#### TOWN OF VERNON

#### **Planning & Zoning Commission (PZC)**

Meeting Notice & Agenda

#### Thursday, July 21, 2022, 7:30 PM

Town Council Chambers 3<sup>rd</sup> Floor 14 Park Place

Vernon, CT 06066

-Revised-AGENDA

- 1. Call to Order & Roll Call by Roland Klee, Chairman
- 2. Administrative Actions/Requests
  - 2.1 Amendment/Adoption of Agenda Additional business to be considered under agenda item #6 "Other Business" requires a Commission vote.
  - 2.2 Approval of the Minutes from June 16, 2022
- 3. New Application(s) for receipt, if any:
  - **3.2 PZ-2022-13, 43 & 45 South Frontage Rd.** An application of David O'Connell (Shawmut Equipment Company Inc.) for a Site Plan and Special Permit to build a structure to conduct retail sales, rental, parts sales and service of new and used construction vehicles (cranes), at 43 & 45 South Frontage Rd. (Tax Map 29, Block 134A, Parcels 11A & 11B). The property is zoned Commercial.
- 4. Public Hearing(s) and Action on Applications:
  - **4.1 PZ 2022-12, 273 Talcottville Rd.** An Application of Larissa A. Addison, Esq. for a Site Plan and Special Permit to change an approved Site Plan from commercial use to a proposed Early Educational Facility at 273 Talcottville Rd. (Tax Map 03, Block 04, Parcel 9C). The Special Permit modification requested includes Section 14.1.1.1 (Plan of Development (POD) and Sec. 4.24.4.3.10 (education facility). The property is zoned PDZ Gerber Farm Area District.
- 5. **8-24 Referrals, If any**
- 6. Other Business/Discussion
- 7. Public Comments Received
- 8. **Adjournment**

#### TOWN OF VERNON

#### Planning & Zoning Commission (PZC)

Thursday, June 16, 2022, 7:30 PM Town Council Chambers 3<sup>rd</sup> Floor

14 Park Place

Vernon, CT 06066

#### **Draft Minutes**

Call to Order & Roll Call by Roland Klee, Chairman

- Regular members present: Roland Klee, Carl Bard, Robin Lockwood, and Joseph Miller
- Alternate Member: Yelena Damsky sitting for Mike Baum
- Absent Members: Mike Mitchell, Mike Baum and Iris Mullan
- Staff present: Shaun Gately, Interim Director
- Recording secretary: Jill Rocco

#### 2. Administrative Actions/Requests

2.1 Amendment/Adoption of Agenda - Additional business to be considered under agenda item #6 "Other Business" requires a Commission vote.

Robin Lockwood **MOVED** to **ADOPT** the agenda. Joseph Miller seconded and the motion carried unanimously.

2.2 Approval of the Minutes from May 19, 2022

Robin Lockwood **MOVED** to **APPROVE** the minutes from May 19, 2022. Joseph Miller seconded and the motion carried unanimously.

3. New Application(s) for receipt, if any:

NONE

1.

4. Public Hearing(s) and Action on Applications:

**4.1 PZ-2022-11, 371 Talcottvile Rd.** An Application of Allan Borghesi for a Site Plan and Special Permit to develop a 3844 sq. ft. Valvoline Oil Change at 371 Talcottville Rd. (Tax Map 04, Block 04, Parcel 6B). The Special Permit requested includes Section 4.9.4.14 (general automotive repairing and services). The property is zoned Commercial.

- Shaun Gately, Interim Director, read the Public Notice published in the Journal Inquirer on June 4, 2022 & June 11, 2022.
- No Public was in attendance.
- Allan Borghese, Borghese Building & Engineering Co, Inc., 2155 East Main St., Torrington CT, spoke in detail in regards to the application.
- Commission asked questions.
- Applicant Allan Borghesi responded.
- Shaun Gately, Interim Director responded.
- Discussion ensued.

VERNOH TOWN CLERI

Robin Lockwood **MOVED** to **CLOSE** the Public Hearing at 7:47 PM. Joseph Miller seconded and the motion carried unanimously.

Roland Klee MOVED to APPROVE PZ-2022-11, 371 Talcottvile Rd. An Application of Allan Borghesi for a Site Plan and Special Permit to develop a 3844 sq. ft. Valvoline Oil Change at 371 Talcottville Rd. (Tax Map 04, Block 04, Parcel 6B). The Special Permit meets the Special Permit criteria of Section 17 and Site Plan criteria of Section 14 and subject to the following conditions:

- Outside display is limited to what's allowed (up to 10% of the floor area).
- All work shall be performed indoors.
- Used tires shall be disposed of properly, not to be stored outside.

Robin Lockwood seconded and the motion carried unanimously.

5. 8-24 Referrals, If any

NONE

6. Other Business/Discussion

NONE

7. Public Comments Received

NONE

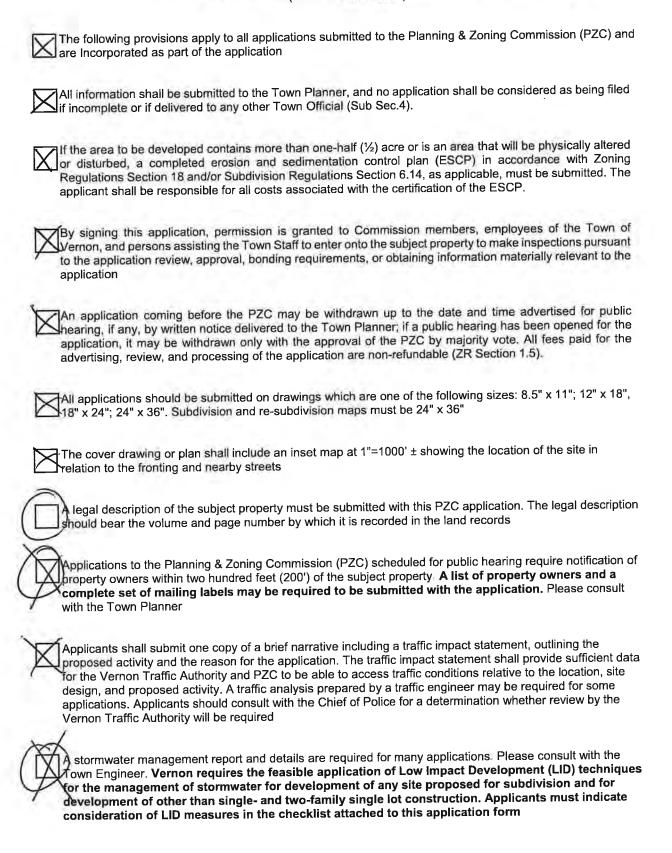
8. Adjournment

Robin Lockwood MOVED to ADJOURN at 7:53 PM. Carl Bard seconded and the motion carried unanimously.

