161 WEST MAIN STREET
GEORGETOWN, MA 01833
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GEOTECHNICAL CONSULTANT

LAHLAF GEOTECHNICAL CONSULTING, INC.
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BILLERICA, MA 01862
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SUSTAINABLE DESIGN CONSULTANT

THE GREEN ENGINEER
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CONCORD, MA 01742
P: 978.369.8978

ACOUSTICAL CONSULTANT

ACENTECH
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CAMBRIDGE, MA 02138
P: 617.499.8000

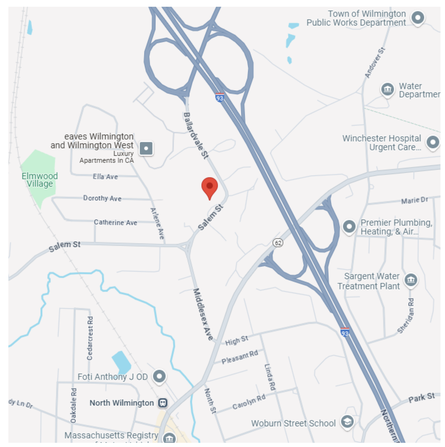
COST ESTIMATING

PM&C COST ESTIMATING
20 DOWNER AVE SUITE 5
HINGHAM, MA 02043
P: 781.740.8007

SHEET NUMBER	SHEET NAME
GENERAL	
G0.00	COVER SHEET
GC1.00	CODE SUMMARY
SURVEY	
EX-1.0	EXISTING CONDITIONS PLAN
EX-1.1	EXISTING CONDITIONS PLAN
CIVIL	
C2.00	LAYOUT AND MATERIALS PLAN
C3.00	GRADING AND DRAINAGE PLAN
C4.00	UTILITIES PLAN
LANDSCAPE	
L1.01	LANDSCAPE SITE PLAN

SHEET NUMBER	SHEET NAME
ARCHITECTURAL	
AG0.01	ABBREVIATIONS SYMBOLS MATERIALS AND LEGEND
AG0.02	WALL TYPES, NOTES AND DETAILS
A1.10	LEVEL 1 OVERALL PLAN
A1.11	LEVEL 1 - AREA A
A1.12	LEVEL 1 - AREA B
A1.13	LEVEL 1 - AREA C
A1.20	LEVEL 2 OVERALL PLAN
A1.21	LEVEL 2 - AREA A
A1.22	LEVEL 2 - AREA B
A1.23	LEVEL 2 - AREA C
A1.30	LEVEL 3 OVERALL PLAN
A1.31	LEVEL 3 - AREA A
A1.32	LEVEL 3 - AREA B
A1.33	LEVEL 3 - AREA C
A3.10	OVERALL ROOF PLAN
A3.11	ROOF PLAN - AREA A
A3.12	ROOF PLAN - AREA B
A3.13	ROOF PLAN - UPPER AREA C
A3.14	ROOF PLAN - LOWER AREA C
A4.10	OVERALL EXTERIOR ELEVATIONS
A4.11	EXTERIOR ELEVATIONS
A4.12	EXTERIOR ELEVATIONS
A4.13	EXTERIOR ELEVATIONS
A4.14	EXTERIOR ELEVATIONS
AQ1.11	LEVEL 1 EQUIPMENT PLANS - AREA A
AQ1.12	LEVEL 1 EQUIPMENT PLANS - AREA B
AQ1.13	LEVEL 1 EQUIPMENT PLANS - AREA C
AQ1.21	LEVEL 2 EQUIPMENT PLANS - AREA A
AQ1.22	LEVEL 2 EQUIPMENT PLANS - AREA B
AQ1.23	LEVEL 2 EQUIPMENT PLANS - AREA C
AQ1.31	LEVEL 3 EQUIPMENT PLANS - AREA A
AQ1.32	LEVEL 3 EQUIPMENT PLANS - AREA B
AQ1.33	LEVEL 3 EQUIPMENT PLANS - AREA C
AQ1.50	CASEWORK PLANS AND ELEVATIONS
AQ1.51	CASEWORK PLANS AND ELEVATIONS

LOCATION MAP



SCHEMATIC DESIGN

04/24/2025

Project Summary & Applicable Codes

The Wilmington Elementary School (the Project) includes construction of a new elementary school serving grades Pre-Kindergarten through grade 5. This summary is intended to convey compliance of the completed school building project with the 10th Edition of the Massachusetts State Building Code (CMR 780) which is anticipated to be effective when the project is eligible for construction permitting.

Applicable Codes:

1. Massachusetts State Building Code (780 CMR), 10th Edition (2021 IBC with amendments)
2. Uniform Sate Plumbing Code (248 CMR 10.00)
3. Massachusetts Architectural Access Board (MAAB) Regulations (521 CMR)
4. 2010 Americans with Disabilities Act Standards for Accessible Design (where more stringent than MAAB)
5. Massachusetts Base Energy Code (780 CMR, Chapter 13), 10th Edition (2021 IECC with amendments)
6. Massachusetts Fire Code (537 CMR 1.00) 2021 NFPA 1 with MA Amendments
7. Massachusetts Electrical Code (527 CMR 12.00) 2023 NFPA 70 with MA Amendments
8. Massachusetts Board of Elevator Regulations (524 CMR)

Occupancy Characteristics

The completed project will contain classrooms for grades Pre-K through 5, administrative offices, a cafeteria (including a performance platform) and associated kitchen, a gymnasium, and associated support spaces (mechanical, electrical, and storage spaces).

The occupancy of the complex will be generally classified as Use Group E (Educational) as defined in Section 305 with specific functions and occupancies defined as follows:

Level	Function	Use Group
1	Classrooms	E
	Offices	B (2)
	Gymnasium	E (1)
	Media Center (Library)	E (1)
	Cafeteria & Kitchen	E (1)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)(3)
2	Classrooms	E
	Offices	B(2)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)
3	Classrooms	E
	Offices	B(2)
	Storage	S-2 (2)
	Utility & Miscellaneous	U (2)

Note 1: Assembly areas that are accessory to Group E occupancies are not considered separate occupancies (§303.1.3).
Note 2: Accessory occupancies are not required to be separated from the main occupancy (§508.2.4).
Note 3: Incidental Accessory Occupancies shall be separated from the main occupancy as described in Table 509.

Physical Characteristics

The project is organized into a three-story classroom wing to the west and a one and two-story public spaces building to the east. The classroom wing contains primarily educational spaces while the public wing incorporates large volume assembly spaces, additional educational spaces, and administrative areas.

The total facility area of the project identified in the Code Plan Diagrams is described as follows:

Level	Building Area (SF)
1	76,560
2	42,479
3	41,692
Total:	**160,731**

The building heights from the average grade plane to highest portion of the flat roof can be characterized as follows:

Stories	Building Height (Area)
Three-Story	44 feet (Classrooms)
Two-Story	29 feet (Media Center, Gymnasium

Construction Type, Allowable Height, Allowable Area

Occupancy Separations & Mixed Use

The building is classified as **Type IIA** construction.

Allowable Height

The allowable tabular building height in feet as described in table 504.3 for Type II A, Group E in a building equipped with an automatic sprinkler system is **85 feet.** The maximum roof height, above the average grade is **44 feet,** at the three-story classroom wing.

The allowable tabular building height in stories as described in table 504.4 for Type II A, Group E in a building equipped with an automatic sprinkler system is **4 stories.** The maximum number of stories at the classroom wings is **3 stories.**

Allowable Area

The allowable tabular area in square feet as described in Table 506.2 for Type II B, Group E in a multistory building equipped with an automatic sprinkler system is **79,500 square feet**.

The project includes a fire access road providing 30-plus foot wide access to 100% of the perimeter of the building. The amount of Area Increase determined in accordance with Table 506.3.3 is **0.75.**

The Project is considered Mixed-Occupancy, Multistory building, and the allowable area for each story is determined in accordance with Section 506.2.2. Because the building is less than four stories, each story will comply individually with Section 508.1 for Mixed Use and Occupancy.

Allowable Area (Aa) = [A_1 + (NS x I_1)]
Aa = [79,500 + (26,500 x 0.75)] = **99,375 SF**

Levels 2, 3 includes unseparated accessory occupancies that do not occupy more than 10 percent of the floor area of the story and complies with Section 508.2 for Accessory Occupancies.

Level 1 includes accessory occupancies that do occupy more than 10 percent of the floor area of the story and will comply with with Section 508.4 for Separated Occupancies.

In order to comply with Section 508.4, portions of the B group occupancy (at the Administration Area), U group occupancies, and S-2 occupancies will be separated from the other occupancies in accordance with Table 508.4 as follows:

- Group B occupancies require a 1-hour fire-resistance rated separation with an automatic sprinkler system.
- Group U and S occupancies have no fire-resistance rated separation requirement with automatic sprinkler system.

Allowable areas for each occupancy group have been calculated assuming Single-Occupancy, Multistory Buildings for a three-story Construction Type IIA building in accordance with section 506.2.2. The allowable areas for each occupancy group are as follows:

Allowable Area-Educational (Aae) = [79,500 + (26,500 x 0.75)] = **99,375 SF**

Allowable Area-Business (Aab) = [112,500 + (37,500 x 0.75)] = **140,625 SF**

Allowable Area-Utility (Aau) = [57,000 + (19,000 x 0.75)] = **71,250 SF**

Allowable Area-Storage S-2 (Aas) = [237,000 + (79,000 x 0.75)] = **296,250 SF**

Level 1 - Allowable Building Area Sum of the Ratios Calculation			
Separated Occupancy	**Allowable Building Area**	**Actual Separated Occupancy Area**	**Ratio (Actual:Allowable)**
E	99,375	67,547	0.680
B	140,625	3,590	0.026
U	71,250	3,802	0.053
S	296,250	1,620	0.005
		Sum of the Ratios:	**0.764**

Level 1 complies with Section 508.4 for separated mixed use.

The following Incidental Uses will be provided with the required separation and/or protection in accordance with Table 509:

Incidental Use per Table 509	**Separation and/or Protection**
Electrical rooms containing transformers over 112 1/2 Kva	1 hour separation [1]
Emergency Electrical rooms & closets	2 hour separation [1]

Note 1: Separation based on NEC requirement, included for convenience

Fire Resistance Rating of Building Elements:

Fire resistance rating of building elements for **Type IIA** construction are based on the requirements of Table 601 or by other code provisions as described below. Refer to Means of Egress section of this Summary for rating of egress components.

Primary Structural Elements

1 hour fire-resistance rating

- Fire protection of structural member in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.
- Heavy Timber complying with section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less fire-resistance rating is required.

The Project will utilize Heavy Timber framing in accordance with section 2304.11. Heavy Timber portions will support the roof construction over the Cafeteria.

Bearing Walls

Exterior: **1-hour** fire-resistance rating
Interior: **1-hour** fire-resistance rating

Other Exterior Walls

The building is significantly separated from any other building and therefore exterior walls are not subject to the fire resistive rating requirements based on separation distance in Table 602.

Exterior walls may be required to be rated in close proximity to exit enclosures in accordance with Section 1023.7.

Portions of exterior walls within 4 feet of the intersection with the fire wall between Code Buildings AB and C will be rated for 1-hour in accordance with section 706.5.1.2.

Interior Walls & Partitions

No requirement based on construction type per Table 601. Interior walls and partitions shall be rated based on the specific conditions outlined in the Occupancy Separations and Mixed Use, Building Separations, or Special Use & Occupancy Considerations sections of this Code Summary. Additional interior wall & partition ratings may also be required by other sections of the code and are described elsewhere in this Summary.

Floor Construction and Secondary Members:

1-hour fire-resistance rating

No requirement based on construction type per Table 601. Horizontal assemblies in compliance with Section 711.2 will be required to separate occupancies as outlined in the Occupancy Separations and Mixed Use, Building Separations, or Special Use & Occupancy Considerations sections of this Code Summary.

Roof Construction and Secondary Members:

1 hour fire-resistance rating

- Fire protection of structural member in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.
- Heavy Timber complying with section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less fire-resistance rating is required.

The Project will utilize Heavy Timber framing in accordance with section 2304.11. Heavy Timber portions will support the roof construction over the Cafeteria.

Means of Egress

Occupant Loads will be calculated based on Table 1004.1.2 for Assembly Spaces without fixed seating, by actual seat count for spaces with fixed seating (1004.4), or by the design occupant load where this value exceeds the tabular values in accordance with Section 1004.2. Occupant loads for individual spaces can be found on the Code Plan Diagrams.

For the sake of these calculations, General Classrooms and other instructional spaces intended to contain only loose furniture are calculated as "Classroom area" (20 net square feet per occupant). Art Studios, Music Classrooms, and other vocational or specialty instruction spaces intended to contain large amounts of fixed casework and/or equipment are calculated as "Shops and other vocational areas" (50 net square feet per occupant).

The number of required exits per story (per section 1006.3) and the total egress capacity required and provided are summarized on the Code Plan Diagrams.

Two exits or exit access doorways shall be provided from all spaces with a maximum occupant load larger than 49 per Table 1006.2.1; this requirement is applicable to all general classrooms with a net square footage over 1000 SF unless an alternative means of calculating the occupant load is reviewed and accepted by the Authority Having Jurisdiction.

Kindergarten and Pre-K classrooms will have a maximum occupancy of 49 posted at the door to the classrooms in lieu of the calculation at 20 SF / occupant. As such, the space is not required to have two means of egress, exit signs, or doors with exit devices.

Three exits shall be provided from spaces with an occupant load of 501 to 1,000 occupants, and four exits shall be provided from spaces with an occupant load greater than 1,000 occupants (1006.2.1.1). Exits shall be arranged in accordance with section 1007.1.1.

The maximum length of exit access travel distance shall not exceed 250 feet in accordance with Table 1017.2.

Corridors are not required to be rated per Table 1020.1.

Corridors with a required Educational occupancy of 100 or more shall not be less than 72" wide in accordance with Table 1020.2, or not less than 44" for all other portions of the building.

Dead end corridors shall not be greater than 50' in length (1020.4 Ex. 2)

Interior exit stairways, which provide a protected path of egress travel to the exit discharge, shall be enclosed with fire barriers and / or horizontal assemblies with a rating of not less than 1 hour (1023.2).

Exit access stairways, which serve only two stories, are not required to be enclosed with a rated shaft enclosure (1019.3.1).

Special Occupancy & Use Considerations

Cafeteria with Performance Platform

Total occupant loads for the Cafeteria where calculated assuming concentrated seating segregated into seating "zones". The total occupant load for the Cafeteria is greater than 50 and less than 500, requiring two means of egress per Section 1006.2.

The area identified on the plans as the Platform specifically meets the code definition of a Platform defined in section 202. Portions of section 410 related to stages, proscenium ratings, roof vents, egress from stairs, and rated separations are not applicable to the platform. The construction of the platform will comply with section 410.4.

Gymnasium

The occupant load of the gymnasium has been calculated using a conservative approach that assumes an event such as a town meeting where loose chairs are organized on the gymnasium floor. Refer to the Code Plan for total occupant load. Using this assumption, the total occupancy of the gymnasium and platform exceeds 500 occupants, and three exits are required. All three of these exits pass into corridors.

Media Center

The occupant load for the Media Center has assumed portions of the space containing shelving will be classified as Stacks and the other portions will be classified as Reading Areas in accordance with table 1004.1.2.

Special Egress Considerations:

Stairways:

Exit access stairways connecting only two stories not open to other stories are not required to be enclosed (1019.3, Ex. 1). The exit access stairway from the upper level adjacent to the Media Center that descends to the Cafeteria will not be enclosed.

Where the exterior stair enclosure walls are not rated, the exterior walls that are less than 180 degrees from the unrated exterior wall of a stairway enclosure shall have a fire resistance rating of not less than 1 hour for a distance of 10 feet from the stair enclosure per section 1023.7. Openings within these walls will have a fire protection rating of ¾ hour.

Fire Protection Systems

Sprinkler systems will be provided in accordance with 903.3.2(1)(a). Such systems will be NFPA 13 systems as required by Section 903.3.1.1

Sprinklers will not be provided in the elevator machine room per Section 903.2 Exception 2. Specific areas exempted from fire protection under section 903.3.1.1.1 require the approval of the fire code official.

Alternative fire-extinguishing systems shall be provided for all Type I hoods in commercial kitchens per section 904.2.2.

Because no floor level is more than 30 feet above the lowest level of fire department vehicle access, no Class III standpipes are required due to building height per section 905.3.1. However, a standpipe will be provided in the enclosed stair as directed by the local Fire Department.

Per section 905.4, Class I standpipe hose connections will be provided to improve the firefighting operations in the following locations:

- At floor level landings of enclosed egress stairs.

The new school will be provided with portable fire extinguishers in accordance with Section 906.1. In addition to general portable fire distribution, additional portable fire extinguishers will be provided in the following locations:

- Within 30 feet of commercial cooking equipment.
- In the elevator machine room.
- On each floor of structure *while under construction* (to be provided by the General Contractor).
- Where required by the International Fire Code sections on Table 906.1. (No such areas have been identified in the project).
- Special hazard areas such as Science Classrooms, Tech classrooms, or other locations required by the fire code official. (No such areas have been identified in the project).

Fire alarm and detection systems will be installed in accordance with Section 907. Refer to Fire Alarm drawings for additional information and requirements.

Emergency Power & Lighting

Emergency Power shall be provided by an on-site generator and in accordance with Chapter 27 to provide the illumination levels set forth in Section 1008. Refer to Electrical drawings for additional information related to generator and egress lighting.

Plumbing Fixtures

The required plumbing fixture types and counts have been calculated based on 248 CMR 10.00: Uniform State Plumbing Code, Table 1.

Toilet fixtures, including toilets and lavatories, are provided for Kindergarten and Pre-kindergarten students in dedicated classrooms, as permitted by 248 CMR section 10.10 (15)(c)12.d

Pre-Kindergarten
Classrooms with Unisex / Gender-neutral toilet rooms pet 10.10 (15)(c)12.d

	Students Only	Toilets	Lavs			Jan. Sink	DF
Required Student Fixtures[1]:	**90**	**5**	**9**			**1 per Flr**	
Provided:						YES	
Gen Neut Allocation[4]	1 Tlt fix per Classroom	5	5				
Lavs Provide in Classrooms[10]	2 per Classroom		10				
Total Fixtures Provided:		**5**	**15**			**0**	**0**

Kindergarten
Classrooms with Unisex / Gender-neutral toilet rooms pet 10.10 (15)(c)12.d

	Students Only	Toilets	Lavs			Jan. Sink	DF
Required Student Fixtures[1]:	**144**	**6**	**6**			**1 per Flr**	
Provided:						YES	
Gen Neut Allocation[4]	1 Tlt fix per Classroom	8	8				
Lavs Provide in Classrooms[10]	2 per Classroom		16				
Total Fixtures Provided:		**8**	**24**			**0**	**0**

Educational Occupancy Scenario - Whole Building (Excluding Pre-Kindergarten & Kindergarten)

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav	M Urinal	Jan. Sink	DF
Required Student Fixtures[1]:	**890**	**11**	**18**	**11**	**18**	**up to 50%**	**1 per Flr**	**7**
Provided:							4	7
Group Toilet Rooms		28	20	21	21	7		
Gen Neut Allocation[4]	0 GN	0	0	0	0			
Total Fixtures Provided:		**28**	**20**	**21**	**21**	**7**	**4**	**7**

Required Faculty Fixtures:

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav
Required Faculty Fixtures[1]:	**140**	**4**	**4**	**3**	**4**
Provided:					
Gen Neut Allocation[4]	13 GN = 7F / 6M	7	7	6	6
Total Fixtures Provided:		**7**	**7**	**6**	**6**

Assembly Occupancy Scenario - Code Building B

	Total Occupants	F Toilets	F Lavs	M Toilet	M Lav	M Urinal
Required Fixtures[3]:	**1115**	**16**	**12**	**8**	**12**	**up to 67%**
Provided[5]:						
Group Toilet Rooms		20	14	20	14	6
Gen Neut Allocation[4]	5 GN = 2F / 3M	1	1	1	1	0
Total Fixtures Provided:		**21**	**15**	**21**	**15**	**6**

1. Student Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Schools, Kindergarten, Middle & High School"
2. Faculty Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Schools, Kindergarten, Middle & High School Staff"
3. Student Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Assembly - Indoor Recreational Facilities, Rinks, Swimming Pools, Gymnasiums and Other with Spectator Seating (Patrons & Staff)"
4. Gender Neutral Allocation accounts for how designated single user gender neutral toilet rooms have been allocated to male or female fixture requirements to satisfy minimum fixture requirements of Table1.
5. Only "open to public" gang and single user toilet rooms on Level 1 have been included in the provided fixtures for Assembly use tabulation.
6. Gender Neutral toilet rooms are used to satisfy the minimum fixture requirements using one of the two options provided in 10.10(15)(g) for each occupancy group.
7. Where option (c) 2. is utilized, the balance of required fixutres are provided in gender-designated gang toilet rooms
8. Where option (c) 1. is utilized, all required plumbing fixtures are provided in gender neutural single user toilet rooms
9. Fixture Counts based on 248 CMR 10.10(15) Table 1 for "Public & Private Pre-Schools and Daycare" one single user rest toom is allowed for up to 20 children and staff combined. The district has committed to a Pre-Kindergarten target class size of 15 students per classroom.
10. Per 248 CMR 10.10(15)(b)(12)(d)(ii) for Students younger than six years old, lavatories may be installed in classroom areas.
11. Per 248 CMR 10.10(15)(b)(12)(d)(i) for Students younger than six years old, unisex/gender neutral toilet facilities may be installed.

The minimum fixture counts for students in Special Education classrooms and in Kindergarten through 2nd grade classrooms are provided as unisex/gender-neutral toilet rooms as permitted in section 10:10(15)(g)(2) of 248 CMR. Gang toilet rooms are provided to meet the required fixture counts for students in grades 3 through 5.

Energy Efficiency

Although the Town of Wilmington is not a Strech Code or Opt-In Code community, the new school building will be designed in accordance with the Massachusetts Municipal Opt-In Specialized Code (225 CMR 23.00: 2021 International Energy Code with Massachusetts Amendments, including Appendix CC.)

The Project will seek compliance through the Targeted Performance Compliance requirements of Section C401.2.1(2).

The building envelope will demonstrate compliance with the Component Performance Alternative method for Low Glazed Wall System Buildings described in section C402.1.5.1.

A solar ready zone will be indicated on the drawings in accordance with the requirements of section C402.3 and Appendix CB. The required reserved electrical requirements stipulated in Appendix CB will be provided.

Section C402.5 - Air Leakage Thermal Envelope

A continuous air barrier complying with Section C402.5.1 will be provided for the building envelope.

The air leakage of all fenestrations will be specified in accordance with the limitations described in Table C402.5.3.

Building entrances shall be designed with Vestibules in accordance with Section C402.5.5. Exterior doors exempt from this requirement include:

- The Shipping / Receiving door and Mechanical Room door. (Section 402.5.8, Ex. 2).

Accessibility

The Project will comply with the Massachusetts Architectural Access Board (MAAB) 521 CMR, or the 2010 Americans with Disability Act Standards for Accessible Design where it is more stringent than MAAB.

Because the School Project is new construction, it shall fully comply with CMR 521 (Section 3.2). Spaces accessed only by ladder, crawlspaces, catwalks, or non-passenger elevators are exempt (Section 3.12).

In educational facilities, only administrative areas, instructional spaces, and areas open to students or the general population are required to comply with 521 CMR (Section 12.1.1). Areas with restricted access intended for use only by staff (such as instructor toilets, toilets for kitchen staff, mechanical and other support spaces) are not required to comply with 521 CMR. Such staff-only toilet rooms or spaces will comply with ADA Standards.

Accessible Routes, General Site and Building Elements

An Accessible Route shall be provided from accessible parking, passenger loading sizes, and public streets or sidewalks to the accessible building entrance they serve and shall coincide with the route for the general public (Section 20.2). At least one accessible route shall connect the building with all facilities, elements, and spaces on the site and within the building (Section 20.2.1). The accessible route will comply with the provisions of Section 20.

All spaces required to be accessible will be provided with at least one accessible means of egress in accordance with Section 20.11.1.

Curb cuts complying with Section 21 shall be provided wherever an accessible route crosses a curb (Section 21.2).

Accessible parking spaces shall be provided in accordance with Table 23.2.1. One in every six, but not less than 1 accessible space shall be van accessible in accordance with ADA 208.2.4 (note this requirement is more stringent than MAAB Section 23.2.2). Accessible spaces will be located on the shortest accessible route from the parking to an accessible entrance (Section 23.3.1). Where an accessible space cannot be located within 200 feet of an accessible entrance, an accessible passenger drop-off shall be provided within 100 feet of the accessible entrance (23.3.3). Accessible Parking Spaces, Accessible Van Spaces, and the associated access to the site Accessible Route will comply with Section 23.4

Plumbing Elements and Facilities

Single User Toilet Rooms intended for use by the students or general public or located in the Administrative Suite shall be accessible in accordance with 521 CMR. Toilet rooms with restricted access only by staff members shall be accessible in accordance with the 2010 ADA Standards.

Toilet fixture counts have been calculated based on 248 CMR (Massachusetts Fuel Gas and Plumbing Code) and distributed throughout the project based on the anticipated occupant load in each area.

Toilet rooms intended for use only by pre-kindergarten (Pre-K) and elementary school aged children (as defined Section 30.1-b) shall be designed in accordance with Sections 30.14 through 30.20. This includes single user toilet rooms in Special Education classrooms, single user toilet rooms in Pre-Kindergarten through 2nd grade classrooms, and gang toilet rooms serving assembly spaces and the grades 3 through 5 classroom wing.

Drinking fountains shall be located on each floor along the accessible route and installed in accordance with 521 CMR Section 36.

Special Occupancy Rooms and Features

The spaces or portions of the building described below require unique description and consideration with respect to accessibility.

<u>Stairways and Elevators.</u>

All stairs connecting public and educational or administrative staff areas will be designed as accessible stairways in accordance with Section 27. Stairways intended only for use by service staff, including the roof access stairs or ladders, are not required to be accessible (Section 12.1.1).

The elevator will be designed in accordance with Section 28 and to accommodate the required gurney size described in 524 CRM (Massachusetts Elevator Regulations) Section 17.40-(1). As such, it will accommodate the dimensional requirements described in 521 CMR Section 28.

<u>Assembly Spaces in Educational Facilities - Generally</u>

Amphitheaters, lecture halls, and classrooms will comply with Chapter 14 for Places of assembly in accordance with section 12.1.3. The gymnasium and cafeteria will also comply with the requirements of Chapter 14.

Assistive Listening Systems shall be provided for all assembly spaces in accordance with 14.5.

<u>Gymnasium</u>

Fixed operable bleacher seating will be provided in the Gymnasium, and the requirements for Number of Accessible Seats (Section 14.2) will be provided for each section of operable bleachers.

<u>Cafeteria</u>

No fixed seating will be provided in the Cafeteria, and the requirements for Number of Accessible Seats (Section 14.2) are not applicable to this space.

Cafeteria tables will be a combination of fixed (attached) and loose seating and will accommodate wheelchairs.

The raised platform (Stage) has an accessible route consisting of a ramp designed in accordance with Section 24 (per Section 14.6.1-a.).

<u>Media Center</u>

The Media Center will be designed to accommodate the requirements for Libraries described in Section 12.2.

At least 5% of all reading and study areas, stacks, reference rooms, computer work stations, shall be accessible and designed to accommodate the requirements of Section 12.2.2.

At least one lane of the check-out area will have a counter a maximum of 36" in height (Section 12.2.3).

Security devices and Card Catalogs will not be provided for the facility.

Aisles between stacks will have a minimum clear width of 42" as the preferred dimension described in Section 12.2.6.

Built In Furnishings and Equipment

Per Section 12.4, a minimum of 1 type of each element in each classroom will comply with the following:

- Countertops and sinks will comply with Section 12.2.2-b, c, and d and consist of a Clear Floor Space with Knee Clearance and a countertop height of 28" to 34".
- At least 50% of shelf space in cabinets with comply with Sections 6.5 Forward Reach and 6.6 Side Reach.
- Controls and operating mechanisms shall comply with Section 39 Controls.

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WILMINGTON ELEMENTARY SCHOOL

320 SALEM STREET
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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KEY PLAN

ORIENTATION AND SCALE:

SHEET TITLE:
CODE SUMMARY

SHEET NUMBER:
GC1.00

UTILITY INFORMATION STATEMENT

1. THE SUB-SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB-SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB-SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.
2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.
3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.
5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.
6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.
7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

NOTES

1. THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO DORE AND WHITTIER FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH DORE AND WHITTIER FOR PK-5 SITE. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.
2. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS PLAN AS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY WHICH OCCURRED OCTOBER 2024.
3. WETLAND RESOURCE AREA BOUNDARIES DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS, INC. ON NOVEMBER 5, 2024.
4. ELEVATION REFERS TO NORTH AMERICAN VERTICAL DATUM (NAVD88) VERTICAL BASED ON RTK GPS OBSERVATIONS WITH CORRECTIONS PROVIDED BY MaCORS NETWORK.
5. THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE SEARCH AND MAY NOT DISCLOSE ANY MATTERS THAT MAY BE REVEALED BY ONE.
6. THIS PLAN DOES NOT SHOW UNWRITTEN OR UNRECORDED EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT AND VISIBLE USES OF THE LAND. THIS PLAN DOES NOT GUARANTEE THAT NO SUCH EASEMENTS EXIST.
7. LEGAL STATUS OF EASEMENTS, WAYS AND RESTRICTIONS NOT DETERMINED BY THIS SURVEY.
8. TITLE TO LAND IN THE ABUTTING WAYS IS NOT SHOWN AND HAS NOT BEEN DETERMINED AS A RESULT OF THIS SURVEY.

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

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- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

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WILMINGTON ELEMENTARY SCHOOL

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

COMMONWEALTH OF MASSACHUSETTS
MARK E. VIOLETTE
#407768
REGISTERED PROFESSIONAL LAND SURVEYOR

Mark Violette
3.28.25

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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KEY PLAN

ORIENTATION AND SCALE:

SEE PLAN

SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET NUMBER:

EX-1.0

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WILMINGTON ELEMENTARY SCHOOL

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

COMMONWEALTH OF MASSACHUSETTS MARK E. VIOLETTE #40768 REGISTERED LAND SURVEYOR

Mark Violette
3.28.25

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04/24/2025

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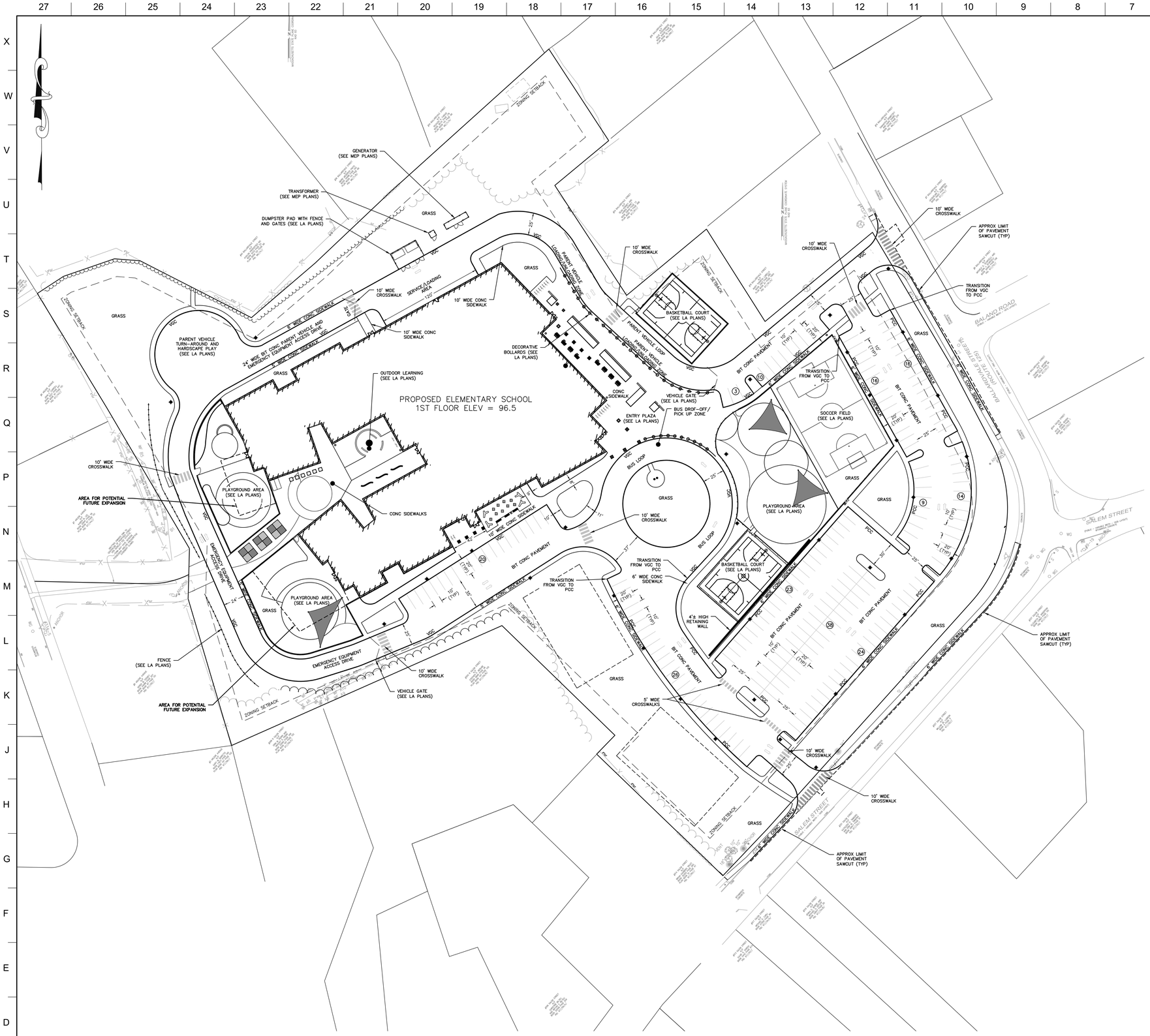
SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET NUMBER:

EX-1.1



EXISTING CONDITIONS/SURVEY NOTES:

1. EXISTING CONDITIONS, INCLUDING SITE ACREAGE, ARE BASED ON A SURVEY PREPARED BY NITSCH ENGINEERING, 2 CENTER PLAZA, SUITE 430, BOSTON, MA 02108, ENTITLED "EXISTING CONDITIONS PLAN 320 SALEM STREET, WILMINGTON, MASSACHUSETTS", SHEET EX-1 AND EX-2, REVISED 12-27-2024 (DRAFT).
2. SITE IMPROVEMENTS AND TOPOGRAPHY SHOWN HEREON ARE BASED ON AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY NITSCH ENGINEERING ON OCTOBER 2024.
3. ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88 DATUM AND WERE GENERATED VIA RTK GPS OBSERVATIONS. THE COORDINATES SHOWN HEREON ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM – MAINLAND ZONE 2001 AS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83). THE COORDINATES WERE GENERATED VIA RTK GPS SURVEY OBSERVATIONS.
4. THE SITE IS NOT WITHIN A 100-YEAR FLOOD PLAIN, AS SHOWN OF FLOOD INSURANCE RATE MAPS, NUMBER 25017C0283F AND 25017C0284E, EFFECTIVE DATE JULY 6, 2016 AND JUNE 4, 2010, RESPECTIVELY.

LAYOUT AND MATERIALS NOTES

1. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
2. REFER TO MEP PLANS FOR SITE LIGHTING LOCATIONS AND DETAILS.
3. CONTRACTOR SHALL REPORT SIGNIFICANT CONFLICTS TO THE OWNER AND THE ENGINEER FOR RESOLUTION.
4. DIMENSIONS OF PARKING SPACES AND DRIVEWAYS ARE FROM FACE OF CURB TO FACE OF CURB. PARKING SPACES ARE 10'x20', UNLESS NOTED OTHERWISE.
5. DIMENSIONS FROM BUILDING ARE FROM FACE OF BUILDING. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER. THE CONTRACTOR SHALL STAKE OUT BUILDING FROM THE LATEST ARCHITECTURAL DRAWINGS.
6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE AFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.
7. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING, LIGHTING, ENTRANCES, DOORWAY PADS, LOADING DOCK DETAILS, ETC.
8. ACCESSIBLE RAMPS WITH DETECTABLE WARNING PANELS WILL BE PROVIDED AT ALL CROSSWALKS, AND SHALL BE PER MASSACHUSETTS STATE CODE AND THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDLINES (WHICHEVER IS MORE STRINGENT).
9. EACH HANDICAP PARKING SPACE SHALL BE PROVIDED WITH A SIGN SIX (6) FEET IN HEIGHT LOCATED AT THE BACK OF THE THE CURB. THE SIGN SHALL CONTAIN THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AS DESCRIBED IN THE AMERICANS WITH DISABILITIES ACT.
10. PROTECT EXISTING PROPERTY MONUMENTS AND ABUTTING PROPERTIES DURING CONSTRUCTION ACTIVITIES.
11. ALL SITE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, AND THE TOWN OF WILMINGTON PUBLIC WORKS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LEGAL REMOVAL AND DISPOSAL OF ALL DEBRIS FROM THE SITE AND AS MAY BE DIRECTED BY THE A/E.
13. ALL FENCING AND GATES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS DIRECTION, SEE LA PLANS FOR DETAILS.
14. THE SITE CONTRACTOR SHALL SAW CUT AND MATCH ALL EXISTING ROAD PAVEMENT AS REQUIRED TO SET NEW CURBING AND CONSTRUCT NEW UTILITIES IN THE STREET.
15. THE USE OF FILL CONTAINING HAZARDOUS MATERIALS OR WASTE IS FORBIDDEN.
16. SEE LANDSCAPE PLANS FOR ALL PLANTING INFORMATION AS WELL AS ADDITIONAL LAYOUT AND MATERIAL INFORMATION.
17. THE MARKING OF THE LIMITS OF WORK IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR SITE CLEARING IS REQUIRED.
18. SEE DEMOLITION SHEET C1.00 AND DETAIL SHEET C5.00 FOR EROSION CONTROL NOTES.
19. WHERE CURBING ABRUPTLY ENDS, PROVIDE A TRANSITION CURB TO A FLUSH CONDITION WITH THE PROPOSED SURFACE/GRADES, SEE DETAIL 6/C5.02.
20. SIGNIFICANT TREES, INCLUDING THEIR BRANCHES AND THEIR ROOT SYSTEMS, SHALL BE PROTECTED WITH SHIELDS, FENCES OR BARRIERS.
21. THE CLEANING OF CATCH BASIN SUMPS AND STORMWATER BASINS IS REQUIRED FOLLOWING CONSTRUCTION AND ACCORDING TO ANY OPERATIONS AND MAINTENANCE PLAN THEREAFTER.

ZONING TABLE

ZONING REGULATIONS REQUIREMENTS	REQUIRED	PROVIDED
MINIMUM LOT SIZE	20,000 SF	12.145± ACRES
MINIMUM LOT FRONTAGE	125 FT	530± FT
MINIMUM LOT WIDTH	125 FT	530± FT
BUILDING SETBACK FRONT YARD SIDE YARD REAR YARD	 40 FT 20 FT 20 FT	 385± FT 62± FT 52± FT
MAXIMUM BUILDING HEIGHT	35 FT/2½ STORIES	46 FT/3 STORIES
MAX BUILDING COVERAGE %	N/A	15.0±%

ZONING DISTRICT: RESIDENCE 20 (R20)

LEGEND

EXISTING		PROPOSED
□	GRANITE BOUND FOUND	
	UTILITY POLE	
GUY	GUY WIRE	
	GUY POLE	
	SIGN	
	POST	
	BOLLARD	•
	DECIDUOUS TREE	
	CONIFEROUS TREE	
G	UNDERGROUND GAS LINE	G
W	UNDERGROUND WATER LINE	W
E	UNDERGROUND ELECTRIC LINE	E
S	UNDERGROUND SEWER LINE	S
D	UNDERGROUND DRAIN LINE	D
T	UNDERGROUND TELECOMM LINE	T
S	SEWER MANHOLE (SMH)	S
	SEWER CLEANOUT (CO)	○
E	ELECTRIC MANHOLE	E
T	TELECOMM MANHOLE	T
D	DRAIN MANHOLE (DMH)	D
	CATCH BASIN (CB)	
	GAS/WATER GATE	
	HYDRANT	
	BUSH	
	LOCUS PROPERTY LINE (±)	
	ADJOINERS PROPERTY LINE (±)	
OHW	OVERHEAD WIRE	
	TREELINE	
#	HISTORIC UTILITY LINE (G/W/E/S/D)	
255	MAJOR CONTOUR LINE	255
254	MINOR CONTOUR LINE	254
X	FENCE	X
	GUARD RAIL	
	CAPE COD BERM	
	HANDICAP SPACE	
	ELECTRIC VEHICLE CHARGING SPACE	
MBX	MAILBOX	
MW	MONITORING WELL	
MH	MANHOLE	

ABBREVIATIONS

BIT CONC	BITUMINOUS CONCRETE
CONC	CONCRETE
HDPE	HIGH-DENSITY POLYETHYLENE
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
PCC	PRECAST CONCRETE CURB
CCB	CAPE COD BERM
FGC	FLUSH GRANITE CURB
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
TYP	TYPICAL
CO	CLEAN OUT
SMH	SEWER MANHOLE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
OCS	OUTLET CONTROL STRUCTURE
CLDIP	CEMENT-LINED DUCTILE IRON PIPE
RIM	RIM ELEVATION
INV	INVERT ELEVATION
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND REPLACE
HC	HANDICAP RAMP
VE	VERTICAL ELLIPTICAL
TC/BC	TOP OF CURB/BOTTOM OF CURB
TW	TOP OF WALL
TOS	TOP OF STAIRS
BOS	BOTTOM OF STAIRS
BW	BOTTOM OF WALL (SURFACE GRADE)
BS	BACK OF SIDEWALK
SSD	SUB SOIL DRAIN
LA	LANDSCAPE ARCHITECT
UD	UNDER DRAIN / SUB DRAIN
UG	UNDERGROUND INFILTRATION
VF	VERIFY IN FIELD
OC	ON CENTER
TELECOMM	TELECOMMUNICATION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 INCH = 40 FT.