Jill Rocco Recording Secretary

#### PZC APPLICATION INSTRUCTIONS & REQUIREMENTS

(Revised March 2021)



Applicants shall submit five (5) copies of a map, plat or plans showing all information required in	Zoning
Regulations Section 14 Site Plans, and Section 17.3.2 Special Permits as may be required, and/o Subdivision Regulations Section 4, 5, 7. One (1) electronic copy of all submission material should the Town Planner at the following email address: sgately@vernon-ct.gov	or the
Plans and drawings submitted with the application must be prepared by the appropriate design policensed in Connecticut	rofessionals
Applicant shall submit the above-required information to the Town Planning Office accompanied in the amount determined by the fees established by the State of Connecticut, Town of Vernon at PZC with the application. The check, which is required as a filing fee, is to be payable to, "Town of (See attached fee schedule)	nd/or the
THE APPLICATION WILL BE CONSIDERED INCOMPLETE IF ANY REQUIRED INFORMATION SUBMITTED. THE APPLICANT SHALL FILE A COPY OF ANY PROPOSED REGULATION AME OR ZONE CHANGE WITH THE TOWN CLERK TEN (10) DAYS PRIOR TO THE HEARING SECTIONS 8-3 (a) AND (d) OF THE GENERAL STATUTES. CERTIFICATION OF THE FILING THESE SECTIONS BY THE APPLICANT MUST BE PRESENTED AT THE PUBLIC HEARING. RECEIPT FORM IS INCLUDED IN THIS APPLICATION PACKET.	NDMENT S AS PER
Per Connecticut General Statutes (CGS) Sections 8-3(g), 8-3c, and 8-26: If an application submit Planning & Zoning Commission (PZC) involves any activity regulated under the wetland st application for this activity must be filed with the Inland Wetlands Commission (IWC) on or before t Planning & Zoning Commission (PZC) application is filed by the applicant. (IWR Sec. 7.2)	atutee an
Per CGS Sec. 8-3i: If the proposed activity is to take place within the watershed of a water conapplicant is required to file a copy of the application with the water company and the Commissione Health by certified mail within seven (7) days of the date of the application.	npany, the of Public

#### TOWN OF VERNON PLANNING & ZONING COMMISSION (PZC)

#### APPLICATION

This form is to be used to apply to the Vemon Planning & Zoning Commission (PZC) for a change of zoning district, amendment of the Zoning Regulations, Site Plan of Development (POD), Special Permit(s), amendment of the Subdivision Regulations, and/or approval of a (re) subdivision, or DMV location approval. Provide all the information requested.

The applicant must be the property owner, the property owner's agent, the Town of Vemon, or someone with a direct financial interest in the subject property; said interest shall be explained and written permission for this application must be obtained from the property owner and submitted with this application if the applicant is not the property owner (ZR Section 2.3).

The list of approvals and the reserves to sections of the Regulations are for informational purposes only to assist with preparation of the PZC application and are not a definitive statement of the sole requirements that may apply to a specific project.

The applicant understands that the application is complete only when all information and documents required by the PZC have been submitted and, further, that any approval by the PZC relies upon complete and accurate information being provided by the applicant. Incorrect information provided by the applicant may make the approval invalid. The PZC may require additional information to be provided by the applicant in the course of reviewing the application and during the monitoring of the project.

Provide all the information requested:

#### I. APPLICANT:

Name:Chief-Legal Officer- /1/	BINGER	
	rties, L.L.C., an Illinois Limited Liability Comp	any
Address: 1400 16th St, Suite 300	e Lieu e e e e e e e e e e e e e e e e e e	
Oak Brook, IL 60523		
Telephone: 630-617-9113	Fax: N/A	
E-mail laddison@insiterealestate.com	,	
	PROPERTY OWNER (S):	
II. P	PROPERTY OWNER (S):	
Name: Jack Yang	PROPERTY OWNER (S):	=-
Name: Jack Yang Title: Principal		
Name: Jack Yang  Title: Principal  Company: 273 Talcottville LLC, a Connec	ecticut limited liability company	
Name: Jack Yang  Title: Principal  Company: 273 Talcottville LLC, a Connec	ecticut limited liability company	
Name: Jack Yang  Title: Principal  Company: 273 Talcottville LLC, a Connect  Address: 1555 Post Road E., Suite  Westport, CT 06880	ecticut limited liability company	

#### III. PROPERTY

Address: 273 Talcottville Rd
Assessor's ID Code: Map # 3 Block # 4 Lov/Parcel # 9C
Land Record Reference to Deed Description: Volume: 2620 Page 240
Does this site contain a watercourse and/or wetlands? (See the Inland Wetlands Map and IWR Section 2.14, 2.15, 2.23, 2.24, 3.11; 4)
X No Yes  No work will be done in regulated area Work will be done in the regulated area
IWC application has been submitted IWC application has not been submitted
Zoning District PDZ Gerber Farm Area District
Is this property located within five hundred (500) feet of a municipal boundary?
X No Yes:
Bolton Coventry Ellington Manchester South Windsor Tolland
Check if Historic Status Applies:
Located in historic district:
Rockville Talcottville
Individual historic property

#### IV. PROJECT

Project Nan	PROPOSED EARLY ED	UCATION FACIL	LITY
Project Con	stact Person:	3	
Name:	DUSTIN PRIEBE	····	
Title:	PROJECT MANAGER		
Company:	INSITE REAL ESTATE		
Address: _	1400 16TH STREET, SUITE	300	
-	OAK BROOK, IL 60523	,t,	
Telephone:	630-592-3213 Fax:	N/A	
F:li	dpriebe@insiterealestate.com	į	

#### V. PZC APPLICATION PROJECT SUMMARY

Describe the project briefly in regard to the purpose of the project and the activities that will occur. Attach to this application a complete and detailed description with maps and documentation as required by the "Town of Vernon Zoning Regulations" and "Town of Vernon Subdivision Regulations".