DORE + WHITTIER
MASSACHUSETTS
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CDW CONSULTANTS
Environmental and Civil Engineering

WILMINGTON ELEMENTARY SCHOOL

320 SALEM ST.
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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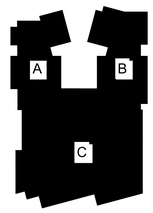
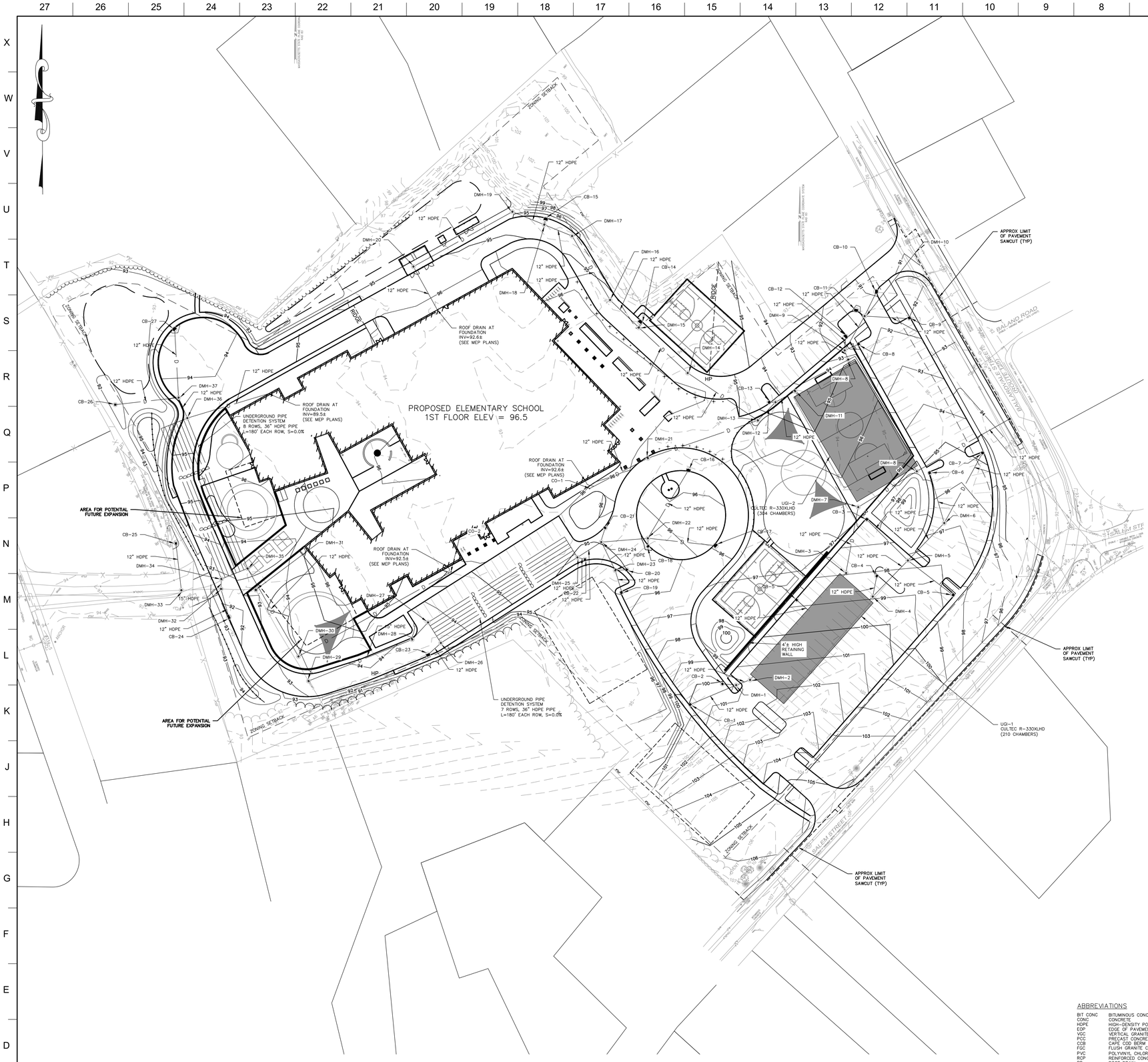
KEY PLAN



ORIENTATION AND SCALE:

SHEET TITLE:
LAYOUT AND MATERIALS PLAN

SHEET NUMBER:
C2.00



EXISTING CONDITIONS/SURVEY NOTES:

1. EXISTING CONDITIONS, INCLUDING SITE ACREAGE, ARE BASED ON A SURVEY PREPARED BY NITSCH ENGINEERING, 2 CENTER PLAZA, SUITE 430, BOSTON, MA 02108, ENTITLED "EXISTING CONDITIONS PLAN 320 SALEM STREET, WILMINGTON, MASSACHUSETTS", SHEET EX-1 AND EX-2, REVISED 12-27-2024 (DRAFT).
2. SITE IMPROVEMENTS AND TOPOGRAPHY SHOWN HEREON ARE BASED ON AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY NITSCH ENGINEERING ON OCTOBER 2024.
3. ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88 DATUM AND WERE GENERATED VIA RTK GPS OBSERVATIONS. THE COORDINATES SHOWN HEREON ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM – MAINLAND ZONE 2001 AS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83). THE COORDINATES WERE GENERATED VIA RTK GPS SURVEY OBSERVATIONS.
4. THE SITE IS NOT WITHIN A 100-YEAR FLOOD PLAIN, AS SHOWN OF FLOOD INSURANCE RATE MAPS, NUMBER 25017C0283F AND 25017C0284E, EFFECTIVE DATE JULY 6, 2016 AND JUNE 4, 2010, RESPECTIVELY.

GRADING AND DRAINAGE NOTES

1. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND THE DESIGNER PRIOR TO ANY SITE WORK WHICH WOULD BE AFFECTED.
2. EXCEPT WHERE NOTED OTHERWISE, ALL DRAINAGE PIPES WITHIN THE SITE SHALL BE HDPE.
3. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. ALL SITE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, AND THE TOWN OF WILMINGTON PUBLIC WORKS.
5. CONTRACTOR SHALL GRADE AND CONSTRUCT ALL ACCESSIBLE HANDICAP RAMPS IN ACCORDANCE WITH THE MASSACHUSETTS STATE CODE AND THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES (WHICHEVER IS MORE STRINGENT). SEE CONSTRUCTION DETAILS FOR SLOPE AND DIMENSIONAL REQUIREMENTS.
6. AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT AS SHOWN ON THE PLANS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OPERATIONS.
7. CONTRACTOR SHALL INSTALL SILT SACKS ON DOWN STREAM CATCH BASINS. PRIOR TO INSTALLING A SILT SACK THE CONTRACTOR SHALL CLEAN OUT THE SUMP OF THE CATCH BASIN.
8. ALL NEW CATCH BASINS TO BE PROVIDED WITH SILT SACKS FOR THE DURATION OF CONSTRUCTION ACTIVITIES.
9. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE DESIGNER. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.
10. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.
11. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
12. ALL UTILITY COVERS, GRATES, ETC. TO REMAIN SHALL BE ADJUSTED TO BE FLUSH WITH THE FINISH GRADE UNLESS OTHERWISE NOTED. RIM ELEVATIONS FOR STRUCTURES AND MANHOLES ARE APPROXIMATE.
13. AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT, CURBS AND EARTHWORK SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS.
14. PITCH EVENLY BETWEEN SPOT GRADES. GRADE ALL AREAS TO DRAIN.
15. THE CONTRACTOR SHALL SCHEDULE HIS WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PUDDLING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF THE FINISH SUBGRADE. PROVIDE TEMPORARY POSITIVE DRAINAGE AS REQUIRED.
16. EXISTING TREES AND SHRUBS OUTSIDE THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON PRIOR APPROVAL OF THE OWNER.
17. THE CONTRACTOR SHALL REMOVE ALL EROSION CONTROL BARRIERS AFTER REVEGETATION OF DISTURBED AREAS AND AFTER APPROVAL OF THE DESIGNER AND OWNER. SEE ADDITIONAL EROSION CONTROL NOTES ON DEMOLITION SHEET C1.00 AND DETAIL SHEET C5.00.
18. SEE EXISTING CONDITIONS SURVEY, BY NITSCH ENGINEERING FOR RIMS, INVERTS, PIPE SIZES, PIPE MATERIALS, SERVICES, AND STRUCTURES NOT LABELED HEREON.
19. NEW SEWER AND DRAIN CONNECTIONS MUST BE CORED AND ATTACHED WITH AN INSERT-A-TEE OR APPROVED EQUAL IF FACTORY WYE IS NOT AVAILABLE OR DAMAGED.
20. PIPE LENGTHS AND SLOPES IN THE DRAINAGE STRUCTURE TABLES ARE BASED ON CENTER TO CENTER LENGTHS AND SLOPES.

ZONING TABLE

ZONING REGULATIONS REQUIREMENTS	REQUIRED	PROVIDED
MINIMUM LOT SIZE	20,000 SF	12.145± ACRES
MINIMUM LOT FRONTAGE	125 FT	530± FT
MINIMUM LOT WIDTH	125 FT	530± FT
BUILDING SETBACK		
FRONT YARD	40 FT	385 FT
SIDE YARD	20 FT	62 FT
REAR YARD	20 FT	52 FT
MAXIMUM BUILDING HEIGHT	35 FT/2½ STORIES	46 FT/3 STORIES
MAX BUILDING COVERAGE %	N/A	15.0%

ZONING DISTRICT: RESIDENCE 20 (R20)

ABBREVIATIONS

BIT CONC	BITUMINOUS CONCRETE
CONC	CONCRETE
HDPE	HIGH-DENSITY POLYETHYLENE
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
PCC	PRECAST CONCRETE CURB
CCB	CAPE COD BERM
FGC	FLUSH GRANITE CURB
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
TYP	TYPICAL
CO	CLEAN OUT
SMH	SEWER MANHOLE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
OCS	OUTLET CONTROL STRUCTURE
CLDIP	CEMENT-LINED DUCTILE IRON PIPE
RIM	RIM ELEVATION
INV	INVERT ELEVATION
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND REPLACE
HC	HANDICAP RAMP
VE	VERTICAL ELLIPTICAL
TC/BC	TOP OF CURB/BOTTOM OF CURB
TW	TOP OF WALL
TOS	TOP OF STAIRS
BOS	BOTTOM OF STAIRS
BW	BOTTOM OF WALL (SURFACE GRADE)
BS	BACK OF SIDEWALK
SSD	SUB SOIL DRAIN
LA	LANDSCAPE ARCHITECT
UD	UNDER DRAIN / SUB DRAIN
UGI	UNDERGROUND INFILTRATION
VIF	VERIFY IN FIELD
OC	ON CENTER
TELECOMM	TELECOMMUNICATION

LEGEND

EXISTING		PROPOSED
□	GRANITE BOUND FOUND	
	UTILITY POLE	
GUY	GUY WIRE	
	GUY POLE	
	SIGN	
	POST	
	BOLLARD	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
G	UNDERGROUND GAS LINE	G
W	UNDERGROUND WATER LINE	W
E	UNDERGROUND ELECTRIC LINE	E
S	UNDERGROUND SEWER LINE	S
D	UNDERGROUND DRAIN LINE	D
T	UNDERGROUND TELECOMM LINE	T
S	SEWER MANHOLE (SMH)	S
	SEWER CLEANOUT (CO)	
E	ELECTRIC MANHOLE	E
T	TELECOMM MANHOLE	T
D	DRAIN MANHOLE (DMH)	D
	CATCH BASIN (CB)	
	GAS/WATER GATE	
	HYDRANT	
	BUSH	
	LOCUS PROPERTY LINE (±)	
	ADJOINERS PROPERTY LINE (±)	
OHW	OVERHEAD WIRE	
	TREELINE	
#	HISTORIC UTILITY LINE (G/W/E/S/D)	
	MAJOR CONTOUR LINE	255
	MINOR CONTOUR LINE	254
X	FENCE	X
	GUARD RAIL	
	CAPE COD BERM	
	HANDICAP SPACE	
	ELECTRIC VEHICLE CHARGING SPACE	
MBX	MAILBOX	
MW	MONITORING WELL	
MH	MANHOLE	

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 INCH = 40 FT.

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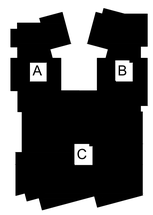
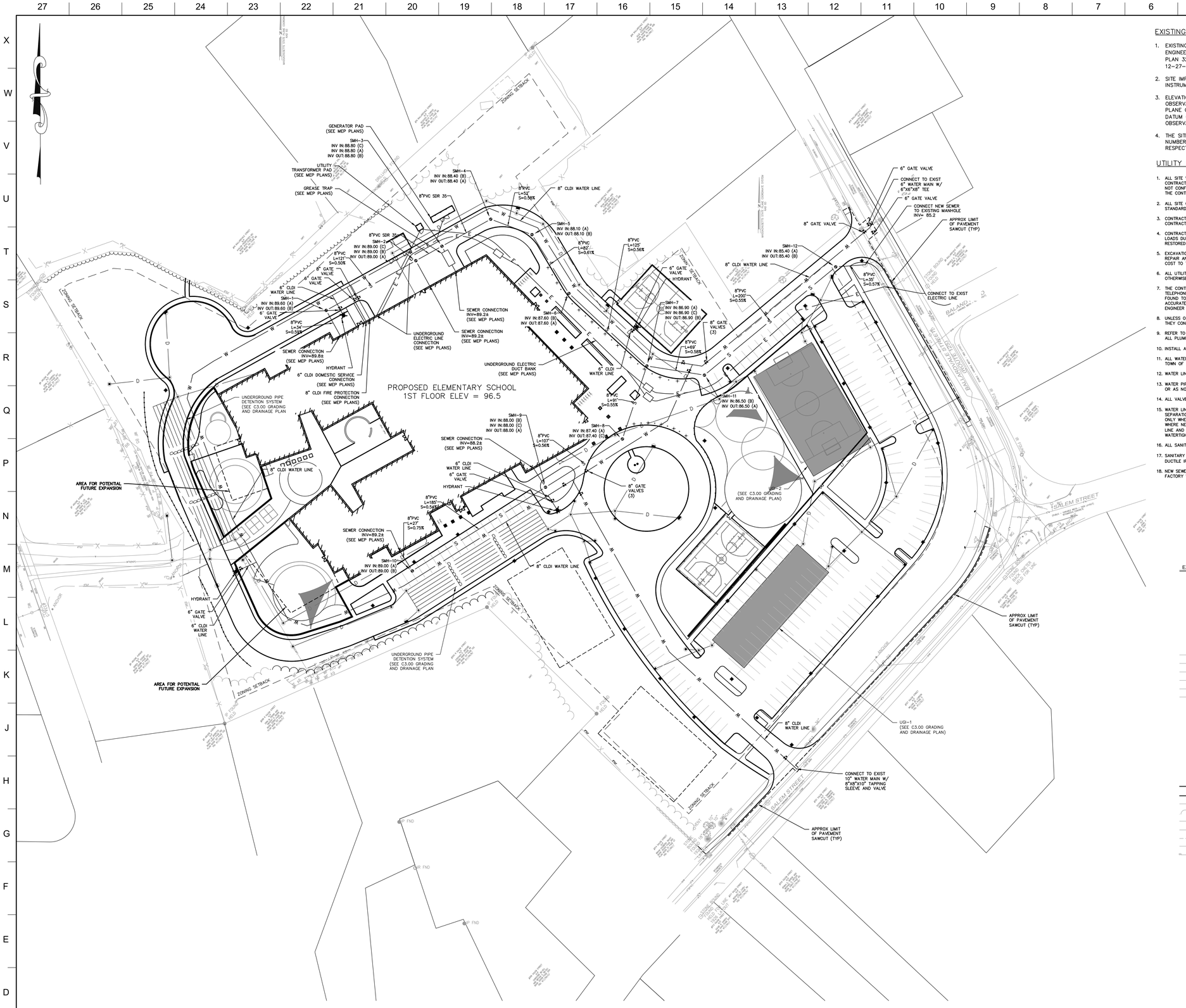
KEY PLAN



ORIENTATION AND SCALE:

SHEET TITLE:
GRADING AND DRAINAGE PLAN

SHEET NUMBER:
C3.00



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4. THE SITE IS NOT WITHIN A 100-YEAR FLOOD PLAIN, AS SHOWN OF FLOOD INSURANCE RATE MAPS, NUMBER 25017C0283F AND 25017C0284E, EFFECTIVE DATE JULY 6, 2016 AND JUNE 4, 2010, RESPECTIVELY.

UTILITY NOTES

1. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE DESIGNER PRIOR TO ANY SITE WORK WHICH WOULD BE AFFECTED.
2. ALL SITE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS (DPW) STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, AND THE TOWN OF WILMINGTON PUBLIC WORKS.
3. CONTRACTOR SHALL INSTALL SILT SACKS ON DOWN STREAM CATCH BASINS. PRIOR TO INSTALLING A SILT SACK THE CONTRACTOR SHALL CLEAN OUT THE SUMP OF THE CATCH BASIN.
4. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.
5. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
6. ALL UTILITY COVERS, GRATES, ETC. TO REMAIN SHALL BE ADJUSTED TO BE FLUSH WITH THE FINISH GRADE UNLESS OTHERWISE NOTED. RIM ELEVATIONS STRUCTURES AND MANHOLES ARE APPROXIMATE.
7. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.
8. UNLESS OTHERWISE INDICATED, ABANDONED EXISTING UTILITY LINES SHALL BE CAPPED AND ABANDONED IN PLACE UNLESS THEY CONFLICT WITH PROPOSED IMPROVEMENTS. CAP REMAINING PORTIONS WHERE PARTIALLY REMOVED.
9. REFER TO ELECTRICAL DRAWINGS FOR ALL SITE ELECTRICAL WORK, AND TO PLUMBING AND MECHANICAL DRAWINGS FOR ALL PLUMBING AND MECHANICAL WORK.
10. INSTALL ALL UTILITIES (INCLUDING CONCRETE PADS) PER UTILITY COMPANY AND DPW STANDARDS.
11. ALL WATER UTILITY IMPROVEMENTS SHALL COMPLY WITH THE AMERICAN WATERWORKS ASSOCIATION STANDARDS AND THE TOWN OF WILMINGTON DPW.
12. WATER LINE SHALL BE CLASS 52 CEMENT LINED DUCTILE IRON.
13. WATER PIPES WITH JOINTS OR FITTINGS AS REQUIRED TO PROVIDE A MINIMUM OF 6" CLEARANCE FOR UTILITY CROSSINGS OR AS NOTED IN THE SPECIFICATIONS.
14. ALL VALVES AND HYDRANTS SHALL CONFORM TO THE TOWN STANDARDS.
15. WATER LINES AND SEWER LINES SHALL BE SEPARATED BY 10' HORIZONTALLY. WHERE THIS IS NOT POSSIBLE, AN 18" SEPARATION BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER LINE IS ALSO ACCEPTABLE BUT ONLY WHERE THE WATER LINE IS ABOVE THE SEWER LINE. BOTH PIPES SHALL BE ENCASED IN CONCRETE IN ANY AREA WHERE NEITHER OF THE TWO SEPARATIONS NOTED ABOVE CAN BE MAINTAINED. IN SUCH AN INSTANCE, BOTH THE WATER LINE AND SEWER LINE (IN THE AREA OF ENCASEMENT) MUST BE PRESSURE TESTED TO 150 PSI TO ENSURE BOTH ARE WATERTIGHT.
16. ALL SANITARY PIPE SHALL BE SDR-35 PVC UNLESS OTHERWISE NOTED.
17. SANITARY PIPES WHERE INVERT DEPTH IS LESS THAN FOUR (4) FEET BELOW FINISHED GRADE, SHALL BE EXTRA HEAVY DUCTILE IRON PIPE (ASTM746) AND INSULATED.
18. NEW SEWER AND DRAIN CONNECTIONS MUST BE CORED AND ATTACHED WITH AN INSERT-A-TEE OR APPROVED EQUAL IF FACTORY WYE IS NOT AVAILABLE OR DAMAGED.

LEGEND

EXISTING		PROPOSED
	GRANITE BOUND FOUND	
	UTILITY POLE	
GUY	GUY WIRE	
	GUY POLE	
	SIGN	
	POST	
	BOLLARD	•
	DECIDUOUS TREE	
	CONIFEROUS TREE	
G	UNDERGROUND GAS LINE	G
W	UNDERGROUND WATER LINE	W
E	UNDERGROUND ELECTRIC LINE	E
S	UNDERGROUND SEWER LINE	S
D	UNDERGROUND DRAIN LINE	D
T	UNDERGROUND TELECOMM LINE	T
S	SEWER MANHOLE (SMH)	S
	SEWER CLEANOUT (CO)	
E	ELECTRIC MANHOLE	E
T	TELECOMM MANHOLE	T
D	DRAIN MANHOLE (DMH)	
	CATCH BASIN (CB)	
	GAS/WATER GATE	
	HYDRANT	
	BUSH	
	LOCUS PROPERTY LINE (±)	
	ADJOINERS PROPERTY LINE (±)	
OHW	OVERHEAD WIRE	
	TREELINE	
	HISTORIC UTILITY LINE (G/W/E/S/D)	
255	MAJOR CONTOUR LINE	255
254	MINOR CONTOUR LINE	254
X	FENCE	X
	GUARD RAIL	
	CAPE COD BERM	
	HANDICAP SPACE	
	ELECTRIC VEHICLE CHARGING SPACE	
MBX	MAILBOX	
MW	MONITORING WELL	
MH	MANHOLE	

ZONING TABLE

ZONING REGULATIONS REQUIREMENTS	REQUIRED	PROVIDED
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REAR YARD	20 FT	52 FT
MAXIMUM BUILDING HEIGHT	35 FT/2½ STORIES	46 FT/3 STORIES
MAX BUILDING COVERAGE %	N/A	15.0%

ZONING DISTRICT: RESIDENCE 20 (R20)

ABBREVIATIONS

BIT CONC	BITUMINOUS CONCRETE
CONC	CONCRETE
HDPE	HIGH-DENSITY POLYETHYLENE
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
PCC	PRECAST CONCRETE CURB
CCB	CAPE COD BERM
FGC	FLUSH GRANITE CURB
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
TYP	TYPICAL
CO	CLEAN OUT
SMH	SEWER MANHOLE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
OCS	OUTLET CONTROL STRUCTURE
CLDIP	CEMENT-LINED DUCTILE IRON PIPE
RIM	RIM ELEVATION
INV	INVERT ELEVATION
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND REPLACE
HC	HANDICAP RAMP
VE	VERTICAL ELLIPTICAL
TC/BC	TOP OF CURB/BOTTOM OF CURB
TW	TOP OF WALL
TOS	TOP OF STAIRS
BOS	BOTTOM OF STAIRS
BW	BOTTOM OF WALL (SURFACE GRADE)
BS	BACK OF SIDEWALK
SSD	SUB SOIL DRAIN
LA	LANDSCAPE ARCHITECT
UD	UNDER DRAIN / SUB DRAIN
UGI	UNDERGROUND INFILTRATION
VIF	VERIFY IN FIELD
OC	ON CENTER
TELECOMM	TELECOMMUNICATION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 INCH = 40 FT.

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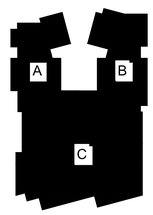
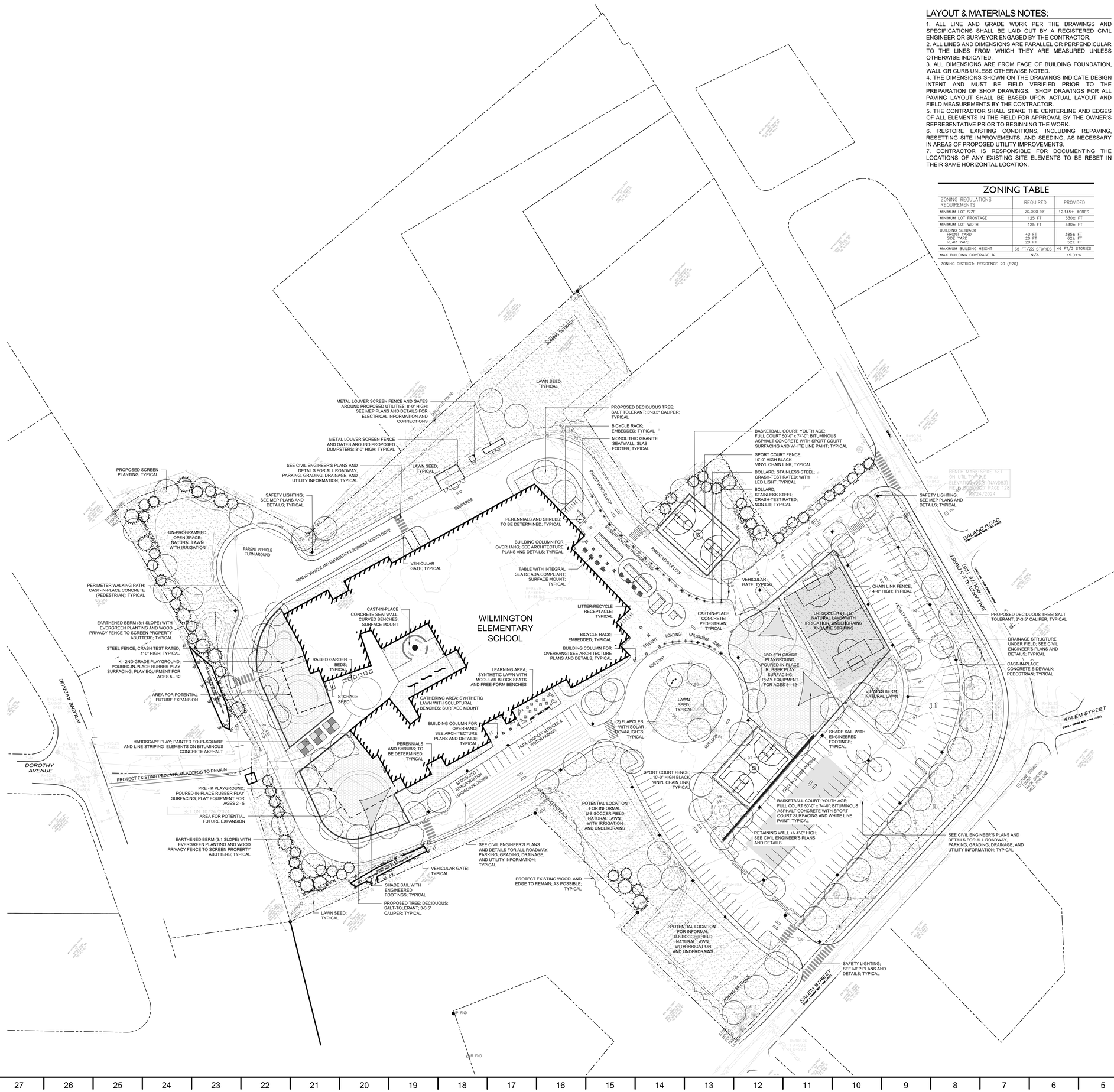
KEY PLAN



ORIENTATION AND SCALE:

SHEET TITLE:
UTILITIES PLAN

SHEET NUMBER:
C4.00



LAYOUT & MATERIALS NOTES:

1. ALL LINE AND GRADE WORK PER THE DRAWINGS AND SPECIFICATIONS SHALL BE LAID OUT BY A REGISTERED CIVIL ENGINEER OR SURVEYOR ENGAGED BY THE CONTRACTOR.
2. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
3. ALL DIMENSIONS ARE FROM FACE OF BUILDING FOUNDATION, WALL OR CURB UNLESS OTHERWISE NOTED.
4. THE DIMENSIONS SHOWN ON THE DRAWINGS INDICATE DESIGN INTENT AND MUST BE FIELD VERIFIED PRIOR TO THE PREPARATION OF SHOP DRAWINGS. SHOP DRAWINGS FOR ALL PAVING LAYOUT SHALL BE BASED UPON ACTUAL LAYOUT AND FIELD MEASUREMENTS BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL STAKE THE CENTERLINE AND EDGES OF ALL ELEMENTS IN THE FIELD FOR APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING THE WORK.
6. RESTORE EXISTING CONDITIONS, INCLUDING REPAVING, RESETTING SITE IMPROVEMENTS, AND SEEDING, AS NECESSARY IN AREAS OF PROPOSED UTILITY IMPROVEMENTS.
7. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING THE LOCATIONS OF ANY EXISTING SITE ELEMENTS TO BE RESET IN THEIR SAME HORIZONTAL LOCATION.

ZONING TABLE

ZONING REGULATIONS REQUIREMENTS	REQUIRED	PROVIDED
MINIMUM LOT SIZE	20,000 SF	12.145± ACRES
MINIMUM LOT FRONTAGE	125 FT	530± FT
MINIMUM LOT WIDTH	125 FT	530± FT
BUILDING SETBACK FRONT YARD SIDE YARD REAR YARD	 40 FT 20 FT 20 FT	 385± FT 62± FT 52± FT
MAXIMUM BUILDING HEIGHT	35 FT/2½ STORIES	46 FT/3 STORIES
MAX BUILDING COVERAGE %	N/A	15.0±%

ZONING DISTRICT: RESIDENCE 20 (R20)

GRADING NOTES:

1. ALL SITE CONDITIONS 12-INCHES BELOW FINISHED GRADE ARE NOT INCLUDED WITHIN THE SCOPE OF WORK BY THE OWNER'S REPRESENTATIVE.
2. EXISTING UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM DRAWINGS AND SHALL BE DEEMED APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS AND ELEVATIONS PRIOR TO EXCAVATION. BEFORE CONSTRUCTION STARTS ALL UTILITY COMPANIES (PUBLIC AND PRIVATE) MUST BE CONTACTED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN. CONTACT "DIG SAFE" AND REPORT ANY DISCREPANCIES IN WRITING TO THE OWNER'S REPRESENTATIVE AND RECEIVE WRITTEN INSTRUCTIONS BEFORE PROCEEDING.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND THEN REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.
4. MAINTAIN EXISTING GRADE AT THE ROOT FLARE OF EXISTING TREES TO REMAIN, UNLESS OTHERWISE SPECIFIED BY THE OWNER'S REPRESENTATIVE.
5. GRADE SURFACES TO ASSURE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS AND TO PREVENT PONDING OF SURFACE DRAINAGE.
6. ALL STAIRS AND STOOPS SHALL HAVE A WASH, NOT TO EXCEED 1/4" PER FOOT UNLESS SPECIFIED BY THE OWNER'S REPRESENTATIVE.
7. PROVIDE VERTICAL CURVES AT ALL ABRUPT CHANGES IN GRADE UNLESS OTHERWISE NOTED. BLEND THE LINE AND GRADE OF NEW EARTHWORK SMOOTHLY INTO EXISTING GRADE.
8. PITCH EVENLY BETWEEN SPOT GRADING. ANY DISCREPANCIES NOT ALLOWING AN EVEN PITCH TO OCCUR SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO CONTINUING WORK.
9. MAINTAIN THE INTEGRITY OF THE EXISTING DRAINAGE SYSTEM AT ALL TIMES. RIM ELEVATIONS OF ALL DRAINAGE STRUCTURES SHALL BE SET FLUSH WITH SURROUNDING GRADES SO AS NOT TO CAUSE A TRIP EDGE.
10. CONTOURS SHOW DESIGN INTENT ONLY. PRIOR TO CONSTRUCTION EXISTING CONTOURS AND ELEVATIONS NEED TO BE FIELD VERIFIED AND SHOW POSITIVE DRAINAGE TO EXISTING AND PROPOSED AREA DRAINS.
11. FOR PEDESTRIAN CONCRETE PAVING SLOPES SHALL BE GRADED TO A MAXIMUM 4.5%. THE CROSS PITCH (PERPENDICULAR TO TRAVEL) FOR ALL WALKWAYS AND PATHS SHALL BE CONSTRUCTED AT 1.5% (1.9% MAXIMUM). ALL PLAZAS SHALL BE GRADED TO A MAXIMUM 2% IN ANY DIRECTION. THE SLOPE OF SIDEWALKS RAMPS AND HANDICAP CURB CUTS SHALL BE CONSTRUCTED AT 7.5% MAXIMUM. RAMPS SHALL BE CONSTRUCTED TO A MAXIMUM SLOPE OF 7.5% AND SHALL HAVE CODE COMPLIANT HANDRAILS. A 5'-0" MINIMUM LEVEL (1.5% PITCH, 1.9% MAXIMUM) AREA SHALL BE PROVIDED AT ALL FLUSH ENTRANCES TO BUILDINGS. PUDDLING OF WATER AT THE ENTRANCES WILL NOT BE ALLOWED.
12. CONTACT OWNER'S REPRENTATIVE IF SLOPES DO NOT MEET MINIMUM AND MAXIMUM REQUIREMENTS.
13. CONTRACTORS TO SUBMIT SHOP DRAWINGS SHOWING CONNECTIONS OF PROPOSED AREA DRAINS TO EXISTING STORMWATER DRAINAGE SYSTEM.

PLANTING PLAN NOTES:

1. ALL PLANTING SOILS SHALL BE (1) PART TOPSOIL, (1) PART COMPOSTED ORGANIC MATTER, (1) PART NATIVE SOIL MIXED PRIOR TO PLANTING INSTALLATION.
2. THE CONTRACTOR SHALL CONFIRM THE ACTUAL DEPTH OF ALL PLANTING AREAS PRIOR TO ANY PLANT MATERIAL BEING SECURED. REPORT ANY LEDGE OR SUBSTANDARD SOIL/SUBSURFACE CONDITIONS TO THE OWNER'S REPRESENTATIVE.
3. THE CONTRACTOR SHALL CONSIDER THE DISPLACEMENT OF PLANTING SOIL FOR THE PLANT MATERIAL ROOT BALLS IN THE OVERALL PLANTING BED FINISHED GRADE. ALLOW ENOUGH ROOM IN THE PLANTING BED ELEVATION TO SPREAD DISPLACED SOIL AND STILL MEET THE INDICATED FINISHED GRADE INCLUDING THE 2" OF HARDWOOD MULCH.
4. ANY MATERIALS ACCUMULATED OVER THE ROOT FLARE OF A TREE OR SHRUB MUST BE REMOVED COMPLETELY UNTIL THE ROOT FLARE IS EXPOSED AND ALL GIRDLING ROOTS REMOVED PRIOR TO PLANTING.
5. THE CONTRACTOR SHALL LOCATE AND VERIFY WITH THE OWNER'S REPRESENTATIVE ALL TREES, SHRUBS, PERENNIALS, AND/OR GROUNDCOVER TO REMAIN, TO BE REMOVED, OR TO BE TRANSPLANTED. PROTECT IN PLACE ALL EXISTING TREES, SHRUBS, AND GROUNDCOVER TO REMAIN.
6. ALL NEW PLANTING MATERIAL SHALL CONFORM TO MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. (AAN). IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY AND THE PLANT HEIGHT SHALL BE MEASURED FROM THE ROOT FLARE, NOT THE BOTTOM OF POT OR BURLAP BALL.
7. STAKE THE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF PLANTING.
8. IN THE EVENT THAT QUANTITY DISCREPANCIES OR MATERIAL OMISSIONS OCCUR BETWEEN THE PLANT MATERIALS LIST AND THE DRAWINGS, THE HIGHER NUMBER OF PLANTS SHALL GOVERN. THE CONTRACTOR SHALL REPORT DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.
9. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, FRUIT, COLOR, AND CULTURE MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE.
10. ALL LAWN AREAS DISTURBED BY CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE THE LIMIT OF WORK SHALL BE LOAMED AND SEEDED.

LEGEND

- PROPERTY LINE
- ZONING SETBACK
- CAST-IN-PLACE CONCRETE PAVEMENT
- POURED-IN-PLACE RUBBER PLAY SURFACING
- SYNTHETIC LAWN
- NATURAL LAWN; SEED
- MONOLITHIC GRANITE SEATWALL
- BICYCLE RACK
- BENCH; BACKED WITH ARMS
- BENCH; BACKLESS WITH NO ARMS
- TABLE WITH INTEGRAL SEATS
- MODULAR BLOCK SEAT; MOVABLE
- FREE-FORM BENCH
- SCULPTURAL BENCH
- LITTER/RECYCLE RECEPTACLE
- SAFETY BOLLARD; WITH LED LIGHT
- SAFETY BOLLARD; NON-LIT
- PROPOSED DECIDUOUS TREE | SHRUB
- PROPOSED EVERGREEN SHRUB
- STEEL FENCE; CRASH TEST-RATED; 4'-0" HIGH
- WOOD PRIVACY BOARD FENCE; 6'-0" HIGH
- SPORT COURT FENCE; CHAIN LINK; 10'-0" HIGH
- CHAIN LINK FENCE; 4'-0" HIGH

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SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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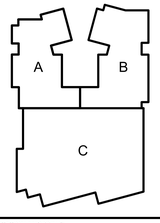
KEY PLAN



ORIENTATION AND SCALE:

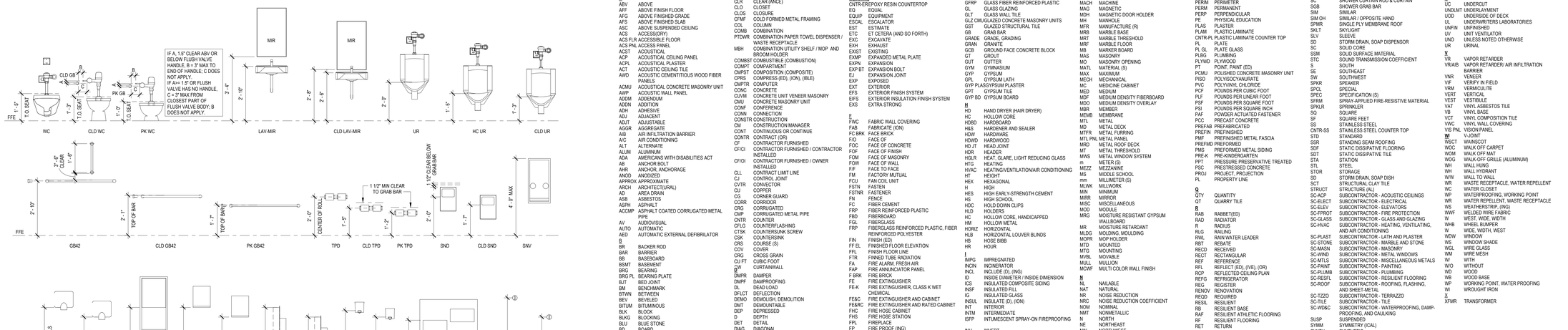
TRUE NORTH
N
PROJECT NORTH

0 20' 40' 80'
SCALE: 1" = 40'-0" GRAPHIC SCALE

SHEET TITLE:
LANDSCAPE SITE PLAN

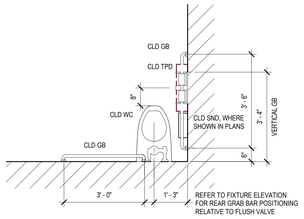
SHEET NUMBER:
L1.01

TYPICAL FIXTURE & ACCESSORY MOUNTING HEIGHTS

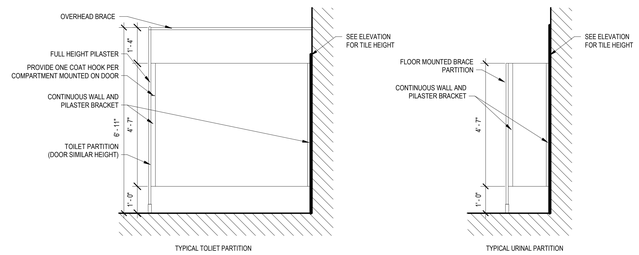


TYPICAL PK WC & GB LOCATIONS
1/2" = 1'-0"

TYPICAL WC & GB LOCATIONS
1/2" = 1'-0"



TYPICAL CLD WC & GB LOCATIONS
1/2" = 1'-0"



2 TYPICAL TOILET PARTITION ELEVATION
1/2" = 1'-0"

ABBREVIATIONS

A
ABV ABOVE
AFF ABOVE FINISH FLOOR
AFG ABOVE FINISHED GRADE
AFS ABOVE FINISHED SLAB
ASC ABOVE SUSPENDED CEILING
ACS ACCESS(ORY)
ACS FLR ACCESSIBLE FLOOR
ACS PNL ACCESS PANEL
ACST ACOUSTICAL
ACP ACOUSTICAL CEILING PANEL
ACPL ACOUSTICAL PLASTER
ACT ACOUSTIC CEILING TILE
AWD ACOUSTIC CEMENTITIOUS WOOD FIBER PANELS
ACMU ACOUSTICAL CONCRETE MASONRY UNIT
AWP ACOUSTIC WALL PANEL
ADDM ADDENDUM
ADDN ADDITION
ADH ADHESIVE
ADJ ADJACENT
ADJT ADJUSTABLE
AGGR AGGREGATE
AIB AIR INFILTRATION BARRIER
A/C AIR CONDITIONING
ALT ALTERNATE
ALUM ALUMINUM
ADA AMERICANS WITH DISABILITIES ACT
AB ANCHOR BOLT
AHR ANCHOR, ANCHORAGE
ANOD ANODIZED
APPROX APPROXIMATE
ARCH ARCHITECT(URAL)
AD AREA DRAIN
ASB ASBESTOS
ASPH ASPHALT
ACCMP ASPHALT COATED CORRUGATED METAL PIPE
AV AUDIO/VISUAL
AUTO AUTOMATIC
AED AUTOMATIC EXTERNAL DEFIBRILATOR

B
BR BACKER ROD
BAR BARRIER
BB BASEBOARD
BSMT BASEMENT
BRG BEARING
BRG PL BEARING PLATE
BJT BED JOINT
BM BENCHMARK
BTWN BETWEEN
BEV BEVELED
BITUM BITUMINOUS
BLK BLOCK
BLKG BLOCKING
BLU BLUE STONE
BD BOARD
BLT BORROWED LITE
BS BOTH SIDES
BW BOTH WAYS
BOT BOTTOM
B/O BOTTOM OF
BOD BOTTOM OF DECK
BORA BOTTOM OF RELIEVING ANGLE
BOS BOTTOM OF STEEL
BRK BRICK
BRKS BRICKS
BRZ BRONZE
BLDG BUILDING
BN BULLNOSE
BB BUTCHER BLOCK

C
CAB CABINET
CUH CABINET UNIT HEATER
CPT CARPET (ED)
CSMT CASEMENT
C CONC CAST CONCRETE
CIP CAST IN PLACE
CI CAST IRON
CS CAST STONE
CSMU CAST STONE MASONRY UNIT
CB CATCH BASIN
CLG CEILING
CLG HT CEILING HEIGHT
CEM CEMENT
C TO C CENTER TO CENTER
CL CENTER LINE
cm CENTIMETER (S)
CER CERAMIC
CT CERAMIC TILE
CH BD CHALKBOARD
CHFR CHAMFER
CHGTB CHANGING TABLE
CH CHEMICAL HARDENER
CLD CHILD
CIR CIRCLE
CRCMF CIRCUMFERENCE
CLRM CLASSROOM

C (CONT.)
CLR CLEAR (ANCE)
CLO CLOSET
CLOS CLOSURE
CFMF COLD FORMED METAL FRAMING
COL COLUMN
COMB COMBINATION
PTDWR COMBINATION PAPER TOWEL DISPENSER / WASTE RECEPTACLE
MBH COMBINATION UTILITY SHELF / MOP AND BROOM HOLDER
COMBST COMBUSTIBLE (COMBUSTION)
COMPT COMPARTMENT
CMPST COMPOSITION (COMPOSITE)
CRS COMPRESS (ED), (ION), (IBLE)
CMPTR COMPUTER
CONC CONCRETE
CUVM CONCRETE UNIT VENEER MASONRY
CMU CONCRETE MASONRY UNIT
CONF CONFERENCE
CONN CONNECTION
CONSTR CONSTRUCTION
CM CONSTRUCTION MANAGER
CONT CONTINUOUS OR CONTINUE
CONTR CONTRACT (OR)
CF CONTRACTOR FURNISHED
CF/CI CONTRACTOR FURNISHED / CONTRACTOR INSTALLED
CF/OI CONTRACTOR FURNISHED / OWNER INSTALLED
CLL CONTRACT LIMIT LINE
CJ CONTROL JOINT
CVTR CONVECTOR
CU COPPER
CG CORNER GUARD
CORR CORRIDOR
CRU CORRUGATED
CMP CORRUGATED METAL PIPE
CNTR COUNTER
CFLG COUNTERFLASHING
CTSK COUNTERSUNK SCREW
CSK COUNTERSINK
CRS COURSE (S)
COV COVER
CRG CROSS GRAIN
CU FT CUBIC FOOT
CW CURTAINWALL

D
DMPR DAMPER
DMPF DAMPROOFING
DL DEAD LOAD
DFLCT DEFLECTION
DEMO DEMOLISH, DEMOLITION
DMT DEMOUNTABLE
DEP DEPRESSED
D DEPTH
DET DETAIL
DIAG DIAGONAL
DIA DIAMETER
DIM DIMENSION
DW DISHWASHER
DISP DISPENSER
DIV DIVISION
DR DOOR
DR OPNG DOOR OPENING
DH DOUBLE HUNG
DBL ACT DOUBLE ACTING
DTS DOVETAIL ANCHOR SLOT
DN DOWN
DS DOWNSPOUT
DT DRAIN TILE
DRB DRAINBOARD
DWR DRAWER
DWG DRAWING (S)
DF DRINKING FOUNTAIN
DWTR DUMBWAITER
DPW DIGITAL GRAPHIC WALL COVERING

E
EA EACH
EF EACH FACE
E EAST
EOD EDGE OF DECK
EOS EDGE OF SLAB
ED EDUCATION
ELEC ELECTRIC (AL)
EWC ELECTRIC WATER COOLER
EP ELECTRICAL PANEL
EL ELEVATION
ELEV ELEVATOR
EMER EMERGENCY
ESB ENCLOSED STEEL BEAM
ENCL ENCLOSURE
ENTR ENTRANCE
EPX EPOXY FLOORING

E (CONT.)
CNTR-EPOXY RESIN COUNTERTOP
EQ EQUAL
EQUIP EQUIPMENT
ESCAL ESCALATOR
EST ESTIMATE
ETC ET CETERA (AND SO FORTH)
EXC EXCAVATE
EXH EXHAUST
EXIST EXISTING
EXMP EXPANDED METAL PLATE
EXPN EXPANSION
EXP BT EXPANSION BOLT
EJ EXPANSION JOINT
EXP EXPOSED
EXT EXTERIOR
EFS EXTERIOR FINISH SYSTEM
EIFS EXTERIOR INSULATION FINISH SYSTEM
EXS EXTRA STRONG

F
FWC FABRIC WALL COVERING
FAB FABRICATE (ION)
FC BRK FACE BRICK
F/O FACE OF
FOC FACE OF CONCRETE
FOF FACE OF FINISH
FOM FACE OF MASONRY
FOW FACE OF WALL
F/F FACE TO FACE
FM FACTORY MUTUAL
FCU FAN COIL UNIT
FSTN FASTEN
FSTNR FASTENER
FN FENCE
FC FIBER CEMENT
FRP FIBER REINFORCED PLASTIC
FBD FIBERBOARD
FGL FIBERGLASS
FRP FIBERGLASS REINFORCED PLASTIC, FIBER REINFORCED POLYESTER
FIN FINISH (ED)
FF EL FINISHED FLOOR ELEVATION
FFL FINISH FLOOR LINE
FTR FINNED TUBE RADIATION
FA FIRE ALARM, FRESH AIR
FAP FIRE ANNUNCIATOR PANEL
F BRK FIRE BRICK
FE FIRE EXTINGUISHER
FE-K FIRE EXTINGUISHER, CLASS K WET CHEMICAL
FE&C FIRE EXTINGUISHER AND CABINET
FE&RC FIRE EXTINGUISHER AND RATED CABINET
FHC FIRE HOSE CABINET
FHV FIRE HOSE STATION
FPL FIREPLACE
FP FIRE PROOF (ING)
FPC FIRE PROTECTION SYSTEM CONTRACTOR
FR FIRE RATED (ING), FRAME (D), (ING)
FRC FIRE RESISTANT COATING
FRJS FIRE RESISTIVE JOINT SEALANT
FRT FIRE RETARDANT TREATED
FRTW FIRE RETARDANT TREATED WOOD
FIXT FIXTURE
FLMB FLAMMABLE
FLASH FLASHING
FHMS FLATHEAD MACHINE SCREW
FHWS FLATHEAD WOOD SCREW
FLEX FLEXIBLE
FKFL FLOCKED FLOORING
FLR FLOOR (ING)
FCO FLOOR CLEANOUT
FD FLOOR DRAIN
FLUOR FLUORESCENT
FSS FOLDING SHOWER SEAT
FT FOOT, FEET
FTG FOOTING
FRG FORGED
FDTN FOUNDATION
FR FRAME (D), (ING), FIRE RATED (ING)
FA FRESH AIR, FIRE ALARM
FS FULL SIZE
FURN FURNISHED, FURNITURE
FURN FURRED (ING)
FUT FUTURE

G
GA GAGE, GAUGE
GALV GALVANIZED
GI GALVANIZED IRON
GIP GALVANIZED IRON PIPE
GKT GASKET (ED)
GC GENERAL CONTRACT (OR)
GL BLK GLASS BLOCK
GLF GLASS FIBER

G (CONT.)
GFRP GLASS FIBER REINFORCED PLASTIC
GL GLASS GLAZING
GLT GLASS WALL TILE
GLZ CMU GLAZED CONCRETE MASONRY UNITS
GST GLAZED STRUCTURAL TILE
GB GRAB BAR
GRADE GRADE, GRADING
GRAN GRANITE
GCB GROUND FACE CONCRETE BLOCK
GT GROUT
GUT GUTTER
GYM GYMNASIUM
GYP GYPSUM
GPL GYPSUM LATH
GYP PLASGYPSUM PLASTER
GPT GYPSUM TILE
GYP BD GYPSUM BOARD

H
HD HAND DRYER (HAIR DRYER)
HC HOLLOW CORE
HDBD HARDBOARD
H&S HARDENER AND SEALER
HDW HARDWARE
HDWD HARDWOOD
HD JT HEAD JOINT
HDR HEADER
HGLR HEAT, GLARE, LIGHT REDUCING GLASS
HTG HEATING
HVAC HEATING/VENTILATION/AIR CONDITIONING
HT HEIGHT
HEX HEXAGONAL
H HIGH
HES HIGH EARLY-STRENGTH CEMENT
HS HIGH SCHOOL
HDC HOLD DOWN CLIPS
HLD HOLDERS
HC HOLLOW CORE, HANDICAPPED
HM HOLLOW METAL
HORIZ HORIZONTAL
HLB HORIZONTAL LOUVER BLINDS
HB HOSE BIBB
HR HOUR

I
IMPG IMPREGNATED
INCIN INCINERATOR
INCL INCLUDE (D), (ING)
ID INSIDE DIAMETER / INSIDE DIMENSION
ICS INSULATED COMPOSITE SIDING
INSF INSULATED FILL
IG INSULATED GLASS
INSUL INSULATE (D), (ION)
INT INTERIOR
INTM INTERMEDIATE
ISFP INTUMESCENT SPRAY-ON FIREPROOFING

INV INVERT
INV EL INVERT ELEVATION
IPS IRON PIPE SIZE

J
JAN JANITOR
JAN CLO JANITOR'S CLOSET
JNT JOINT
JNT BK JOINT BACKER
J JOIST

K
KPL KICKPLATE
KIT KITCHEN
KO KNOCKOUT

L
LBL LABEL
LAB LABORATORY
LAD LADDER
LB LAG BOLT
LAM LAMINATE (D)
LAV LAVATORY
LH LEFT HAND
L LENGTH
LT LIGHT
LT CTRL LIGHT CONTROL
LTG LIGHTING
LP LIGHTPROOF
LT WT LIGHT WEIGHT
LWC LIGHTWEIGHT CONCRETE
LMST LIMESTONE
LF LINEAR FEET
LIN LINOLEUM
LIN TILE LINOLEUM TILE
LTL LINTEL
LL LIVE LOAD
LKR LOCKER
LLH LONG LEG HORIZONTAL
LLV LONG LEG VERTICAL
LVR LOUVER
LPT LOW POINT

M
MACH MACHINE
MAG MAGNETIC
MDH MAGNETIC DOOR HOLDER
MH MANHOLE
MFR MANUFACTURE (R)
MRB MARBLE BASE
MRT MARBLE THRESHOLD
MRF MARBLE FLOOR
MB MARKER BOARD
MAS MASONRY
MO MASONRY OPENING
MATL MATERIAL (S)
MAX MAXIMUM
MECH MECHANICAL
MC MEDICINE CABINET
MED MEDIUM
MDF MEDIUM DENSITY FIBERBOARD
MDO MEDIUM DENSITY OVERLAY
MBR MEMBER
MEMB MEMBRANE
MTL METAL
MD METAL DECK
MTFR METAL FURRING
MTL PNL METAL PANEL
MRD METAL ROOF DECK
MT METAL THRESHOLD
MWS METAL WINDOW SYSTEM
m METER (S)
MEZZ MEZZANINE
MS MIDDLE SCHOOL
mm MILLIMETER (S)
MLWK MILLWORK
MIN MINIMUM
MIRR MIRROR
MISC MISCELLANEOUS
MOD MODULE
MRG MOISTURE RESISTANT GYPSUM WALLBOARD
MR MOISTURE RETARDANT
MLDG MOLDING, MOULDING
MOPB MOP HOLDER
MTD MOUNTED
MTG MOUNTING
MVBL MOVABLE
MULL MULLION
MWF MULTI COLOR WALL FINISH

N
NL NAILABLE
NAT NATURAL
NR NOISE REDUCTION
NRC NOISE REDUCTION COEFFICIENT
NOM NOMINAL
NMT NONMETALLIC
N NORTH
NE NORTHEAST
NW NORTHWEST
NA NOT APPLICABLE
NIC NOT IN CONTRACT
NTS NOT TO SCALE
NO NUMBER

O
OBS OBSCURE
OFF OFFICE
OC ON CENTER (S)
OP OPAQUE
OPNG OPENING
OPP OPPOSITE
OPH OPPOSITE HAND
OSB ORIENTED STRAND BOARD
OZ OUNCE
OD OUTSIDE DIAMETER / OUTSIDE DIMENSIO
OA OVERALL
OVH OVERHEAD
OH DR OVERHEAD DOOR
OF/CI OWNER FURNISHED, CONTRACTOR INSTALLED
OF/OI OWNER FURNISHED, OWNER INSTALLED

P
PT PAINT (ED), POINT
PMTL PAINTED METAL
PT STL PAINTED STEEL
PR PAIR
PNL PANEL
PB PANIC BAR
PTD PAPER TOWEL DISPENSER
PTDWR (COMBINATION) PAPER TOWEL DISPENSER / WASTE RECEPTACLE
PAR PARALLEL
PRKG PARKING
PBD PARTICLE BOARD
PTN PARTITION
P&M PATCH AND MATCH
PV PAVE(D), (ING)

P (CONT.)
PERF PERFORATE (D)
PERIM PERIMETER
PERM PERMANENT
PERP PERPENDICULAR
PE PHYSICAL EDUCATION
PLAS PLASTER
PLAM PLASTIC LAMINATE
CNTR-PL PLASTIC LAMINATE COUNTER TOP
PL PLATE
PL GL PLATE GLASS
PLBG PLUMBING
PLYWD PLYWOOD
PT POINT, PAINT (ED)
PCMU POLISHED CONCRETE MASONRY UNIT
PISO POLYISOCYANURATE
PVC POLYVINYL CHLORIDE
PCF POUNDS PER CUBIC FOOT
PLF POUNDS PER LINEAR FOOT
PSF POUNDS PER SQUARE FOOT
PSI POUNDS PER SQUARE INCH
PAF POWDER ACTUATED FASTENER
PCC PRECAST CONCRETE
PREFAB PREFABRICATED
PREFIN PREFINISHED
PMF PREFINISHED METAL FASCIA
PREFMD PREFORMED
PMS PREFORMED METAL SIDING
PRE-K PRE-KINDERGARTEN
PPT PRESSURE PRESERVATIVE TREATED
PSC PRESTRESSED CONCRETE
PROJ PROJECT, PROJECTION
PL PROPERTY LINE

Q
QTY QUANTITY
QT QUARRY TILE

R
RAB RABBET(ED)
RAD RADIATOR
R RADIUS
RLG RAILING
RWL RAIN WATER LEADER
RBT REBATE
RECD RECEIVED
RECT RECTANGULAR
REF REFERENCE
RFL REFLECT (ED), (IVE), (OR)
RCP REFLECTED CEILING PLAN
REFG REFRIGERATOR
REG REGISTER
RENOV RENOVATION
REQD REQUIRED
RESIL RESILIENT
RB RESILIENT BASE
RAF RESILIENT ATHLETIC FLOORING
RF RESILIENT FLOORING
RET RETURN
RA RETURN AIR
RVS REVERSE (SIDE)
REV REVISION (S), REVISED
RH RIGHT HAND
ROW RIGHT OF WAY
R RISER
RVT RIVET
RB HK ROBE HOOK
RD ROOF DRAIN
RTU ROOF TOP UNIT
RF ROOFING
RM ROOM
RO ROUGH OPENING
RBR RUBBER
RFL RUBBER FLOORING
RST RUBBER STAIR TREAD, RISER & LANDING
RBL RUBBLE STONE

S
SFGL SAFETY GLASS
SANO SANITARY NAPKIN DISPOSAL
SNV SANITARY NAPKIN VENDOR
SCHED SCHEDULE
STEM SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH
STEAM SCIENCE, TECHNOLOGY, ENGINEERING, ARTS, AND MATH
SCRN SCREEN
SLNT SEALANT
S&BR SEALANT AND BACKER ROD
SLR SEALER
SJT SEISMIC JOINT
SJC SEISMIC JOINT COVER
SHTHG SHEATHING
SHT GL SHEET GLASS
SHT LIN SHEET LINOLEUM
SV SHEET VINYL
SHV SHELF, SHELVING
SHO SHORE, (D), (ING)

S (CONT.)
SC SHOWER CURTAIN ROD & CURTAIN
SGB SHOWER GRAB BAR
SIM SIMILAR
SIM OH SIMILAR / OPPOSITE HAND
SPMR SINGLE PLY MEMBRANE ROOF
SKLT SKYLIGHT
SLV SLEEVE
SD STORM DRAIN, SOAP DISPENSOR
SC SOLID CORE
SSM SOLID SURFACE MATERIAL
STC SOUND TRANSMISSION COEFFICIENT
S SOUTH
SE SOUTHEAST
SW SOUTHWEST
SPKR SPEAKER
SPCL SPECIAL
SPEC SPECIFICATION (S)
SFRM SPRAY-APPLIED FIRE-RESISTIVE MATERIAL
SPKLR SPRINKLER
SQ SQUARE
SF SQUARE FEET
SS STAINLESS STEEL
CNTR-SS STAINLESS STEEL COUNTER TOP
STD STANDARD
SSR STANDING SEAM ROOFING
SDF STATIC DISSIPATIVE FLOORING
SDT STATIC DISSIPATIVE TILE
STA STATION
STL STEEL
STOR STORAGE
SD STORM DRAIN, SOAP DISH
SCT STRUCTURAL CLAY TILE
STRUCT STRUCTURE (AL)
SC-ACP SUBCONTRACTOR - ACOUSTIC CEILINGS
SC-ELECT SUBCONTRACTOR - ELECTRICAL
SC-ELEV SUBCONTRACTOR - ELEVATORS
SC-FPROT SUBCONTRACTOR - FIRE PROTECTION
SC-GLASS SUBCONTRACTOR - GLASS AND GLAZING
SC-HVAC SUBCONTRACTOR - HEATING, VENTILATING, AND AIR CONDITIONING
SC-PLAST SUBCONTRACTOR - LATH AND PLASTER
SC-STONE SUBCONTRACTOR - MARBLE AND STONE
SC-MASN SUBCONTRACTOR - MASONRY
SC-WIND SUBCONTRACTOR - METAL WINDOWS
SC-MTLS SUBCONTRACTOR - MISCELLANEOUS METALS
SC-PAINT SUBCONTRACTOR - PAINTING
SC-PLUMB SUBCONTRACTOR - PLUMBING
SC-RESFL SUBCONTRACTOR - RESILIENT FLOORING
SC-ROOF SUBCONTRACTOR - ROOFING, FLASHING, AND SHEET METAL
SC-TZZO SUBCONTRACTOR - TERRAZZO
SC-TILE SUBCONTRACTOR - TILE
SC-WDMC SUBCONTRACTOR - WATERPROOFING, DAMPPROOFING, AND CAULKING
SUSP SUSPENDED
SYMM SYMMETRY (ICAL)
SYNTH SYNTHETIC
SYS SYSTEM

T
TB TACKBOARD
TKS TACK STRIP
TEL TELEPHONE
TV TELEVISION
TMPD TEMPERED
TEMP HDBD TEMPERED HARDBOARD
TD TERRA DOTTA
TC TERRA COTTA
TER TERRAZZO
TERB TERRAZZO PRECAST BASE
THK THICKNESS
THRES THRESHOLD
TRS TILE REDUCER STRIP
TPD TOILET PAPER DISPENSER
TPTN TOILET PARTITION
TOL TOLERANCE
T&G TONGUE AND GROOVE
TOB TOP OF BEAM
TOB TOP OF BRICK
TO BRKS TOP OF BRICK SHELF
TOW TOP OF CONCRETE WALL
TOD TOP OF DECK
TO FL TOP OF FLOOR
TOF TOP OF FOOTING
TO FDN TOP OF FOUNDATION
TO SLAB TOP OF SLAB
TO STL TOP OF STEEL
TOW TOP OF WALL
TWB TOWEL BAR
XFMR TRANSFORMER
TGS TRANSLUCENT GLAZING SYSTEM
T TREAD
TS TUBE STEEL
TYP TYPICAL

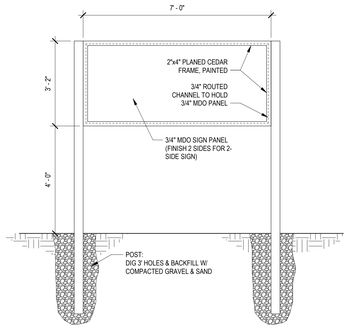
U
UC UNDERCUT
UNDLMT UNDERLAYMENT
UOD UNDERSIDE OF DECK
UL UNDERWRITERS LABORATORIES
UNFIN UNFINISHED
UV UNIT VENTILATOR
UNO UNLESS NOTED OTHERWISE
UR URINAL

V
VR VAPOR RETARDER
VR/AIB VAPOR RETARDER/ AIR INFILTRATION BARRIER
VNR VENEER
VIF VERIFY IN FIELD
VRM VERMICULITE
VERT VERTICAL
VEST VESTIBULE
VAT VINYL ASBESTOS TILE
VB VINYL BASE
VCT VINYL COMPOSITION TILE
VWC VINYL WALL COVERING
VIS PNL VISION PANEL

W
W/ WITH
WSCT WAINSCOT
WOC WALK OFF CARPET
WOM WALK OFF MAT
WG WALK-OFF GRILLE (ALUMINUM)
WH WALL HUNG
WH WALL HYDRANT
WT WALL TO WALL
WR WASTE RECEPTACLE, WATER REPELLENT
WC WATER CLOSET
WP WATERPROOFING, WORKING POINT
WR WATER REPELLENT, WASTE RECEPTACLE
WS WEATHERSTRIP, (ING)
WWF WELDED WIRE FABRIC
W WEST, WIDE, WIDTH
WHB WHEEL BUMPER
W WIDE, WIDTH, WEST
WDW WINDOW
WS WINDOW SHADE
WGL WIRE GLASS
WM WIRE MESH
W/I WITH
W/O WITHOUT
WD WOOD
WB WOOD BASE
WP WORKING POINT, WATER PROOFING
WI WROUGHT IRON

X
XFMR TRANSFORMER

PROJECT SIGN



NOTES
1. ALL FRAME POSTS SHALL BE 4" x 4" PLANED CEDAR , PAINTED.
2. THE MDO PANEL SHALL BE PRIMED AND PAINTED, BOTH SIDES.
3. SIGN SHALL BE CONSTRUCTED SO THAT THE PANEL FITS INTO THE ROUTED CHANNEL AND ALL FASTENERS ARE NOT VISIBLE.
4. FASTENERS SHALL NOT PENETRATE MDO PANEL.

SYMBOLS LEGEND

- DATUM POINT
- NEW CONSTRUCTION GRID BUBBLE
- EXISTING CONSTRUCTION GRID BUBBLE
- CENTER LINE
- ITEMS BELOW CUT LINE - HIDDEN
- ITEMS ABOVE CUT LINE - OVERHEAD
- ROOM NAME / ROOM NUMBER (ROOM NAME 200A-A)
- DOOR NUMBER (100)
- WINDOW TAG (W4)
- BORROWED LIGHT TAG (BL3)
- CURTAIN WALL TAG (CW1)
- STOREFRONT TAG (SF1)
- WALL TYPE TAG
- INDICATES PARTIAL HEIGHT OF WALL IN INCHES
- WALL TYPE - SEE AG0.02 FOR TYPES (X1.11)
- INDICATES ANY RATING OF WALL
- ELEVATION CALLOUT (1 / A101)
- BUILDING SECTION CALLOUT (1 / A101)
- DETAIL CALLOUT (1 / A101)
- MULTIPLE ELEVATION CALLOUT (A9.10)
- REVISION TAG
- REVISED CONTENT

GENERAL NOTES

1. ABBREVIATIONS ON THIS SHEET APPLY TO ARCHITECTURAL DRAWINGS ONLY. THE LIST OF ABBREVIATIONS IS COMPREHENSIVE AND NOT RESTRICTED TO THOSE USED FOR THIS PROJECT – NOT ALL ABBREVIATIONS WILL BE FOUND WITHIN THE DRAWINGS.
2. LEGEND SYMBOLS ON THIS SHEET APPLY TO ARCHITECTURAL DRAWINGS ONLY. THE SYMBOLS LEGEND IS COMPREHENSIVE AND NOT RESTRICTED TO THOSE USED FOR THIS PROJECT – NOT ALL SYMBOLS WILL BE FOUND WITHIN THE DRAWINGS.
3. REPRESENTATION OF MATERIALS PATTERNS IN DRAWINGS AND DETAILS MAY BE AT A DIFFERENT APPARENT SCALE THAN THE THOSE SHOWN ON THE MATERIALS LEGEND ON THIS SHEET.
4. CONTRACTORS REQUIRING SLEEVES, BOX-OUTS, CORED HOLES, ETC. IN FLOORS AND WALLS TO FACILITATE THE INSTALLATION OF THEIR WORK SHALL FULLY COORDINATE THE LOCATION AND REQUIREMENTS WITH THE CM/GC AND ALL PERTINENT AND RELATED TRADES.
5. THE CONTRACTOR REQUIRING SLEEVES OR BOX-OUTS SHALL PROVIDE THOSE DEVICES TO THE APPROPRIATE TRADE FOR INSTALLATION.
6. MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, TECHNOLOGY, SECURITY, AND OTHER SIMILAR CONTRACTORS SHALL FULLY COORDINATE THE LOCATION AND INSTALLATION OF EQUIPMENT, PIPING, SUPPORTS, HOUSEKEEPING CURBS, DRAINS, DUCTWORK, ETC. TO PROVIDE A COMPLETE AND OPERATIONAL BUILDING. THE DRAWINGS DO NOT DEPICT THE INSTALLATION OF SUCH ITEMS WITH EXACT LOCATION; THEREFORE THE CONTRACTORS SHALL PERFORM THIS COORDINATION, AND THE OWNER WILL NOT CONSIDER ANY ADDITIONAL COSTS RELATED TO THE FIELD CONFLICTS RESULTING FROM FAILURE OF THE CONTRACTORS TO COORDINATE THEIR WORK.
7. CONTRACTORS REQUIRING ACCESS DOORS AND CLEANOUTS IN THE FINISHED SPACES SHALL PROVIDE DEVICES AND COORDINATE THE LOCATION WITH ALL AFFECTED TRADES. ACCESS DOORS IN FINISHED CEILINGS AND WALLS SHALL BE DOCUMENTED IN DETAIL ON COORDINATION DRAWINGS AND SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO PLACEMENT.
8. ALL CONTRACTORS PROVIDING "BUILT-IN" ITEMS,(INCLUDING BUT NOT LIMITED TO EQUIPMENT, CASEWORK, MILLWORK, WINDOWS, STOREFRONT AND CURTAIN WALL ASSEMBLIES, DOORS, FIELD INSTALLED GLAZING) SHALL FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE THERMAL AND ACOUSTICAL REQUIREMENTS OF THE FLOOR AND ROOF CONSTRUCTION, WALLS AND PARTITIONS BY INSTALLING PROPER SEALS AND CLOSURES AT THE PERIMETER OF ALL OPENINGS.
10. LOCATION OF ALL FLOOR DRAINS AND TRENCH DRAINS MUST BE COORDINATED WITH EQUIPMENT LAYOUTS AND RELATED TRADES.
11. AT ALL EXPOSED CONCRETE WALLS PROVIDE 3/4" x 3/4" CHAMFER AT OUTSIDE CORNERS (HORIZONTAL AND VERTICAL), UNLESS NOTED OTHERWISE.
12. WALL VR/AIB SHALL BE CONTINUOUS AND SHALL BE SEALED AT ALL EDGES OF WALL AND PENETRATIONS. REFER TO SPECIFIC DETAILS FOR TERMINATIONS AT WINDOWS, DOORS, CURTAIN WALL, TOP AND BOTTOM OF WALL, ETC. REFER TO SPECIFICATIONS AND MANUFACTURER RECOMMENDATIONS FOR ITEMS NOT SPECIFICALLY DETAILED.
13. ALL CMU DIMENSIONS ARE TO THE FACE OF CMU. ALL METAL STUD PARTITION DIMENSIONS ARE TO THE FACE OF STUD UNLESS OTHERWISE NOTED.

MATERIALS LEGEND

- EARTH
- FILL
- CONCRETE PRE-CAST CONCRETE
- CONCRETE MASONRY UNITS
- BRICK
- SAND GRANULAR FILL / MORTAR
- STEEL
- FLUID APPLIED OR SHEET MEMBRANE MATERIAL
- REINFORCING BARS
- PLASTER/LATH
- GYPSUM WALL BOARD
- PLYWOOD
- WOOD BLOCKING CONTINUOUS (NOM. DIM.)
- WOOD SHIMS SPACED BLOCKING
- BATT INSULATION
- MINERAL WOOL INSULATION
- RIGID INSULATION
- REINFORCING - WWF
- FINISHED HARDWOOD
- ACOUSTIC CEILING PANEL
- RESIN BASED SOLID MATERIAL
- CARPET
- STONE, GRAVEL
- SPRAY FOAM INSULATION
- CEMENT - FIBER
- STONE/GRANITE/MARBLE
- GLASS

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

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SCHEMATIC DESIGN
04/24/2025

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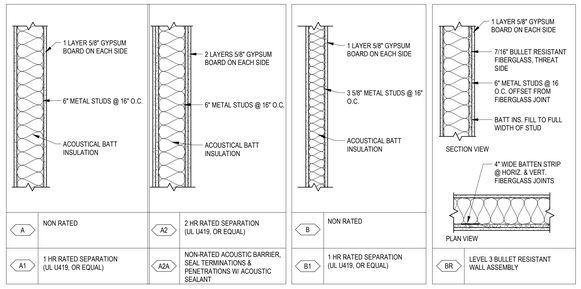
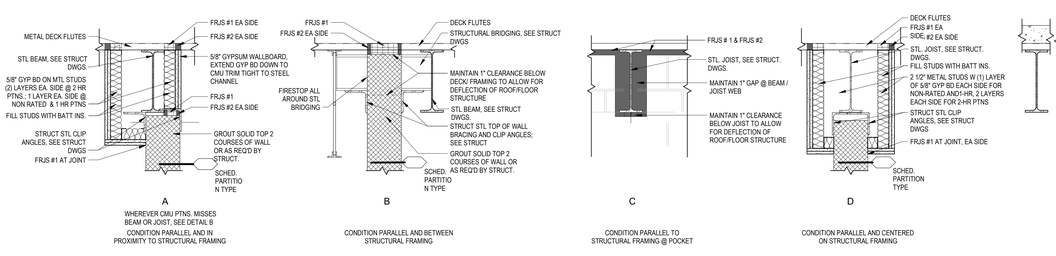
KEY PLAN

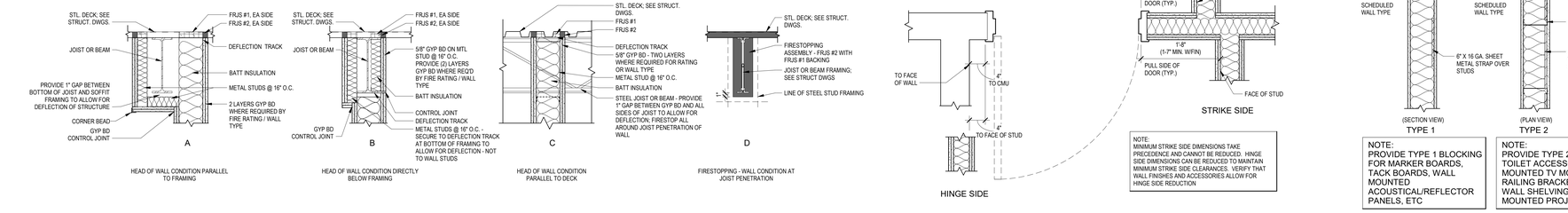
ORIENTATION AND SCALE:

SHEET TITLE:
ABBREVIATIONS SYMBOLS MATERIALS AND LEGEND

SHEET NUMBER:
AG0.01







4 TYPICAL TOP OF RATED CMU PARTITION DETAILS
1" = 1'-0"

1 TYPICAL TOP OF RATED STUD PARTITION DETAILS
1" = 1'-0"

2 TYPICAL DOOR OFFSETS (U.N.O)
1" = 1'-0"

5 TYPICAL BLOCKING DETAIL
1" = 1'-0"

3 TYPICAL DIMENSION DETAIL
1" = 1'-0"

TYPICAL PARTITION GENERAL NOTES

1. ALL PARTITIONS SHALL EXTEND TO THE UNDERSIDE OF THE METAL ROOF DECK OR FLOOR DECK ABOVE, UNLESS SPECIFICALLY INDICATED AS OTHERWISE ON DRAWINGS. REFER TO PARTITION TERMINATION DETAILS AT SHEET AG0.02.
2. ACOUSTIC INSULATION SHALL BE PROVIDED IN ALL NON-FIRE RATED PARTITIONS AS INDICATED BY PARTITION TYPES. INSULATION SHALL EXTEND MINIMUM 6 INCHES ABOVE THE HIGHEST ADJACENT CEILING. INSULATION IN FIRE RATED PARTITIONS SHALL BE PROVIDED PER THE U.L. ASSEMBLY DETAILS INDICATED.
3. PROVIDE CONTROL JOINTS IN GYPSUM WALL BOARD PARTITIONS AT 30 FEET MAXIMUM SPACING, WHETHER OR NOT THE DRAWINGS DEPICT CONTROL JOINTS. LOCATE JOINTS AT TOP CORNERS OF DOOR AND BORROWED LIGHT FRAMES TO THE GREATEST EXTENT POSSIBLE.
4. WHERE GYP BD CONTROL JOINTS OCCUR AWAY FROM DOOR OR BORROWED LIGHT FRAMES, JOINTS SHALL EXTEND THE FULL HEIGHT OF THE FRAMED WALL, WHETHER OR NOT CONCEALED BY SURFACE INSTALLED EQUIPMENT OR APPLIED TREATMENTS, OR CEILINGS.
5. PROVIDE FIRE RATED CONTROL JOINTS MATCHING THE REQUIRED RATING OF THE WALL ASSEMBLY AT FIRE RATED WALLS. REFER TO CONTROL JOINT DETAILS AT SHEET AG0.02.
6. PROVIDE MASONRY CONTROL JOINTS AT MAXIMUM 24 FOOT SPACING, AND WHERE INDICATED ON DRAWINGS. PROVIDE BRICK CONTROL JOINTS WITHIN 24 INCHES OF EACH OUTWARD CORNER OF EXTERIOR WALLS. AT INWARD CORNERS, PROVIDE CONTROL JOINTS AT THE CHANGE IN SURFACE PLANE ON THE "LEAST VISIBLE" SIDE OF THE CORNER.
7. THE INTEGRITY OF GYP BD FIRE RATED PARTITIONS SHALL BE MAINTAINED WHEREVER RECESSED EQUIPMENT, DEVICES, SPECIALTIES, OR OTHER COMPONENTS OF MORE THAN 20 SQUARE INCHES IN FACE AREA OF RECESS OR PENETRATION OCCURS. WHERE SUCH RECESSED EQUIPMENT DOES NOT FEATURE A FIRE RATED CABINET OR ENCLOSURE MATCHING THE FIRE RATING OF THE WALL BEING PENETRATED, THE RECESS SHALL BE LINED WITH LAYER(S) OF GYPSUM WALL BOARD TO PROVIDE AN EQUIVALENT FIRE RATING, THROUGHOUT THE RECESS, OR FIRESTOPPED WITH AN APPROVED ASSEMBLY SUITABLE TO THE PENETRATION SIZE, PENETRATING ITEM, AND REQUIRED RATING. THE CONTRACTOR RESPONSIBLE FOR THE RECESSED EQUIPMENT SHALL COORDINATE THE RECESS REQUIREMENTS, DEPTH, AND DETAILING OF THE OPENING WITH THE CM/GC TO CONFIRM THAT ADEQUATE WALL DEPTH EXISTS. FIRESTOPPING MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR REQUIRING THE PENETRATION PER THE REQUIREMENTS OF SECTION 07 84 00. IF A RATED CABINET IS NOT PROVIDED THE COST OF LINING THE RECESS WITH GYPSUM WALL BOARD OR PROVISION OF FIRESTOPPING SHALL BE PAID BY THE CONTRACTOR RESPONSIBLE FOR THE RECESSED EQUIPMENT.
8. LINTELS SHALL BE PROVIDED AT OPENINGS IN MASONRY PARTITIONS FOR DOORS, WINDOWS, LOUVERS, RECESSED EQUIPMENT INCLUDING, BUT NOT LIMITED TO UNIT HEATERS, CONVECTORS, FIRE HOSE CABINETS, TOILET ACCESSORIES, AND DUCTWORK PENETRATIONS THAT ARE OVER 8 INCHES WIDE. PROVIDE LOOSE STEEL LINTELS (FURNISHED BY SECTION 05 00 01 TO SECTION 04 00 01 FOR INSTALLATION) AT PENETRATIONS NOT EXPOSED TO VIEW OR IN CONCEALED SPACES. AT LOCATIONS WHERE MASONRY IS EXPOSED TO VIEW, PROVIDE UNIT MASONRY LINTELS UNLESS SPANS REQUIRE OTHERWISE. REFER TO STRUCTURAL DRAWINGS FOR MASONRY LINTEL AND LOOSE STEEL LINTEL SCHEDULES AND TYPICAL DETAIL REQUIREMENTS.
9. ALL EXPOSED VERTICAL CORNERS OF CONCRETE MASONRY UNITS SHALL FEATURE RADIUS CORNER BLOCK, UNLESS SPECIFICALLY INDICATED AS SQUARE OR OTHERWISE IN DETAILS.
10. FIRE RESISTANCE RATING FOR MASONRY WALLS SHALL BE ACHIEVED BY ONE OF THE FOLLOWING METHODS, WHICH SHALL BE AT THE CONTRACTOR'S OPTION. THE CONTRACTOR SHALL DOCUMENT WHICH COMPLIANCE METHOD IS PROPOSED AS PART OF THE PRODUCT SUBMITTALS:
    a. USE OF MASONRY UNITS IN THICKNESS INDICATED, BEARING U.L. TESTING APPROVAL (AS A STAND-ALONE SYSTEM WITHOUT APPLIED FINISHES) FOR THE RATINGS INDICATED.
    b. USE OF MASONRY UNITS IN THICKNESS INDICATED, OF COMPOSITION, DENSITY, AND FACE THICKNESS TO MEET THE REQUIREMENTS OF TABLE 721.3.2 "MINIMUM EQUIVALENT THICKNESS OF BEARING OR NONBEARING CONCRETE MASONRY WALLS" OF THE MA STATE BUILDING CODE (IBC), BASED ON THE EQUIVALENT THICKNESS OF THE HOLLOW, NON-GROUT FILLED UNITS DETERMINED IN ACCORDANCE WITH ASTM C140.
    c. USE OF MASONRY UNITS IN SIZES INDICATED, WITH AIR SPACES AND CELLS WITHIN BLOCK FILLED SOLID WITH SAND, PEA-STONE, CRUSHED STONE, SLAG, OR OTHER MATERIALS AS DESCRIBED IN SECTION 721.3.1.4, MEETING THE ASTM TESTS DESCRIBED THEREIN, SUCH THAT THE TOTAL THICKNESS OF THE MASONRY UNITS MEETS THE EQUIVALENT THICKNESS REQUIREMENTS LISTED IN TABLE 721.3.2 OF THE MA STATE BUILDING CODE (IBC) FOR THE BLOCK COMPOSITION AND AGGREGATES PROPOSED FOR USE BY THE CONTRACTOR.
    d. USE OF MASONRY UNITS IN THICKNESS INDICATED, WITH ALL AIR SPACES AND CORES GROUTED SOLID, SUCH THAT THE TOTAL THICKNESS OF THE MASONRY UNITS MEETS THE EQUIVALENT THICKNESS REQUIREMENTS LISTED IN TABLE 721.3.2 OF THE MA STATE BUILDING CODE (IBC) FOR THE BLOCK COMPOSITION AND AGGREGATES PROPOSED FOR USE BY THE CONTRACTOR.
11. ALL FIRE RATED PARTITIONS SHALL EXTEND TO UNDERSIDE OF DECK ABOVE, WITH ALL GAPS AND DECK FLUTES AT TOPS OF WALLS FILLED WITH FIRE RESISTANT JOINT SEALANTS (FRJS).
    a. FRJS1 – PACKING MATERIAL: MINIMUM 4.0 PCF MINERAL WOOL INSULATION, IN THICKNESS 1 INCH LESS THAN OVERALL WALL THICKNESS OR AS REQUIRED BY THE SELECTED U.L. ASSEMBLY SUITABLE TO THE WALL TYPE AND REQUIRED RATING (WHICHEVER IS GREATER). TIGHTLY PACK MINERAL WOOL INTO FLUTES OF STEEL DECKING AND GAP AT TOP OF WALL TO FILL GAPS COMPLETELY AND FORM A PERMANENT FORM TO SERVE AS BACKING FOR FRJS2.
    b. FRJS2: FIRESTOPPING SEALANT: MINIMUM 1/2" THICK MATERIAL INSTALLED ON EACH SIDE OF JOINT TO COVER FRJS1 COMPLETELY AND SPAN BUILDING JOINT, WITH SURFACE OF SEALANT FLUSH WITH SURFACE OF WALL. WHERE EXPOSED TO VIEW FIRESTOPPING SEALANT SHALL BE PAINTABLE AND INSTALLATION SHALL BE SUITABLE FOR EXPOSURE TO VIEW IN FINISHED SPACES.
    c. SELECTION OF PROPRIETARY MATERIALS AND U.L. APPROVED ASSEMBLIES APPROPRIATE TO REQUIRED RATINGS AND CONSTRUCTION IS AT THE CONTRACTOR'S OPTION, HOWEVER **ALL FIRESTOPPING MATERIALS FOR THE PROJECT SHALL BE PROVIDED FROM THE SAME MANUFACTURER REGARDLESS OF WHICH TRADE OWNS THE FIRESTOPPING WORK**. THE CM/GC SHALL BE RESPONSIBLE FOR COORDINATING THIS REQUIREMENT WITH ALL TRADES.
12. ALL GAPS AT BUILDING JOINTS AND THROUGH PENETRATIONS AT WALLS THAT ARE INDICATED AS "SMOKE RATED" SHALL BE FILLED WITH FRJS #1 AND SEALED ON ONE SIDE WITH FRJS #2 AS DEFINED ABOVE, SUCH THAT GAPS ARE SEALED TO PREVENT THE PASSAGE OF SMOKE.
13. ALL GAPS AT BUILDING JOINTS AND THROUGH-PENETRATIONS OF NON-FIRE RATED WALLS SHALL BE SEALED TO REDUCE NOISE TRANSFER. AT CONTRACTOR'S OPTION, PROVIDE ACOUSTIC FOAM INSULATION PER SECTION 07 21 19, OR PACK CONTINUOUS MINERAL WOOL INSULATION TO FILL GAPS TO FULL THICKNESS OF WALL.

TYPICAL PARTITION NOTES
1/8" = 1'-0"

BACK-UP WALL CONSTRUCTION
- X1 6" CFMF
- X2 8" CFMF
- X3 8" CMU
- X4 12" CMU
- X5 10" CFMF

X2.11

CLADDING GROUP
- 1 MASONRY VENEER
- 2 METAL PANEL VENEER / CLADDING
- 3 CEMENT-FIBER SYSTEMS
- 4 METAL SIDING

CLADDING TYPE
SEE WALL TYPES FOR CLADDING
SEE ELEVATIONS FOR COLOR & PATTERN

EXTERIOR WALL TYPE NUMBERING SYSTEM
1/8" = 1'-0"

GYPSUM WALL BOARD SCHEDULE

1. WHERE METAL STUD AND GYPSUM WALL BOARD PARTITIONS ARE INDICATED ON THE DRAWINGS USE THE FOLLOWING TABLE IN CONJUNCTION WITH THE ROOM FINISH SCHEDULE TO DETERMINE THE TYPE OF GYPSUM WALL BOARD REQUIRED

GYP BD1	ABUSE RESISTANCE	USE ON VERTICAL SURFACES BELOW 10 FEET UNLESS NOTED OTHERWISE
GYP BD2	NON REINFORCED	USE ON VERTICAL SURFACES ABOVE 10 FEET TO UNDERSIDE OF DECK UNLESS NOTED OTHERWISE
GYP BD3	MOLD AND ABUSE RESISTANT	USE IN ALL TOILET ROOMS, LOCKER ROOMS, KITCHENS AND OTHER AREAS WHICH ARE SUBJECT TO MOISTURE* (VERTICAL AND HORIZONTAL)
GYP BD4	IMPACT RESISTANT	USE ON VERTICAL SURFACES UP TO 10 FEET ABOVE FLOOR IN CIRCULATION AND COMMON USE AREAS (INCLUDING BUT NOT LIMITED TO CORRIDORS, AUDITORIUMS CAFETERIAS, GYMNASIUMS)
GYP BD5	EXTERIOR GYPSUM SHEATHING	USE ON ALL EXTERIOR WALLS WITH COLD FORMED METAL FRAMING BACK-UP
GYP BD6	INTERIOR CEILING BOARD	USE ON ALL INTERIOR GYP-BD CEILINGS, UNLESS THE LOCATION REQUIRES GYP BD3 DUE TO MOISTURE
GYP BD7	(NOT USED)	-
GYP BD8	CEMENTITIOUS BOARD	USE ON ALL SURFACES TO RECEIVE TILE (WET OR DRY)
GYP BD9	FLEXIBLE	USE IN AREAS THAT REQUIRE CURVED WALLS OR SOFFITS, ETC.
?	SHAFTWALL AND COREBOARD	?

*MODERATE AND HIGH MOISTURE AREAS SHALL BE AS DEFINED BY THE GYP BD MANUFACTURER FOR EACH TYPE OF BOARD. COORDINATE WITH MANUFACTURERS RECOMMENDED USES AND/OR MOISTURE LIMITATIONS.

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PROJECT NUMBER: 23-0847

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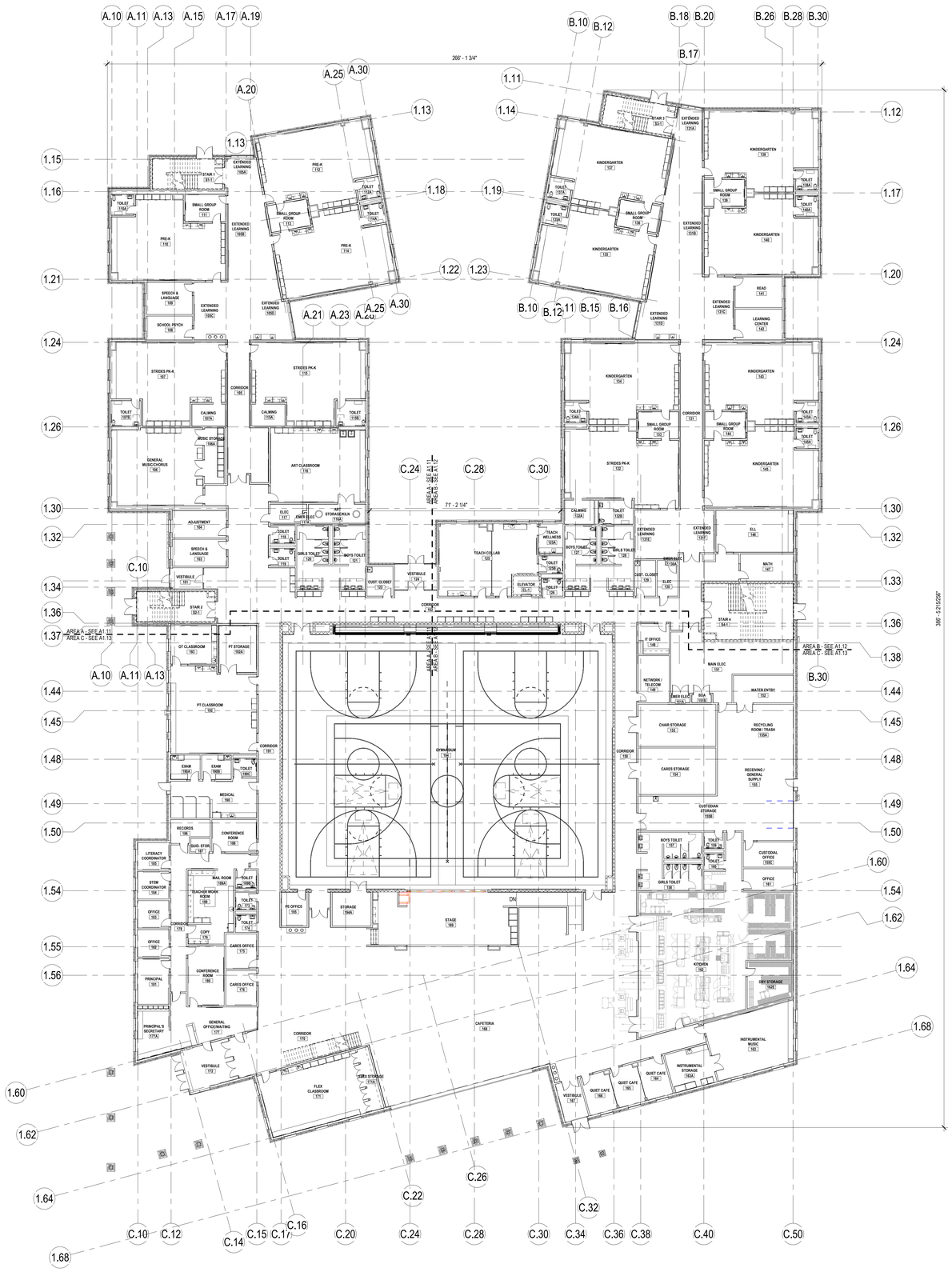
KEY PLAN

ORIENTATION AND SCALE:

SHEET TITLE:
WALL TYPES, NOTES AND DETAILS

SHEET NUMBER:
AG0.02



PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
3. WHERE COLUMN LINES ARE SHOWN INSIDE WALLS AND PARALLEL TO THE WALL IT SHALL BE ASSUMED THAT THE WALL IS CENTERED ON THE COLUMN LINE UNLESS DIMENSIONED OTHERWISE.
4. WHERE ENLARGED PLANS ARE INDICATED, REFER TO ENLARGED PLAN SHEET FOR DIMENSIONS, WALL TYPES, AND DETAIL REFERENCES.
5. REFER TO HORIZONTAL CONTROL PLANS AND STRUCTURAL DRAWINGS FOR SLAB INFORMATION (INCLUDING DEPRESSIONS, EDGE DIMENSIONS, AND SHAFT OPENINGS).