urpose: Early Education Facility
General Activities: Drop off and pickup of children ages 6 weeks to
6 years for early education classes and activities.
VI. APPROVAL (S) REQUESTED
Subdivision or Resubdivision
Subdivision (Sub. Sec. 4, 5, 6)  Resubdivision (Sub. Sec. 4, 5, 6)  Minor modification f subdivision or resubdivision (Sub. Sec. 4.6)  Town acceptance of a road (Sub. Sec. 6.5-6. 8 & 9)  Amendment of Subdivision Regulations (Sub. Sec. II)
ee Subdivision Regulations Sec. 4 for application fee schedules.
X Soil Erosion and Sediment Control Plan (ESCP) (ZR Sec. 2.117; 18) (Sub. 6.14)
X Site Plan of Development (POD) (ZR Sec. 14)
POD approval (ZR Sec. 14.1.1.1; 14.1.2)  X Modification of an approved POD (ZR Sec. 14.1.1.1)  Minor modification of a site POD (ZR Sec. 14.1.1.2)
Special Permit(s) (ZR Section 17.3)
Special Permit in an aquifer area (ZR Sec. 2.4; 2.5; 2.119; 20)  Special Permit for excavation (ZR Sec. 2.52; 2.79; 15)  Special Permit for use in a district (ZR Sec. 1.2 & 4)
Special Permit for lot coverage (ZR Sec. 1.2; 2.61; 2.68; 4)  Special Permit for signs (ZR Sec. 1.2; 2.106-115; 4; 16; 21.7)  Special Permit for parking (ZR Sec. 4; 12; 21.4
Special Permit for elderly housing (ZR Sec. 2.60; 17.4) Special Permit for Bed & Breakfast (B & B) (ZR Sec. 2.9; 17.3.4) Special Permit for serving alcohol (ZR Sec. 2.103, 17.1)
Special Permit for massage (ZR Sec. 2.76-78; 4)  Special Permit for telecommunications (ZR Sec. 2.21; 3.23 & 23)  Special Permit for dumps and/or incinerators (ZR Section 8)

X Special Permit modifications (ZR Sec. 17.3.2.2). Cite ZR Section and des PZ-2016-01. Modification to the approved site plan from a
commercial use to a proposed early education facility
 Zoning:
Site specific change of zoning district and map (ZR Sec. 1.2; 1.3; 4)  Amendment of Zoning Regulations (Sec. 1.2; 1.3; 4)
Site specific change to the Aquifer Protection Overlay Zone Map (ZR Sec

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#### VII. APPLICATION CONDITIONS / STIPULATIONS

The following provisions apply to all applications submitted to the Planning & Zoning Commission (PZC) and are incorporated as part of the application.

All information shall be submitted to the Town Planner and no application shall be considered as being filed if incomplete or if delivered to any other Town Official (Sub Sec.4).

If the area to be developed contains more than one-half (1/2) acre area that will be physically altered or disturbed, a completed erosion and sedimentation control plan (ESCP) in accordance with Zoning Regulations Section 18 and/or Subdivision Regulations Section 6.14, as applicable, must be submitted. The applicant shall be responsible for all costs associated with the certification of the ESCP.

By signing this application, permission is granted to Commission members, employees of the Town of Vernon, and persons assisting the Town Staff to go onto the subject property to make inspections pursuant to the application review, approval, bonding requirements, or obtaining information materially relevant to the application.

No application coming before a Commission may be withdrawn after it has been advertised for a public hearing unless the Chairman or Secretary of the Commission is notified in writing by the applicant or his representative not later than forty-eight (48) hours prior to the scheduled hearing before the Commission. All fees encumbered in the advertising and review of the application is non-refundable (ZR Section 1.5).

All applications must be submitted on drawings which are one of the following sizes: 8.5" x 11"; 12" x 18", 18" x 24"; 24" x 36". Subdivision and resubdivision maps must be 24" x 36".

The application shall include an 8.5" x 11" map showing the location of the site and an 8.5" x 11" general plan of development (POD) map showing the development proposed on the site.

A legal description of the subject property must be submitted with this PZC application. The legal description should bear the Volume number and Page number by which it is recorded in the land records.

Applications to the Planning & Zoning Commission (PZC) require notification of property owners within two hundred feet (200') of the subject property. A list of property owners and a complete set of mailing labels must be submitted with the application.

Applicants shall submit one copy of a brief narrative including a traffic impact statement, outlining the proposed activity and the reason for the application. The traffic impact statement shall provide sufficient data for the Vernon Traffic Authority and PZC to be able to access traffic conditions relative to the location, site design, and proposed activity.

Applicant shall submit twenty (20) copies of a map showing all information required in Zoning Regulations Section 14 Site Plans, and Section 17.3.2 Special Permits as may be required, and/or the Subdivision Regulations Section 4,5,7.

The map must be prepared by a licensed surveyor, if the application involves (a) exterior modification to the building or premises, such as off-street parking, which need dimensionally critical measurements to insure compliance with zoning or (b) the improvements involve disturbing more than one half acre of land.

Applicant shall submit the above-required information to the Town Planning Office accompanied by a check in the amount determined by the fees established by the State of Connecticut, Town of Vernon and/or the PZC with the application. The check, which is required as a filing fee, is to be payable to, "Town of Vernon". (See attached fee schedule).

THE APPLICATION WILL BE CONSIDERED INCOMPLETE IF ANY REQUIRED INFORMATION IS NOT SUBMITTED.

APPLICANT SHALL FILE A COPY OF ANY PROPOSED REGULATION AMENDMENT, ZONE CHANGE, OR WETLANDS REDESIGNATION WITH THE TOWN CLERK TEN (10) DAYS PRIOR TO THE HEARING AS PER SECTIONS 8-3(a) AND (d) AND 22a-42a (b) OF THE GENERAL STATUTES. CERTIFICATION OF THE FILING UNDER THESE SECTIONS BY THE APPLICANT MUST BE PRESENTED AT THE PUBLIC HEARING.

Per Connecticut General Statutes (CGS) Section 8-26: If an application submitted to the Planning & Zoning Commission (PZC) involves any activity or area regulated under the wetlands statutes, an application for this activity must be filed with the Inland Wetlands Commission (IWC) on or before the day the Planning & Zoning Commission (PZC) application is filed by the applicant. (IWR Sec. 3.11)

Per CGS Sec. 8-31: If the proposed activity is to take place within a watershed of a Water company, the applicant is required to file a copy of the application with the Water Company via certified mail within seven (7) days of the date of the application. (IWR Sec. 4.3.6).

The applicant, undersigned, has reviewed the "Town of Vernon Planning and Zoning Regulations and Inland Wetlands and Watercourses Regulations" and has prepared this application with complete and accurate information:

Property Owner, Applicant, or Applicant's Agent:

INSITE REAL ESTATE INVESTMENT PROPERTIES, L.L.C.

PROPERTIES, L.L.C.