LEVEL 1 ROOM SCHEDULE

ROOM #	ROOM NAME	AREA
103	SPEECH & LANGUAGE	200 SF
104	ADJUSTMENT	200 SF
105A	EXTENDED LEARNING	43 SF
105B	EXTENDED LEARNING	233 SF
105C	EXTENDED LEARNING	140 SF
105D	EXTENDED LEARNING	215 SF
105E	EXTENDED LEARNING	159 SF
106	GENERAL MUSIC/CHORUS	980 SF
106A	MUSIC STORAGE	150 SF
107	STRIDES PK-K	1100 SF
107A	CALMING	100 SF
107B	TOILET	105 SF
108	SCHOOL PSYCH	150 SF
109	SPEECH & LANGUAGE	200 SF
110	PRE-K	1100 SF
110A	TOILET	65 SF
111	SMALL GROUP ROOM	150 SF
112	PRE-K	1100 SF
112A	TOILET	65 SF
113	SMALL GROUP ROOM	150 SF
114	PRE-K	1100 SF
114A	TOILET	65 SF
115	STRIDES PK-K	1100 SF
115A	CALMING	100 SF
115B	TOILET	105 SF
116	ART CLASSROOM	980 SF
116A	ART STORAGE/KILN	150 SF
125	TEACH COLLAB	900 SF
125A	TEACH WELLNESS	100 SF
131A	EXTENDED LEARNING	41 SF
131B	EXTENDED LEARNING	158 SF
131C	EXTENDED LEARNING	123 SF
131D	EXTENDED LEARNING	179 SF
131E	EXTENDED LEARNING	159 SF
131F	EXTENDED LEARNING	81 SF
132	STRIDES PK-K	1100 SF
132A	CALMING	100 SF
132B	TOILET	114 SF
133	SMALL GROUP ROOM	150 SF
134	KINDERGARTEN	1100 SF
134A	TOILET	65 SF
135	KINDERGARTEN	1100 SF
135A	TOILET	65 SF
136	SMALL GROUP ROOM	150 SF
137	KINDERGARTEN	1100 SF
137A	TOILET	65 SF
138	KINDERGARTEN	1100 SF
138A	TOILET	65 SF
139	SMALL GROUP ROOM	150 SF
140	KINDERGARTEN	1100 SF
140A	TOILET	65 SF
141	READ	200 SF
142	LEARNING CENTER	200 SF
143	KINDERGARTEN	1100 SF
143A	TOILET	65 SF
144	SMALL GROUP ROOM	150 SF
145	KINDERGARTEN	1100 SF
145A	TOILET	65 SF
146	ELL	450 SF
147	MATH	200 SF
148	IT OFFICE	120 SF
149	NETWORK / TELECOM	200 SF
153	CHAIR STORAGE	452 SF
154	CARES STORAGE	500 SF
155	RECEIVING / GENERAL SUPPLY	1159 SF
155A	RECYCLING ROOM / TRASH	413 SF
155B	CUSTODIAN STORAGE	206 SF
155C	CUSTODIAL OFFICE	175 SF
161	OFFICE	150 SF
162	KITCHEN	2255 SF
162E	DRY STORAGE	250 SF
163	INSTRUMENTAL MUSIC	700 SF
163A	INSTRUMENTAL STORAGE	240 SF
164	QUIET CAFE	150 SF
165	QUIET CAFE	150 SF
166	QUIET CAFE	149 SF
168	CAFETERIA	4392 SF
168A	CAFETERIA	219 SF
169	STAGE	1002 SF
171	FLEX CLASSROOM	900 SF
171A	FLEX STORAGE	100 SF
175	CARES OFFICE	150 SF
176	CARES OFFICE	150 SF
177	GENERAL OFFICE/WAITING	528 SF
177A	PRINCIPAL'S SECRETARY	128 SF
179	COPY	150 SF
180	CONFERENCE ROOM	300 SF
181	PRINCIPAL	200 SF
182	OFFICE	120 SF
183	OFFICE	120 SF
184	STEM COORDINATOR	120 SF
185	LITERACY COORDINATOR	120 SF
186	RECORDS	110 SF
187	GUID. STOR.	35 SF
188	CONFERENCE ROOM	200 SF
189	TEACHER WORK ROOM	200 SF
189A	MAIL ROOM	100 SF
190	MEDICAL	450 SF
190A	EXAM	100 SF
190B	EXAM	100 SF
190C	TOILET	60 SF
192	PT CLASSROOM	1000 SF
192A	PT STORAGE	250 SF
193	OT CLASSROOM	250 SF
194	GYMNASIUM	12000 SF
194A	STORAGE	180 SF
195	PE OFFICE	120 SF

LEVEL ONE GROSS SF = 78,462

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WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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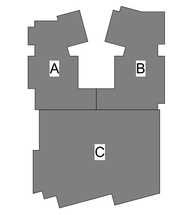
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:

LEVEL 1 OVERALL PLAN

SHEET NUMBER:

A1.10

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
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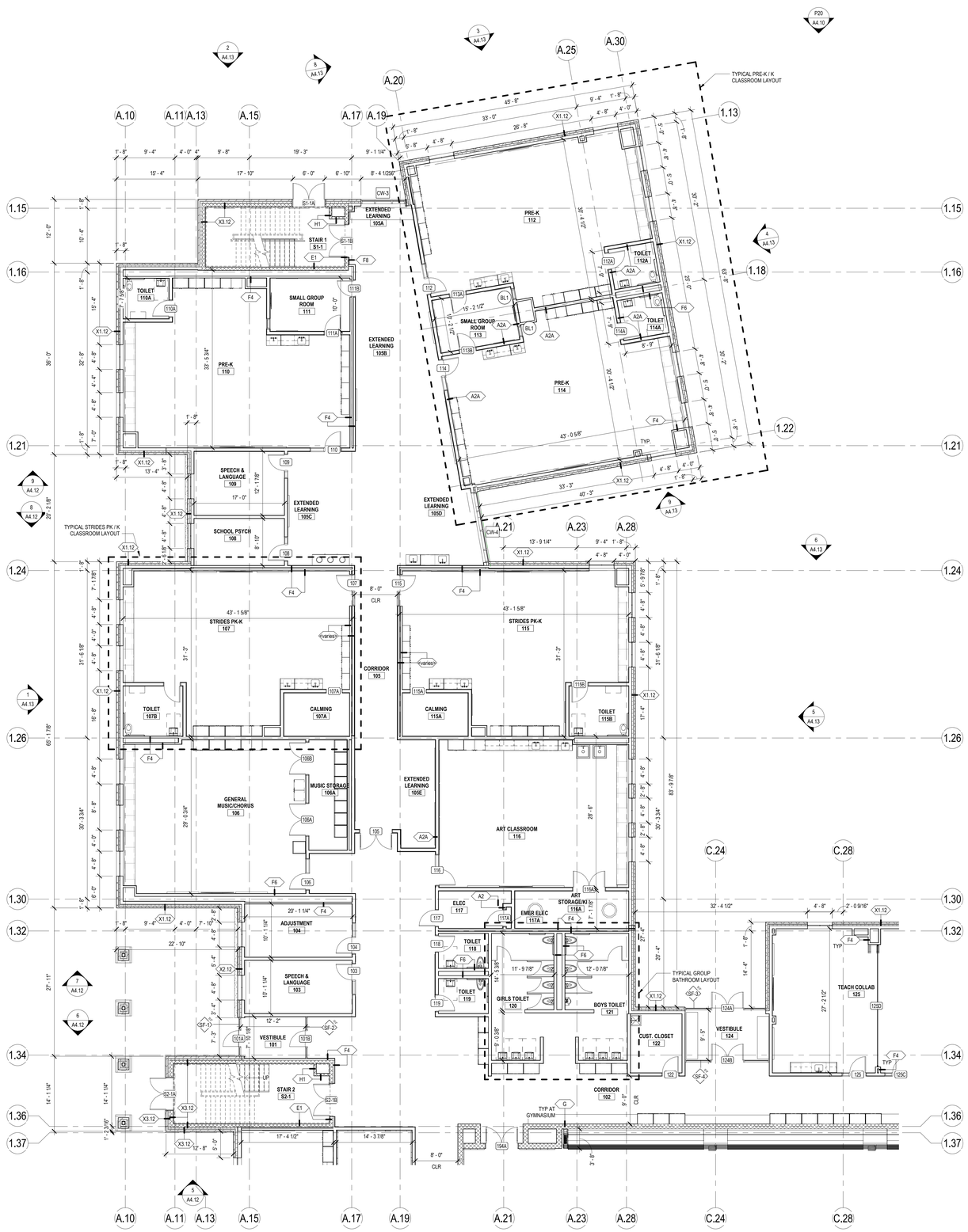
5. REFER TO HORIZONTAL CONTROL PLANS AND STRUCTURAL DRAWINGS FOR SLAB INFORMATION (INCLUDING DEPRESSIONS, EDGE DIMENSIONS, AND SHAFT OPENINGS).



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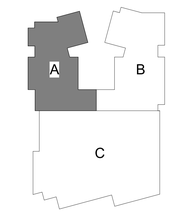

ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
LEVEL 1 - AREA A

SHEET NUMBER:
A1.11

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
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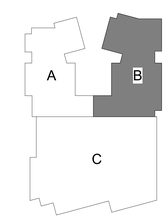

ORIENTATION AND SCALE:

N
TRUE NORTH
PROJECT NORTH
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SCALE: 1/8"=1'-0"
GRAPHIC SCALE

SHEET TITLE:

LEVEL 1 - AREA B

SHEET NUMBER:

A1.12

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
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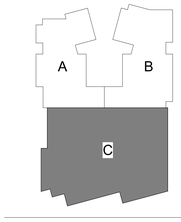

ORIENTATION AND SCALE:

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PROJECT NORTH
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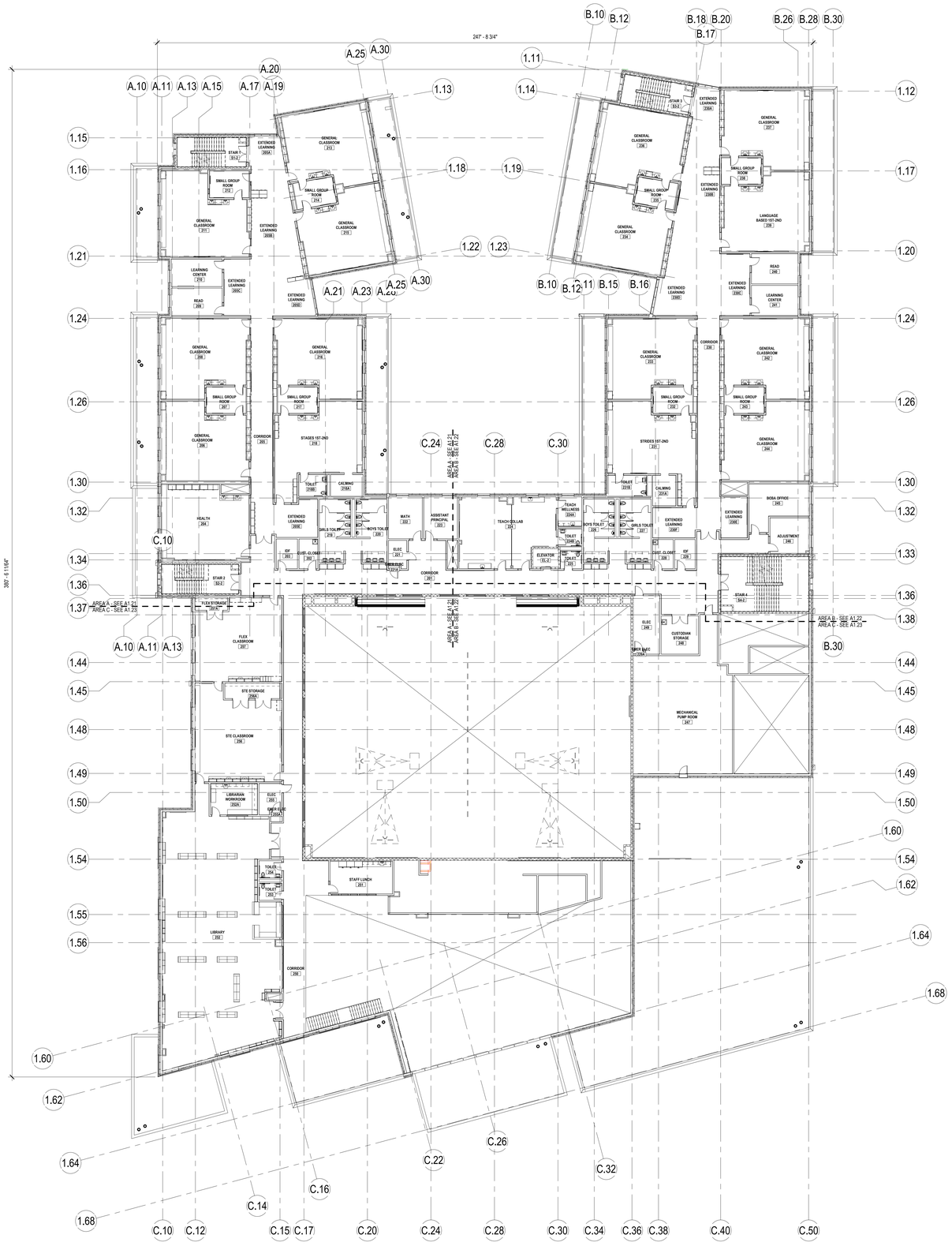
SCALE: 1/8"=1'-0" GRAPHIC SCALE

SHEET TITLE:

LEVEL 1 - AREA C

SHEET NUMBER:

A1.13



PLAN GENERAL NOTES

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LEVEL 2 ROOM SCHEDULE		
ROOM #	ROOM NAME	AREA
204	HEALTH	900 SF
205A	EXTENDED LEARNING	58 SF
205B	EXTENDED LEARNING	243 SF
205C	EXTENDED LEARNING	163 SF
205D	EXTENDED LEARNING	292 SF
205E	EXTENDED LEARNING	212 SF
206	GENERAL CLASSROOM	900 SF
207	SMALL GROUP ROOM	150 SF
208	GENERAL CLASSROOM	900 SF
209	READ	200 SF
210	LEARNING CENTER	200 SF
211	GENERAL CLASSROOM	900 SF
212	SMALL GROUP ROOM	150 SF
213	GENERAL CLASSROOM	900 SF
214	SMALL GROUP ROOM	150 SF
215	GENERAL CLASSROOM	900 SF
216	GENERAL CLASSROOM	900 SF
217	SMALL GROUP ROOM	150 SF
218	STAGES 1ST-2ND	900 SF
218A	CALMING	100 SF
218B	TOILET	86 SF
222	MATH	200 SF
223	ASSISTANT PRINCIPAL	200 SF
224	TEACH COLLAB	900 SF
224A	TEACH WELLNESS	100 SF
230A	EXTENDED LEARNING	43 SF
230B	EXTENDED LEARNING	261 SF
230C	EXTENDED LEARNING	140 SF
230D	EXTENDED LEARNING	262 SF
230E	EXTENDED LEARNING	154 SF
230F	EXTENDED LEARNING	172 SF
231	STRIDES 1ST-2ND	900 SF
231A	CALMING	100 SF
231B	TOILET	116 SF
232	SMALL GROUP ROOM	150 SF
233	GENERAL CLASSROOM	900 SF
234	GENERAL CLASSROOM	900 SF
235	SMALL GROUP ROOM	150 SF
236	GENERAL CLASSROOM	900 SF
237	GENERAL CLASSROOM	900 SF
238	SMALL GROUP ROOM	150 SF
239	LANGUAGE BASED 1ST-2ND	900 SF
240	READ	200 SF
241	LEARNING CENTER	200 SF
242	GENERAL CLASSROOM	900 SF
243	SMALL GROUP ROOM	150 SF
244	GENERAL CLASSROOM	900 SF
245	BCBA OFFICE	320 SF
246	ADJUSTMENT	200 SF
248	CUSTODIAN STORAGE	202 SF
251	STAFF LUNCH	289 SF
252	LIBRARY	3859 SF
252A	LIBRARIAN WORKROOM	209 SF
256	STE CLASSROOM	1080 SF
256A	STE STORAGE	120 SF
257	FLEX CLASSROOM	975 SF
257A	FLEX STORAGE	60 SF

LEVEL TWO GROSS SF = 43,822

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

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NO.	DATE	TITLE

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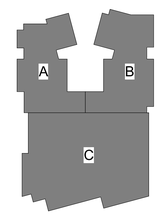
KEY PLAN



ORIENTATION AND SCALE:

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TRUE NORTH
PROJECT NORTH
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SCALE: 1/16"=1'-0" GRAPHIC SCALE

SHEET TITLE:

LEVEL 2 OVERALL PLAN

SHEET NUMBER:

A1.20

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
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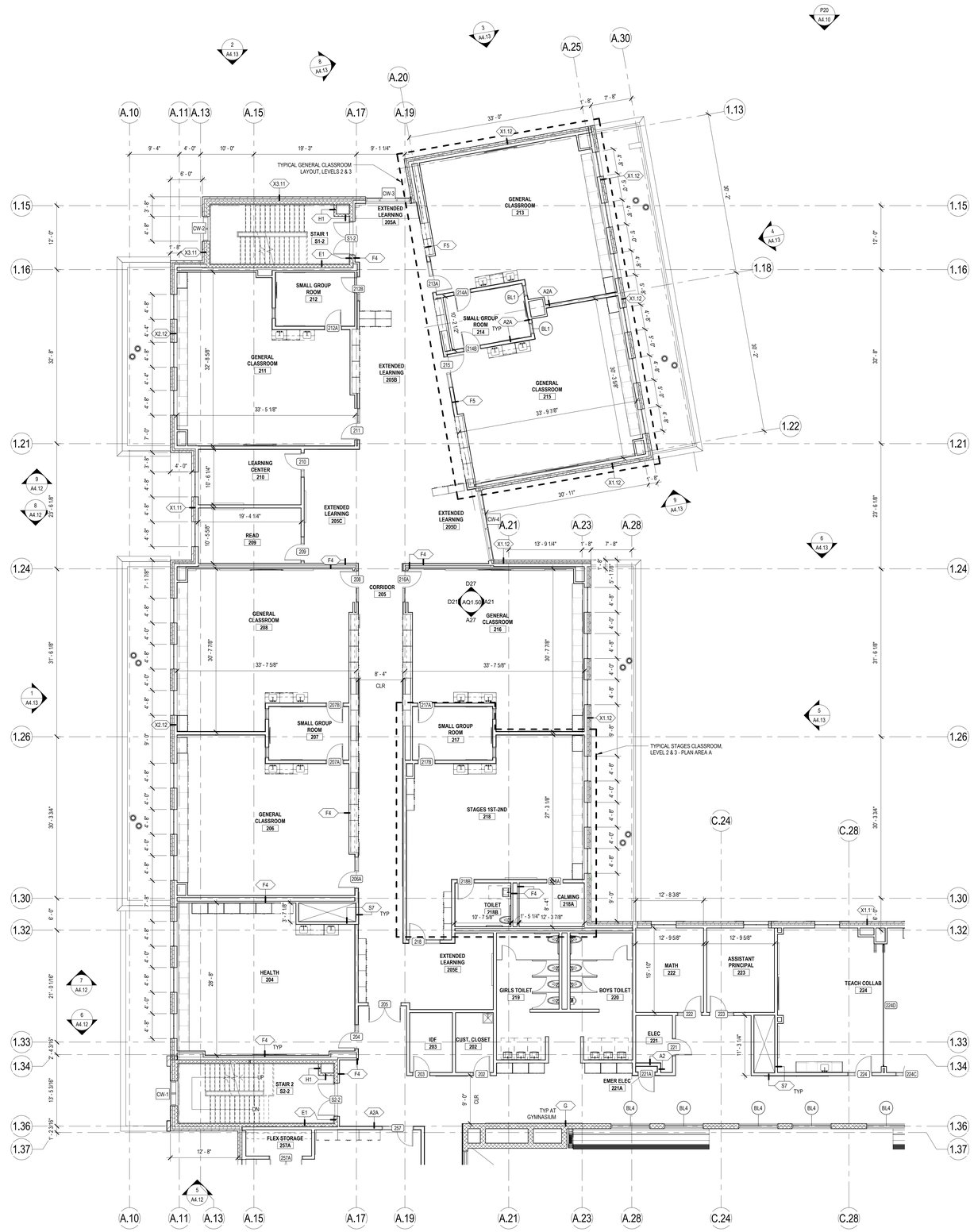

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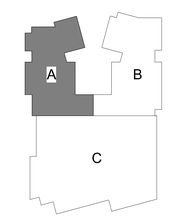

ORIENTATION AND SCALE:

N
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SCALE: 1/8"=1'-0"
GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE:

LEVEL 2 - AREA A

SHEET NUMBER:

A1.21

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
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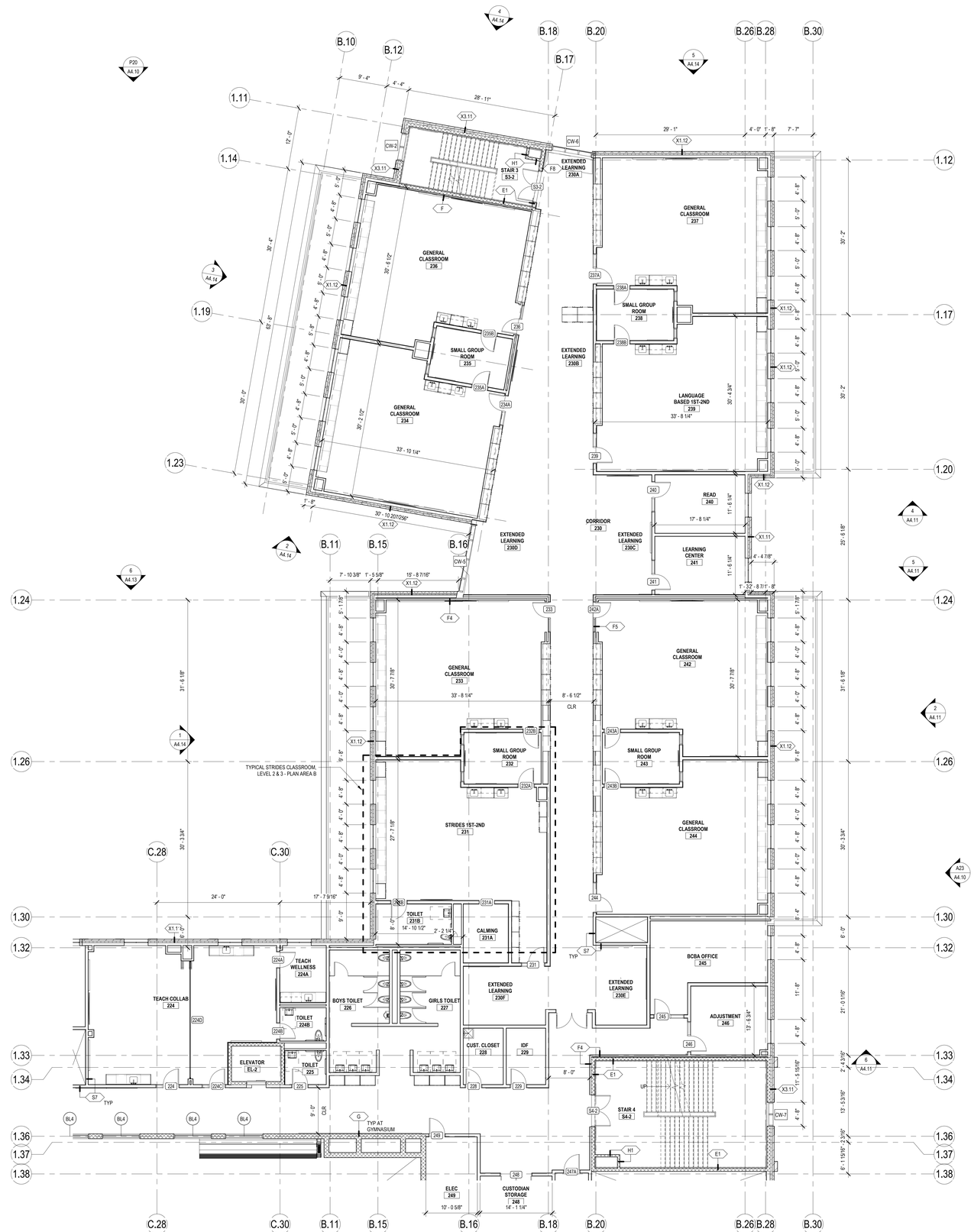

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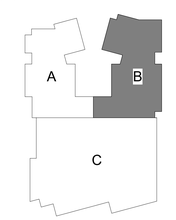

ORIENTATION AND SCALE:

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TRUE NORTH
PROJECT NORTH
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SCALE: 1/8"=1'-0" GRAPHIC SCALE

SHEET TITLE:

LEVEL 2 - AREA B

SHEET NUMBER:

A1.22

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
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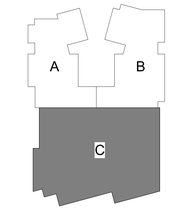

ORIENTATION AND SCALE:

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TRUE NORTH
PROJECT NORTH
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SCALE: 1/8"=1'-0" GRAPHIC SCALE

SHEET TITLE:

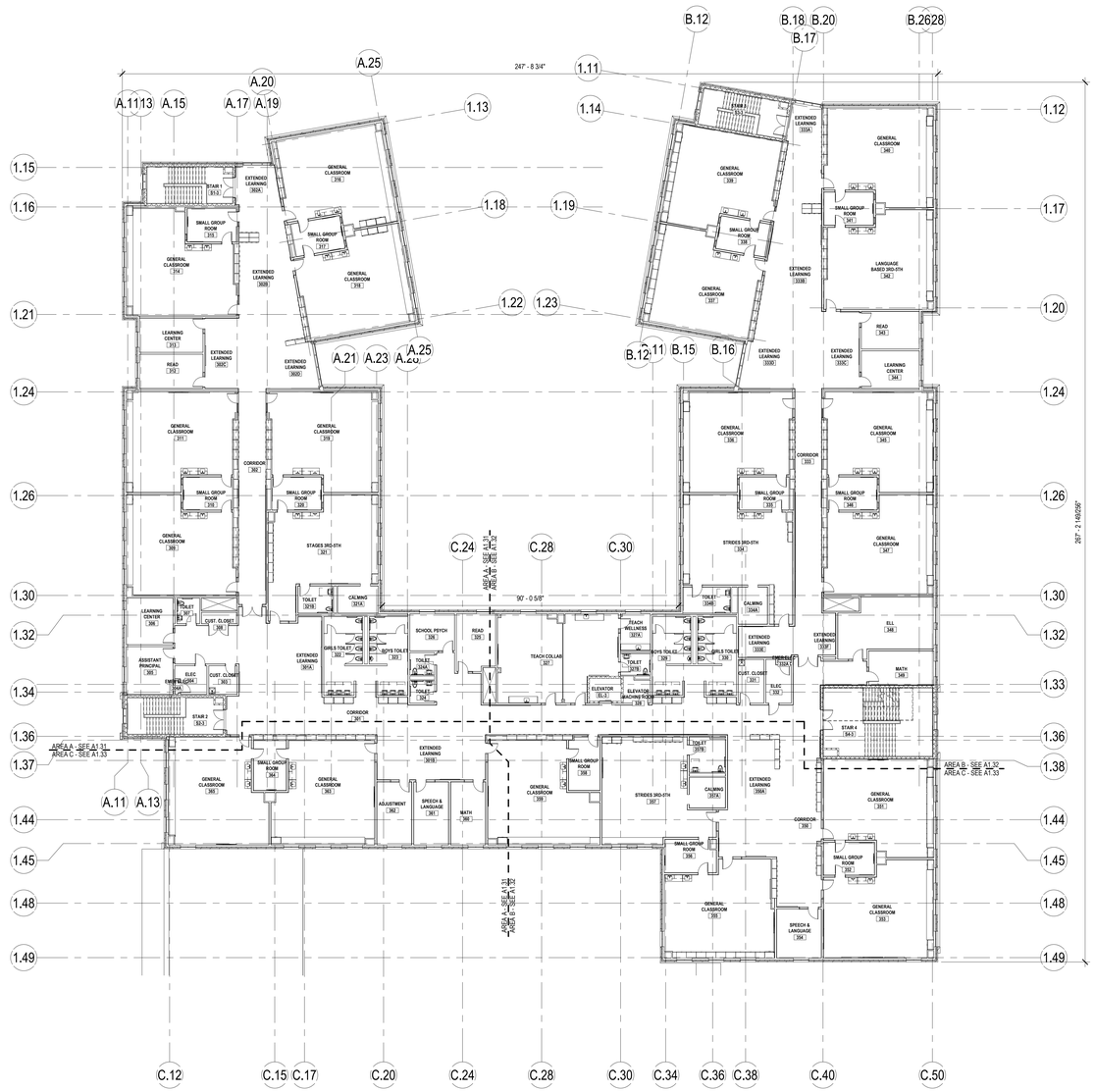
LEVEL 2 - AREA C

SHEET NUMBER:

A1.23

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
3. WHERE COLUMN LINES ARE SHOWN INSIDE WALLS AND PARALLEL TO THE WALL IT SHALL BE ASSUMED THAT THE WALL IS CENTERED ON THE COLUMN LINE UNLESS DIMENSIONED OTHERWISE.
4. WHERE ENLARGED PLANS ARE INDICATED, REFER TO ENLARGED PLAN SHEET FOR DIMENSIONS, WALL TYPES, AND DETAIL REFERENCES.
5. REFER TO HORIZONTAL CONTROL PLANS AND STRUCTURAL DRAWINGS FOR SLAB INFORMATION (INCLUDING DEPRESSIONS, EDGE DIMENSIONS, AND SHAFT OPENINGS).



LEVEL 3 ROOM SCHEDULE		
ROOM #	ROOM NAME	AREA
301A	EXTENDED LEARNING	371 SF
301B	EXTENDED LEARNING	359 SF
302A	EXTENDED LEARNING	44 SF
302B	EXTENDED LEARNING	249 SF
302C	EXTENDED LEARNING	164 SF
302D	EXTENDED LEARNING	228 SF
305	ASSISTANT PRINCIPAL	200 SF
306	LEARNING CENTER	200 SF
309	GENERAL CLASSROOM	900 SF
310	SMALL GROUP ROOM	150 SF
311	GENERAL CLASSROOM	900 SF
312	READ	200 SF
313	LEARNING CENTER	200 SF
314	GENERAL CLASSROOM	900 SF
315	SMALL GROUP ROOM	150 SF
316	GENERAL CLASSROOM	900 SF
317	SMALL GROUP ROOM	150 SF
318	GENERAL CLASSROOM	900 SF
319	GENERAL CLASSROOM	900 SF
320	SMALL GROUP ROOM	150 SF
321	STAGES 3RD-5TH	900 SF
321A	CALMING	100 SF
321B	TOILET	86 SF
325	READ	200 SF
326	SCHOOL PSYCH	150 SF
327	TEACH COLLAB	900 SF
327A	TEACH WELLNESS	100 SF
333A	EXTENDED LEARNING	43 SF
333B	EXTENDED LEARNING	331 SF
333C	EXTENDED LEARNING	179 SF
333D	EXTENDED LEARNING	270 SF
333E	EXTENDED LEARNING	139 SF
333F	EXTENDED LEARNING	50 SF
334	STRIDES 3RD-5TH	900 SF
334A	CALMING	99 SF
334B	TOILET	114 SF
335	SMALL GROUP ROOM	150 SF
336	GENERAL CLASSROOM	900 SF
337	GENERAL CLASSROOM	900 SF
338	SMALL GROUP ROOM	150 SF
339	GENERAL CLASSROOM	900 SF
340	GENERAL CLASSROOM	900 SF
341	SMALL GROUP ROOM	150 SF
342	LANGUAGE BASED 3RD-5TH	900 SF
343	READ	200 SF
344	LEARNING CENTER	200 SF
345	GENERAL CLASSROOM	900 SF
346	SMALL GROUP ROOM	150 SF
347	GENERAL CLASSROOM	900 SF
348	ELL	450 SF
349	MATH	200 SF
350A	EXTENDED LEARNING	573 SF
351	GENERAL CLASSROOM	900 SF
352	SMALL GROUP ROOM	153 SF
353	GENERAL CLASSROOM	900 SF
354	SPEECH & LANGUAGE	200 SF
355	GENERAL CLASSROOM	900 SF
356	SMALL GROUP ROOM	150 SF
357	STRIDES 3RD-5TH	900 SF
357A	CALMING	100 SF
357B	TOILET	114 SF
358	SMALL GROUP ROOM	150 SF
359	GENERAL CLASSROOM	900 SF
360	MATH	201 SF
361	SPEECH & LANGUAGE	200 SF
362	ADJUSTMENT	200 SF
363	GENERAL CLASSROOM	900 SF
364	SMALL GROUP ROOM	150 SF
365	GENERAL CLASSROOM	900 SF

LEVEL THREE GROSS SF = 42,751

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320 SALEM STREET
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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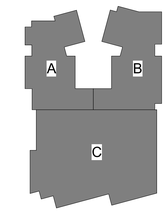
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:

LEVEL 3 OVERALL PLAN

SHEET NUMBER:

A1.30

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
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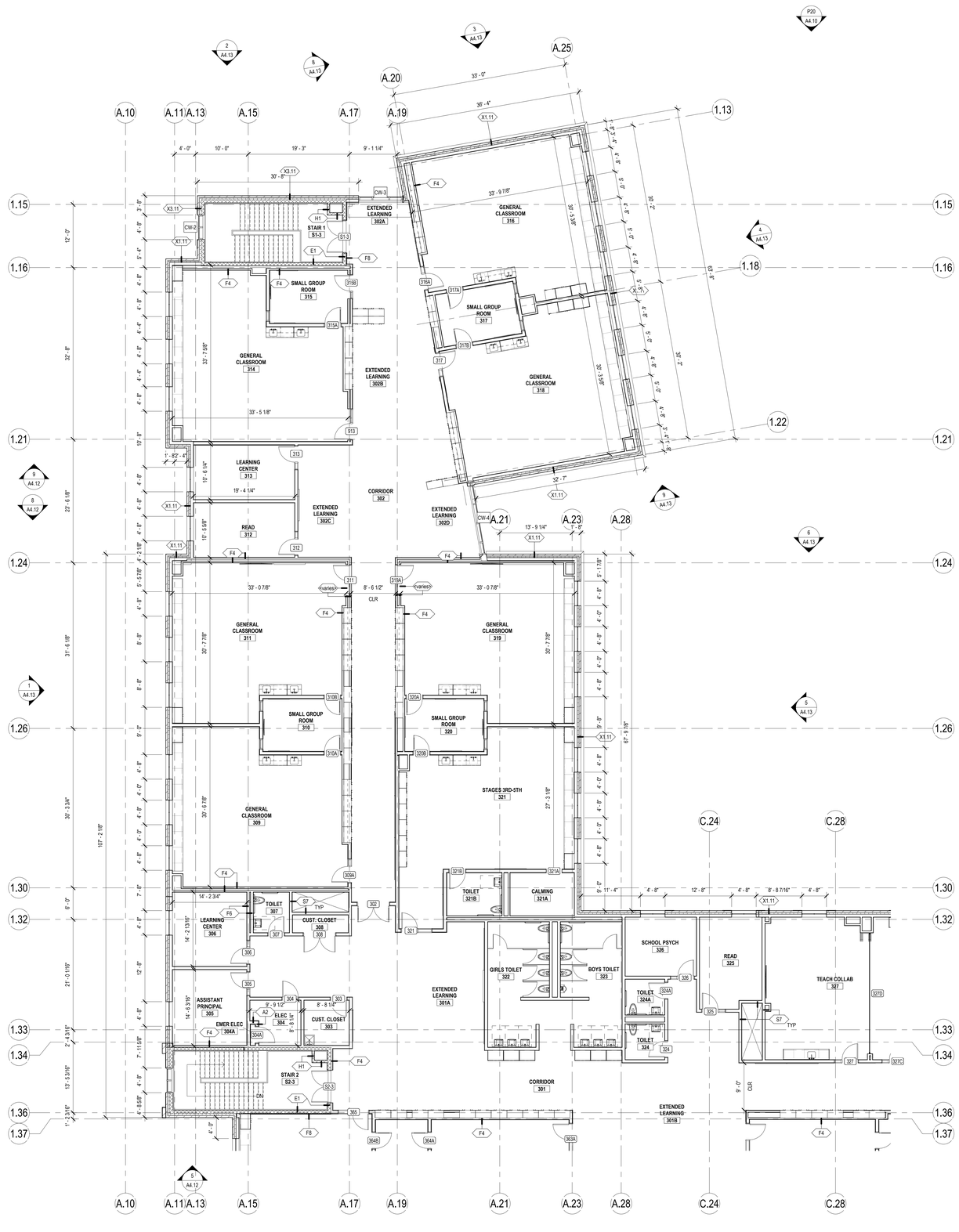
4. WHERE ENLARGED PLANS ARE INDICATED, REFER TO ENLARGED PLAN SHEET FOR DIMENSIONS, WALL TYPES, AND DETAIL REFERENCES.
5. REFER TO HORIZONTAL CONTROL PLANS AND STRUCTURAL DRAWINGS FOR SLAB INFORMATION (INCLUDING DEPRESSIONS, EDGE DIMENSIONS, AND SHAFT OPENINGS).



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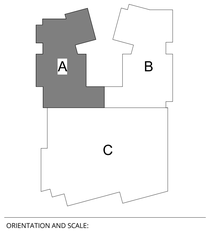

ORIENTATION AND SCALE:

N
TRUE NORTH
0 4' 8' 16'
SCALE: 1/8"=1'-0" GRAPHIC SCALE
PROJECT NORTH

SHEET TITLE:

LEVEL 3 - AREA A

SHEET NUMBER:

A1.31

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
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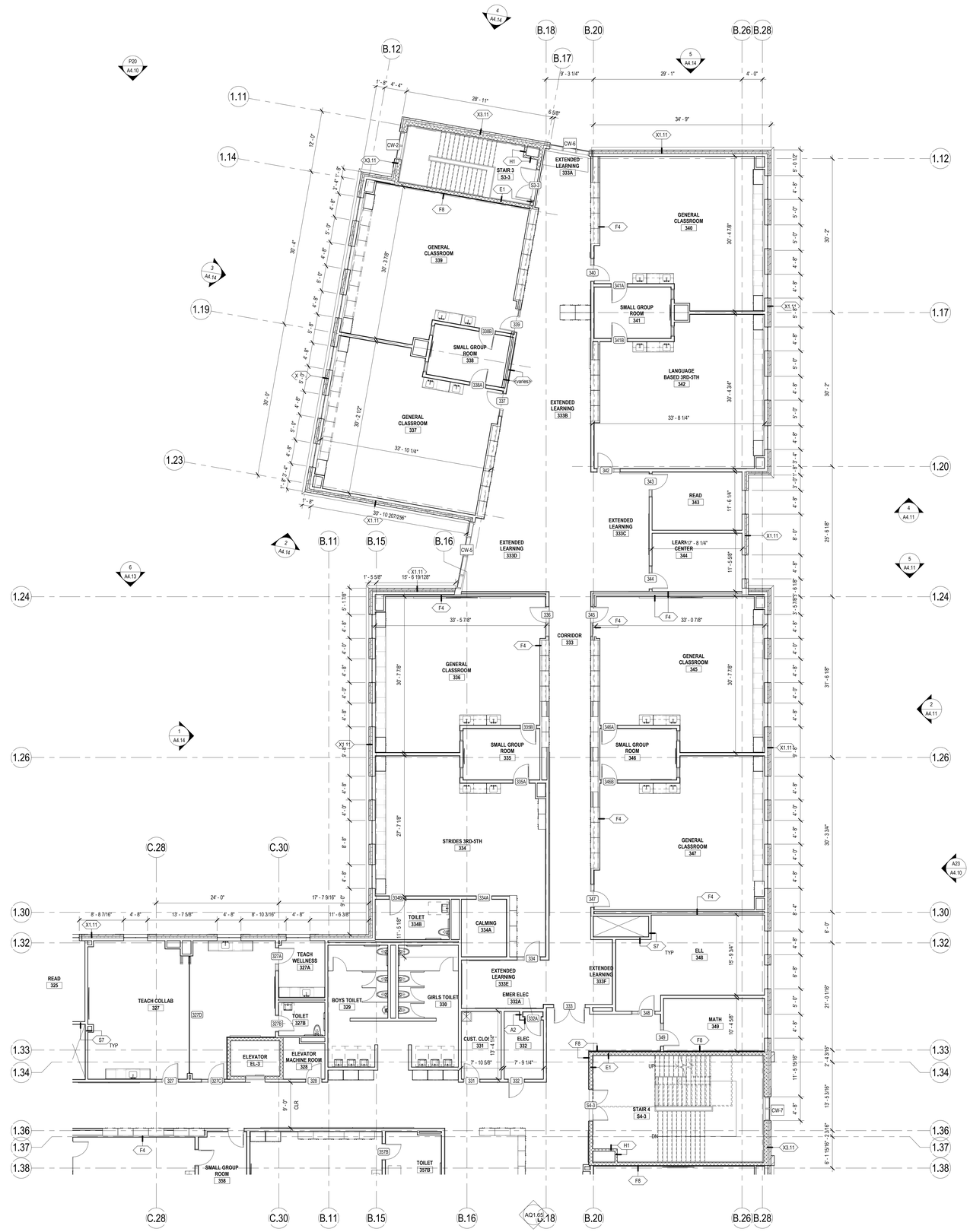

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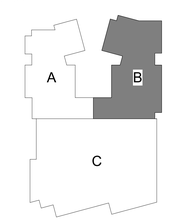

ORIENTATION AND SCALE:

N TRUE NORTH
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SCALE: 1/8"=1'-0" GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE:
LEVEL 3 - AREA B

SHEET NUMBER:
A1.32

PLAN GENERAL NOTES

1. ALL INTERIOR CMU PARTITIONS ARE TYPE "E", UNLESS NOTED OTHERWISE. ALL INTERIOR STUD PARTITIONS ARE TYPE "A", UNLESS NOTED OTHERWISE.
2. WHERE DOORS, WINDOWS, BORROWED LITES, GRILLES, OR OPENINGS OCCUR IT SHALL BE ASSUMED THAT THE WALL CONSTRUCTION IS THE SAME ABOVE AS ADJACENT, UNLESS NOTED OTHERWISE.
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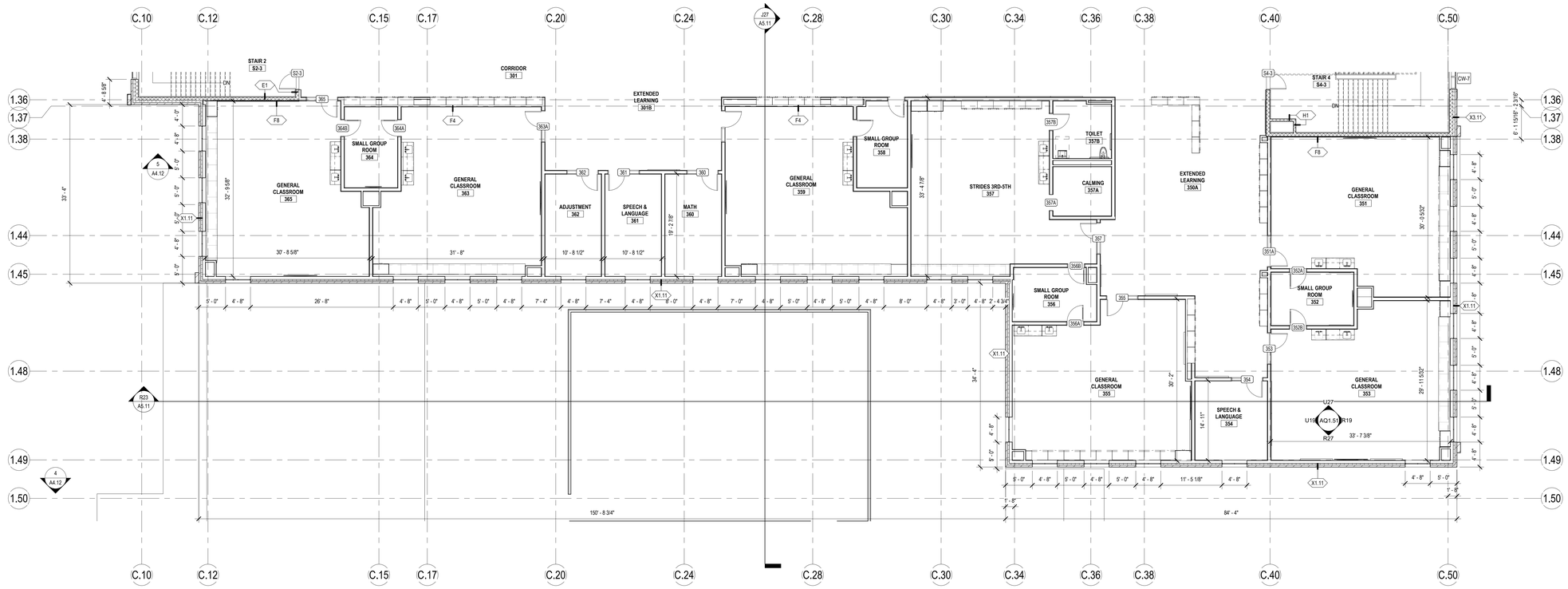