Signature

Signature

Signature

Date

Date

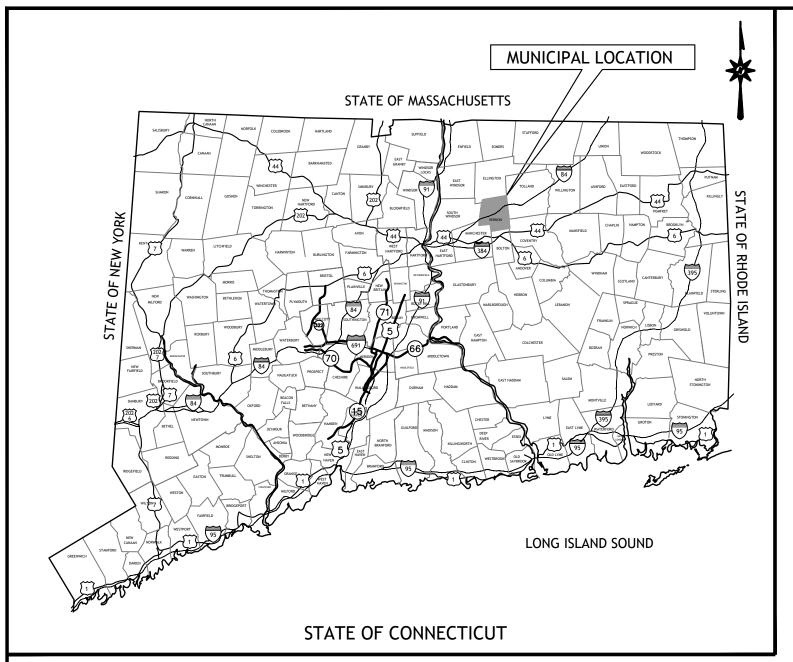
#### TO BE FILLED IN BY THE PLANNING DEPARTMENT

Date Application Submitted	-	
Date Application Received by Commission	<del></del> ;	_
PZC File:		

### USE THIS FORM ONLY IF THE REQUIREMENTS OF 8.3(a)/22-a-42a(b) OF THE C.G.S. MUST BE MET

#### RECEIPT FOR DOCUMENTS SUBMITTED FOR PUBLIC INSPECTION

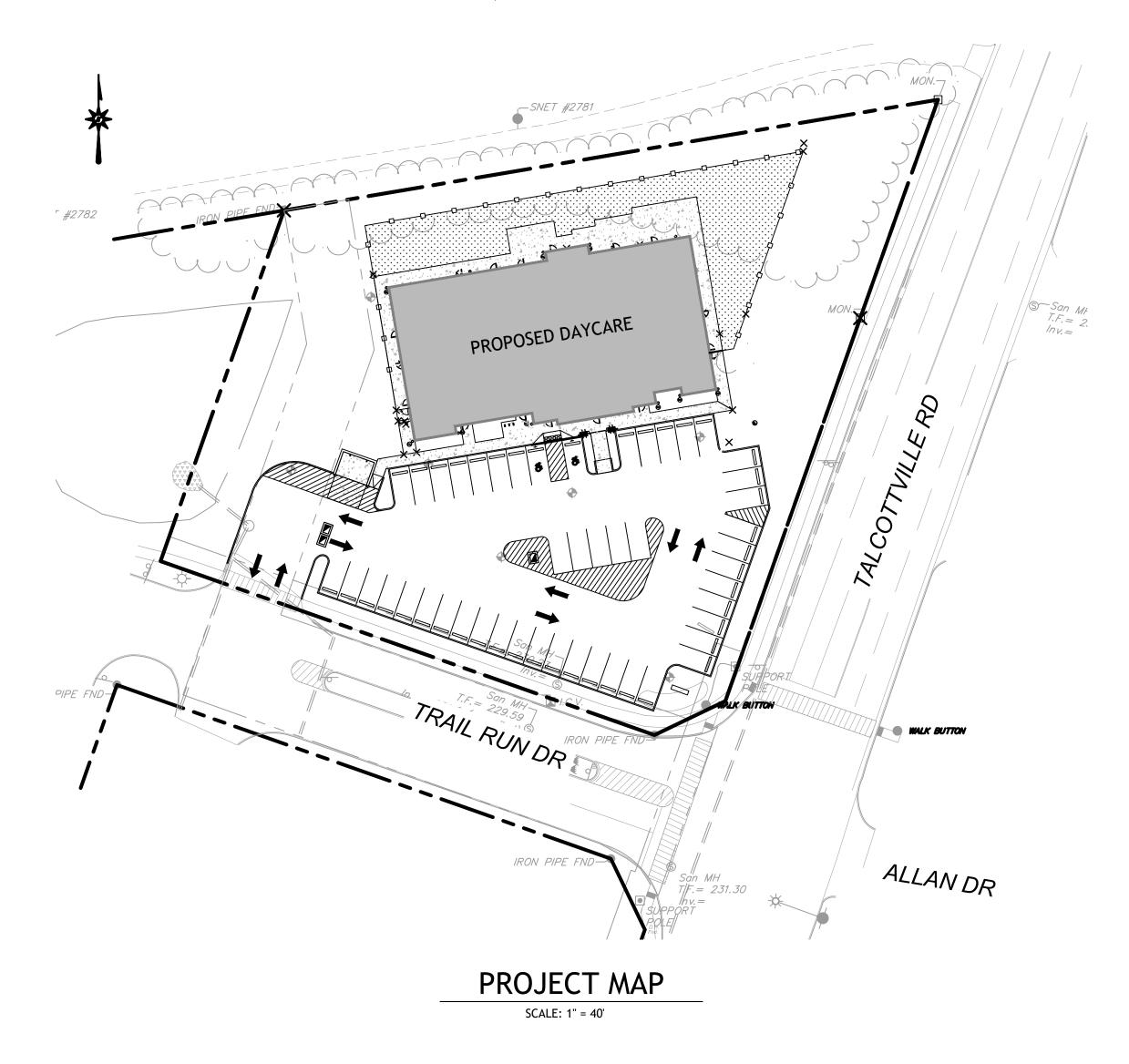
TO:	VERNON TOWN CLERK
FROM:	
REFERENCE:	π" = %
DATE"	9 <b>1</b> ,
	The attached documents, consisting of:
	Are being submitted for public inspection under CGS 8-3(a)/22a-42a (b).
	в от рисло имрессион инцег CGS 8-3(в)/228-42h (b).
	Received:
	Vernon Town ClerkSignature
	Date:



LOCATION MAP

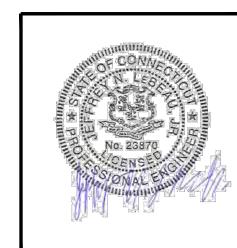
# SITE PLAN APPLICATION TOWN OF VERNON PLANNING & ZONING COMMISSION

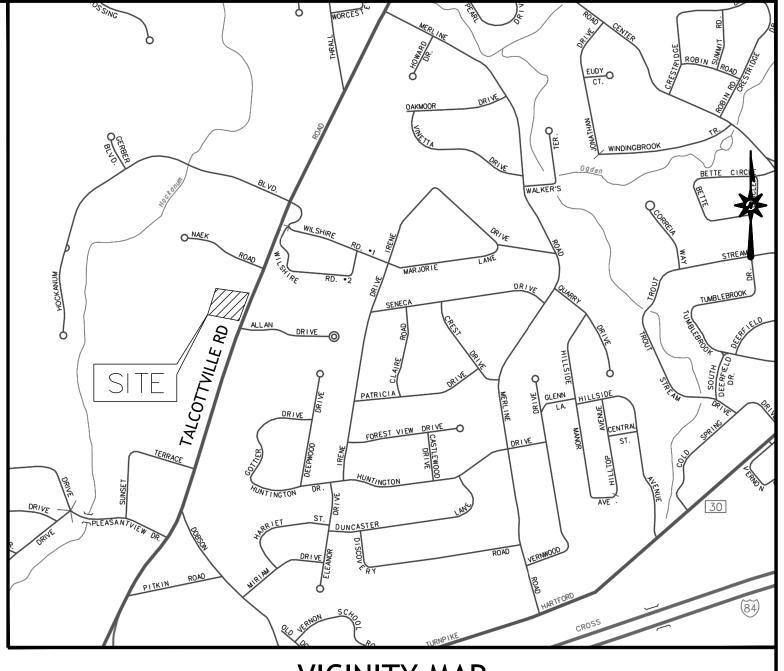
273 TALCOTTVILLE RD (CT RT 83) VERNON, CONNECTICUT



PREPARED FOR:

INSITE REAL ESTATE
1400 16TH STREET, SUITE 300
OAK BROOK, IL 60523-8854





VICINITY MAP

SCALE: 1" = 1,000'

TITLE SHEET

--- ALTA/NSPS LAND TITLE SURVEY (1 OF 2)

--- ALTA/NSPS LAND TITLE SURVEY (2 OF 2)

C1.01 SITE PLAN

C1.02 EROSION & SEDIMENT CONTROL PLAN

C1.03 GRADING PLAN

C1.04 DRAINAGE PLAN

C1.05 LANDSCAPE PLAN

C1.06 PHOTOMETRIC PLAN

C1.07 UTILITY PLAN

C2.01 NOTES

C2.02 - C2.04 DETAILS

**DATES** 

ISSUE DATE: JUNE 29, 2022 REVISION:

PREPARED BY:



DBE | DAS | MBE | GNMSDC CERTIFIED

CIVIL | GEOTECHNICAL

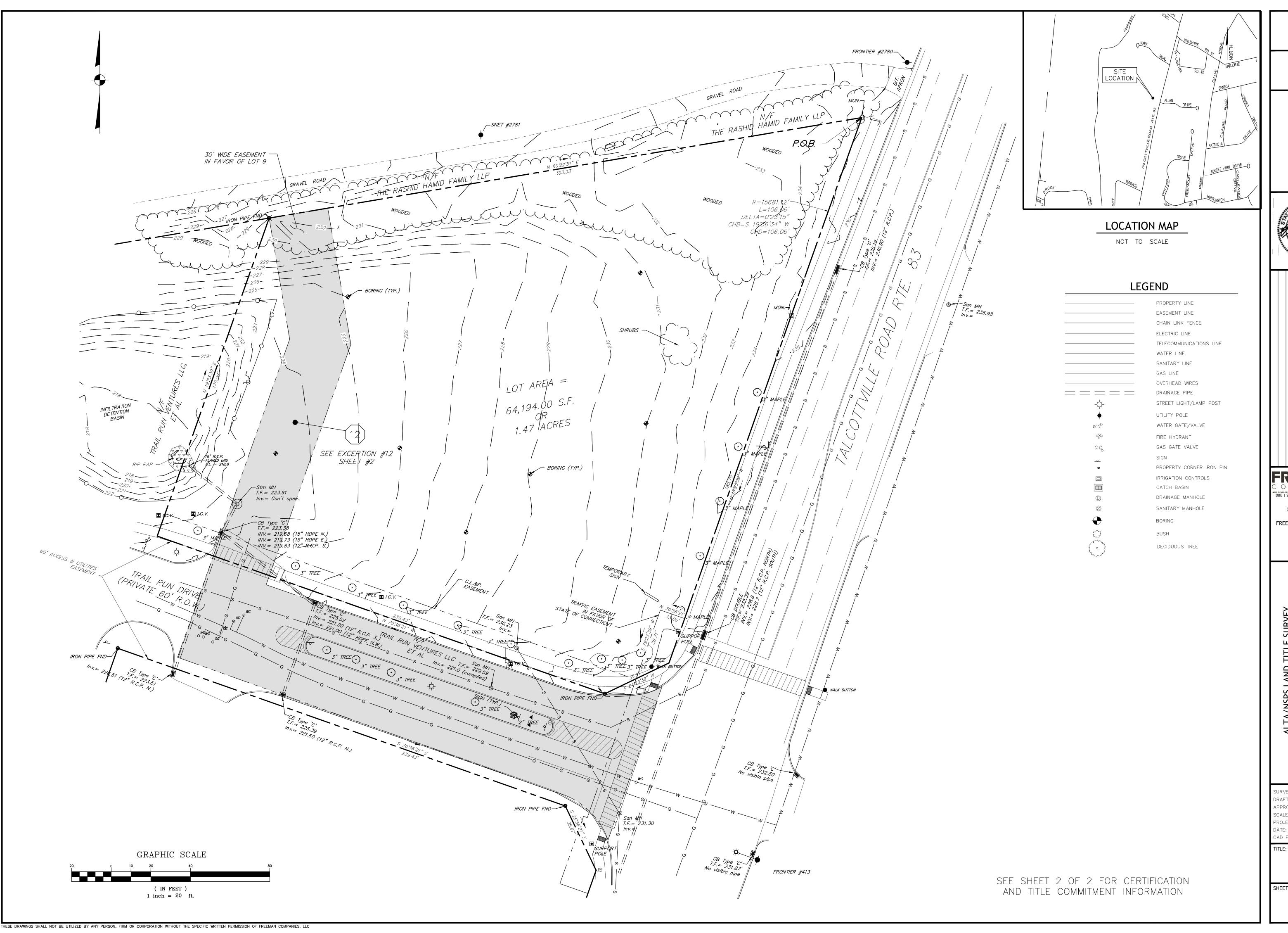
SURVEY | ENVIRONMENTAL

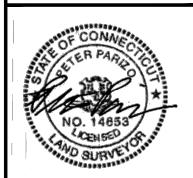
FREEMAN COMPANIES, LLC

36 JOHN STREET
HARTFORD, CT 06103
TEL: 860-251-9550
FAX: 860-986-7161
WWW.FREEMANCOS.COM
ELEVATE YOUR EXPECTATIONS

FREEMAN COMPANIES, LLC . R: \2022\2022-0303 27

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC





FREEMAN

COMPANIES

LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

LAND DEVELOPMENT | ENGINEERING DESIGN | CONSTRUCTION SERVICES

FREEMAN COMPANIES, LLC

36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
(860)251-9550
FAX:(860)986-7161