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WILMINGTON ELEMENTARY SCHOOL

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WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

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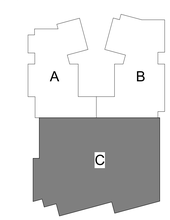


ORIENTATION AND SCALE:

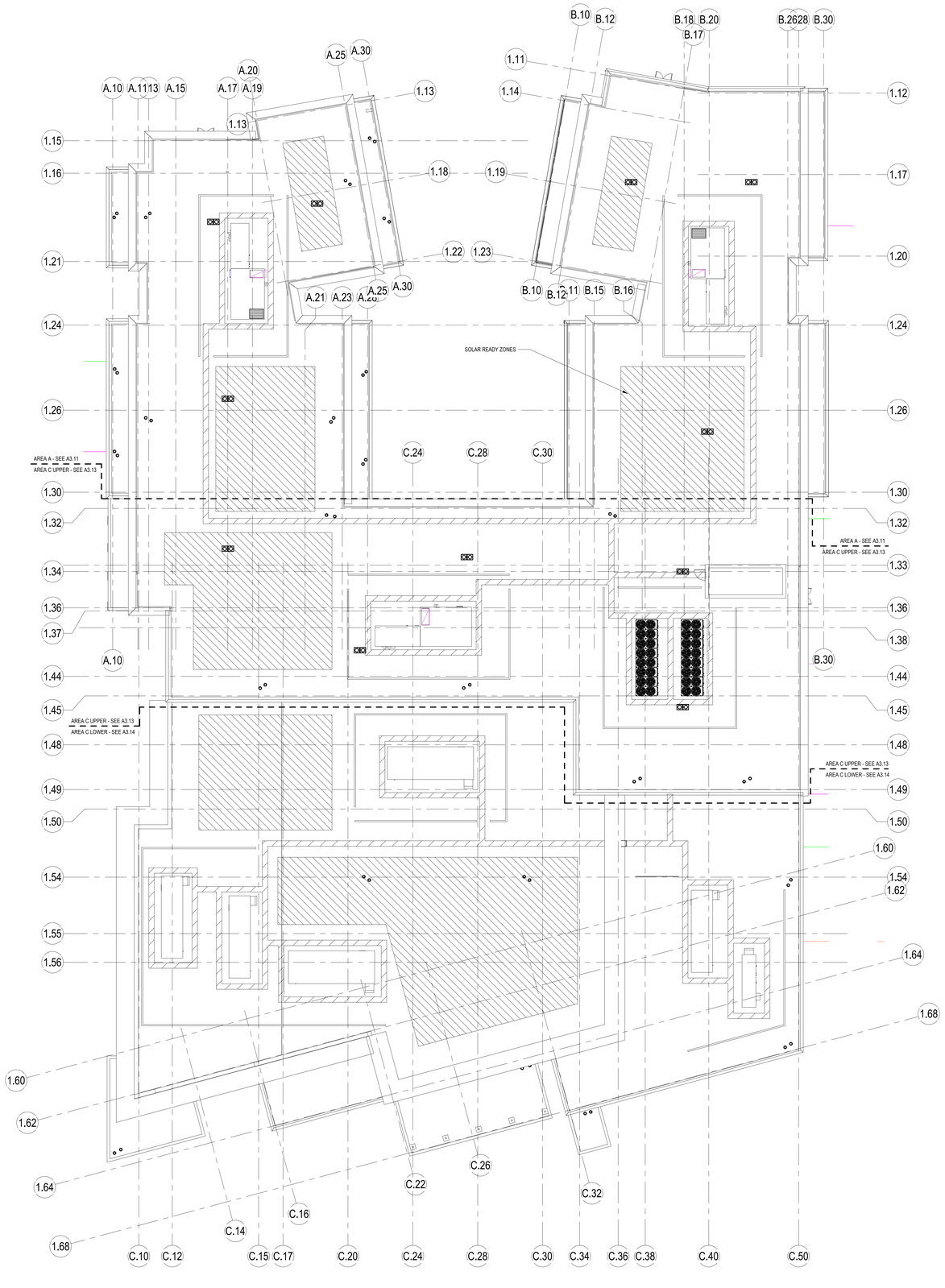
PROJECT NORTH

SHEET TITLE:

LEVEL 3 - AREA C

SHEET NUMBER:

A1.33



ROOF PLAN GENERAL NOTES

1. ALL ROOF AREAS SHALL BE ROOFING SYSTEM TYPE R1.1 UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
2. REFER TO SHEET A3.50 FOR DETAILED DESCRIPTIONS OF ROOF SYSTEM TYPES AND TYPICAL DETAILS.
3. ROOF TYPES INDICATED ARE INTENDED TO DESCRIBE ROOFING SYSTEMS IN GENERAL. REFER TO STRUCTURAL DRAWINGS FOR COORDINATION OF STRUCTURAL DECK OR SUBSTRATE. COORDINATE WITH STRUCTURAL AND MEPFP DRAWINGS FOR LOCATIONS OF ROOF TOP EQUIPMENT SUPPORTED ON CONCRETE SLABS. COORDINATE TRANSITIONS BETWEEN STRUCTURAL DECK SYSTEMS AND MAINTAIN MINIMUM INSULATION THICKNESSES AT EQUIPMENT SLABS TO ENSURE SYSTEM PERFORMANCE AND WARRANTY REQUIREMENTS.
4. REFER TO MEPFP DRAWINGS FOR COORDINATION OF MECHANICAL EQUIPMENT, DEVICES, COMPONENTS, AND ASSOCIATED SUPPORT SYSTEMS. REFER TO PROJECT DETAILS INDICATED IN ARCHITECTURAL, STRUCTURAL, AND MEPFP DRAWINGS AND INCORPORATE ROOFING COMPONENTS REQUIRED TO ENSURE A WEATHER-TIGHT AND WARRANTIED SYSTEM AS DESCRIBED IN THE SPECIFICATIONS.
5. UNDERSIDE OF DECK (UOD) ELEVATIONS INDICATED ARE THEORETICAL ELEVATIONS PROVIDED AT STRUCTURAL COLUMN GRID INTERSECTIONS AND ARE RELATIVE TO THE LOWEST LEVEL OF THE PROJECT, UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. THE ROOFING AREAS SHALL FEATURE PLANAR SLOPE TOWARD DRAINS OF A MINIMUM ¼ INCH VERTICAL IN 12 INCHES HORIZONTAL DISTANCE. PROVIDE TAPERED INSULATION OR SHIMS TO MAINTAIN MINIMUM SLOPE AND AVOID PONDING.
7. PROVIDE TAPERED INSULATION AND/OR CRICKETS AT THE UPSLOPE SIDE OF ALL CURBS AND OTHER OBSTRUCTIONS TO DRAINAGE SLOPES, INCLUDING BUT NOT LIMITED TO CURBS FOR MECHANICAL EQUIPMENT, SKYLIGHTS, ACCESS HATCHES, AND SMOKE HATCHES.
8. PROVIDE ROOF WALK PADS AT EACH ROOF ACCESS POINT (ADJACENT TO ROOF HATCHES AND BOTTOM AND TOP OF ALL LADDERS OR STAIRS), AND AROUND ALL ROOFTOP EQUIPMENT WHETHER SHOWN IN DRAWINGS OR NOT.
9. DETAIL REFERENCES MAY NOT BE INDICATED FOR EACH OCCURRENCE OF ROOF PENETRATIONS OR ROOF MOUNTED EQUIPMENT. REFER TO THE ROOF LEGEND FOR ITEMS SHOWN ON THE ROOF PLAN, AND TO TYPICAL ROOF DETAILS AT SHEET A3.50 THAT ARE APPLICABLE TO THE WORK OF THIS PROJECT.
10. ROOFING SYSTEMS SHALL COMPLY WITH WIND LOAD AND PERFORMANCE REQUIREMENTS FOR ROOF COVERINGS. FASTENINGS, JOINT SEAM TREATMENTS, AND OTHER INSTALLATION DETAILS SHALL MEET MANUFACTURER'S REQUIREMENTS TO SATISFY CODE AND MEET WARRANTY REQUIREMENTS.
11. PROVIDE TAPERED INSULATION EDGE STRIPS, SHIMS, ADDITIONAL WOOD BLOCKING AND INSULATION FILLERS AS REQUIRED TO PROVIDE ¼:12 MIN SLOPE AND FLUSH CONTINUOUS TRANSITIONS BETWEEN ROOF DECK TYPES.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION ITEMS SHOWN ARE APPROXIMATE SIZE AND LOCATION FOR COORDINATION PURPOSES. REFER TO MEPFP PLANS AND SCHEDULES FOR ACTUAL ITEM DESIGNATIONS AND COORDINATE REQUIRED PENETRATIONS AND CLEARANCES, INCLUDING MANUFACTURER'S REQUIRED MAINTENECE CLEARANCES.
13. DETAIL REFERENCES ARE NOT INDICATED FOR EACH ROOF CONDITION OR PENETRATION. THE CONTRACTOR SHALL REFER TO PROJECT DETAILS FOR INFORMATION APPLICABLE TO MISCELLANEOUS ITEMS WHICH INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT PENETRATIONS, GUY-WIRE TIE-DOWN POINTS, PROTECTED WOOD SLEEPERS, CONDENSATE LINES AND OTHER MISCELLANEOUS PIPING, AND SMALL DIAMETER EXHAUST DUCTS. REFER TO KITCHEN EQUIPMENT, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION OF REQUIRED ROOF PENETRATIONS AND DETAILS WHERE APPLICABLE.
14. PROVIDE 3' x 3' SUMP AT DRAINS, MAX SLOPE 1:12.

ROOFING SYSTEM
- R1 SINGLE PLY ROOFING SYSTEM
- R2 FIBERGLASS ROOF SHINGLES
- R3 STANDING SEAM METAL ROOFING
- R4 PROJECT SPECIFIC

STRUCTURAL DECKING MATERIAL
- 1 STEEL METAL DECKING
- 2 CONCRETE SLAB OR PLANK
- 3 STRUCTURAL WOOD SHEATHING
- 4 WOOD PLANK (HEAVY TIMBER)
- 5 CEMENTITIOUS WOOD FIBER COMPOSITE DECK (TECTUM)
- 6 PROJECT SPECIFIC

FOR ALL STRUCTURAL DECKING MATERIAL, SEE STRUCTURAL DRAWINGS FOR TYPE

FINISH - PROJECT SPECIFIC
- a COLOR OR DECORATIVE GRAVEL
- b COLOR OR NO DECORATIVE GRAVEL

ROOF LEGEND

R1.1	ROOF TYPE TAG, REFER TO A3.50 AND A3.51 FOR TYPES
	ROOF DRAIN / OVERFLOW DRAIN W/ INSUL SUMP: SEE PLUMBING DWG's
	DIRECTION OF SLOPING STRUCTURE (FLAT INSULATION AREA)
	DIRECTION OF SLOPE AT TAPERED INSULATION (MIN. 1/4"=1'-0")
	ROOF ACCESS HATCH
	TAPERED INSULATION (MIN. SLOPE = 1/4"-1'-0")
	WALKWAY PADS
	EXPANSION JOINT
ROOF HYDRANT	ROOF HYDRANT; SEE FIRE PROTECTION DRAWINGS
EQUIPMENT SCREEN SEGMENT NUMBER. REFER TO A8/A3.51 FOR SEGMENT HEIGHTS. ROOF TOP EQUIPMENT SCREEN	
VTR	VENT THROUGH ROOF: COORDINATE LOCATION W/ PLUMBING DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
EF	EXHAUST FAN WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	ROOF HOOD/ GRAVITY VENT WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
COND	CONDENSING UNIT ON PROTECTED WOOD SLEEPERS; COORD PITCH POCKET PIPE PENETRATION. COORDINATE LOCATION WITH HVAC DRAWINGS. SEE PROTECTED WOOD SLEEPER AND PITCH POCKET DETAILS @ SHEET A3.51
	AIR HANDLING UNIT ON CURBS: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	HVAC PIPING PENETRATION @ ROOF. COORDINATE LOCATION, SIZE, AND TYPE WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.50
	SOLAR READY ZONE

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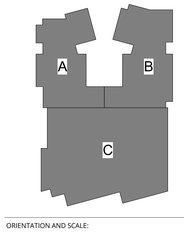
KEY PLAN



ORIENTATION AND SCALE:

N
0 8' 16' 32'
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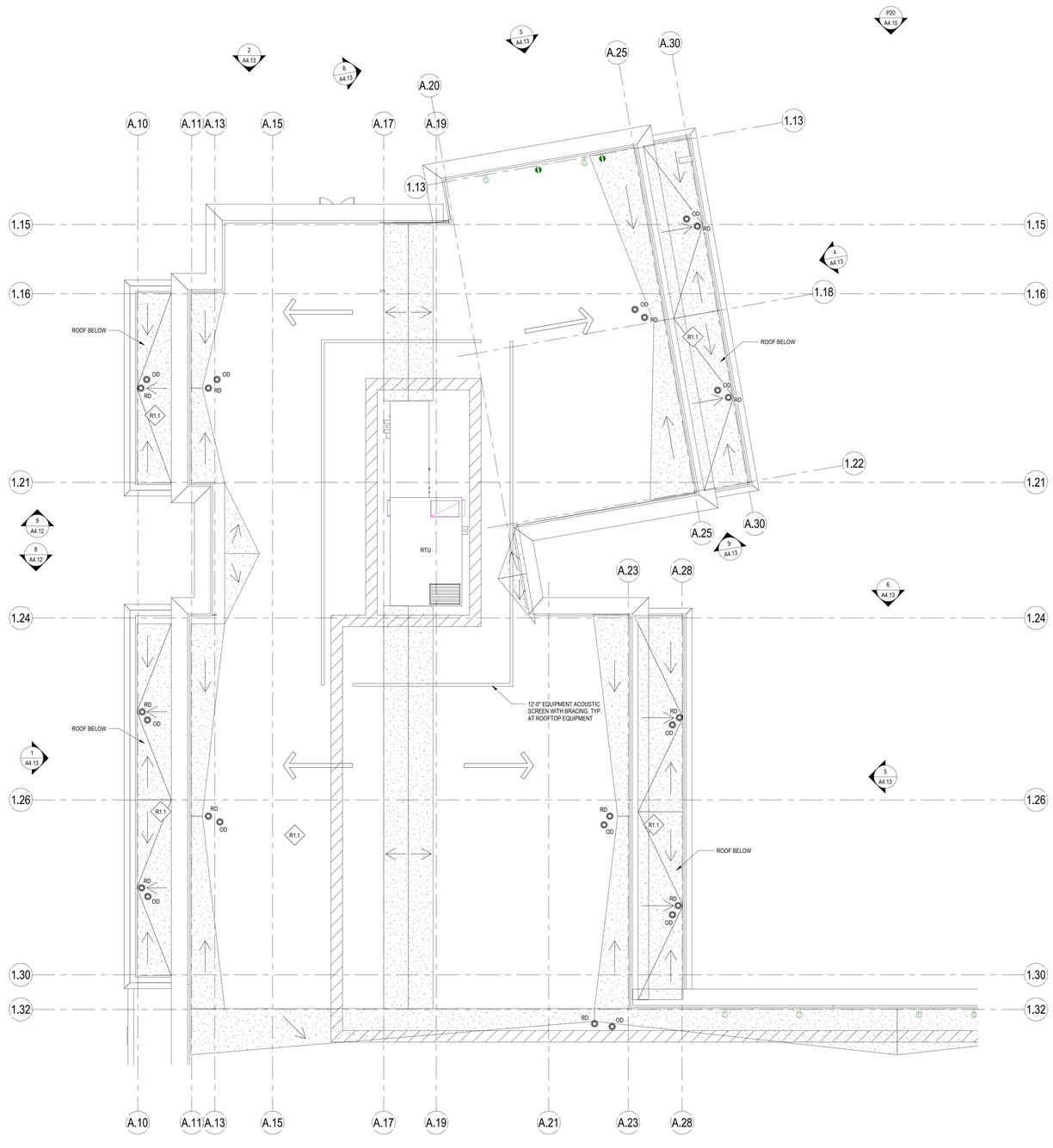
TRUE NORTH
PROJECT NORTH

SHEET TITLE:
OVERALL ROOF PLAN

SHEET NUMBER:
A3.10



ROOF PLAN GENERAL NOTES

1. ALL ROOF AREAS SHALL BE ROOFING SYSTEM TYPE R1.1 UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
2. REFER TO SHEET A3.50 FOR DETAILED DESCRIPTIONS OF ROOF SYSTEM TYPES AND TYPICAL DETAILS.
3. ROOF TYPES INDICATED ARE INTENDED TO DESCRIBE ROOFING SYSTEMS IN GENERAL. REFER TO STRUCTURAL DRAWINGS FOR COORDINATION OF STRUCTURAL DECK OR SUBSTRATE. COORDINATE WITH STRUCTURAL AND MEPFP DRAWINGS FOR LOCATIONS OF ROOF TOP EQUIPMENT SUPPORTED ON CONCRETE SLABS. COORDINATE TRANSITIONS BETWEEN STRUCTURAL DECK SYSTEMS AND MAINTAIN MINIMUM INSULATION THICKNESSES AT EQUIPMENT SLABS TO ENSURE SYSTEM PERFORMANCE AND WARRANTY REQUIREMENTS.
4. REFER TO MEPFP DRAWINGS FOR COORDINATION OF MECHANICAL EQUIPMENT, DEVICES, COMPONENTS, AND ASSOCIATED SUPPORT SYSTEMS. REFER TO PROJECT DETAILS INDICATED IN ARCHITECTURAL, STRUCTURAL, AND MEPFP DRAWINGS AND INCORPORATE ROOFING COMPONENTS REQUIRED TO ENSURE A WEATHER-TIGHT AND WARRANTIED SYSTEM AS DESCRIBED IN THE SPECIFICATIONS.
5. UNDERSIDE OF DECK (UOD) ELEVATIONS INDICATED ARE THEORETICAL ELEVATIONS PROVIDED AT STRUCTURAL COLUMN GRID INTERSECTIONS AND ARE RELATIVE TO THE LOWEST LEVEL OF THE PROJECT, UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. THE ROOFING AREAS SHALL FEATURE PLANAR SLOPE TOWARD DRAINS OF A MINIMUM ¼ INCH VERTICAL IN 12 INCHES HORIZONTAL DISTANCE. PROVIDE TAPERED INSULATION OR SHIMS TO MAINTAIN MINIMUM SLOPE AND AVOID PONDING.
7. PROVIDE TAPERED INSULATION AND/OR CRICKETS AT THE UPSLOPE SIDE OF ALL CURBS AND OTHER OBSTRUCTIONS TO DRAINAGE SLOPES, INCLUDING BUT NOT LIMITED TO CURBS FOR MECHANICAL EQUIPMENT, SKYLIGHTS, ACCESS HATCHES, AND SMOKE HATCHES.
8. PROVIDE ROOF WALK PADS AT EACH ROOF ACCESS POINT (ADJACENT TO ROOF HATCHES AND BOTTOM AND TOP OF ALL LADDERS OR STAIRS), AND AROUND ALL ROOFTOP EQUIPMENT WHETHER SHOWN IN DRAWINGS OR NOT.
9. DETAIL REFERENCES MAY NOT BE INDICATED FOR EACH OCCURRENCE OF ROOF PENETRATIONS OR ROOF MOUNTED EQUIPMENT. REFER TO THE ROOF LEGEND FOR ITEMS SHOWN ON THE ROOF PLAN, AND TO TYPICAL ROOF DETAILS AT SHEET A3.50 THAT ARE APPLICABLE TO THE WORK OF THIS PROJECT.
10. ROOFING SYSTEMS SHALL COMPLY WITH WIND LOAD AND PERFORMANCE REQUIREMENTS FOR ROOF COVERINGS, FASTENINGS, JOINT SEAM TREATMENTS, AND OTHER INSTALLATION DETAILS SHALL MEET MANUFACTURER'S REQUIREMENTS TO SATISFY CODE AND MEET WARRANTY REQUIREMENTS.
11. PROVIDE TAPERED INSULATION EDGE STRIPS, SHIMS, ADDITIONAL WOOD BLOCKING AND INSULATION FILLERS AS REQUIRED TO PROVIDE ¼:12 MIN SLOPE AND FLUSH CONTINUOUS TRANSITIONS BETWEEN ROOF DECK TYPES.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION ITEMS SHOWN ARE APPROXIMATE SIZE AND LOCATION FOR COORDINATION PURPOSES. REFER TO MEPFP PLANS AND SCHEDULES FOR ACTUAL ITEM DESIGNATIONS AND COORDINATE REQUIRED PENETRATIONS AND CLEARANCES, INCLUDING MANUFACTURER'S REQUIRED MAINTENENCE CLEARANCES.
13. DETAIL REFERENCES ARE NOT INDICATED FOR EACH ROOF CONDITION OR PENETRATION. THE CONTRACTOR SHALL REFER TO PROJECT DETAILS FOR INFORMATION APPLICABLE TO MISCELLANEOUS ITEMS WHICH INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT PENETRATIONS, GUY-WIRE TIE-DOWN POINTS, PROTECTED WOOD SLEEPERS, CONDENSATE LINES AND OTHER MISCELLANEOUS PIPING, AND SMALL DIAMETER EXHAUST DUCTS. REFER TO KITCHEN EQUIPMENT, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION OF REQUIRED ROOF PENETRATIONS AND DETAILS WHERE APPLICABLE.
14. PROVIDE 3' x 3' SUMP AT DRAINS, MAX SLOPE 1:12.

ROOF LEGEND

(2) R2	ROOF TYPE TAG. REFER TO A3.50 AND A3.51 FOR TYPES
	ROOF DRAIN / OVERFLOW DRAIN W/ INSUL SUMP; SEE PLUMBING DWG's
	DIRECTION OF SLOPING STRUCTURE (FLAT INSULATION AREA)
	DIRECTION OF SLOPE AT TAPERED INSULATION (MIN. 1/4"=1'-0")
	ROOF ACCESS HATCH
	TAPERED INSULATION (MIN. SLOPE = 1/4":1'-0")
	WALKWAY PADS
	EXPANSION JOINT
ROOF HYDRANT	ROOF HYDRANT; SEE FIRE PROTECTION DRAWINGS
EQUIPMENT SCREEN SEGMENT NUMBER. REFER TO AB/A3.51 FOR SEGMENT HEIGHTS. ROOF TOP EQUIPMENT SCREEN (6)	
VTR	VENT THROUGH ROOF: COORDINATE LOCATION W/ PLUMBING DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
EF	EXHAUST FAN WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	ROOF HOOD/ GRAVITY VENT WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
COND	CONDENSING UNIT ON PROTECTED WOOD SLEEPERS; COORD PITCH POCKET PIPE PENETRATION. COORDINATE LOCATION WITH HVAC DRAWINGS. SEE PROTECTED WOOD SLEEPER AND PITCH POCKET DETAILS @ SHEET A3.51
	AIR HANDLING UNIT ON CURBS: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	HVAC PIPING PENETRATION @ ROOF. COORDINATE LOCATION, SIZE, AND TYPE WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.50
	SOLAR READY ZONE

ROOFING SYSTEM
- R1 SINGLE PLY ROOFING SYSTEM
- R2 FIBERGLASS ROOF SHINGLES
- R3 STANDING SEAM METAL ROOFING
- R4 PROJECT SPECIFIC

(2) R2 ½

STRUCTURAL DECKING MATERIAL
- 1 STEEL METAL DECKING
- 2 CONCRETE SLAB OR PLANK
- 3 STRUCTURAL WOOD SHEATHING
- 4 WOOD PLANK (HEAVY TIMBER)
- 5 CEMENTITIOUS WOOD FIBER COMPOSITE DECK (TECTUM)
- 6 PROJECT SPECIFIC

FOR ALL STRUCTURAL DECKING MATERIAL, SEE STRUCTURAL DRAWINGS FOR TYPE

FINISH - PROJECT SPECIFIC
- a COLOR OR DECORATIVE GRAVEL
- b COLOR OR NO DECORATIVE GRAVEL

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WILMINGTON ELEMENTARY SCHOOL

320 SALEM STREET
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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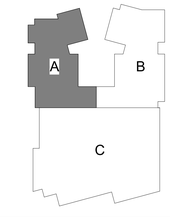
KEY PLAN

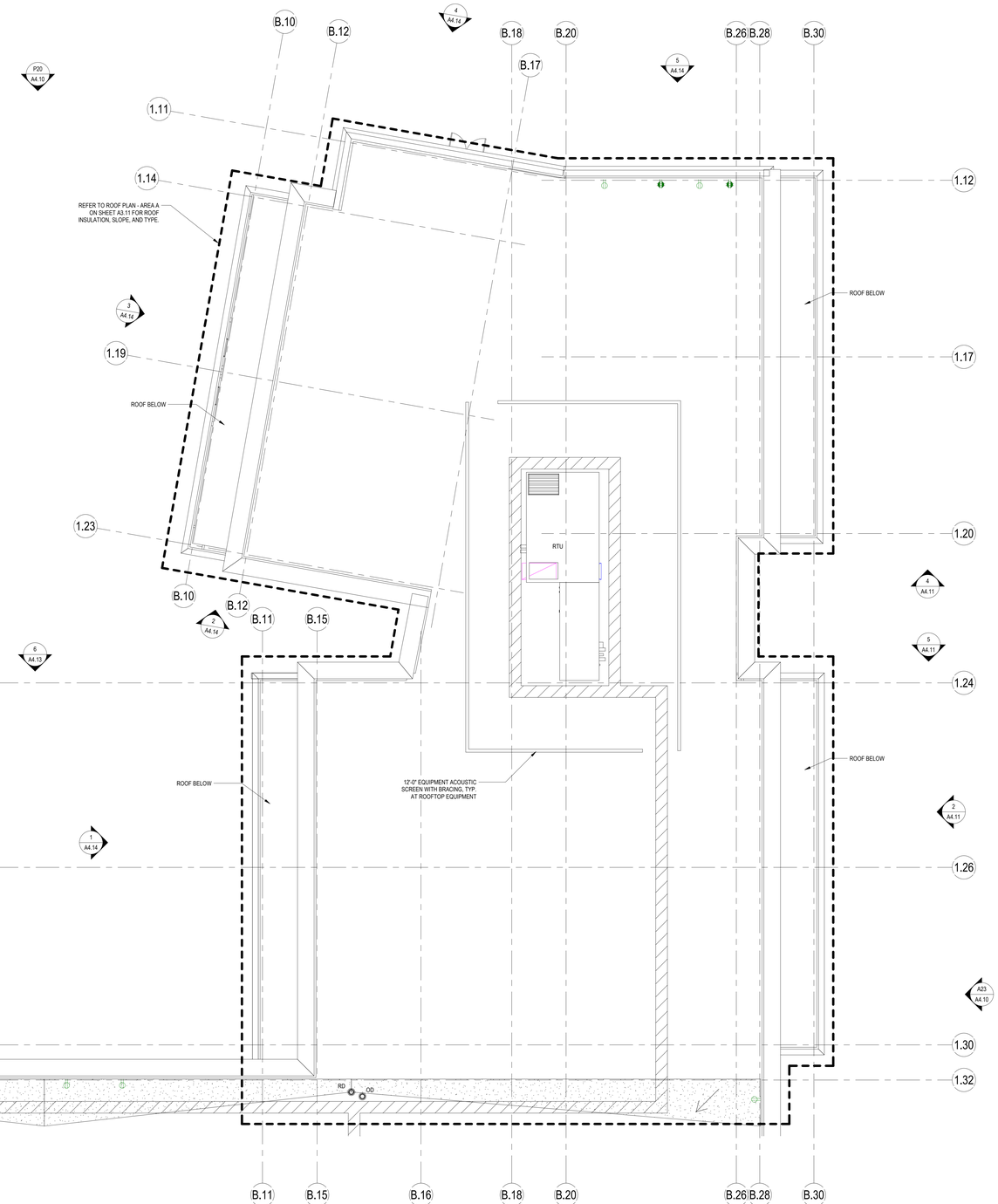


ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
ROOF PLAN - AREA A

SHEET NUMBER:
A3.11



ROOF PLAN GENERAL NOTES

1. ALL ROOF AREAS SHALL BE ROOFING SYSTEM TYPE R1.1 UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
2. REFER TO SHEET A3.50 FOR DETAILED DESCRIPTIONS OF ROOF SYSTEM TYPES AND TYPICAL DETAILS.
3. ROOF TYPES INDICATED ARE INTENDED TO DESCRIBE ROOFING SYSTEMS IN GENERAL. REFER TO STRUCTURAL DRAWINGS FOR COORDINATION OF STRUCTURAL DECK OR SUBSTRATE. COORDINATE WITH STRUCTURAL AND MEPFP DRAWINGS FOR LOCATIONS OF ROOF TOP EQUIPMENT SUPPORTED ON CONCRETE SLABS. COORDINATE TRANSITIONS BETWEEN STRUCTURAL DECK SYSTEMS AND MAINTAIN MINIMUM INSULATION THICKNESSES AT EQUIPMENT SLABS TO ENSURE SYSTEM PERFORMANCE AND WARRANTY REQUIREMENTS.
4. REFER TO MEPFP DRAWINGS FOR COORDINATION OF MECHANICAL EQUIPMENT, DEVICES, COMPONENTS, AND ASSOCIATED SUPPORT SYSTEMS. REFER TO PROJECT DETAILS INDICATED IN ARCHITECTURAL, STRUCTURAL, AND MEPFP DRAWINGS AND INCORPORATE ROOFING COMPONENTS REQUIRED TO ENSURE A WEATHER-TIGHT AND WARRANTIED SYSTEM AS DESCRIBED IN THE SPECIFICATIONS.
5. UNDERSIDE OF DECK (UOD) ELEVATIONS INDICATED ARE THEORETICAL ELEVATIONS PROVIDED AT STRUCTURAL COLUMN GRID INTERSECTIONS AND ARE RELATIVE TO THE LOWEST LEVEL OF THE PROJECT, UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. THE ROOFING AREAS SHALL FEATURE PLANAR SLOPE TOWARD DRAINS OF A MINIMUM ¼ INCH VERTICAL IN 12 INCHES HORIZONTAL DISTANCE. PROVIDE TAPERED INSULATION OR SHIMS TO MAINTAIN MINIMUM SLOPE AND AVOID PONDING.
7. PROVIDE TAPERED INSULATION AND/OR CRICKETS AT THE UPSLOPE SIDE OF ALL CURBS AND OTHER OBSTRUCTIONS TO DRAINAGE SLOPES, INCLUDING BUT NOT LIMITED TO CURBS FOR MECHANICAL EQUIPMENT, SKYLIGHTS, ACCESS HATCHES, AND SMOKE HATCHES.
8. PROVIDE ROOF WALK PADS AT EACH ROOF ACCESS POINT (ADJACENT TO ROOF HATCHES AND BOTTOM AND TOP OF ALL LADDERS OR STAIRS), AND AROUND ALL ROOFTOP EQUIPMENT WHETHER SHOWN IN DRAWINGS OR NOT.
9. DETAIL REFERENCES MAY NOT BE INDICATED FOR EACH OCCURRENCE OF ROOF PENETRATIONS OR ROOF MOUNTED EQUIPMENT. REFER TO THE ROOF LEGEND FOR ITEMS SHOWN ON THE ROOF PLAN, AND TO TYPICAL ROOF DETAILS AT SHEET A3.50 THAT ARE APPLICABLE TO THE WORK OF THIS PROJECT.
10. ROOFING SYSTEMS SHALL COMPLY WITH WIND LOAD AND PERFORMANCE REQUIREMENTS FOR ROOF COVERINGS. FASTENINGS, JOINT SEAM TREATMENTS, AND OTHER INSTALLATION DETAILS SHALL MEET MANUFACTURER'S REQUIREMENTS TO SATISFY CODE AND MEET WARRANTY REQUIREMENTS.
11. PROVIDE TAPERED INSULATION EDGE STRIPS, SHIMS, ADDITIONAL WOOD BLOCKING AND INSULATION FILLERS AS REQUIRED TO PROVIDE ¼:12 MIN SLOPE AND FLUSH CONTINUOUS TRANSITIONS BETWEEN ROOF DECK TYPES.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION ITEMS SHOWN ARE APPROXIMATE SIZE AND LOCATION FOR COORDINATION PURPOSES. REFER TO MEPFP PLANS AND SCHEDULES FOR ACTUAL ITEM DESIGNATIONS AND COORDINATE REQUIRED PENETRATIONS AND CLEARANCES, INCLUDING MANUFACTURER'S REQUIRED MAINTENECE CLEARANCES.
13. DETAIL REFERENCES ARE NOT INDICATED FOR EACH ROOF CONDITION OR PENETRATION. THE CONTRACTOR SHALL REFER TO PROJECT DETAILS FOR INFORMATION APPLICABLE TO MISCELLANEOUS ITEMS WHICH INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT PENETRATIONS, GUY-WIRE TIE-DOWN POINTS, PROTECTED WOOD SLEEPERS, CONDENSATE LINES AND OTHER MISCELLANEOUS PIPING, AND SMALL DIAMETER EXHAUST DUCTS. REFER TO KITCHEN EQUIPMENT, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION OF REQUIRED ROOF PENETRATIONS AND DETAILS WHERE APPLICABLE.
14. PROVIDE 3' x 3' SUMP AT DRAINS, MAX SLOPE 1:12.

ROOF LEGEND

(02.1a)	ROOF TYPE TAG. REFER TO A3.50 AND A3.51 FOR TYPES
	ROOF DRAIN / OVERFLOW DRAIN W/ INSUL SUMP. SEE PLUMBING DWG's
	DIRECTION OF SLOPING STRUCTURE (FLAT INSULATION AREA)
	DIRECTION OF SLOPE AT TAPERED INSULATION (MIN. 1/4"=1'-0")
	ROOF ACCESS HATCH
	TAPERED INSULATION (MIN. SLOPE = 1/4":1'-0")
	WALKWAY PADS
	EXPANSION JOINT
ROOF HYDRANT	ROOF HYDRANT; SEE FIRE PROTECTION DRAWINGS
EQUIPMENT SCREEN SEGMENT NUMBER. REFER TO AB/A3.51 FOR SEGMENT HEIGHTS. ROOF TOP EQUIPMENT SCREEN (6)	
VTR	VENT THROUGH ROOF; COORDINATE LOCATION W/ PLUMBING DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
EF	EXHAUST FAN WITH CURB; COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	ROOF HOOD/ GRAVITY VENT WITH CURB; COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
COND	CONDENSING UNIT ON PROTECTED WOOD SLEEPERS; COORD PITCH POCKET PIPE PENETRATION. COORDINATE LOCATION WITH HVAC DRAWINGS. SEE PROTECTED WOOD SLEEPER AND PITCH POCKET DETAILS @ SHEET A3.51
	AIR HANDLING UNIT ON CURBS: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	HVAC PIPING PENETRATION @ ROOF. COORDINATE LOCATION, SIZE, AND TYPE WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.50
	SOLAR READY ZONE

ROOFING SYSTEM
- R1 SINGLE PLY ROOFING SYSTEM
- R2 FIBERGLASS ROOF SHINGLES
- R3 STANDING SEAM METAL ROOFING
- R4 PROJECT SPECIFIC

(02.1)

STRUCTURAL DECKING MATERIAL
- 1 STEEL METAL DECKING
- 2 CONCRETE SLAB OR PLANK
- 3 STRUCTURAL WOOD SHEATHING
- 4 WOOD PLANK (HEAVY TIMBER)
- 5 CEMENTITIOUS WOOD FIBER COMPOSITE DECK (TECTUM)
- 6 PROJECT SPECIFIC

FOR ALL STRUCTURAL DECKING MATERIAL, SEE STRUCTURAL DRAWINGS FOR TYPE

FINISH - PROJECT SPECIFIC
- a COLOR OR DECORATIVE GRAVEL
- b COLOR OR NO DECORATIVE GRAVEL

DORE + WHITTIER

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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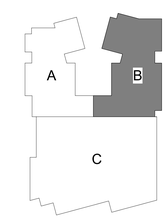
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
ROOF PLAN - AREA B

SHEET NUMBER:
A3.12

ROOF LEGEND

R2.1a	ROOF TYPE TAG, REFER TO A3.50 AND A3.51 FOR TYPES
	ROOF DRAIN / OVERFLOW DRAIN W/ INSUL SUMP: SEE PLUMBING DWG's
	DIRECTION OF SLOPING STRUCTURE (FLAT INSULATION AREA)
	DIRECTION OF SLOPE AT TAPERED INSULATION (MIN. 1/4"=1'-0")
	ROOF ACCESS HATCH
	TAPERED INSULATION (MIN. SLOPE = 1/4"-1'-0")
	WALKWAY PADS
	EXPANSION JOINT
ROOF HYDRANT	ROOF HYDRANT; SEE FIRE PROTECTION DRAWINGS
EQUIPMENT SCREEN SEGMENT NUMBER. REFER TO A9/A3.51 FOR SEGMENT HEIGHTS. ROOF TOP EQUIPMENT SCREEN 6	
VTR	VENT THROUGH ROOF: COORDINATE LOCATION W/ PLUMBING DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
EF	EXHAUST FAN WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	ROOF HOOD/ GRAVITY VENT WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
COND	CONDENSING UNIT ON PROTECTED WOOD SLEEPERS; COORD PITCH POCKET PIPE PENETRATION. COORDINATE LOCATION WITH HVAC DRAWINGS. SEE PROTECTED WOOD SLEEPER AND PITCH POCKET DETAILS @ SHEET A3.51
	AIR HANDLING UNIT ON CURBS: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	HVAC PIPING PENETRATION @ ROOF. COORDINATE LOCATION, SIZE, AND TYPE WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.50
	SOLAR READY ZONE

ROOF PLAN GENERAL NOTES

1. ALL ROOF AREAS SHALL BE ROOFING SYSTEM TYPE R1.1 UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
2. REFER TO SHEET A3.50 FOR DETAILED DESCRIPTIONS OF ROOF SYSTEM TYPES AND TYPICAL DETAILS.
3. ROOF TYPES INDICATED ARE INTENDED TO DESCRIBE ROOFING SYSTEMS IN GENERAL. REFER TO STRUCTURAL DRAWINGS FOR COORDINATION OF STRUCTURAL DECK OR SUBSTRATE. COORDINATE WITH STRUCTURAL AND MEPFP DRAWINGS FOR LOCATIONS OF ROOF TOP EQUIPMENT SUPPORTED ON CONCRETE SLABS. COORDINATE TRANSITIONS BETWEEN STRUCTURAL DECK SYSTEMS AND MAINTAIN MINIMUM INSULATION THICKNESSES AT EQUIPMENT SLABS TO ENSURE SYSTEM PERFORMANCE AND WARRANTY REQUIREMENTS.
4. REFER TO MEPFP DRAWINGS FOR COORDINATION OF MECHANICAL EQUIPMENT, DEVICES, COMPONENTS, AND ASSOCIATED SUPPORT SYSTEMS. REFER TO PROJECT DETAILS INDICATED IN ARCHITECTURAL, STRUCTURAL, AND MEPFP DRAWINGS AND INCORPORATE ROOFING COMPONENTS REQUIRED TO ENSURE A WEATHER-TIGHT AND WARRANTIED SYSTEM AS DESCRIBED IN THE SPECIFICATIONS.
5. UNDERSIDE OF DECK (UOD) ELEVATIONS INDICATED ARE THEORETICAL ELEVATIONS PROVIDED AT STRUCTURAL COLUMN GRID INTERSECTIONS AND ARE RELATIVE TO THE LOWEST LEVEL OF THE PROJECT, UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. THE ROOFING AREAS SHALL FEATURE PLANAR SLOPE TOWARD DRAINS OF A MINIMUM ¼ INCH VERTICAL IN 12 INCHES HORIZONTAL DISTANCE. PROVIDE TAPERED INSULATION OR SHIMS TO MAINTAIN MINIMUM SLOPE AND AVOID PONDING.
7. PROVIDE TAPERED INSULATION AND/OR CRICKETS AT THE UPSLOPE SIDE OF ALL CURBS AND OTHER OBSTRUCTIONS TO DRAINAGE SLOPES, INCLUDING BUT NOT LIMITED TO CURBS FOR MECHANICAL EQUIPMENT, SKYLIGHTS, ACCESS HATCHES, AND SMOKE HATCHES.
8. PROVIDE ROOF WALK PADS AT EACH ROOF ACCESS POINT (ADJACENT TO ROOF HATCHES AND BOTTOM AND TOP OF ALL LADDERS OR STAIRS), AND AROUND ALL ROOFTOP EQUIPMENT WHETHER SHOWN IN DRAWINGS OR NOT.
9. DETAIL REFERENCES MAY NOT BE INDICATED FOR EACH OCCURRENCE OF ROOF PENETRATIONS OR ROOF MOUNTED EQUIPMENT. REFER TO THE ROOF LEGEND FOR ITEMS SHOWN ON THE ROOF PLAN, AND TO TYPICAL ROOF DETAILS AT SHEET A3.50 THAT ARE APPLICABLE TO THE WORK OF THIS PROJECT.
10. ROOFING SYSTEMS SHALL COMPLY WITH WIND LOAD AND PERFORMANCE REQUIREMENTS FOR ROOF COVERINGS. FASTENINGS, JOINT SEAM TREATMENTS, AND OTHER INSTALLATION DETAILS SHALL MEET MANUFACTURER'S REQUIREMENTS TO SATISFY CODE AND MEET WARRANTY REQUIREMENTS.
11. PROVIDE TAPERED INSULATION EDGE STRIPS, SHIMS, ADDITIONAL WOOD BLOCKING AND INSULATION FILLERS AS REQUIRED TO PROVIDE ¼:12 MIN SLOPE AND FLUSH CONTINUOUS TRANSITIONS BETWEEN ROOF DECK TYPES.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION ITEMS SHOWN ARE APPROXIMATE SIZE AND LOCATION FOR COORDINATION PURPOSES. REFER TO MEPFP PLANS AND SCHEDULES FOR ACTUAL ITEM DESIGNATIONS AND COORDINATE REQUIRED PENETRATIONS AND CLEARANCES, INCLUDING MANUFACTURER'S REQUIRED MAINTENECE CLEARANCES.
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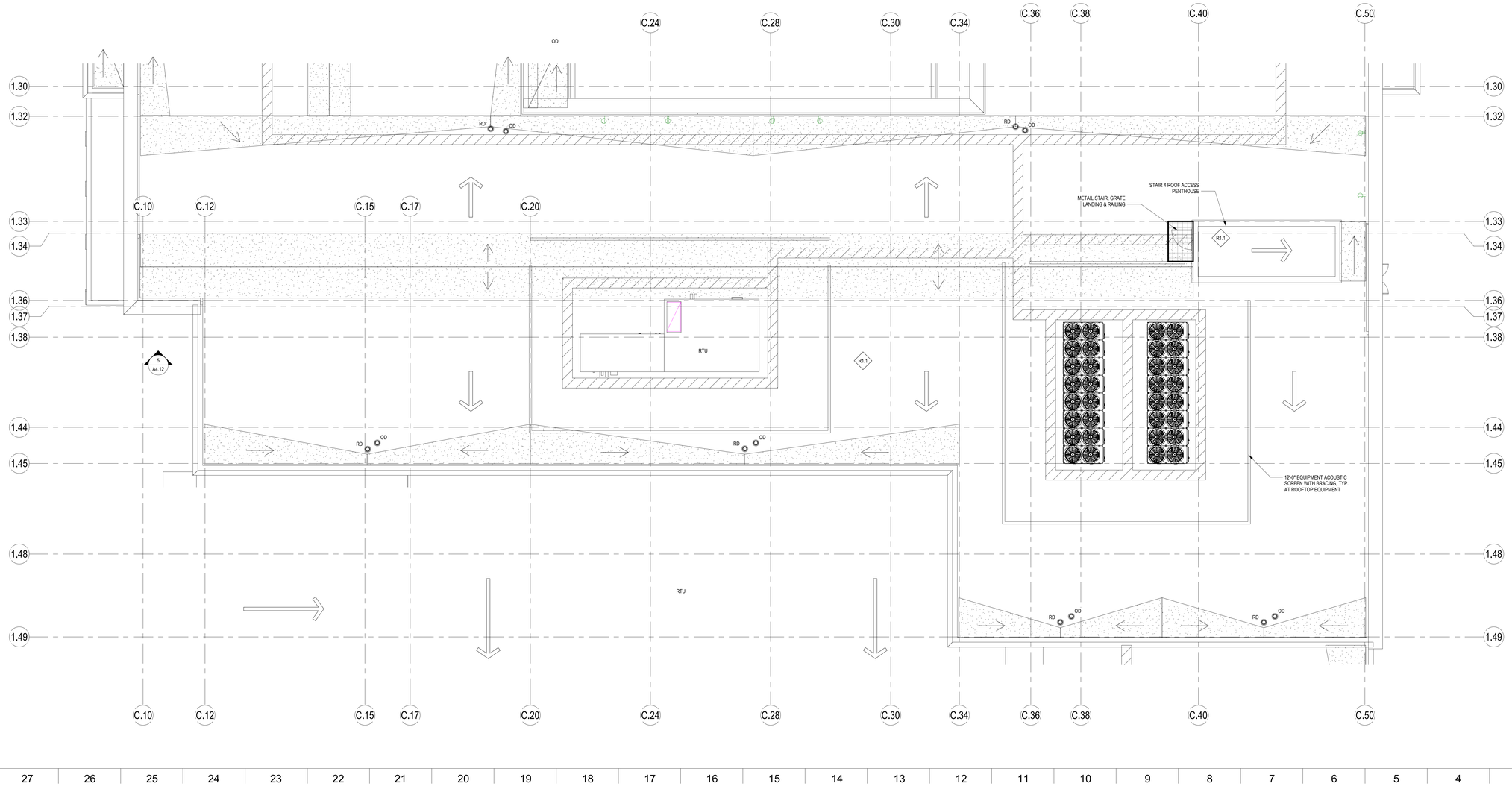
14. PROVIDE 3' x 3' SUMP AT DRAINS, MAX SLOPE 1:12.



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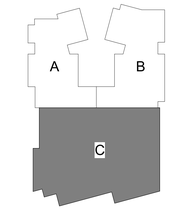
KEY PLAN



ORIENTATION AND SCALE:

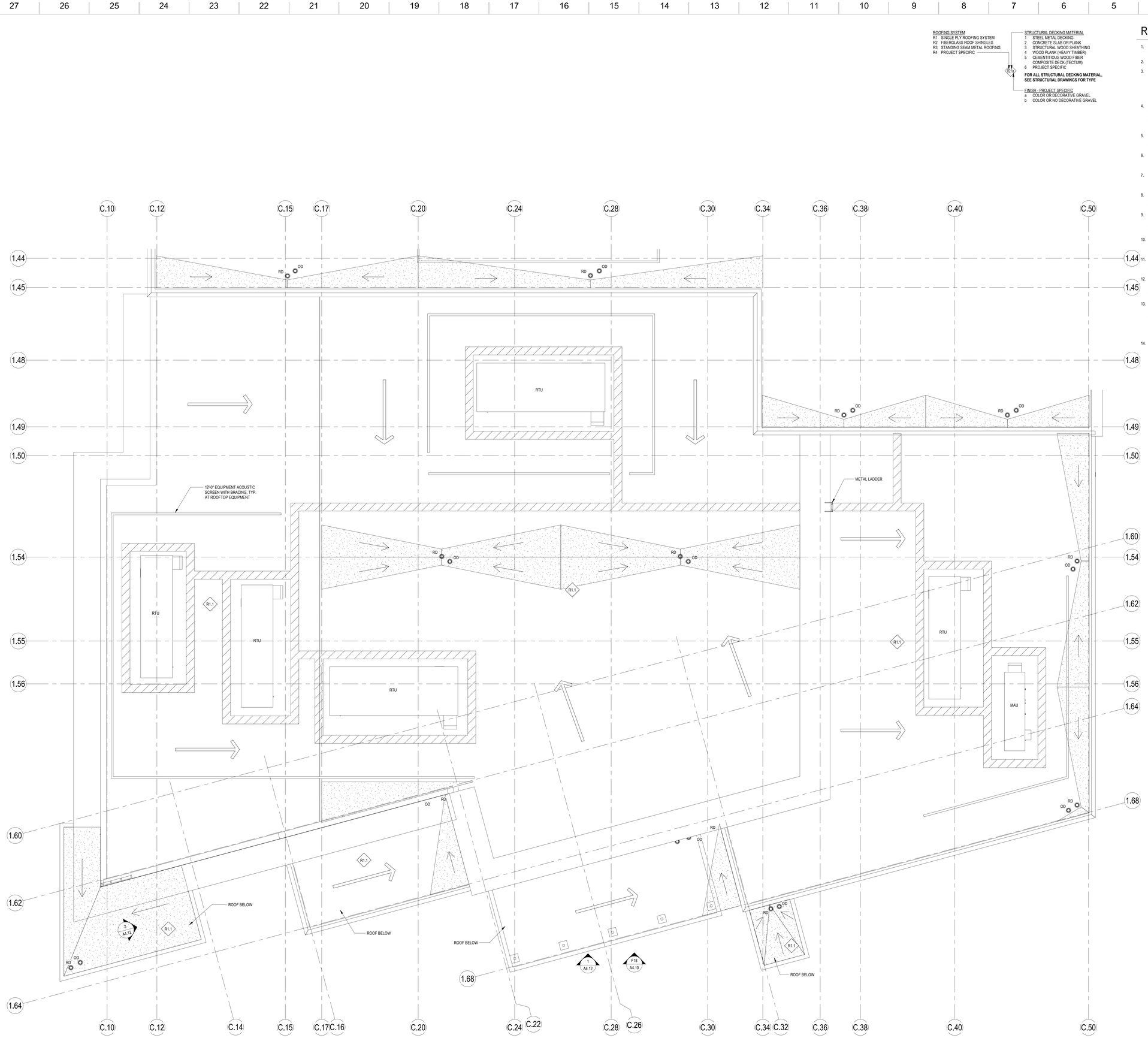
PROJECT NORTH

SHEET TITLE:

ROOF PLAN - UPPER AREA C

SHEET NUMBER:

A3.13



ROOF PLAN GENERAL NOTES

1. ALL ROOF AREAS SHALL BE ROOFING SYSTEM TYPE R1.1 UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
2. REFER TO SHEET A3.50 FOR DETAILED DESCRIPTIONS OF ROOF SYSTEM TYPES AND TYPICAL DETAILS.
3. ROOF TYPES INDICATED ARE INTENDED TO DESCRIBE ROOFING SYSTEMS IN GENERAL. REFER TO STRUCTURAL DRAWINGS FOR COORDINATION OF STRUCTURAL DECK OR SUBSTRATE. COORDINATE WITH STRUCTURAL AND MEPFP DRAWINGS FOR LOCATIONS OF ROOF TOP EQUIPMENT SUPPORTED ON CONCRETE SLABS. COORDINATE TRANSITIONS BETWEEN STRUCTURAL DECK SYSTEMS AND MAINTAIN MINIMUM INSULATION THICKNESSES AT EQUIPMENT SLABS TO ENSURE SYSTEM PERFORMANCE AND WARRANTY REQUIREMENTS.
4. REFER TO MEPFP DRAWINGS FOR COORDINATION OF MECHANICAL EQUIPMENT, DEVICES, COMPONENTS, AND ASSOCIATED SUPPORT SYSTEMS. REFER TO PROJECT DETAILS INDICATED IN ARCHITECTURAL, STRUCTURAL, AND MEPFP DRAWINGS AND INCORPORATE ROOFING COMPONENTS REQUIRED TO ENSURE A WEATHER-TIGHT AND WARRANTIED SYSTEM AS DESCRIBED IN THE SPECIFICATIONS.
5. UNDERSIDE OF DECK (UOD) ELEVATIONS INDICATED ARE THEORETICAL ELEVATIONS PROVIDED AT STRUCTURAL COLUMN GRID INTERSECTIONS AND ARE RELATIVE TO THE LOWEST LEVEL OF THE PROJECT, UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. THE ROOFING AREAS SHALL FEATURE PLANAR SLOPE TOWARD DRAINS OF A MINIMUM ¼ INCH VERTICAL IN 12 INCHES HORIZONTAL DISTANCE. PROVIDE TAPERED INSULATION OR SHIMS TO MAINTAIN MINIMUM SLOPE AND AVOID PONDING.
7. PROVIDE TAPERED INSULATION AND/OR CRICKETS AT THE UPSLOPE SIDE OF ALL CURBS AND OTHER OBSTRUCTIONS TO DRAINAGE SLOPES, INCLUDING BUT NOT LIMITED TO CURBS FOR MECHANICAL EQUIPMENT, SKYLIGHTS, ACCESS HATCHES, AND SMOKE HATCHES.
8. PROVIDE ROOF WALK PADS AT EACH ROOF ACCESS POINT (ADJACENT TO ROOF HATCHES AND BOTTOM AND TOP OF ALL LADDERS OR STAIRS), AND AROUND ALL ROOFTOP EQUIPMENT WHETHER SHOWN IN DRAWINGS OR NOT.
9. DETAIL REFERENCES MAY NOT BE INDICATED FOR EACH OCCURRENCE OF ROOF PENETRATIONS OR ROOF MOUNTED EQUIPMENT. REFER TO THE ROOF LEGEND FOR ITEMS SHOWN ON THE ROOF PLAN, AND TO TYPICAL ROOF DETAILS AT SHEET A3.50 THAT ARE APPLICABLE TO THE WORK OF THIS PROJECT.
10. ROOFING SYSTEMS SHALL COMPLY WITH WIND LOAD AND PERFORMANCE REQUIREMENTS FOR ROOF COVERINGS. FASTENINGS, JOINT SEAM TREATMENTS, AND OTHER INSTALLATION DETAILS SHALL MEET MANUFACTURER'S REQUIREMENTS TO SATISFY CODE AND MEET WARRANTY REQUIREMENTS.
11. PROVIDE TAPERED INSULATION EDGE STRIPS, SHIMS, ADDITIONAL WOOD BLOCKING AND INSULATION FILLERS AS REQUIRED TO PROVIDE ¼:12 MIN SLOPE AND FLUSH CONTINUOUS TRANSITIONS BETWEEN ROOF DECK TYPES.
12. MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION ITEMS SHOWN ARE APPROXIMATE SIZE AND LOCATION FOR COORDINATION PURPOSES. REFER TO MEPFP PLANS AND SCHEDULES FOR ACTUAL ITEM DESIGNATIONS AND COORDINATE REQUIRED PENETRATIONS AND CLEARANCES, INCLUDING MANUFACTURER'S REQUIRED MAINTENECE CLEARANCES.
13. DETAIL REFERENCES ARE NOT INDICATED FOR EACH ROOF CONDITION OR PENETRATION. THE CONTRACTOR SHALL REFER TO PROJECT DETAILS FOR INFORMATION APPLICABLE TO MISCELLANEOUS ITEMS WHICH INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT PENETRATIONS, GUY-WIRE TIE-DOWN POINTS, PROTECTED WOOD SLEEPERS, CONDENSATE LINES AND OTHER MISCELLANEOUS PIPING, AND SMALL DIAMETER EXHAUST DUCTS. REFER TO KITCHEN EQUIPMENT, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION OF REQUIRED ROOF PENETRATIONS AND DETAILS WHERE APPLICABLE.
14. PROVIDE 3' x 3' SUMP AT DRAINS, MAX SLOPE 1:12.

ROOF LEGEND

R2.1a	ROOF TYPE TAG, REFER TO A3.50 AND A3.51 FOR TYPES
	ROOF DRAIN / OVERFLOW DRAIN W/ INSUL SUMP. SEE PLUMBING DWG's
	DIRECTION OF SLOPING STRUCTURE: (FLAT INSULATION AREA)
	DIRECTION OF SLOPE AT TAPERED INSULATION (MIN. 1/4"=1'-0")
	ROOF ACCESS HATCH
	TAPERED INSULATION (MIN. SLOPE = 1/4":1'-0")
	WALKWAY PADS
	EXPANSION JOINT
ROOF HYDRANT	ROOF HYDRANT. SEE FIRE PROTECTION DRAWINGS
EQUIPMENT SCREEN SEGMENT NUMBER. REFER TO A8/A3.51 FOR SEGMENT HEIGHTS. ROOF TOP EQUIPMENT SCREEN 6	
VTR	VENT THROUGH ROOF. COORDINATE LOCATION W/ PLUMBING DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
EF	EXHAUST FAN WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	ROOF HOOD/ GRAVITY VENT WITH CURB: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
COND	CONDENSING UNIT ON PROTECTED WOOD SLEEPERS; COORD PITCH POCKET PIPE PENETRATION. COORDINATE LOCATION WITH HVAC DRAWINGS. SEE PROTECTED WOOD SLEEPER AND PITCH POCKET DETAILS @ SHEET A3.51
	AIR HANDLING UNIT ON CURBS: COORDINATE LOCATION WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.51
	HVAC PIPING PENETRATION @ ROOF. COORDINATE LOCATION, SIZE, AND TYPE WITH HVAC DRAWINGS. SEE TYPICAL FLASHING DETAILS @ SHEET A3.50
	SOLAR READY ZONE

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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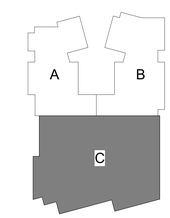
KEY PLAN



ORIENTATION AND SCALE:

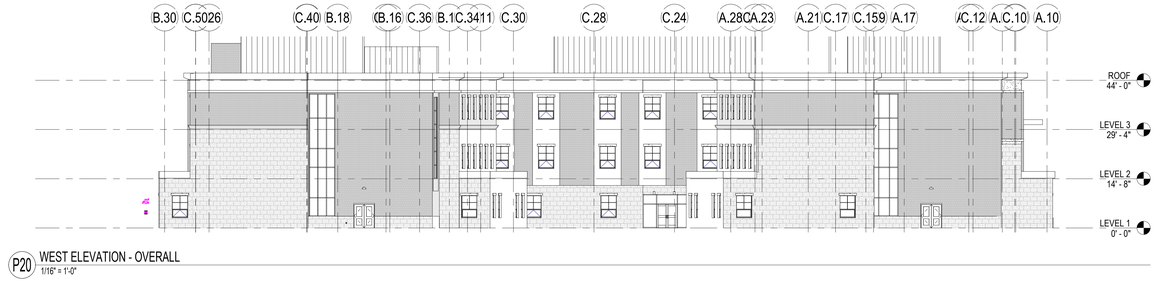
N TRUE NORTH
0 4' 8' 16'
SCALE: 1/8"=1'-0" GRAPHIC SCALE
PROJECT NORTH

SHEET TITLE:

ROOF PLAN - LOWER AREA C

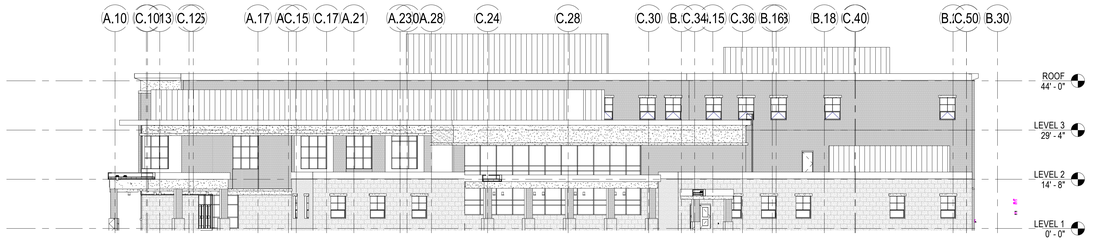
SHEET NUMBER:

A3.14

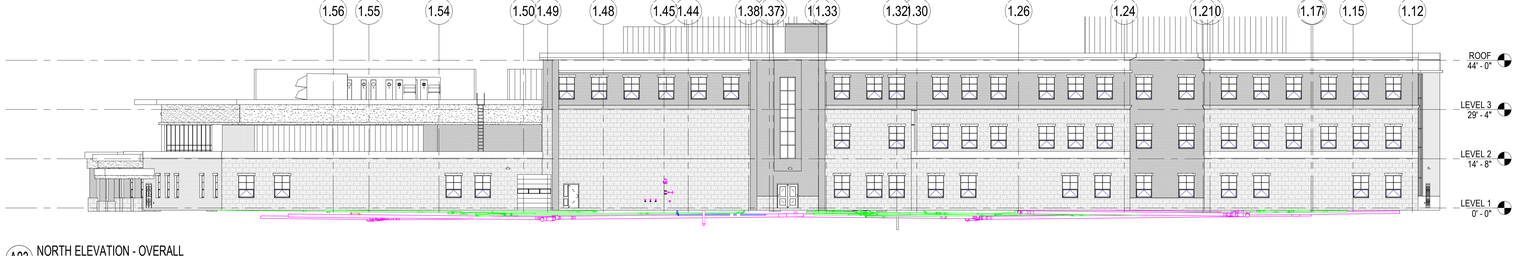


P20 WEST ELEVATION - OVERALL
1/16" = 1'-0"

K23 SOUTH ELEVATION - OVERALL
1/16" = 1'-0"



F18 EAST ELEVATION - OVERALL
1/16" = 1'-0"



A23 NORTH ELEVATION - OVERALL
1/16" = 1'-0"

EXTERIOR ELEVATION GENERAL NOTES

1. EXTERIOR ELEVATIONS ARE PROVIDED TO SHOW THE GENERAL ARRANGEMENT OF EXTERIOR WALL FINISH MATERIALS. REFER TO WALL SECTIONS AND DETAILS FOR DETAILED DESCRIPTION OF CONSTRUCTION.
2. LINE OF GRADE INDICATED IS APPROXIMATE – REFER TO CIVIL / LANDSCAPE GRADING PLANS FOR GRADING INFORMATION.
3. WHERE PORTIONS OF ELEVATIONS ARE OBSCURED FROM VIEW BY FREESTANDING COLUMNS, FASCIA, ROOF EDGES, OR OTHER PROJECTING CONSTRUCTION, THE CONTRACTOR SHALL ASSUME THAT THE ADJACENT WALL FINISHES EXTEND INTO THE AREAS OBSCURED FROM VIEW, UNLESS SPECIFICALLY INDICATED AS OTHERWISE IN BUILDING AND WALL SECTIONS.
4. DIMENSIONAL INFORMATION PROVIDED RELATIVE TO MASONRY VENEER IS BASED ON NOMINAL FULL INCH MASONRY COURSING.
5. REFER TO ROOF PLAN FOR DESCRIPTION OF ROOFING SYSTEMS AND MATERIALS.
6. REFER TO CURTAIN-WALL TYPES AND DETAILS FOR INFORMATION RELATED TO CURTAIN-WALL, GLAZING TYPES, INSTALLATION, AND TRIM AT OPENINGS.
7. REFER TO WINDOW TYPES AND DETAILS FOR INFORMATION RELATED TO WINDOWS, OPERABLE SASH, GLAZING TYPES, INSTALLATION, AND TRIM AT OPENINGS.
8. REFER TO LOUVER TYPES AND DETAILS FOR INFORMATION RELATED TO LOUVER OPENINGS, SIZES, INSTALLATION, AND TRIM AT OPENINGS.
9. REFER TO BUILDING AND WALL SECTIONS FOR HEIGHT OF MASONRY COURSING AND TOP OF MASONRY ELEVATIONS.
10. PROVIDE MASONRY VENEER CONTROL JOINTS WHERE INDICATED IN ELEVATIONS. IN ADDITION, PROVIDE CONTROL JOINTS AT THE FOLLOWING LOCATIONS:
    a. ON ONE SIDE OF AN OUTWARD BUILDING CORNER WITHIN 2'-4" OF THE CORNER.
    b. AT EACH INWARD BUILDING CORNER.
    c. WHERE THE HEIGHT OF THE FACADE MASONRY VENEER CHANGES.
    d. WHERE THE METHOD OF SUPPORT FOR MASONRY VENEER CHANGES, SUCH AS AT ENDS OF RELIEVING ANGLES OR STRUCTURAL LINTELS SUPPORTED FROM ROOF STRUCTURE.
    e. ON UNINTERRUPTED SPANS OF MASONRY VENEER AT MAXIMUM 24'-0" SPACING.
11. SEALANT AND BACKER ROD AT MASONRY VENEER CONTROL JOINTS SHALL BE PROVIDED AND INSTALLED BY THE WATERPROOFING / JOINT SEALANT SUB-CONTRACTOR.
12. WHERE LOOSE LINTELS CROSS CONTROL JOINTS, PROVIDE BOND-BREAK FABRIC WRAP OF LINTEL END AT PORTION OF LINTEL EXTENDING PAST CONTROL JOINT.
13. WHERE MASONRY VENEER MATERIAL CHANGES OCCUR, INCLUDING FROM BRICK TO CMU OR PRECAST CONCRETE, PROVIDE A BOND BREAK SEPARATOR BETWEEN COURSES.
14. ELEVATIONS MAY NOT SHOW ALL BUILDING FEATURES WITH CLARITY, SUCH AS REGLET COUNTER-FLASHINGS AND TERMINATION BARS WHERE ROOF MEMBRANE FLASHINGS TERMINATE ON SIDE WALLS. REFER TO WALL SECTION AND ROOF EDGE DETAILS FOR DETAILS AND INFORMATION RELATED TO THESE CONDITIONS.
15. PAINT ALL EXPOSED LINTELS TO MATCH ADJACENT WALL.

EXTERIOR MATERIALS LEGEND

- BRICK
- CONCRETE / CAST STONE
- METAL PANEL / MCM PANEL
- CORRUGATED METAL PANEL (SIDING AND EQUIPMENT
- EV-CMU
- LOUVER
- VERTICAL STANDING SEAM METAL PANEL SIDING
- VISION PANEL - OPERABLE

EXTERIOR ELEVATION SYMBOLS LEGEND

- O CA — CAMERA; SEE SECURITY DWGS
- HW — FIRE ALARM HORN/ STROBE; SEE FIRE ALARM DWGS
- SP — SPEAKER; SEE COMMUNICATION DWGS
- FA — RED FIRE ALARM BEACON; SEE FIRE ALARM DWGS
- CR — CARD READER; SEE TECHNOLOGY DWGS
- SE — AMBER SECURITY BEACON; SEE FIRE ALARM AND TECHNOLOGY DRAWINGS
- A1 — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- SP — SPRINKLER ALARM BEACON AND BELL; SEE FIRE ALARM DWGS
- D — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- H — HOSE BIB; SEE PLUMBING DWGS
- PENDANT MOUNT LIGHT FIXTURE, SEE ELEC. DWGS. LOCATE SL4 AT 8'-0" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE SL5 AT 14'-0" ABOVE LEVEL 1 TO B.O. FIXTURE.
- WALL SCONCE LIGHT FIXTURE, SEE ELEC. DWGS. LOCATE LEVEL 1 SC1 AT 7'-8" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE LEVEL 2 SC-1 AT 4'-0" ABOVE LEVEL 2 TO B.O. FIXTURE
- 3/4" — EXTENT OF BRICK VENEER PROJECTING BEYOND THE DATUM FACE OF BRICK VENEER PLANE. SEE PROJECT DETAILS AND SPECIAL BRICK SHAPES FOR ASSEMBLIES

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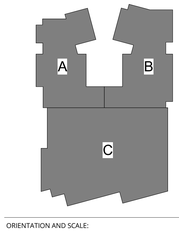
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:

OVERALL EXTERIOR ELEVATIONS

SHEET NUMBER:

A4.10

EXTERIOR MATERIALS LEGEND

- BRICK
- METAL PANEL / MCM PANEL
- EV-CMU
- VERTICAL STANDING SEAM METAL PANEL SIDING
- CONCRETE / CAST STONE
- CORRUGATED METAL PANEL (SIDING AND EQUIPMENT
- LOUVER
- VISION PANEL - OPERABLE

EXTERIOR ELEVATION SYMBOLS LEGEND

- CA — CAMERA; SEE SECURITY DWGS
- SP — SPEAKER; SEE COMMUNICATION DWGS
- CR — CARD READER; SEE TECHNOLOGY DWGS
- A1 — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
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- +3/4" — EXTENT OF BRICK VENEER PROJECTING BEYOND THE DATUM FACE OF BRICK VENEER PLANE. SEE PROJECT DETAILS AND SPECIAL BRICK SHAPES FOR ASSEMBLIES
- H — FIRE ALARM HORN/ STROBE; SEE FIRE ALARM DWGS
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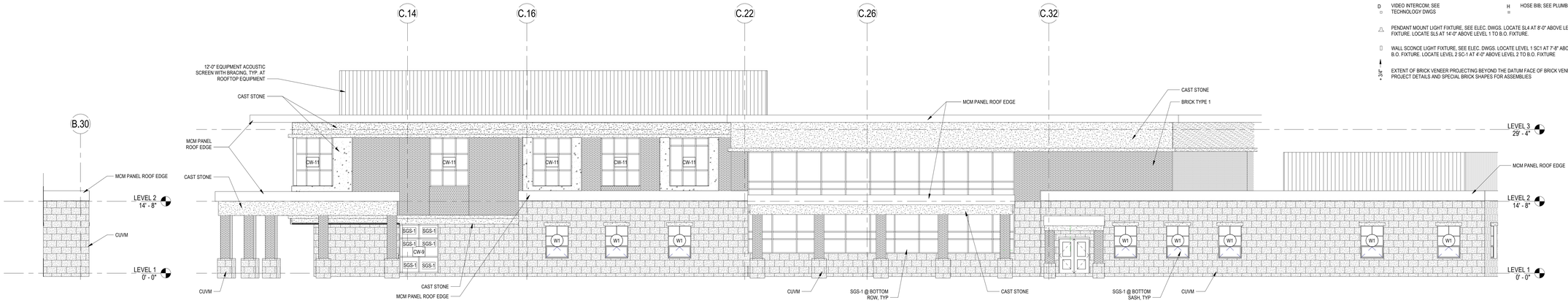
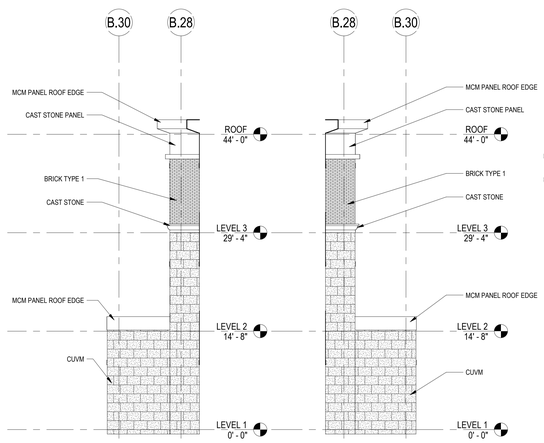
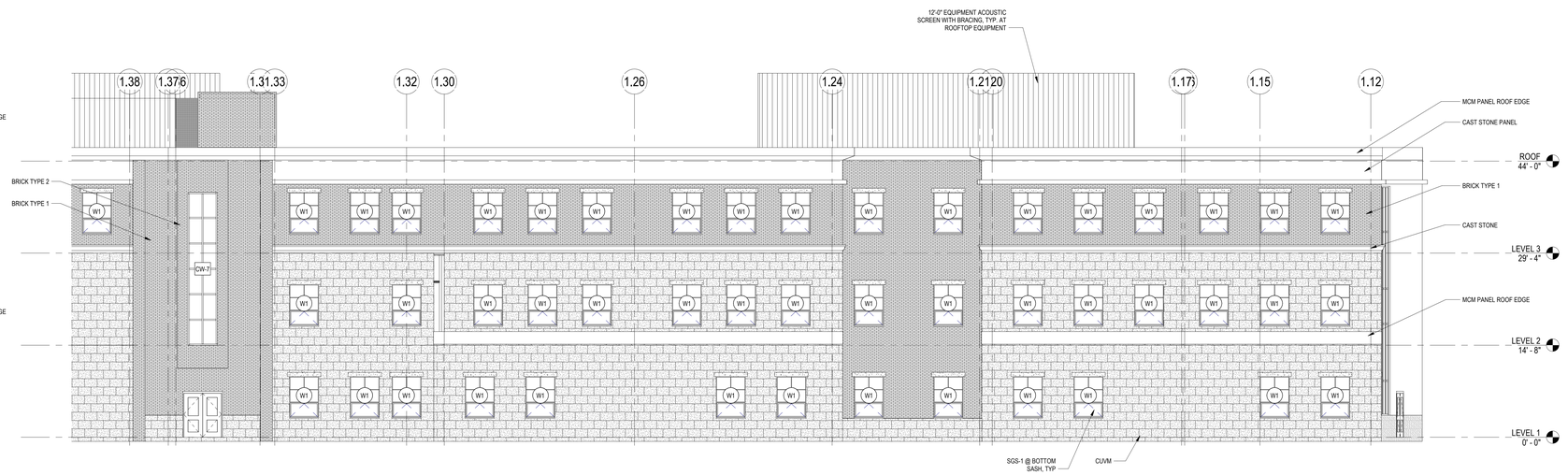


6 PARTIAL EAST ELEVATION 5
1/8" = 1'-0"



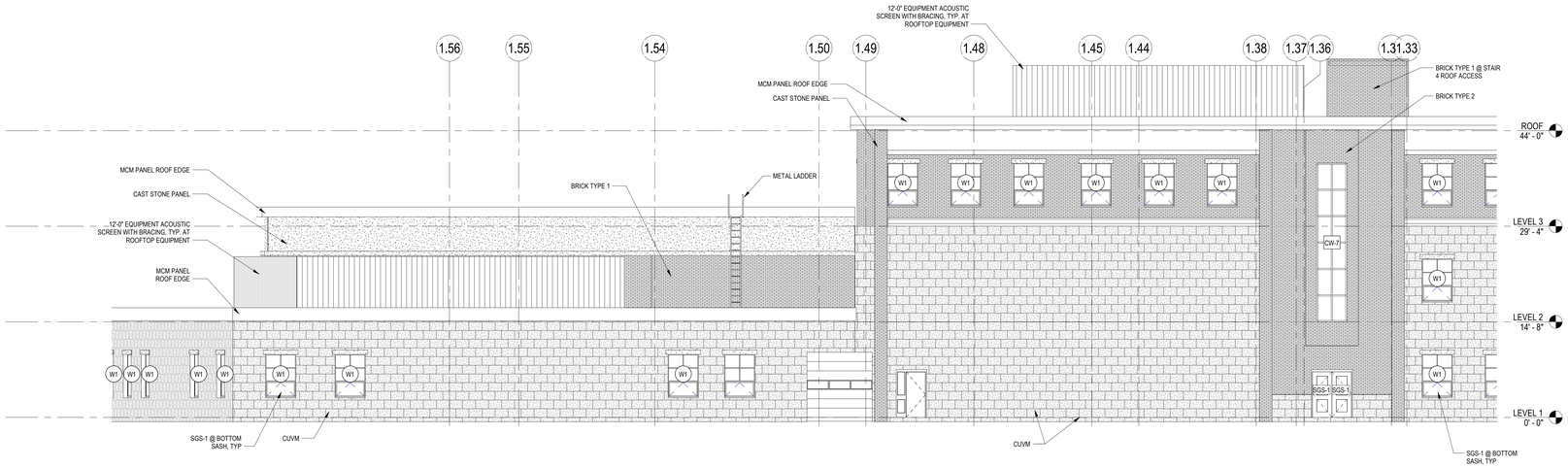
3 PARTIAL EAST ELEVATION 1
1/8" = 1'-0"



5 PARTIAL WEST ELEVATION 6
1/8" = 1'-0"

4 PARTIAL EAST ELEVATION 4
1/8" = 1'-0"

2 PARTIAL NORTH ELEVATION 3
1/8" = 1'-0"



1 PARTIAL NORTH ELEVATION
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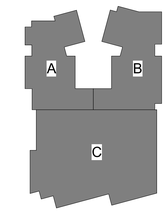
KEY PLAN



ORIENTATION AND SCALE:

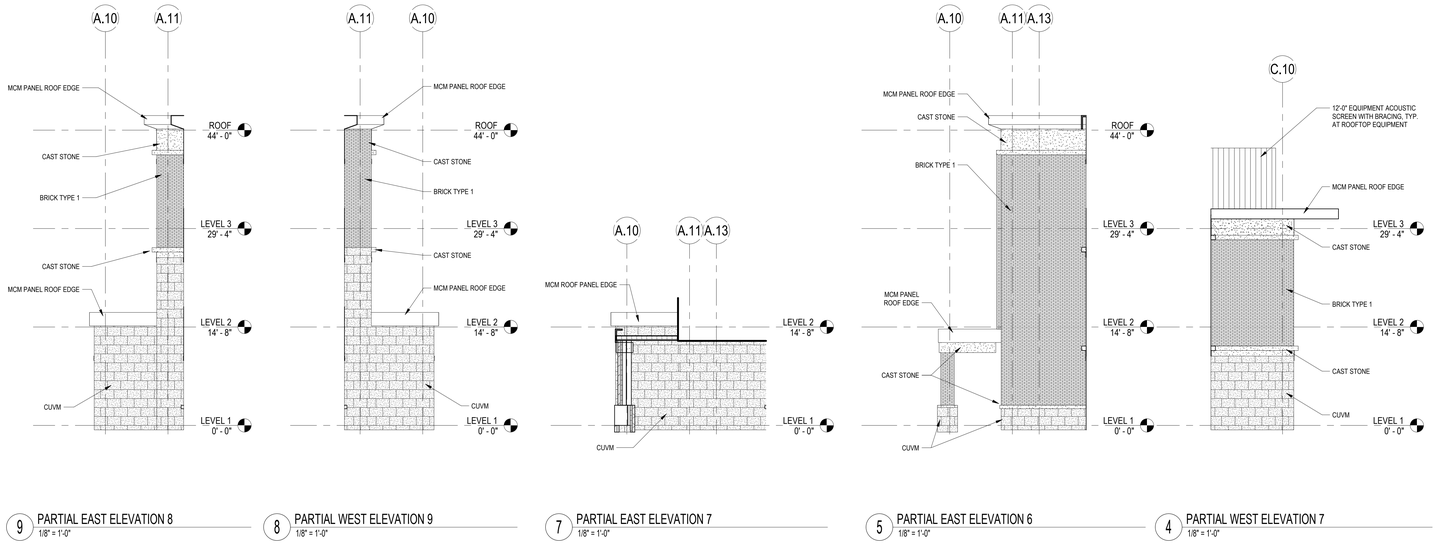
PROJECT NORTH

SHEET TITLE:

EXTERIOR ELEVATIONS

SHEET NUMBER:

A4.11



9 PARTIAL EAST ELEVATION 8
1/8" = 1'-0"

8 PARTIAL WEST ELEVATION 9
1/8" = 1'-0"

7 PARTIAL EAST ELEVATION 7
1/8" = 1'-0"

5 PARTIAL EAST ELEVATION 6
1/8" = 1'-0"

4 PARTIAL WEST ELEVATION 7
1/8" = 1'-0"

EXTERIOR ELEVATION SYMBOLS LEGEND

CA	CAMERA; SEE SECURITY DWGS		FIRE ALARM HORN/ STROBE; SEE FIRE ALARM DWGS
SP	SPEAKER; SEE COMMUNICATION DWGS	FA	RED FIRE ALARM BEACON; SEE FIRE ALARM DWGS
CR	CARD READER; SEE TECHNOLOGY DWGS	SE	AMBER SECURITY BEACON; SEE FIRE ALARM AND TECHNOLOGY DRAWINGS
A1	VIDEO INTERCOM; SEE TECHNOLOGY DWGS	SP	SPRINKLER ALARM BEACON AND BELL; SEE FIRE ALARM DWGS
D	VIDEO INTERCOM; SEE TECHNOLOGY DWGS	H	HOSE BIB; SEE PLUMBING DWGS

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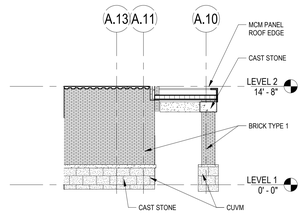
3'-0" EXTENT OF BRICK VENEER PROJECTING BEYOND THE DATUM FACE OF BRICK VENEER PLANE. SEE PROJECT DETAILS AND SPECIAL BRICK SHAPES FOR ASSEMBLIES



6 PARTIAL WEST ELEVATION 8
1/8" = 1'-0"

EXTERIOR ELEVATION GENERAL NOTES

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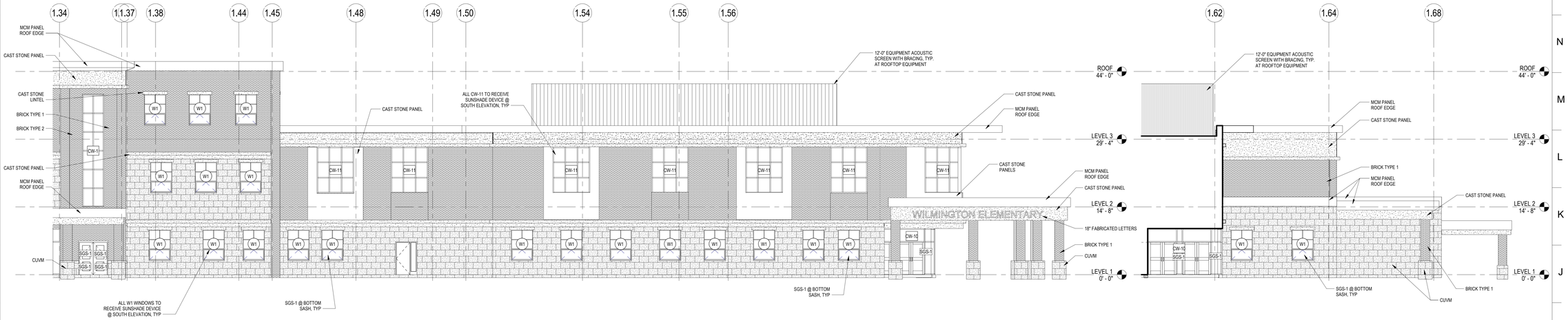
15. PAINT ALL EXPOSED LINTELS TO MATCH ADJACENT WALL.

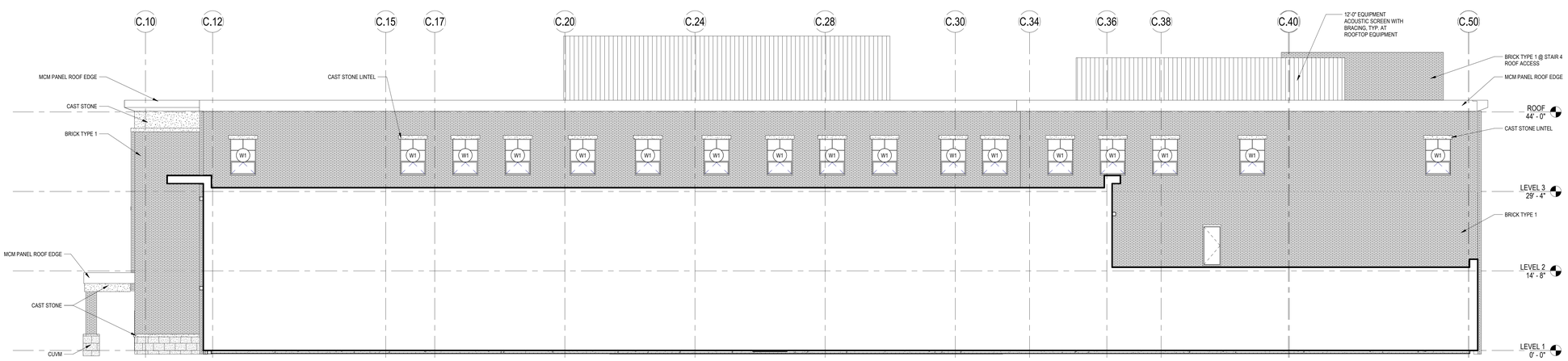
EXTERIOR MATERIALS LEGEND

BRICK	CONCRETE / CAST STONE
METAL PANEL / MCM PANEL	CORRUGATED METAL PANEL (SIDING AND EQUIPMENT
EV-CMU	LOUVER
VERTICAL STANDING SEAM METAL PANEL SIDING	VISION PANEL - OPERABLE



3 PARTIAL SOUTH ELEVATION
1/8" = 1'-0"

2 PARTIAL SOUTH ELEVATION 3
1/8" = 1'-0"



1 PARTIAL EAST ELEVATION 2
1/8" = 1'-0"

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320 SALEM STREET
WILMINGTON, MA 01887

PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

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SCHEMATIC DESIGN
04/24/2025

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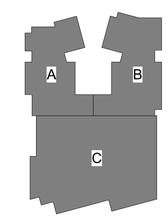
KEY PLAN

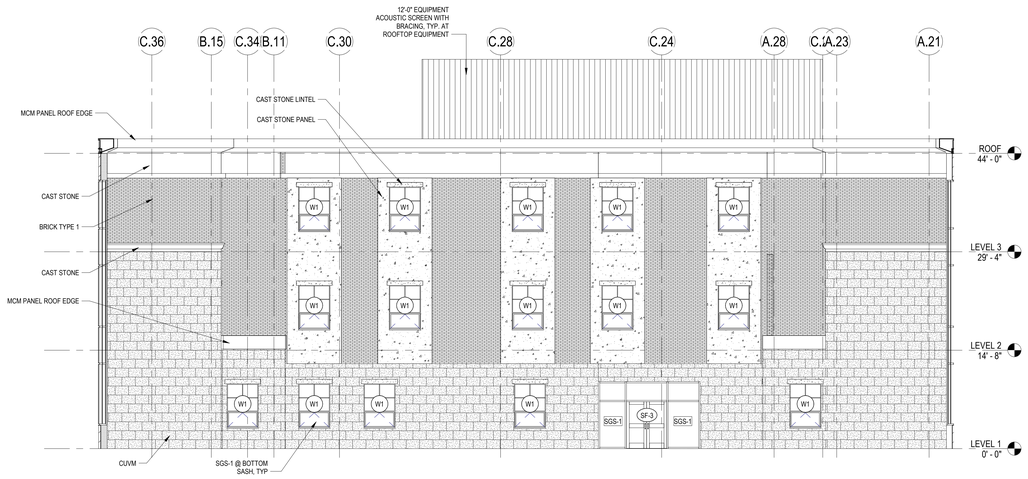


ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
EXTERIOR ELEVATIONS

SHEET NUMBER:
A4.12



6 PARTIAL WEST ELEVATION 5
1/8" = 1'-0"

EXTERIOR MATERIALS LEGEND

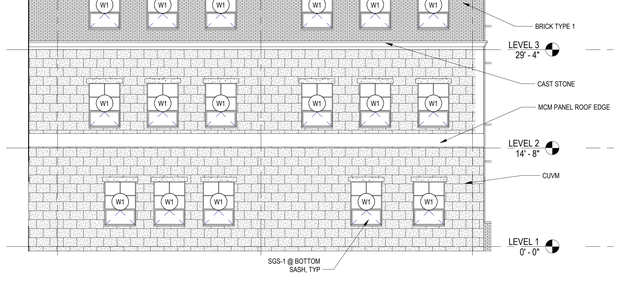
- BRICK
- METAL PANEL / MCM PANEL
- EV-CMU
- VERTICAL STANDING SEAM METAL PANEL SIDING
- CONCRETE / CAST STONE
- CORRUGATED METAL PANEL (SIDING AND EQUIPMENT
- LOUVER
- VISION PANEL - OPERABLE

EXTERIOR ELEVATION SYMBOLS LEGEND

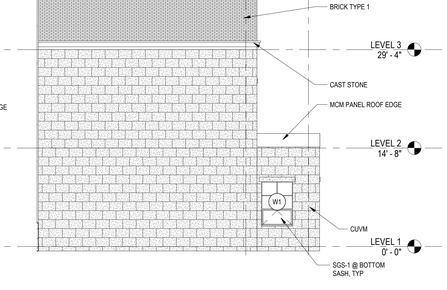
- CA — CAMERA; SEE SECURITY DWGS
- SP — SPEAKER; SEE COMMUNICATION DWGS
- CR — CARD READER; SEE TECHNOLOGY DWGS
- A1 — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- D — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- HF — FIRE ALARM HORN/ STROBE; SEE FIRE ALARM DWGS
- FA — RED FIRE ALARM BEACON; SEE FIRE ALARM DWGS
- SE — AMBER SECURITY BEACON; SEE FIRE ALARM AND TECHNOLOGY DRAWINGS
- SP — SPRINKLER ALARM BEACON AND BELL; SEE FIRE ALARM DWGS
- H — HOSE BIB; SEE PLUMBING DWGS
- PENDANT MOUNT LIGHT FIXTURE. SEE ELEC. DWGS. LOCATE SL4 AT 8'-0" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE SL5 AT 14'-0" ABOVE LEVEL 1 TO B.O. FIXTURE.
- WALL SCONCE LIGHT FIXTURE, SEE ELEC. DWGS. LOCATE LEVEL 1 SC1 AT 7'-8" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE LEVEL 2 SC-1 AT 4'-0" ABOVE LEVEL 2 TO B.O. FIXTURE
- 3/4" — EXTENT OF BRICK VENEER PROJECTING BEYOND THE DATUM FACE OF BRICK VENEER PLANE. SEE PROJECT DETAILS AND SPECIAL BRICK SHAPES FOR ASSEMBLIES

EXTERIOR ELEVATION GENERAL NOTES

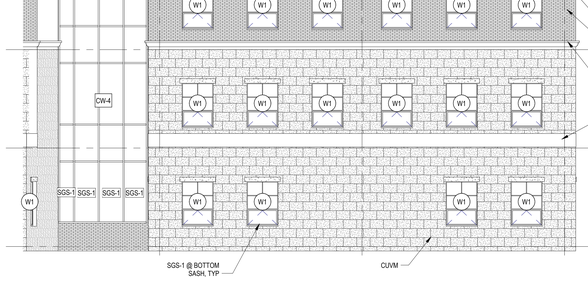
1. EXTERIOR ELEVATIONS ARE PROVIDED TO SHOW THE GENERAL ARRANGEMENT OF EXTERIOR WALL FINISH MATERIALS. REFER TO WALL SECTIONS AND DETAILS FOR DETAILED DESCRIPTION OF CONSTRUCTION.
2. LINE OF GRADE INDICATED IS APPROXIMATE – REFER TO CIVIL / LANDSCAPE GRADING PLANS FOR GRADING INFORMATION.
3. WHERE PORTIONS OF ELEVATIONS ARE OBSCURED FROM VIEW BY FREESTANDING COLUMNS, FASCIA, ROOF EDGES, OR OTHER PROJECTING CONSTRUCTION, THE CONTRACTOR SHALL ASSUME THAT THE ADJACENT WALL FINISHES EXTEND INTO THE AREAS OBSCURED FROM VIEW, UNLESS SPECIFICALLY INDICATED AS OTHERWISE IN BUILDING AND WALL SECTIONS.
4. DIMENSIONAL INFORMATION PROVIDED RELATIVE TO MASONRY VENEER IS BASED ON NOMINAL FULL INCH MASONRY COURSING.
5. REFER TO ROOF PLAN FOR DESCRIPTION OF ROOFING SYSTEMS AND MATERIALS.
6. REFER TO CURTAIN-WALL TYPES AND DETAILS FOR INFORMATION RELATED TO CURTAIN-WALL, GLAZING TYPES, INSTALLATION, AND TRIM AT OPENINGS.
7. REFER TO WINDOW TYPES AND DETAILS FOR INFORMATION RELATED TO WINDOWS, OPERABLE SASH, GLAZING TYPES, INSTALLATION, AND TRIM AT OPENINGS.
8. REFER TO LOUVER TYPES AND DETAILS FOR INFORMATION RELATED TO LOUVER OPENINGS, SIZES, INSTALLATION, AND TRIM AT OPENINGS.
9. REFER TO BUILDING AND WALL SECTIONS FOR HEIGHT OF MASONRY COURSING AND TOP OF MASONRY ELEVATIONS.
10. PROVIDE MASONRY VENEER CONTROL JOINTS WHERE INDICATED IN ELEVATIONS. IN ADDITION, PROVIDE CONTROL JOINTS AT THE FOLLOWING LOCATIONS:
    a. ON ONE SIDE OF AN OUTWARD BUILDING CORNER WITHIN 2'-4" OF THE CORNER.
    b. AT EACH INWARD BUILDING CORNER.
    c. WHERE THE HEIGHT OF THE FACADE MASONRY VENEER CHANGES.
    d. WHERE THE METHOD OF SUPPORT FOR MASONRY VENEER CHANGES, SUCH AS AT ENDS OF RELIEVING ANGLES OR STRUCTURAL LINTELS SUPPORTED FROM ROOF STRUCTURE.
    e. ON UNINTERRUPTED SPANS OF MASONRY VENEER AT MAXIMUM 24'-0" SPACING.
11. SEALANT AND BACKER ROD AT MASONRY VENEER CONTROL JOINTS SHALL BE PROVIDED AND INSTALLED BY THE WATERPROOFING / JOINT SEALANT SUB-CONTRACTOR.
12. WHERE LOOSE LINTELS CROSS CONTROL JOINTS, PROVIDE BOND-BREAK FABRIC WRAP OF LINTEL END AT PORTION OF LINTEL EXTENDING PAST CONTROL JOINT.
13. WHERE MASONRY VENEER MATERIAL CHANGES OCCUR, INCLUDING FROM BRICK TO CMU OR PRECAST CONCRETE, PROVIDE A BOND BREAK SEPARATOR BETWEEN COURSES.
14. ELEVATIONS MAY NOT SHOW ALL BUILDING FEATURES WITH CLARITY, SUCH AS REGLET COUNTER-FLASHINGS AND TERMINATION BARS WHERE ROOF MEMBRANE FLASHINGS TERMINATE ON SIDE WALLS. REFER TO WALL SECTION AND ROOF EDGE DETAILS FOR DETAILS AND INFORMATION RELATED TO THESE CONDITIONS.
15. PAINT ALL EXPOSED LINTELS TO MATCH ADJACENT WALL.