SPS LAND TITLE SURVEY
PREPARED FOR
TALCOTTVILLE LLC
ILLE ROAD (CONN. RTE. NO. 8

SURVEYED: C.A

DRAFTED: P.P

APPROVED: L.K

SCALE: 1" = 20

PROJECT NO.: 2022-0303

DATE: 04/22/2022

E:

ALTA/NSPS

LAND TITLE

SURVEY

SHEET NUMBER:

1 of 2

#### PROPERTY DESCRIPTION - 273 TALCOTTVILLE ROAD, VERNON, CONNECTICUT

A CERTAIN PIECE OR PARCEL OF LAND LOCATED ON THE NORTHWESTERLY CORNER OF THE INTERSECTION OF TALCOTTVILLE ROAD (A.K.A. CT. ROUTE 83 AND TRAIL RUN DRIVE IN VERNON, CONNECTICUT BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A CONCRETE MONUMENT ON THE WESTERLY STREET LINE OF SAID TALCOTTVILLE ROAD BEING THE NORTHEASTERLY CORNER OF THE LAND HEREIN DESCRIBED:

THENCE ALONG SAID STREET LINE, ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 15,681.12 FEET AND AN ARC DISTANCE OF 106.06 FEET TO A POINT OF TANGENCY;

THENCE ALONG SAID STREET LINE S 19°23'39" W, A DISTANCE OF 185.70 FEET TO A POINT;

THENCE S 64°23'39" W, A DISTANCE OF 35.97 FEET TO AN IRON PIPE ON THE NORTHERLY LINE OF TRAIL RUN DRIVE, A PRIVATE ROAD, BEING LAND NOW OR FORMERLY OF TRAIL RUN VENTURES LLC, ET AL;

THENCE ALONG SAID LINE OF TRAIL RUN DRIVE, N 70°36'21" W A DISTANCE OF 239.43 FEET TO A POINT;

THENCE ALONG LAND NOW OR FORMERLY OF TRAIL RUN VENTURES LLC, ET AL, N 19°23'39" E A DISTANCE OF 170.08 FEET TO AN IRON PIPE;

THENCE, ALONG LAND NOW OR FORMERLY OF THE RASHID HAMID FAMILY LLP, N 80°22'51" E A DISTANCE OF 303.33 FEET TO THE POINT AND PLACE OF BEGINNING.

#### ZONING DISTRICT - PDZ (PLANNED DEVELOPMENT ZONE)

REQUIRED BUILDING SETBACKS
FRONT YARD = 50' (TALCOTTVILLE RD.)
CORNER SIDE YARD = 50' (TRAIL RUN DR.)
INTERIOR SIDE YARD = 10'
REAR YARD = 10'
REQUIRED PARKING SETBACKS
FRONT YARD = 10' (TALCOTTVILLE RD.)
CORNER YARD = 10' (TRAIL RUN DR.)
INTERIOR SIDE YARD = 10'
REAR YARD = 10'

REQUIRED SIGNAGE SETBACK = 10'

#### OFF STREET PARKING REQUIREMENTS (PROPOSED DAYCARE)

PARKING STALL COUNT = 1/EMPLOYEE PLUS 1/5 STUDENTS ADA STALL COUNT = 2 PARKING STALL SIZE = 9' x 17' DRIVE AISLE WIDTH = 24' REQUIRED ISLANDS = 1/20 STALLS

#### MAP REFERENCE(S)

1. COMPILATION PLAN, MAP SHOWING EASEMENT AREA TO BE GRANTED TO THE THE CONNECTICUT LIGHT AND POWER COMPANY DBA EVERSOURCE ENERGY, ACROSS THE PROERTY OF TALCOTTVILLE VERNON DEVELOPMENT, LLC, TALCOTTVILLE ROAD RTE. #83, VERNON, CONNECTICUT, SCALE: 1"=80', DATE: NOVEMBER 20, 2018, FILE NO. E8097.

2. EASEMENT MAP, TOWN OF VERNON, MAP SHOWING EASEMENT ACQUIRED FROM TALCOTTVILLE VERNON DEVELOPMENT, LLC BY THE STATE OF CONNECTICUT, DEPARTMENT OF TRANSPORTATION, TALCOTTVILLE ROAD, CONN. RTE. NO. 83, SCALE: 1"=40', MAY 2018.

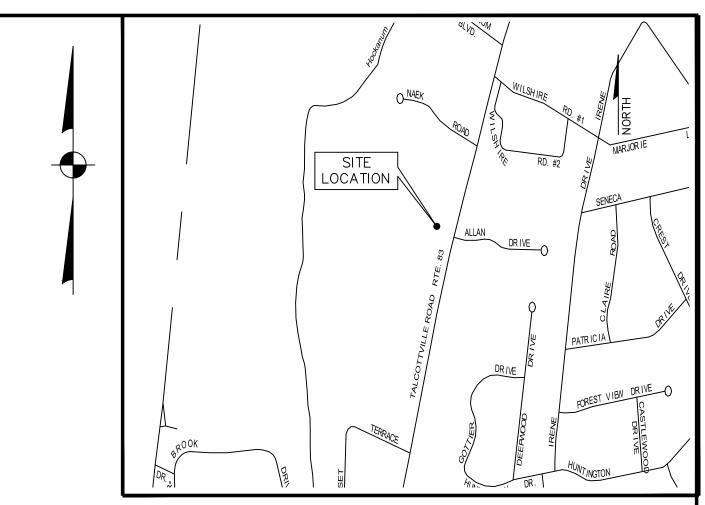
3. RIGHT OF WAY SURVEY, TOWN OF VERNON, MAP SHOWING LAND TO BE ACQUIRED FROM TALCOTTVILLE VERNON DEVELOPMENT, LLC BY THE STATE OF CONNECTICUT, DEPARTMENT OF TRANSPORTATION, TALCOTTVILLE ROAD, CONN. RTE. NO. 83, SCALE: 1"=100', MAY 2018.

#### TITLE COMMITMENT INFORMATION

TITLE COMMITMENT NUMBER: NCS-1101053-MAD COMMITMENT DATE: DECEMBER 1, 2021

RESTRICTIONS, CONDITIONS AND EASEMENTS	RECORDING REFERENCE VOL./PG.	DESCRIPTION	STATUS ON PLAT
1		ANY FACTS, RIGHTS, INTERESTS, OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR THAT MAY BE ASSERTED BY PERSONS IN POSSESSION OF THE LAND.	NOT PLOTTABLE
2		ANY ENCROACHMENT, ENCUMBRANCES, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND AND NOT SHOWN BY THE PUBLIC RECORDS.	SHOWN ON THE SURV IF APPLICABLE
(3)		EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.	NOT PLOTTABLE
4		TITLE TO AND RIGHTS OF THE PUBLIC AND OTHERS ENTITLED THERETO IN AND TO THOSE PORTIONS OF THE LAND LYING WITHIN THE BOUNDS OF ADJACENT STREETS, ROADS, AND WAYS.	NOT PLOTTABLE
5		THE ACREAGE OR SQUARE FOOTAGE BEING OTHER THAN AS STATED IN SCHEDULE A OR THE PLAN(S) THEREIN REFERRED TO.	NOT PLOTTABLE
6		ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE ON WHICH ALL OF THE SCHEDULE B, PART 1—REQUIREMENTS ARE MET.	NOT PLOTTABLE
7		REAL ESTATE TAXES TO THE TOWN OF VERNON ON THE LIST OF OCTOBER 1, 2020.  () SEMI-ANNUAL PAYMENTS - TOTAL TAX = \$ 3,484.28; FIRST PAYMENT DUE JULY 1, 2021 IS PAID, SECOND PAYMENT DUE JANUARY 1, 2022 IS NOT YET DUE AND PAYABLE.	NOT PLOTTABLE
8		REAL ESTATE TAXES TO THE TOWN OF VERNON ON THE LIST OF OCTOBER 1, 2021	NOT PLOTTABLE
9		WATER AND SEWER USE CHARGES TO THE PUBLIC/PRIVATE AUTHORITY WHEN NEXT DUE. CALL FOR ACCOUNT STATUS.	NOT PLOTTABLE
(10)	2539/279	EASEMENT AGREEMENT BY AND BETWEEN TALCOTTVILLE VERNON DEVELOPMENT, LLC, AND THE TOWN OF VERNON DATED JANUARY 17, 2018 IN VOLUME 2539 AT PAGE 279.	NOT PLOTTABLE
(11)	2539/284 2568/57	DECLARATION OF EASEMENTS BY TALCOTTVILLE VERNON DEVELOPMENT, LLC, DATED JANUARY 17, 2018 AND RECORDED JANUARY 18, 2018 IN VOLUME 2539 AT PAGE 284, AS CORRECTED BY AFFIDAVIT BY TALCOTTVILLE VERNON DEVELOPMENT, LLC, DATED JULY 17, 2018 AND RECORDED JULY 23, 2018 IN VOLUME 2568 AT PAGE 57.	NOT PLOTTABLE
12	2540/129	RIGHT OF WAY EASEMENT TO MARIANIST SOCIETY, INC., DATED JANUARY 17, 2018 AND RECORDED JANUARY 24, 2018 IN VOLUME 2540 AT PAGE 129.	PLOTTED ON SURVEY
13)	2568/61	WATER MAIN EASEMENT GRANTED TO THE CONNECTICUT WATER COMPANY DATED JULY 17, 2018 AND RECORDED JULY 23, 2018 IN VOLUME 2568 AT PAGE 61.	NOT PLOTTABLE
14	2575/175	CAVEAT BY THE WATER POLLUTION CONTROL AUTHORITY OF THE TOWN OF VERNON DATED SEPTEMBER 6, 2018 AND RECORDED SEPTEMBER 6, 2018 IN VOLUME 2575 AT PAGE 175.	NOT PLOTTABLE
15)	2583/265	GAS DISTRIBUTION EASEMENT GRANTED TO YANKEE GAS SERVICES COMPANY DBA EVERSOURCE ENERGY DATED OCTOBER 23, 2018 AND RECORDED NOVEMBER 13, 2018 IN VOLUME 2583 AT PAGE 265.	NOT PLOTTABLE
16	2592/329	ELECTRIC DISTRIBUTION EASEMENT GRANTED TO THE CONNECTICUT ELECTRIC LIGHT AND POWER COMPANY DBA EVERSOURCE ENERGY DATED DECEMBER 20, 2018 AND RECORDED JANUARY 28, 2019 IN VOLUME 2592 AT PAGE 329.	NOT PLOTTABLE
17	2636/222	TRAFFIC EASEMENTS AS SET FORTH IN A DEED FROM TALCOTTVILLE VERNON DEVELOPMENT, LLC, TO THE STATE OF CONNECTICUT DATED NOVEMBER 3, 2019 AND RECORDED NOVEMBER 26, 2019 IN VOLUME 2636 AT PAGE 222.	NOT PLOTTABLE
18	2442/100	CERTIFICATE OF APPROVAL OF SPECIAL PERMIT BY THE TOWN OF VERNON PLANNING AND ZONING COMMISSION DATED MARCH 18, 2016 AND RECORDED MARCH 30, 2016 IN VOLUME 2442 AT PAGE 100.	NOT PLOTTABLE
(19)	2539/99	CERTIFICATE OF APPROVAL OF SPECIAL PERMIT BY THE TOWN OF VERNON PLANNING AND ZONING COMMISSION DATED SEPTEMBER 1, 2017 AND RECORDED JANUARY 12, 2018 IN VOLUME 2539 AT PAGE 99.	NOT PLOTTABLE
20	2539/100	CERTIFICATE OF APPROVAL OF SPECIAL PERMIT BY THE TOWN OF VERNON PLANNING AND ZONING COMMISSION DATED SEPTEMBER 1, 2017 AND RECORDED JANUARY 12, 2018 IN VOLUME 2539 AT PAGE 100.	NOT PLOTTABLE
(21)		ANY ITEMS THAT MAY APPEAR ON SAID MAP.	AS SHOWN ON THI SURVEY
(22)	312/297	VARIANCE GRANTED BY THE VERNON ZONING BOARD OF APPEALS DATED MAY 18, 1977 AND RECORDED JUNE 5, 1977 IN VOLUME 312 AT PAGE 297 OF THE VERNON LAND RECORDS. (AFFECTS 253 TALCOTTVILLE ROAD; MAY AFFECT 273 TALCOTTVILLE ROAD)	NOT PLOTTABLE
23)	322/147	VARIANCE GRANTED BY THE VERNON ZONING BOARD OF APPEALS DATED OCTOBER 13, 1977 AND RECORDED OCTOBER 4, 1977 IN VOLUME 322 AT PAGE 147 OF THE VERNON LAND RECORDS. (AFFECTS 253 TALCOTTVILLE ROAD; MAY AFFECT 273 TALCOTTVILLE ROAD)	NOT PLOTTABLE
24)	234/330	SEWER CAVEAT BY THE SEWER AUTHORITY OF THE TOWN OF VERNON DATED AND RECORDED AUGUST 16, 1973 IN VOLUME 234 AT PAGE 330 OF THE VERNON LAND RECORDS.	NOT PLOTTABLE
(25)	828/246	CERTIFICATE OF NOTICE OF ASSESSMENTS AND DEFERRAL OF PAYMENTS (SEWER) BY THE SEWER AUTHORITY OF THE TOWN OF VERNON RECORDED APRIL 3, 1991 IN VOLUME 828 AT PAGE 246 OF THE VERNON LAND RECORDS.	NOT PLOTTABLE
(26)	1097/29	CAVEAT (DEFERRED SEWER) BY THE TOWN OF VERNON WATER POLLUTION CONTROL AUTHORITY IN THE AMOUNT OF\$70,500.00 DATED AND RECORDED APRIL 18, 1997 IN VOLUME 1097 AT PAGE 29 OF THE VERNON LAND RECORDS.	NOT PLOTTABLE
27)	2379/15	TAX ASSESSOR'S CERTIFICATE DATED AND RECORDED DECEMBER 11, 2014 IN VOLUME 2379 AT PAGE 15 OF THE VERNON LAND RECORDS.	NOT PLOTTABLE
(28)	98/457	DRAINAGE EASEMENT IN FAVOR OF THE STATE OF CONNECTICUT AS SET FORTH IN CERTIFICATE OF CONDEMNATION DATED JULY 19, 1954 AND RECORDED IN VOLUME 98 AT PAGE 457 OF THE VERNON LAND RECORDS. (AFFECTS 253 TALCOTTVILLE ROAD; MAY AFFECT 273 TALCOTTVILLE ROAD)	NOT PLOTTABLE
29	189/238	RIGHTS TO DRAIN IN A WARRANTY DEED FROM DWIGHT LYMAN AND FAITH LYMAN TO ANDREW J. ASHLAND AND JOSEPH F. TOTH DATED JULY 27, 1970 AND RECORDED IN VOLUME 189 AT PAGE 238 OF THE VERNON LAND RECORDS. (AFFECTS 253 TALCOTTVILLE ROAD; MAY AFFECT 273 TALCOTTVILLE ROAD)	NOT PLOTTABLE
(30)			
(31)			