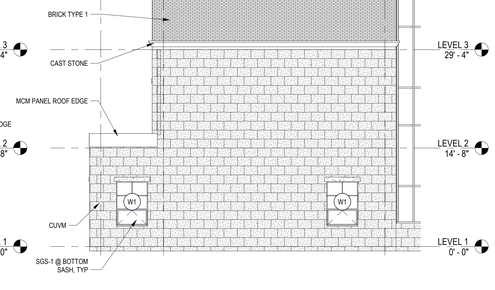
5 PARTIAL NORTH ELEVATION 2
1/8" = 1'-0"



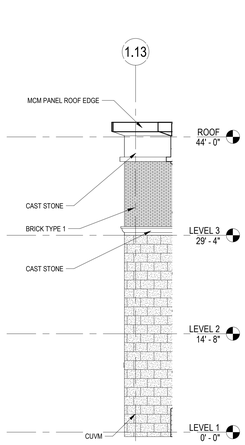
9 PARTIAL EAST ELEVATION 3
1/8" = 1'-0"



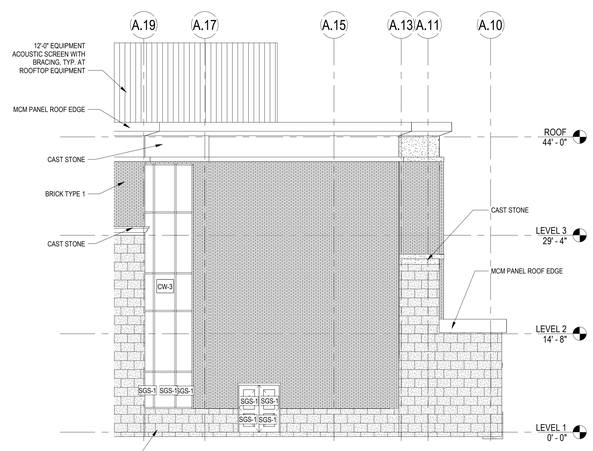
4 PARTIAL NORTH ELEVATION 4
1/8" = 1'-0"



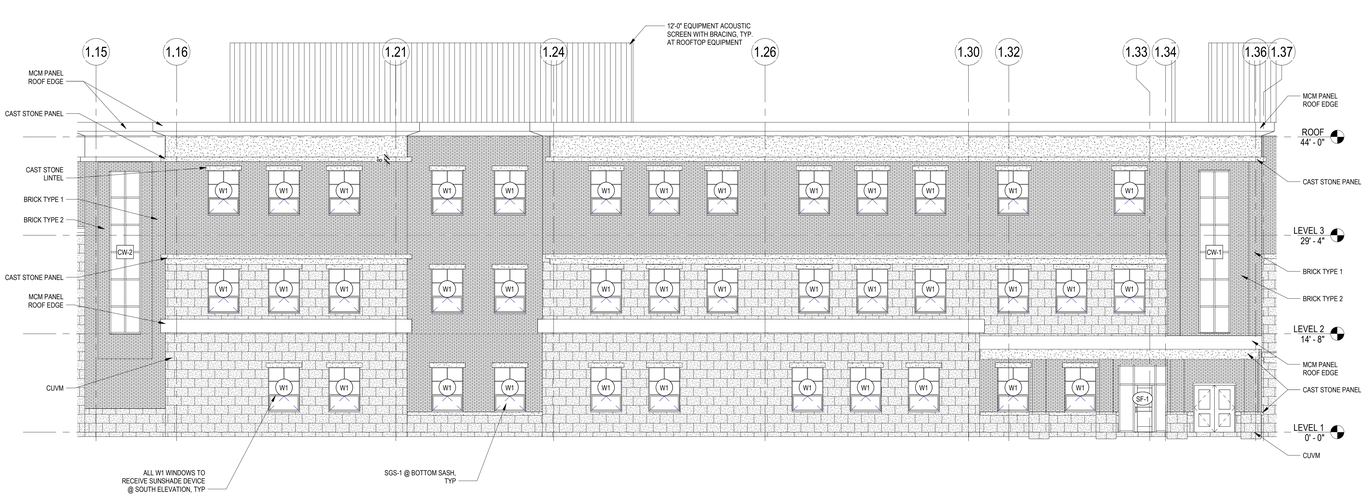
3 PARTIAL WEST ELEVATION 2
1/8" = 1'-0"



8 PARTIAL SOUTH ELEVATION 4
1/8" = 1'-0"



2 PARTIAL WEST ELEVATION 1
1/8" = 1'-0"



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1/8" = 1'-0"

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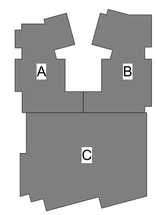
KEY PLAN

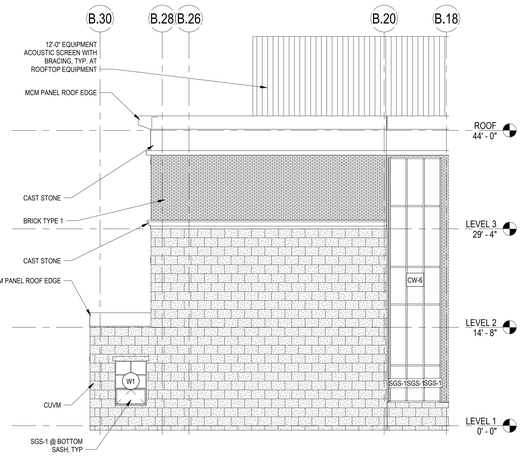


ORIENTATION AND SCALE:

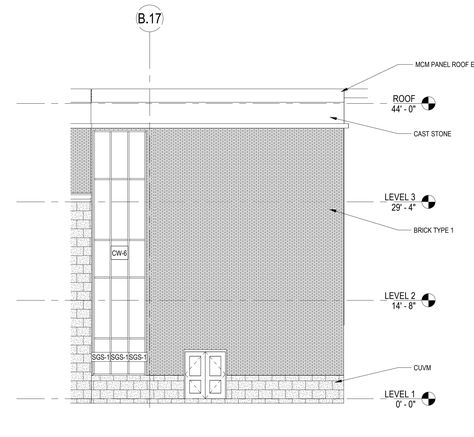
PROJECT NORTH

SHEET TITLE:
EXTERIOR ELEVATIONS

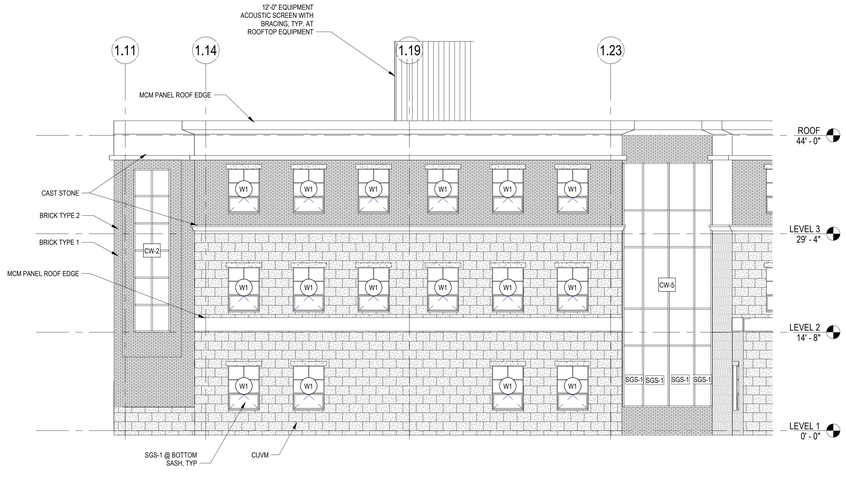
SHEET NUMBER:
A4.13



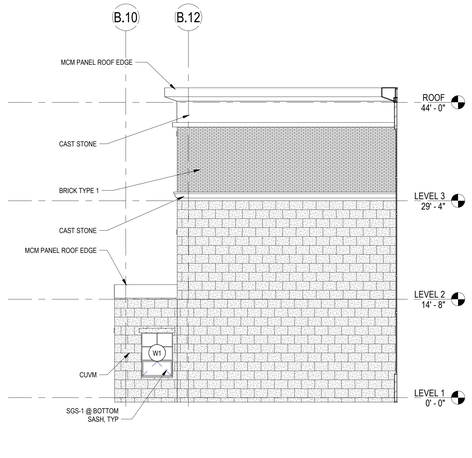
5 PARTIAL WEST ELEVATION 4
1/8" = 1'-0"



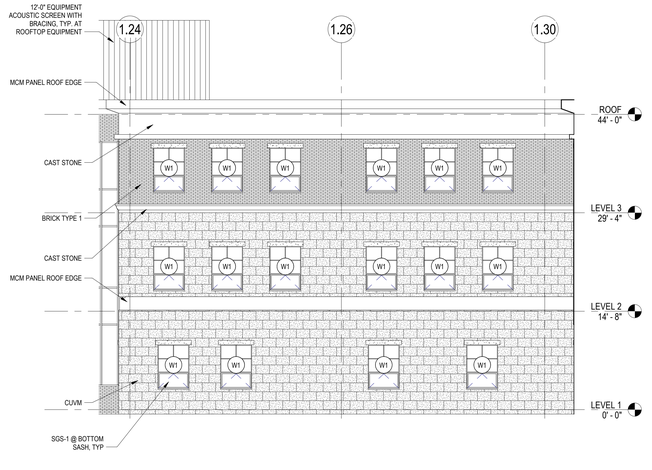
4 PARTIAL WEST ELEVATION 3
1/8" = 1'-0"



3 PARTIAL SOUTH ELEVATION 5
1/8" = 1'-0"



2 PARTIAL EAST ELEVATION 9
1/8" = 1'-0"



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EXTERIOR MATERIALS LEGEND

- BRICK
- CONCRETE / CAST STONE
- METAL PANEL / MCM PANEL
- CORRUGATED METAL PANEL (SIDING AND EQUIPMENT
- EIFS-CMU
- LOUVER
- VERTICAL STANDING SEAM METAL PANEL SIDING
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- CA — CAMERA; SEE SECURITY DWGS
- H — FIRE ALARM HORN/ STROBE; SEE FIRE ALARM DWGS
- SP — SPEAKER; SEE COMMUNICATION DWGS
- FA — RED FIRE ALARM BEACON; SEE FIRE ALARM DWGS
- CR — CARD READER; SEE TECHNOLOGY DWGS
- SE — AMBER SECURITY BEACON; SEE FIRE ALARM AND TECHNOLOGY DRAWINGS
- A1 — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- SP — SPRINKLER ALARM BEACON AND BELL; SEE FIRE ALARM DWGS
- D — VIDEO INTERCOM; SEE TECHNOLOGY DWGS
- H — HOSE BIB; SEE PLUMBING DWGS
- PENDANT MOUNT LIGHT FIXTURE, SEE ELEC. DWGS. LOCATE SL4 AT 8'-0" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE SL5 AT 14'-0" ABOVE LEVEL 1 TO B.O. FIXTURE.
- WALL SCONCE LIGHT FIXTURE, SEE ELEC. DWGS. LOCATE LEVEL 1 SC1 AT 7'-8" ABOVE LEVEL 1 TO B.O. FIXTURE. LOCATE LEVEL 2 SC-1 AT 4'-0" ABOVE LEVEL 2 TO B.O. FIXTURE
- 3/4" + — EXTENT OF BRICK VENEER PROJECTING BEYOND THE DATUM FACE OF BRICK VENEER PLANE. SEE PROJECT DETAILS AND SPECIAL BRICK SHAPES FOR ASSEMBLIES

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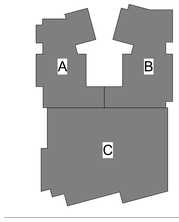
KEY PLAN

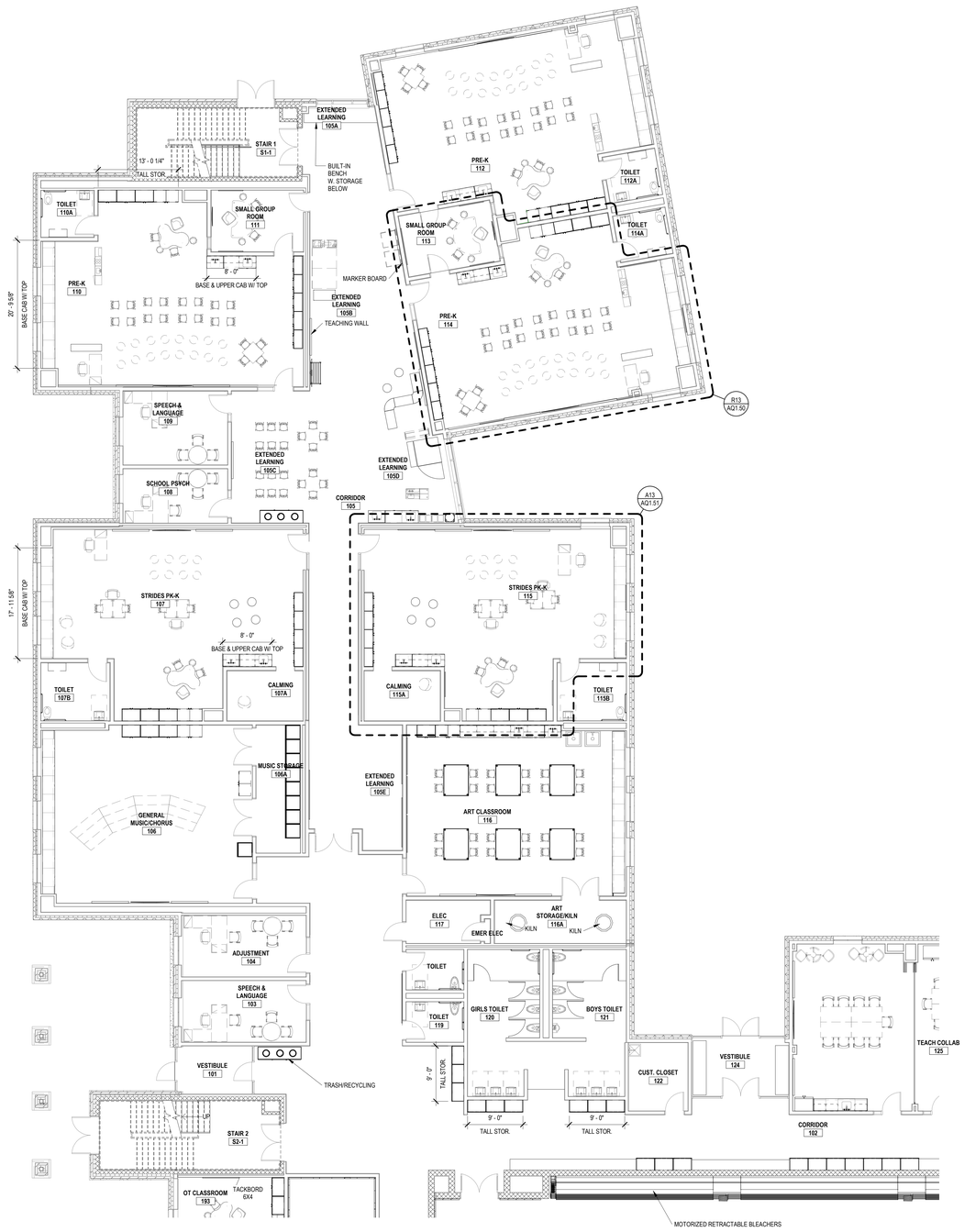


ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
EXTERIOR ELEVATIONS

SHEET NUMBER:
A4.14



CASEWORK GENERAL NOTES

1. CABINET DIMENSIONS INDICATED ARE NOMINAL AND MAY VARY SLIGHTLY BY MANUFACTURER; HOWEVER COUNTERTOP HEIGHTS AT ACCESSIBLE CABINETS SHALL BE AS INDICATED, AND NO HIGHER THAN 2'-10" ABOVE FLOOR AT ANY LOCATION, REGARDLESS OF 'OUT OF LEVEL' FLOOR CONDITIONS.
2. REFER TO CASEWORK LEGEND SHEETS FOR CABINET TYPES DESIGNATED ON THESE PLANS AND ELEVATIONS.
3. FIELD-VERIFY ALL CLEAR WALL DIMENSIONS PRIOR TO FABRICATING CASEWORK.
4. PROVIDE SCRIBE TRIM AT ALL CABINETS MEETING ADJACENT WALL CONSTRUCTION UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
5. PROVIDE FILLER / SCRIBE TRIM AT EACH CABINET MEETING ADJACENT CABINETS AT 90 DEGREE INTERIOR CORNERS UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. ALL CABINETS SHALL FEATURE FULLY FINISHED SIDES AND BACKS WHERE EXPOSED TO VIEW, WHETHER SPECIFICALLY INDICATED OR NOT.
7. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER AND THE CASEWORK SUBCONTRACTOR SHALL COORDINATE INSTALLATION OF CONCEALED BLOCKING REQUIRED FOR WALL CABINET AND ADJUSTABLE SHELVING STANDARD INSTALLATION WITH ROUGH CARPENTRY SUBCONTRACTOR TO ASSURE PROPER PLACEMENT OF BLOCKING.
8. UNLESS SPECIFICALLY INDICATED, RESILIENT BASE SHALL BE INSTALLED AT BASES OF ALL TOE KICKS AND FLUSH-CONFIGURATION CABINETS. REFER TO FINISH SCHEDULE AND INDEX OF FINISHES FOR BASE TYPES. BASE TO BE INSTALLED BY RESILIENT FLOORING SUBCONTRACTOR.
9. COORDINATE CASEWORK DIMENSIONS WITH APPLIANCES SUBMITTED AND ACCEPTED FOR USE. CONFIRM ALL APPLIANCE DIMENSIONS, INSTALLATION REQUIREMENTS, AND REQUIRED CLEARANCES PRIOR TO FABRICATION. INDICATE CLEARANCES AND UNIQUE REQUIREMENTS IN SHOP DRAWINGS.
10. PROVIDE BACK AND SIDE SPLASHES AT ALL COUNTERTOPS AT ADJACENT WALL CONSTRUCTION AND TALL CABINET BODIES. BACK AND SIDE SPLASHES SHALL BE FIELD APPLIED AND MATCH THE MATERIAL AND COLOR OF THE COUNTERTOP UNLESS SPECIFICALLY NOTED OTHERWISE.
11. WHERE BACK OR SIDE SPLASHES OCCUR IMMEDIATELY BELOW WINDOW OPENINGS, COORDINATE THE HEIGHT AND DETAILS OF THE SPLASH WITH THE FINISH CARPENTRY SUBCONTRACTOR. WOOD APRON TRIM AT SUCH LOCATIONS SHALL BE REPLACED BY THE SPLASH COMPONENT. REFER TO DETAILS.
12. COUNTERTOPS AT ALL GENERAL CLASSROOMS, OFFICES, AND OTHER NON-SCIENCE SPACES SHALL BE TYPE "CT-PL" TYPE UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
13. COUNTERTOPS AT SCIENCE LABORATORY CLASSROOMS, INCLUDING BUT NOT LIMITED TO BIOLOGY, CHEMISTRY, ENVIRONMENTAL SCIENCE, AND PHYSICS LABORATORIES, RELATED PREP ROOMS, AND ART ROOMS SHALL BE TYPE "CT-ER" UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
14. UNLESS SPECIFICALLY IDENTIFIED BY TYPE, LOOSE FURNISHINGS INCLUDING STOOLS, CHAIRS, DESKS AND TABLES SHOWN DASHED ARE NOT IN CONTRACT.
15. WHERE CABINETS ARE LOCATED WITH FIN-TUBE RADIATION HEATING BEHIND, THE CABINETS CARCASS SHALL BE FABRICATED TO PROVIDE UNRESTRICTED MOVEMENT OF AIR FROM THE TOE KICK BELOW THE CABINET, UNDER THE CABINET BOTTOM, TO THE SPACE BEHIND THE CABINETS AT THE FIN-TUBE HEATING. THE CASEWORK MANUFACTURER SHALL PROVIDE 1/8" THK PERFORATED STEEL GRILLES WITH FACTORY-APPLIED BLACK BAKED ENAMEL FINISH AT THE TOE KICK FOR FULL WIDTHS OF CABINETS, AND 4" WIDE PENCIL-PROOF, CLEAR ANODIZED ALUMINUM GRATINGS IN FRAMES AT THE COUNTER LEDGE. SEE PLANS FOR LENGTHS OF GRATINGS.
16. FUME HOODS AND RELATED BASE CABINETS SHALL BE PROVIDED AND INSTALLED BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. CASEWORK BASE CABINETS SHALL MATCH THE PRODUCTS PROVIDED BY THE CASEWORK SUBCONTRACTOR IN EVERY REGARD.
17. SERVICE FITTINGS ARE WITHIN FUME HOODS INCLUDING BUT NOT LIMITED TO GAS, WATER, AND COMPRESSED AIR, SHALL BE PROVIDED AND INSTALLED IN THE HOOD EQUIPMENT BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. FINAL CONNECTION OF UTILITIES TO THE FITTINGS SHALL BE COMPLETED BY THE PLUMBING SUBCONTRACTOR.
18. WHERE ELECTRICAL OR DATA OUTLETS ARE INDICATED IN CASEWORK, ROUGH OPENINGS FOR OUTLET BOXES SHALL BE FACTORY PROVIDED. JUNCTION BOXES AND DEVICES SHALL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.
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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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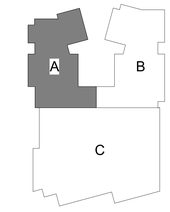
KEY PLAN



ORIENTATION AND SCALE:

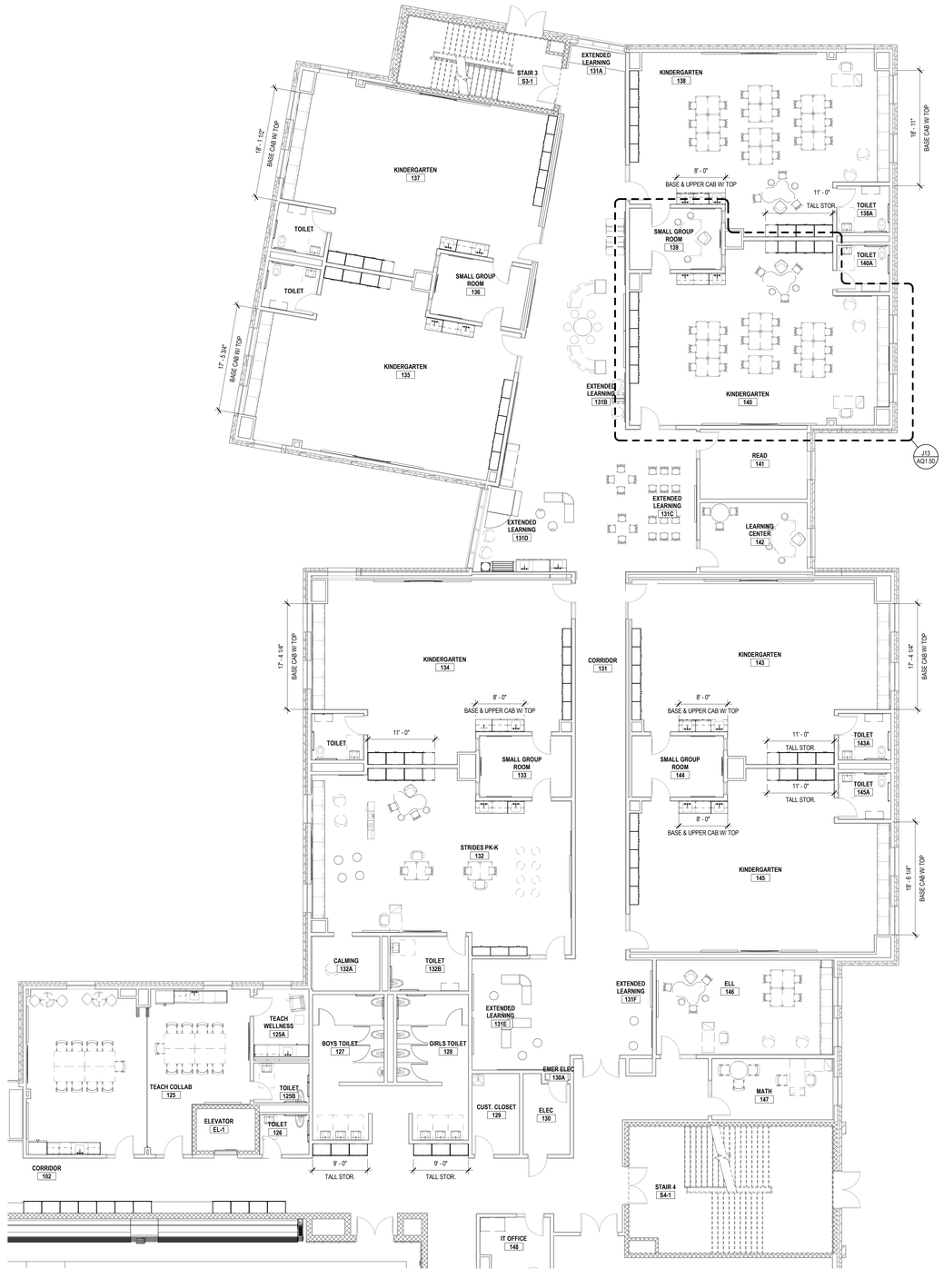
PROJECT NORTH

SHEET TITLE:

LEVEL 1 EQUIPMENT PLANS - AREA A

SHEET NUMBER:

AQ1.11



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SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

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SCHEMATIC DESIGN
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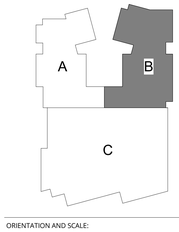
KEY PLAN



ORIENTATION AND SCALE:

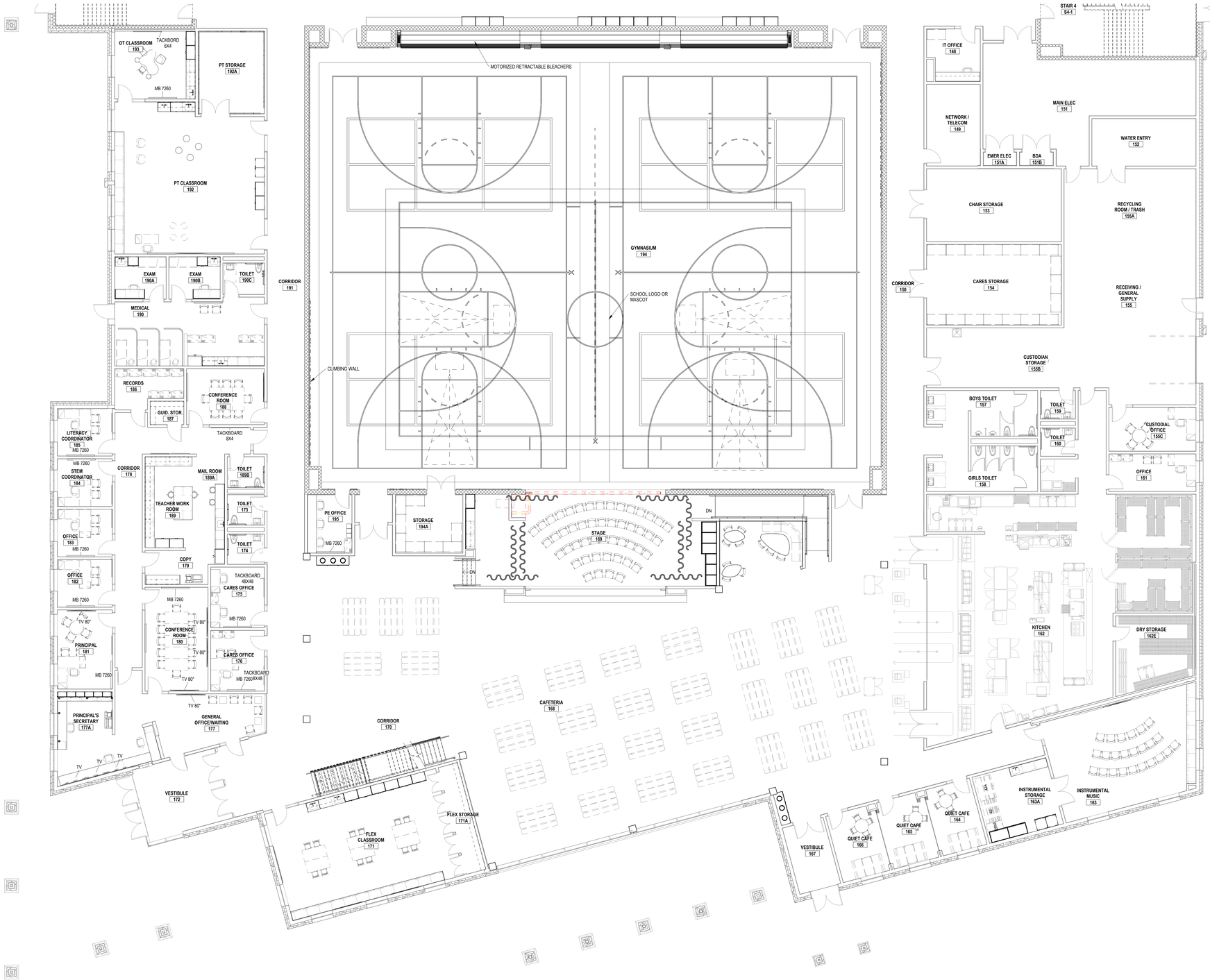
PROJECT NORTH

SHEET TITLE:

LEVEL 1 EQUIPMENT PLANS - AREA B

SHEET NUMBER:

AQ1.12



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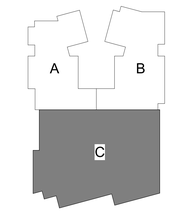

ORIENTATION AND SCALE:

N
TRUE NORTH
PROJECT NORTH
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SCALE: 1/8"=1'-0" GRAPHIC SCALE

SHEET TITLE:

LEVEL 1
EQUIPMENT PLANS
- AREA C

SHEET NUMBER:

AQ1.13

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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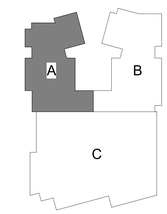
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:

LEVEL 2
EQUIPMENT PLANS
- AREA A

SHEET NUMBER:

AQ1.21

CASEWORK GENERAL NOTES

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3. FIELD-VERIFY ALL CLEAR WALL DIMENSIONS PRIOR TO FABRICATING CASEWORK.
4. PROVIDE SCRIBE TRIM AT ALL CABINETS MEETING ADJACENT WALL CONSTRUCTION UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
5. PROVIDE FILLER / SCRIBE TRIM AT EACH CABINET MEETING ADJACENT CABINETS AT 90 DEGREE INTERIOR CORNERS UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. ALL CABINETS SHALL FEATURE FULLY FINISHED SIDES AND BACKS WHERE EXPOSED TO VIEW, WHETHER SPECIFICALLY INDICATED OR NOT.
7. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER AND THE CASEWORK SUBCONTRACTOR SHALL COORDINATE INSTALLATION OF CONCEALED BLOCKING REQUIRED FOR WALL CABINET AND ADJUSTABLE SHELVING STANDARD INSTALLATION WITH ROUGH CARPENTRY SUBCONTRACTOR TO ASSURE PROPER PLACEMENT OF BLOCKING.
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9. COORDINATE CASEWORK DIMENSIONS WITH APPLIANCES SUBMITTED AND ACCEPTED FOR USE. CONFIRM ALL APPLIANCE DIMENSIONS, INSTALLATION REQUIREMENTS, AND REQUIRED CLEARANCES PRIOR TO FABRICATION. INDICATE CLEARANCES AND UNIQUE REQUIREMENTS IN SHOP DRAWINGS.
10. PROVIDE BACK AND SIDE SPLASHES AT ALL COUNTERTOPS AT ADJACENT WALL CONSTRUCTION AND TALL CABINET BODIES. BACK AND SIDE SPLASHES SHALL BE FIELD APPLIED AND MATCH THE MATERIAL AND COLOR OF THE COUNTERTOP UNLESS SPECIFICALLY NOTED OTHERWISE.
11. WHERE BACK OR SIDE SPLASHES OCCUR IMMEDIATELY BELOW WINDOW OPENINGS, COORDINATE THE HEIGHT AND DETAILS OF THE SPLASH WITH THE FINISH CARPENTRY SUBCONTRACTOR. WOOD APRON TRIM AT SUCH LOCATIONS SHALL BE REPLACED BY THE SPLASH COMPONENT. REFER TO DETAILS.
12. COUNTERTOPS AT ALL GENERAL CLASSROOMS, OFFICES, AND OTHER NON-SCIENCE SPACES SHALL BE TYPE "CT-PL" TYPE UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
13. COUNTERTOPS AT SCIENCE LABORATORY CLASSROOMS, INCLUDING BUT NOT LIMITED TO BIOLOGY, CHEMISTRY, ENVIRONMENTAL SCIENCE, AND PHYSICS LABORATORIES, RELATED PREP ROOMS, AND ART ROOMS SHALL BE TYPE "CT-ER" UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
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18. WHERE ELECTRICAL OR DATA OUTLETS ARE INDICATED IN CASEWORK, ROUGH OPENINGS FOR OUTLET BOXES SHALL BE FACTORY PROVIDED. JUNCTION BOXES AND DEVICES SHALL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.
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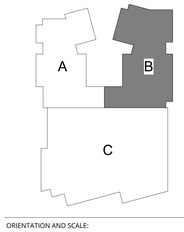
KEY PLAN



ORIENTATION AND SCALE:

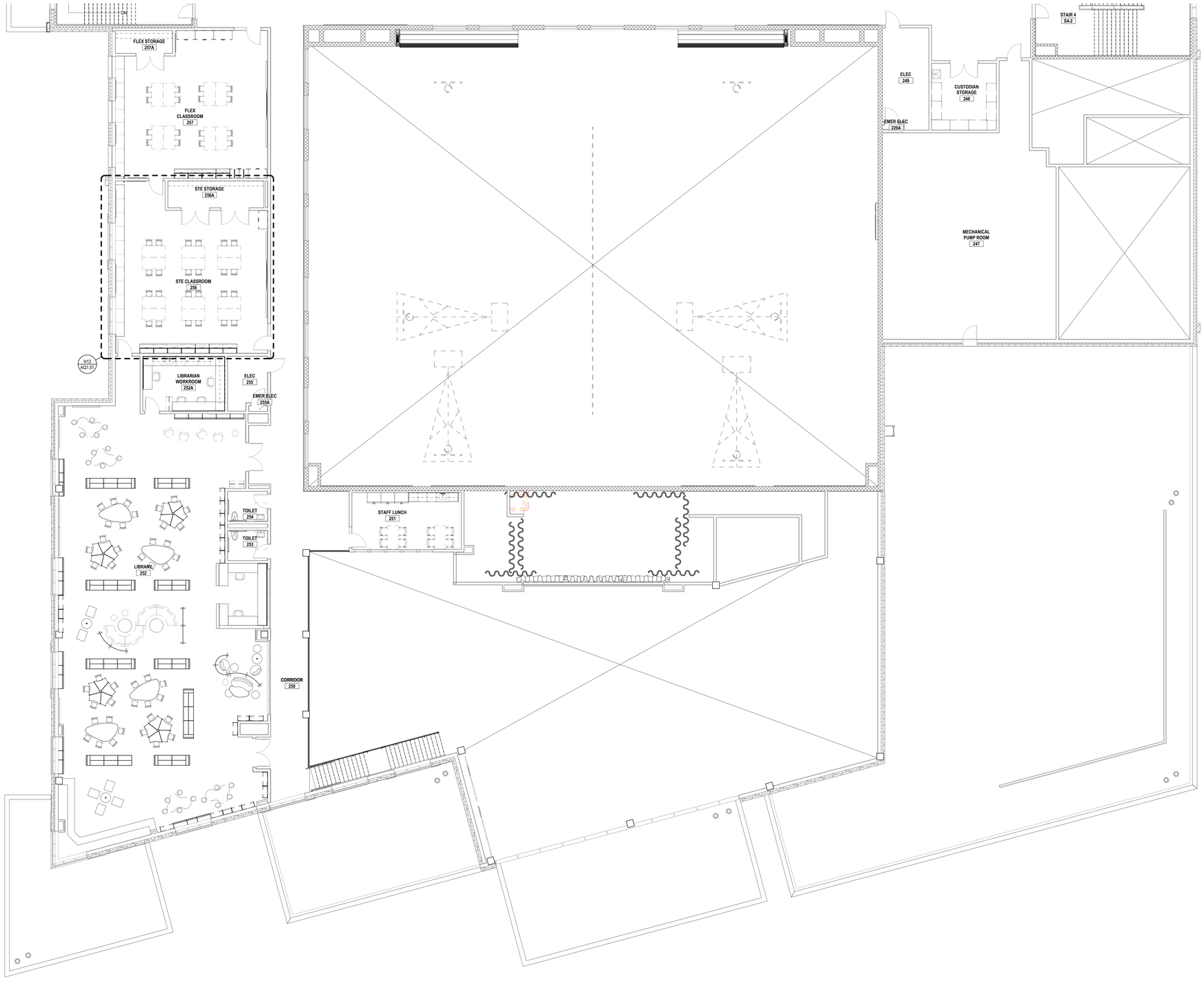
PROJECT NORTH

SHEET TITLE:

LEVEL 2
EQUIPMENT PLANS
- AREA B

SHEET NUMBER:

AQ1.22



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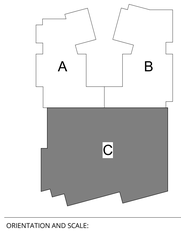

ORIENTATION AND SCALE:

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TRUE NORTH
PROJECT NORTH
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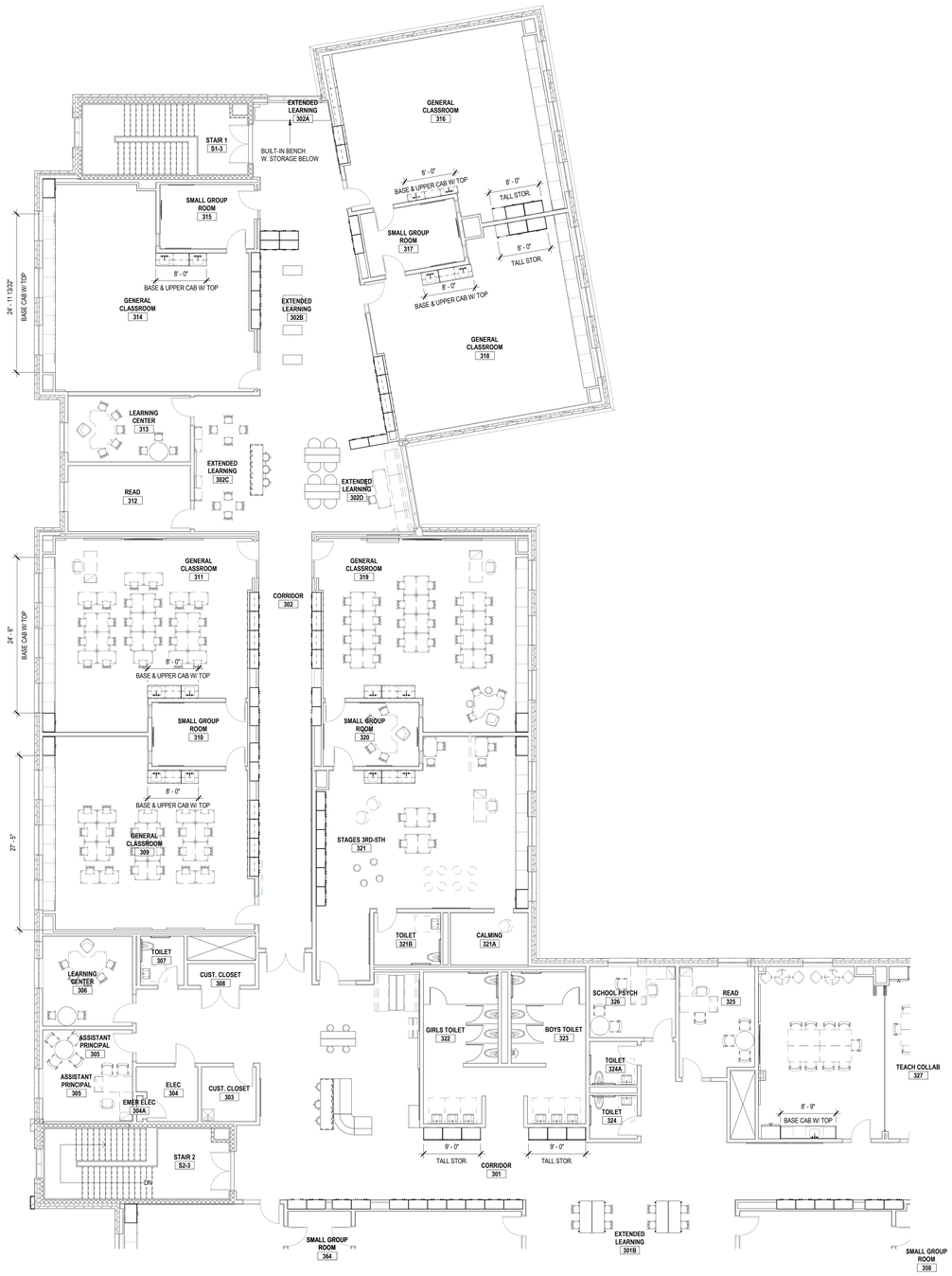
SCALE: 1/8"=1'-0" GRAPHIC SCALE

SHEET TITLE:

LEVEL 2
EQUIPMENT PLANS
- AREA C

SHEET NUMBER:

AQ1.23



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SCHEMATIC DESIGN
04/24/2025

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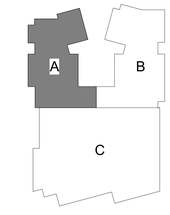
KEY PLAN



ORIENTATION AND SCALE:

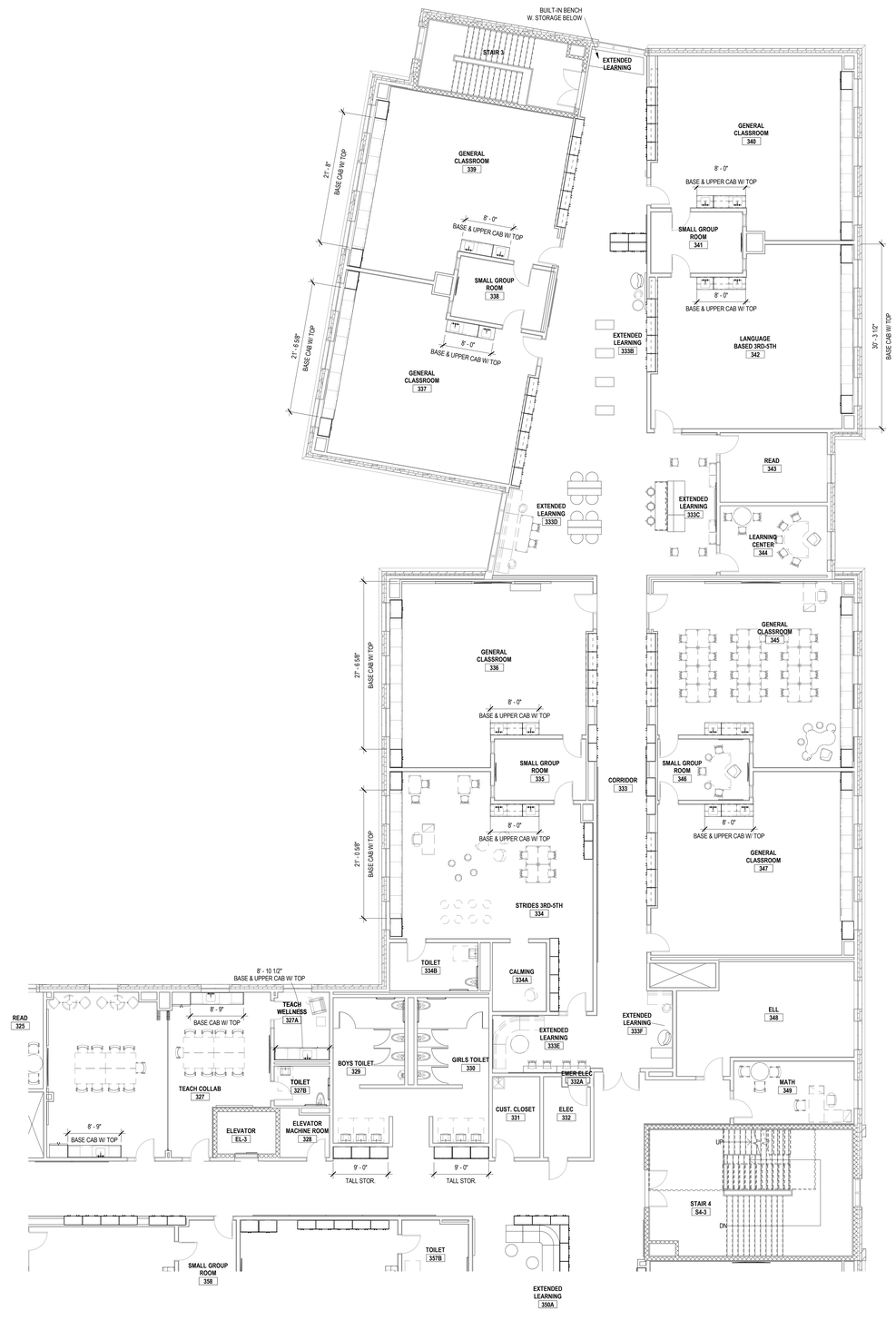
PROJECT NORTH

SHEET TITLE:

LEVEL 3
EQUIPMENT PLANS
- AREA A

SHEET NUMBER:

AQ1.31



CASEWORK GENERAL NOTES

1. CABINET DIMENSIONS INDICATED ARE NOMINAL AND MAY VARY SLIGHTLY BY MANUFACTURER; HOWEVER COUNTERTOP HEIGHTS AT ACCESSIBLE CABINETS SHALL BE AS INDICATED, AND NO HIGHER THAN 2'-10" ABOVE FLOOR AT ANY LOCATION, REGARDLESS OF 'OUT OF LEVEL' FLOOR CONDITIONS.
2. REFER TO CASEWORK LEGEND SHEETS FOR CABINET TYPES DESIGNATED ON THESE PLANS AND ELEVATIONS.
3. FIELD-VERIFY ALL CLEAR WALL DIMENSIONS PRIOR TO FABRICATING CASEWORK.
4. PROVIDE SCRIBE TRIM AT ALL CABINETS MEETING ADJACENT WALL CONSTRUCTION UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
5. PROVIDE FILLER / SCRIBE TRIM AT EACH CABINET MEETING ADJACENT CABINETS AT 90 DEGREE INTERIOR CORNERS UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. ALL CABINETS SHALL FEATURE FULLY FINISHED SIDES AND BACKS WHERE EXPOSED TO VIEW, WHETHER SPECIFICALLY INDICATED OR NOT.
7. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER AND THE CASEWORK SUBCONTRACTOR SHALL COORDINATE INSTALLATION OF CONCEALED BLOCKING REQUIRED FOR WALL CABINET AND ADJUSTABLE SHELVING STANDARD INSTALLATION WITH ROUGH CARPENTRY SUBCONTRACTOR TO ASSURE PROPER PLACEMENT OF BLOCKING.
8. UNLESS SPECIFICALLY INDICATED, RESILIENT BASE SHALL BE INSTALLED AT BASES OF ALL TOE KICKS AND FLUSH-CONFIGURATION CABINETS. REFER TO FINISH SCHEDULE AND INDEX OF FINISHES FOR BASE TYPES. BASE TO BE INSTALLED BY RESILIENT FLOORING SUBCONTRACTOR.
9. COORDINATE CASEWORK DIMENSIONS WITH APPLIANCES SUBMITTED AND ACCEPTED FOR USE. CONFIRM ALL APPLIANCE DIMENSIONS, INSTALLATION REQUIREMENTS, AND REQUIRED CLEARANCES PRIOR TO FABRICATION. INDICATE CLEARANCES AND UNIQUE REQUIREMENTS IN SHOP DRAWINGS.
10. PROVIDE BACK AND SIDE SPLASHES AT ALL COUNTERTOPS AT ADJACENT WALL CONSTRUCTION AND TALL CABINET BODIES. BACK AND SIDE SPLASHES SHALL BE FIELD APPLIED AND MATCH THE MATERIAL AND COLOR OF THE COUNTERTOP UNLESS SPECIFICALLY NOTED OTHERWISE.
11. WHERE BACK OR SIDE SPLASHES OCCUR IMMEDIATELY BELOW WINDOW OPENINGS, COORDINATE THE HEIGHT AND DETAILS OF THE SPLASH WITH THE FINISH CARPENTRY SUBCONTRACTOR. WOOD APRON TRIM AT SUCH LOCATIONS SHALL BE REPLACED BY THE SPLASH COMPONENT. REFER TO DETAILS.
12. COUNTERTOPS AT ALL GENERAL CLASSROOMS, OFFICES, AND OTHER NON-SCIENCE SPACES SHALL BE TYPE 'CT-PL' TYPE UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
13. COUNTERTOPS AT SCIENCE LABORATORY CLASSROOMS, INCLUDING BUT NOT LIMITED TO BIOLOGY, CHEMISTRY, ENVIRONMENTAL SCIENCE, AND PHYSICS LABORATORIES, RELATED PREP ROOMS, AND ART ROOMS SHALL BE TYPE 'CT-ER' UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
14. UNLESS SPECIFICALLY IDENTIFIED BY TYPE, LOOSE FURNISHINGS INCLUDING STOOLS, CHAIRS, DESKS AND TABLES SHOWN DASHED ARE NOT IN CONTRACT.
15. WHERE CABINETS ARE LOCATED WITH FIN-TUBE RADIATION HEATING BEHIND, THE CABINETS CARCASS SHALL BE FABRICATED TO PROVIDE FOR UNRESTRICTED MOVEMENT OF AIR FROM THE TOE KICK BELOW THE CABINET, UNDER THE CABINET BOTTOM, TO THE SPACE BEHIND THE CABINETS AT THE FIN-TUBE HEATING. THE CASEWORK MANUFACTURER SHALL PROVIDE 1/8" THK PERFORATED STEEL GRILLES WITH FACTORY-APPLIED BLACK BAKED ENAMEL FINISH AT THE TOE KICK FOR FULL WIDTHS OF CABINETS, AND 4" WIDE PENCIL-PROOF, CLEAR ANODIZED ALUMINUM GRATINGS IN FRAMES AT THE COUNTER LEDGE. SEE PLANS FOR LENGTHS OF GRATINGS.
16. FUME HOODS AND RELATED BASE CABINETS SHALL BE PROVIDED AND INSTALLED BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. CASEWORK BASE CABINETS SHALL MATCH THE PRODUCTS PROVIDED BY THE CASEWORK SUBCONTRACTOR IN EVERY REGARD.
17. SERVICE FITTINGS ARE WITHIN FUME HOODS INCLUDING BUT NOT LIMITED TO GAS, WATER, AND COMPRESSED AIR, SHALL BE PROVIDED AND INSTALLED IN THE HOOD EQUIPMENT BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. FINAL CONNECTION OF UTILITIES TO THE FITTINGS SHALL BE COMPLETED BY THE PLUMBING SUBCONTRACTOR.
18. WHERE ELECTRICAL OR DATA OUTLETS ARE INDICATED IN CASEWORK, ROUGH OPENINGS FOR OUTLET BOXES SHALL BE FACTORY PROVIDED. JUNCTION BOXES AND DEVICES SHALL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.
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21. WHERE STAINLESS STEEL SINKS ARE INDICATED IN TYPE CT-PL OR CT-ER COUNTERTOPS, THEY SHALL BE PROVIDED AND INSTALLED BY THE PLUMBING SUBCONTRACTOR. OPENINGS FOR SUCH SINKS SHALL BE PROVIDED BY THE CASEWORK SUBCONTRACTOR BASED ON TEMPLATE INFORMATION PROVIDED BY OR COORDINATION WITH THE PLUMBING SUBCONTRACTOR.
22. FIRE EXTINGUISHERS INDICATED AT SAFETY CABINETS SHALL BE PROVIDED AND INSTALLED BY THE FIRE PROTECTION SPECIALTIES SUBCONTRACTOR.
23. WHERE CONTROLS INCLUDING, BUT NOT LIMITED TO PLUMBING VALVES, CLEANOUTS, OR ELECTRICAL OR DATA CONDUCTORS AND CABLING RUN THROUGH BUS-WAYS OR CHASES CONCEALED BEHIND OR WITHIN MILLWORK, ACCESS PANELS SHALL BE PROVIDED IN THE MILLWORK TO PROVIDE ACCESS TO SUCH UTILITIES. ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND FINISH AS THE ADJACENT CABINETRY, AND SHALL BE FACTORY CREATED. FIELD CUTTING SHALL NOT BE PERMITTED. PANELS SHOULD BE MINIMUM 12' X 12' INCHES IN SIZE, AND SHALL BE SECURED IN PLACE FLUSH WITH THE ADJACENT CABINET BODY, USING PAN HEAD STAINLESS STEEL FINISH PHILIPS HEAD SCREWS WITH STAINLESS STEEL FINISHED WASHERS AT NO MORE THAN 12" ON CENTER AROUND THE PERIMETER OF THE ACCESS PANEL.

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320 SALEM STREET
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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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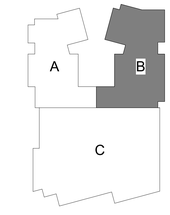

ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:

LEVEL 3
EQUIPMENT PLANS
- AREA B

SHEET NUMBER:

AQ1.32

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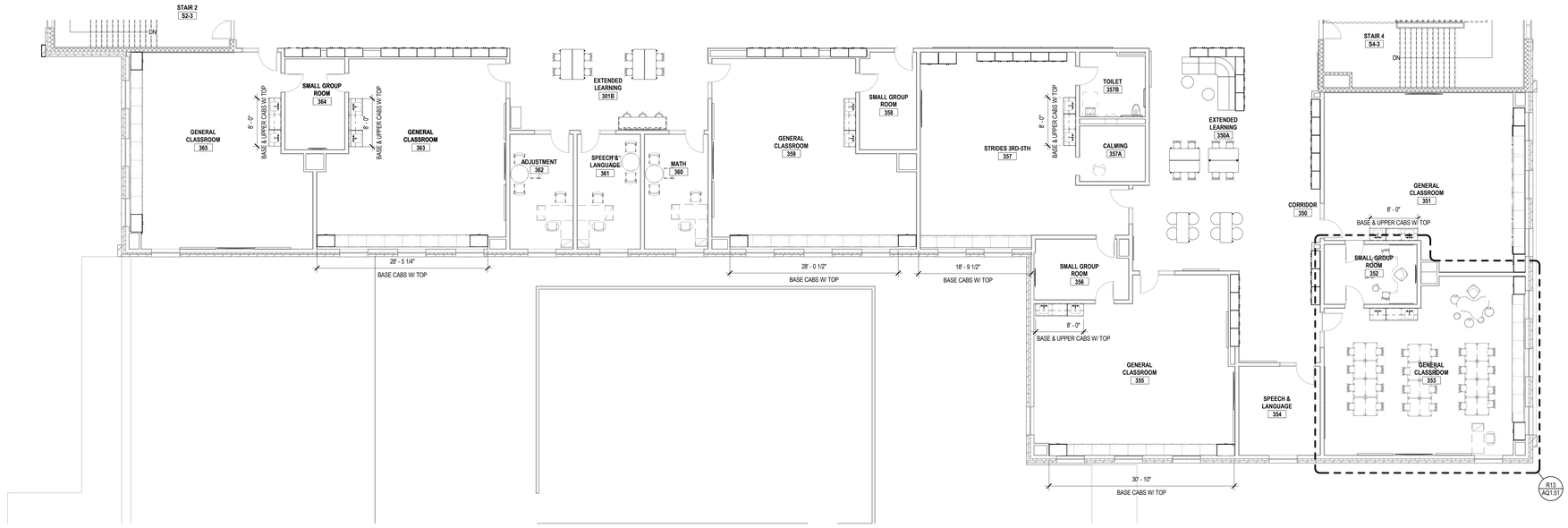

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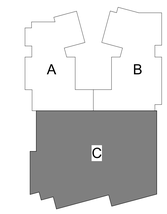
KEY PLAN



ORIENTATION AND SCALE:

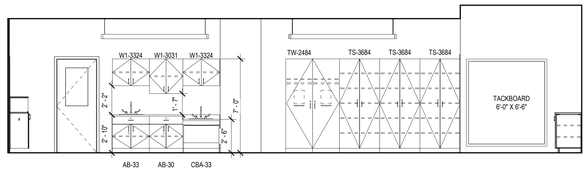
PROJECT NORTH

SHEET TITLE:

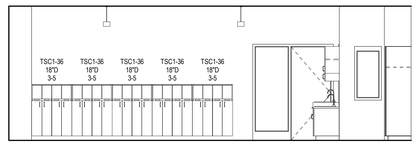
LEVEL 3
EQUIPMENT PLANS
- AREA C

SHEET NUMBER:

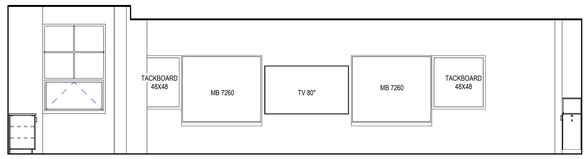
AQ1.33



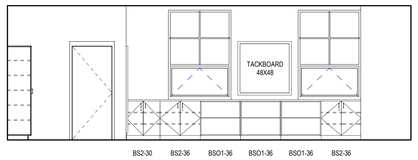
U27 INTERIOR ELEVATION - PRE-K CLASSROOM - WEST
1/4" = 1'-0"



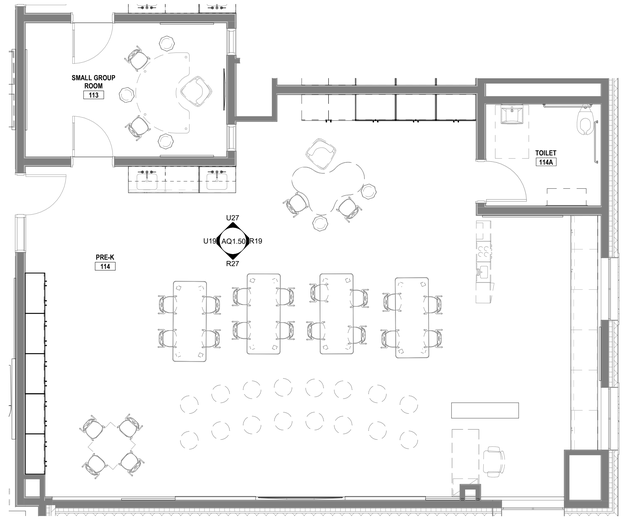
U19 INTERIOR ELEVATION - PRE-K CLASSROOM - SOUTH
1/4" = 1'-0"



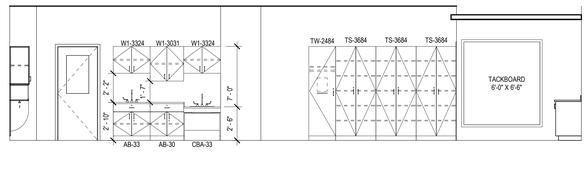
R27 INTERIOR ELEVATION - PRE-K CLASSROOM - EAST
1/4" = 1'-0"



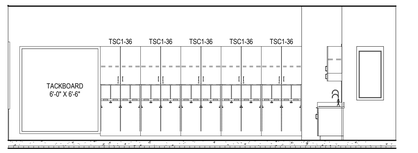
R19 INTERIOR ELEVATION - PRE-K CLASSROOM - NORTH
1/4" = 1'-0"



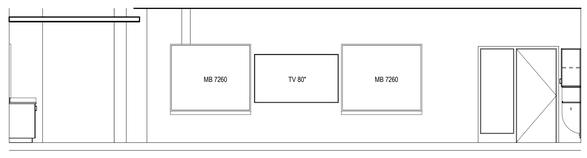
R13 ENLARGED PLAN - TYPICAL PRE-K CLASSROOM
1/4" = 1'-0"



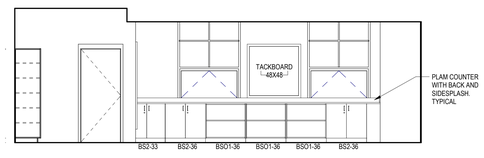
M27 INTERIOR ELEVATION - KINDERGARTEN - WEST
1/4" = 1'-0"



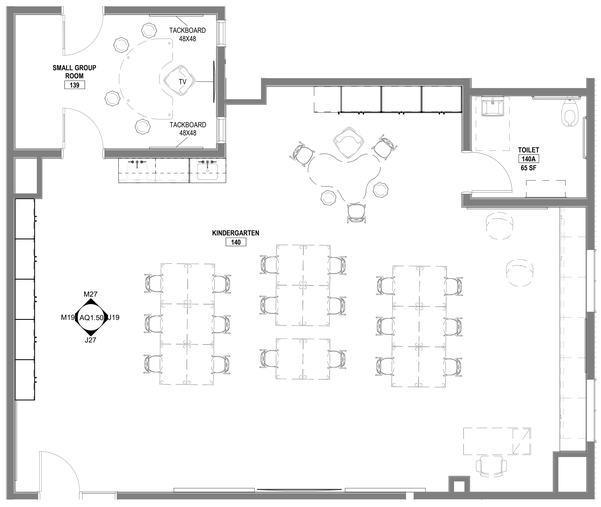
M19 INTERIOR ELEVATION - KINDERGARTEN - SOUTH
1/4" = 1'-0"



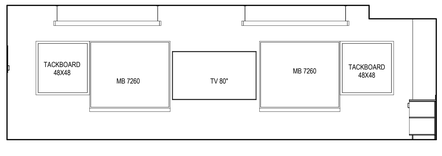
J27 INTERIOR ELEVATION - KINDERGARTEN - EAST
1/4" = 1'-0"



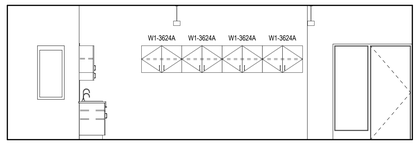
J19 INTERIOR ELEVATION - KINDERGARTEN - NORTH
1/4" = 1'-0"



J13 ENLARGED PLAN - TYPICAL KINDERGARTEN CLASSROOM
1/4" = 1'-0"



D27 INTERIOR ELEVATION - 1ST GRADE CLASSROOM - WEST
1/4" = 1'-0"



D21 INTERIOR ELEVATION - 1ST GRADE CLASSROOM - SOUTH
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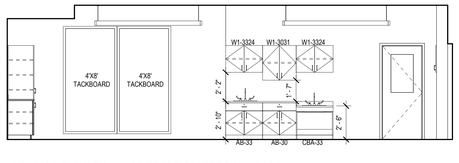

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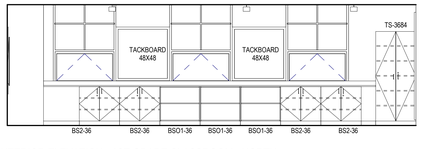

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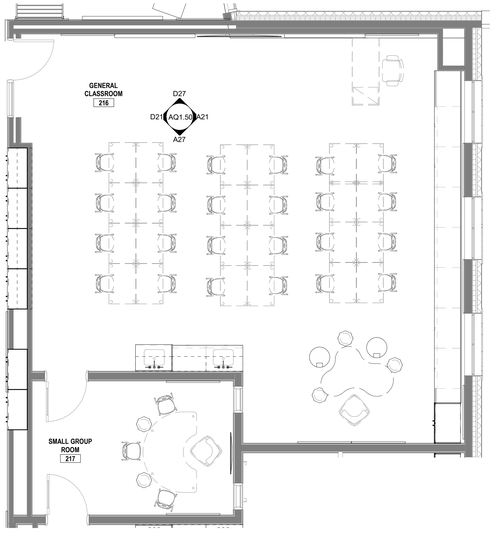

A13 ENLARGED PLAN - TYPICAL 1ST GRADE CLASSROOM
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3. FIELD-VERIFY ALL CLEAR WALL DIMENSIONS PRIOR TO FABRICATING CASEWORK.
4. PROVIDE SCRIBE TRIM AT ALL CABINETS MEETING ADJACENT WALL CONSTRUCTION UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
5. PROVIDE FILLER / SCRIBE TRIM AT EACH CABINET MEETING ADJACENT CABINETS AT 90 DEGREE INTERIOR CORNERS UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. ALL CABINETS SHALL FEATURE FULLY FINISHED SIDES AND BACKS WHERE EXPOSED TO VIEW, WHETHER SPECIFICALLY INDICATED OR NOT.
7. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER AND THE CASEWORK SUBCONTRACTOR SHALL COORDINATE INSTALLATION OF CONCEALED BLOCKING REQUIRED FOR WALL CABINET AND ADJUSTABLE SHELVING STANDARD INSTALLATION WITH ROUGH CARPENTRY SUBCONTRACTOR TO ASSURE PROPER PLACEMENT OF BLOCKING.
8. UNLESS SPECIFICALLY INDICATED, RESILIENT BASE SHALL BE INSTALLED AT BASES OF ALL TOE KICKS AND FLUSH-CONFIGURATION CABINETS. REFER TO FINISH SCHEDULE AND INDEX OF FINISHES FOR BASE TYPES. BASE TO BE INSTALLED BY RESILIENT FLOORING SUBCONTRACTOR.
9. COORDINATE CASEWORK DIMENSIONS WITH APPLIANCES SUBMITTED AND ACCEPTED FOR USE. CONFIRM ALL APPLIANCE DIMENSIONS, INSTALLATION REQUIREMENTS, AND REQUIRED CLEARANCES PRIOR TO FABRICATION. INDICATE CLEARANCES AND UNIQUE REQUIREMENTS IN SHOP DRAWINGS.
10. PROVIDE BACK AND SIDE SPLASHES AT ALL COUNTERTOPS AT ADJACENT WALL CONSTRUCTION AND TALL CABINET BODIES. BACK AND SIDE SPLASHES SHALL BE FIELD APPLIED AND MATCH THE MATERIAL AND COLOR OF THE COUNTERTOP UNLESS SPECIFICALLY NOTED OTHERWISE.
11. WHERE BACK OR SIDE SPLASHES OCCUR IMMEDIATELY BELOW WINDOW OPENINGS, COORDINATE THE HEIGHT AND DETAILS OF THE SPLASH WITH THE FINISH CARPENTRY SUBCONTRACTOR. WOOD APRON TRIM AT SUCH LOCATIONS SHALL BE REPLACED BY THE SPLASH COMPONENT. REFER TO DETAILS.
12. COUNTERTOPS AT ALL GENERAL CLASSROOMS, OFFICES, AND OTHER NON-SCIENCE SPACES SHALL BE TYPE 'CT-PL' TYPE UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
13. COUNTERTOPS AT SCIENCE LABORATORY CLASSROOMS, INCLUDING BUT NOT LIMITED TO BIOLOGY, CHEMISTRY, ENVIRONMENTAL SCIENCE, AND PHYSICS LABORATORIES, RELATED PREP ROOMS, AND ART ROOMS SHALL BE TYPE 'CT-ER' UNLESS SPECIFICALLY NOTED. REFER TO CASEWORK SPECIFICATIONS.
14. UNLESS SPECIFICALLY IDENTIFIED BY TYPE, LOOSE FURNISHINGS INCLUDING STOOLS, CHAIRS, DESKS AND TABLES SHOWN DASHED ARE NOT IN CONTRACT.
15. WHERE CABINETS ARE LOCATED WITH FIN-TUBE RADIATION HEATING BEHIND, THE CABINETS CARCASS SHALL BE FABRICATED TO PROVIDE FOR UNRESTRICTED MOVEMENT OF AIR FROM THE TOE KICK BELOW THE CABINET, UNDER THE CABINET BOTTOM, TO THE SPACE BEHIND THE CABINETS AT THE FIN-TUBE HEATING. THE CASEWORK MANUFACTURER SHALL PROVIDE 1/8" TYK PERFORATED STEEL GRILLES WITH FACTORY-APPLIED BLACK BAKED ENAMEL FINISH AT THE TOE KICK FOR FULL WIDTHS OF CABINETS, AND 4" WIDE PENCIL-PROOF, CLEAR ANODIZED ALUMINUM GRATINGS IN FRAMES AT THE COUNTER LEDGE. SEE PLANS FOR LENGTHS OF GRATINGS.
16. FUME HOODS AND RELATED BASE CABINETS SHALL BE PROVIDED AND INSTALLED BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. CASEWORK BASE CABINETS SHALL MATCH THE PRODUCTS PROVIDED BY THE CASEWORK SUBCONTRACTOR IN EVERY REGARD.
17. SERVICE FITTINGS ARE WITHIN FUME HOODS INCLUDING BUT NOT LIMITED TO GAS, WATER, AND COMPRESSED AIR, SHALL BE PROVIDED AND INSTALLED IN THE HOOD EQUIPMENT BY THE LABORATORY EQUIPMENT SUBCONTRACTOR. FINAL CONNECTION OF UTILITIES TO THE FITTINGS SHALL BE COMPLETED BY THE PLUMBING SUBCONTRACTOR.
18. WHERE ELECTRICAL OR DATA OUTLETS ARE INDICATED IN CASEWORK, ROUGH OPENINGS FOR OUTLET BOXES SHALL BE FACTORY PROVIDED. JUNCTION BOXES AND DEVICES SHALL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.
19. WHERE SERVICE FITTINGS ARE INDICATED IN CASEWORK INCLUDING BUT NOT LIMITED TO GAS, WATER, AND COMPRESSED AIR, THEY SHALL BE PROVIDED AND INSTALLED IN THE CASEWORK BY THE CASEWORK SUBCONTRACTOR. FINAL CONNECTION OF UTILITIES TO THE FITTINGS SHALL BE COMPLETED BY THE PLUMBING TRADE CONTRACTOR.
20. WHERE RESIN SINKS ARE INDICATED IN TYPE CT-ER COUNTERTOPS, THEY SHALL BE PROVIDED AND INSTALLED BY THE CASEWORK SUBCONTRACTOR. FINAL CONNECTION OF DRAIN PIPING SHALL BE COMPLETED BY THE PLUMBING SUBCONTRACTOR.
21. WHERE STAINLESS STEEL SINKS ARE INDICATED IN TYPE CT-PL OR CT-ER COUNTERTOPS, THEY SHALL BE PROVIDED AND INSTALLED BY THE PLUMBING SUBCONTRACTOR. OPENINGS FOR SUCH SINKS SHALL BE PROVIDED BY THE CASEWORK SUBCONTRACTOR BASED ON TEMPLATE INFORMATION PROVIDED BY OR COORDINATION WITH THE PLUMBING SUBCONTRACTOR.
22. FIRE EXTINGUISHERS INDICATED AT SAFETY CABINETS SHALL BE PROVIDED AND INSTALLED BY THE FIRE PROTECTION SPECIALTIES SUBCONTRACTOR.
23. WHERE CONTROLS INCLUDING, BUT NOT LIMITED TO PLUMBING VALVES, CLEANOUTS, OR ELECTRICAL OR DATA CONDUCTORS AND CABLING RUN THROUGH BUS-WAYS OR CHASES CONCEALED BEHIND OR WITHIN MILLWORK, ACCESS PANELS SHALL BE PROVIDED IN THE MILLWORK TO PROVIDE ACCESS TO SUCH UTILITIES. ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND FINISH AS THE ADJACENT CABINETRY, AND SHALL BE FACTORY CREATED. FIELD CUTTING SHALL NOT BE PERMITTED. PANELS SHOULD BE MINIMUM 12 X 12 INCHES IN SIZE, AND SHALL BE SECURED IN PLACE FLUSH WITH THE ADJACENT CABINET BODY, USING PAN HEAD STAINLESS STEEL FINISH PHILIPS HEAD SCREWS WITH STAINLESS STEEL FINISHED WASHERS AT NO MORE THAN 12" ON CENTER AROUND THE PERIMETER OF THE ACCESS PANEL.

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PROJECT NUMBER: 23-0847

SEAL AND SIGNATURE:

REVISIONS:

NO.	DATE	TITLE

ISSUE TITLE AND DATE:

SCHEMATIC DESIGN
04/24/2025

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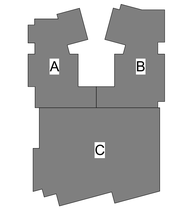
KEY PLAN

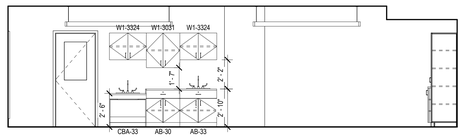


ORIENTATION AND SCALE:

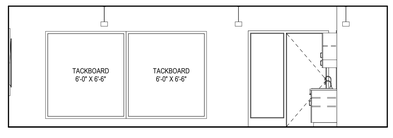
PROJECT NORTH

SHEET TITLE:
CASEWORK PLANS AND ELEVATIONS

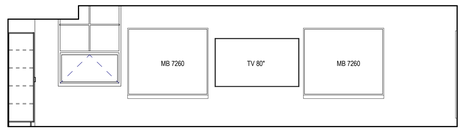
SHEET NUMBER:
AQ1.50



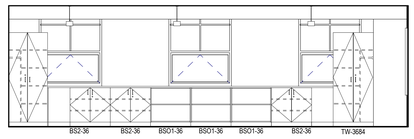
U27 INTERIOR ELEVATION - GENERAL CLASSROOM 5TH GRADE - WEST
1/4" = 1'-0"



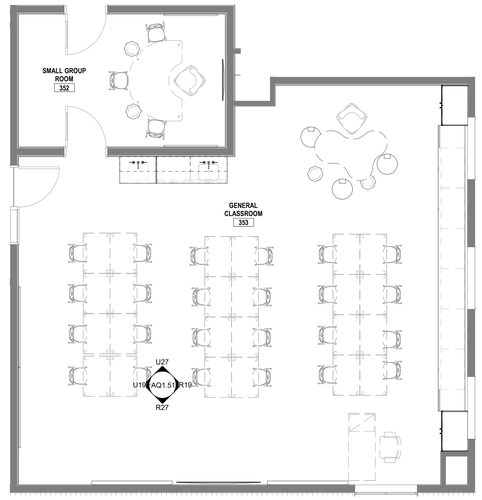
U19 INTERIOR ELEVATION - GENERAL CLASSROOM 5TH GRADE - SOUTH
1/4" = 1'-0"



R27 INTERIOR ELEVATION - GENERAL CLASSROOM 5TH GRADE - EAST
1/4" = 1'-0"



R19 INTERIOR ELEVATION - GENERAL CLASSROOM 5TH GRADE - NORTH
1/4" = 1'-0"



R13 ENLARGED PLAN - TYPICAL 5TH GRADE CLASSROOM
1/4" = 1'-0"

CASEWORK GENERAL NOTES

1. CABINET DIMENSIONS INDICATED ARE NOMINAL AND MAY VARY SLIGHTLY BY MANUFACTURER; HOWEVER COUNTERTOP HEIGHTS AT ACCESSIBLE CABINETS SHALL BE AS INDICATED, AND NO HIGHER THAN 2'-10" ABOVE FLOOR AT ANY LOCATION, REGARDLESS OF 'OUT OF LEVEL' FLOOR CONDITIONS.
2. REFER TO CASEWORK LEGEND SHEETS FOR CABINET TYPES DESIGNATED ON THESE PLANS AND ELEVATIONS.
3. FIELD-VERIFY ALL CLEAR WALL DIMENSIONS PRIOR TO FABRICATING CASEWORK.
4. PROVIDE SCRIBE TRIM AT ALL CABINETS MEETING ADJACENT WALL CONSTRUCTION UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
5. PROVIDE FILLER / SCRIBE TRIM AT EACH CABINET MEETING ADJACENT CABINETS AT 90 DEGREE INTERIOR CORNERS UNLESS SPECIFICALLY INDICATED AS OTHERWISE.
6. ALL CABINETS SHALL FEATURE FULLY FINISHED SIDES AND BACKS WHERE EXPOSED TO VIEW, WHETHER SPECIFICALLY INDICATED OR NOT.
7. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER AND THE CASEWORK SUBCONTRACTOR SHALL COORDINATE INSTALLATION OF CONCEALED BLOCKING REQUIRED FOR WALL CABINET AND ADJUSTABLE SHELVING STANDARD INSTALLATION WITH ROUGH CARPENTRY SUBCONTRACTOR TO ASSURE PROPER PLACEMENT OF BLOCKING.
8. UNLESS SPECIFICALLY INDICATED, RESILIENT BASE SHALL BE INSTALLED AT BASES OF ALL TOE KICKS AND FLUSH-CONFIGURATION CABINETS. REFER TO FINISH SCHEDULE AND INDEX OF FINISHES FOR BASE TYPES. BASE TO BE INSTALLED BY RESILIENT FLOORING SUBCONTRACTOR.
9. COORDINATE CASEWORK DIMENSIONS WITH APPLIANCES SUBMITTED AND ACCEPTED FOR USE. CONFIRM ALL APPLIANCE DIMENSIONS, INSTALLATION REQUIREMENTS, AND REQUIRED CLEARANCES PRIOR TO FABRICATION. INDICATE CLEARANCES AND UNIQUE REQUIREMENTS IN SHOP DRAWINGS.
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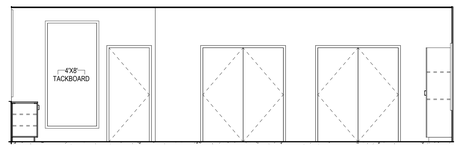
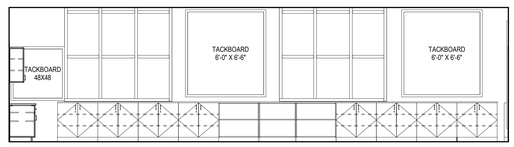
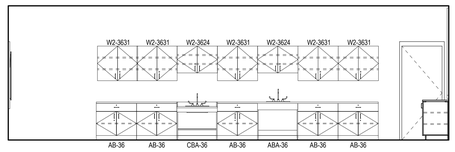
23. WHERE CONTROLS INCLUDING, BUT NOT LIMITED TO PLUMBING VALVES, CLEANOUTS, OR ELECTRICAL OR DATA CONDUCTORS AND CABLING RUN THROUGH BUS-WAYS OR CHASES CONCEALED BEHIND OR WITHIN MILLWORK, ACCESS PANELS SHALL BE PROVIDED IN THE MILLWORK TO PROVIDE ACCESS TO SUCH UTILITIES. ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND FINISH AS THE ADJACENT CABINETRY, AND SHALL BE FACTORY CREATED. FIELD CUTTING SHALL NOT BE PERMITTED. PANELS SHOULD BE MINIMUM 12 X 12 INCHES IN SIZE, AND SHALL BE SECURED IN PLACE FLUSH WITH THE ADJACENT CABINET BODY, USING PAN HEAD STAINLESS STEEL FINISH PHILIPS HEAD SCREWS WITH STAINLESS STEEL FINISHED WASHERS AT NO MORE THAN 12" ON CENTER AROUND THE PERIMETER OF THE ACCESS PANEL.



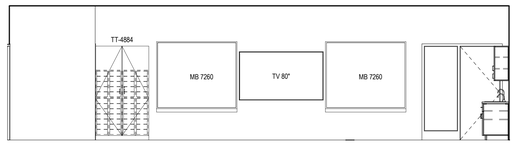
L27 INTERIOR ELEVATION - STE CLASSROOM - WEST
1/4" = 1'-0"



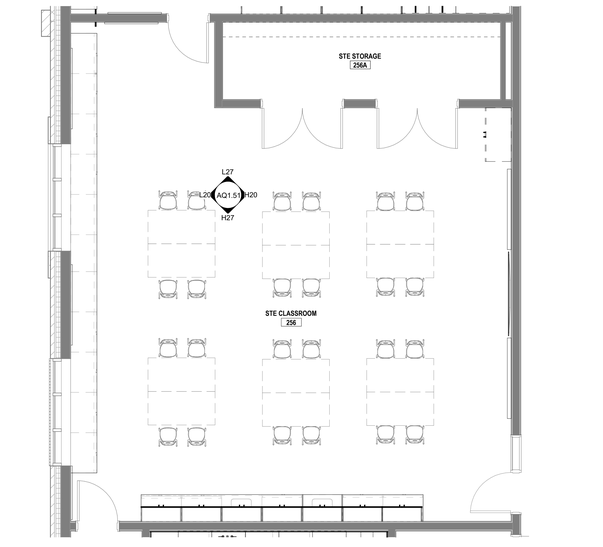
L20 INTERIOR ELEVATION - STE CLASSROOM - SOUTH
1/4" = 1'-0"



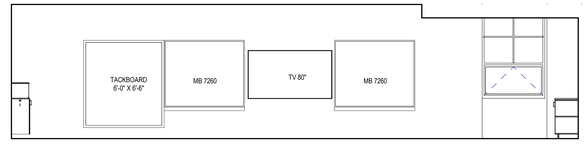
H27 INTERIOR ELEVATION - STE CLASSROOM - EAST
1/4" = 1'-0"



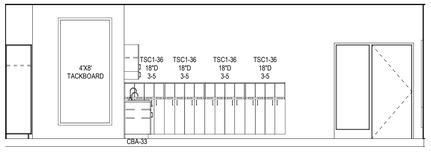
H20 INTERIOR ELEVATION - STE CLASSROOM - NORTH
1/4" = 1'-0"



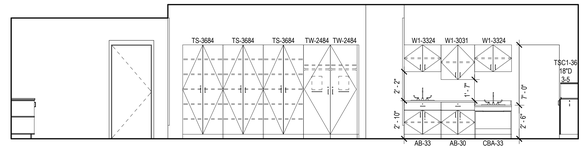
H13 ENLARGED PLAN - STE CLASSROOM - PLAN
1/4" = 1'-0"



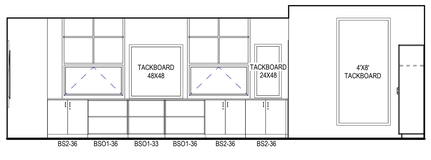
D27 INTERIOR ELEVATION - STRIDES PK-K WEST
1/4" = 1'-0"



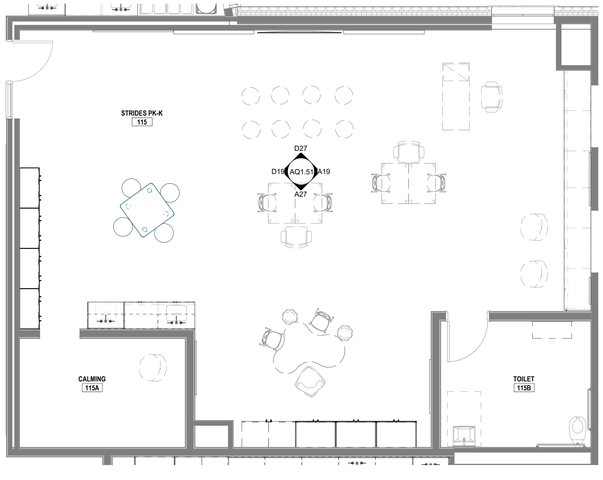
D19 INTERIOR ELEVATION - STRIDES PK-K - SOUTH
1/4" = 1'-0"



A27 INTERIOR ELEVATION - STRIDES PK-K - EAST
1/4" = 1'-0"



A19 INTERIOR ELEVATION - STRIDES PK-K - NORTH
1/4" = 1'-0"



A13 ENLARGED PLAN - TYPICAL PK STRIDES CLASSROOM
1/4" = 1'-0"

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PROJECT NUMBER: 23-0847

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NO.	DATE	TITLE

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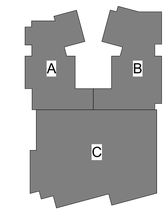
KEY PLAN



ORIENTATION AND SCALE:

PROJECT NORTH

SHEET TITLE:
CASEWORK PLANS AND ELEVATIONS

SHEET NUMBER:
AQ1.51