FIRST AMERICAN TITLE INSURANCE COMPANY



#### LOCATION MAP

NOT TO SCALE

#### SURVEY NOTES

- 1. THIS SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS.
- 2. THE TYPE OF SURVEY IS AN ALTA/NSPS LAND TITLE SURVEY.
- 3. BEARINGS DEPICTED HEREON REFER TO THE CONNECTICUT STATE PLANE COORDINATE SYSTEM NAD83.
- 4. PROPERTY LIES WITHIN FLOOD ZONE X (AREAS OF MINIMAL FLOODING) AS DEPICTED ON "FIRM FLOOD INSURANCE RATE MAP FOR TOLLAND COUNTY, CONNECTICUT, MAP NUMBER 0901310005C MAP EFFECTIVE DATE 08/09/1999".
- 5. UNDERGROUND UTILITIES ARE DEPICTED IN APPROXIMATE LOCATIONS BASED ON MARK—OUT SERVICES, AVAILABLE MAPS AND RECORDS, AND VISIBLE SURFACE EVIDENCE. UTILITIES MAY EXIST THAT ARE NOT SHOWN. VERIFY INFORMATION IN THE FIELD. BEFORE ANY DIGGING OR SITE EXCAVATION.

  " CALL BEFORE YOU DIG" 811 OR 1—800—922—4455.
- 6. THERE ARE CURRENTLY NO IDENTIFIABLE PARKING SPACE MARKINGS ON THE
- 7. THERE ARE CURRENTLY NO EXISTING BUILDINGS THEREFORE NO DIVISION OR PARTY WALLS.
- 8. THERE ARE NO KNOWN PROPOSED CHANGES TO STREET RIGHT OF WAY LINES.
- 9. THERE ARE NO KNOWN OFFSITE EASEMENTS OR SERVITUDES OTHER THAN THOSE DEPICTED ON THE SURVEY.
- 10. NO ENCROACHMENT EXISTS ON THE SUBJECT PROPERTY.
- 11. CURRENTLY, THE SITE IS VACANT.
- 12. THERE WAS NO VISIBLE EVIDENCE OF CEMETERIES OR BURIAL GROUNDS WHILE CONDUCTING THE FIELDWORK .
- 13. THERE WAS NO EVIDENCE OF THE SITE BEING USED AS A SOLID WASTE DUMP, DUMP, OR SANITARY LANDFILL DURING THE TIME OF SURVEY.
- 14. THERE ARE NO KNOWN WETLANDS ON THE SUBJECT PROPERTY.
- 15. THE ABOVE DESCRIBED PROPERTY IS THE SAME PROPERTY DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY'S COMMITMENT FOR TITLE INSURANCE NUMBER NCS-1101053-MAD, WITH AN EFFECTIVE DATE OF DECEMBER 1, 2021.

NO. 14853 NO. 14853 NO. SURVEYOR

LEEWSIONS

LECTION

BEEVISIONS

COMPANIES

LAND DEVELOPMENT ENGINEERING DESIGN CONSTRUCTION SERVICES

DBE | SBE | MBE | SBA (8)a CERTIFIED

LAND DEVELOPMENT

ENGINEERING DESIGN

CONSTRUCTION SERVICES

FREEMAN COMPANIES, LLC

36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
(860)251-9550
FAX:(860)986-7161

ALTA/NSPS LAND TITLE SURVEY
PREPARED FOR
273 TALCOTTVILLE LLC
FALCOTTVILLE ROAD (CONN. RTE. NO. 83
VERNON, CONNECTICUT

SURVEYED: C.A

DRAFTED: P.P.

APPROVED: L.K.

SCALE: 1" = 20

PROJECT NO.: 2022-0303

DATE: 04/22/2022

CAD FILE: 2022-0303

ALTA/NSPS LAND TITLE SURVEY

SHEET NUMBER:

2 of 2

COMMITMENT NO. NCS-1101053-MAD, COMMITMENT DATE DECEMBER 1, 2021

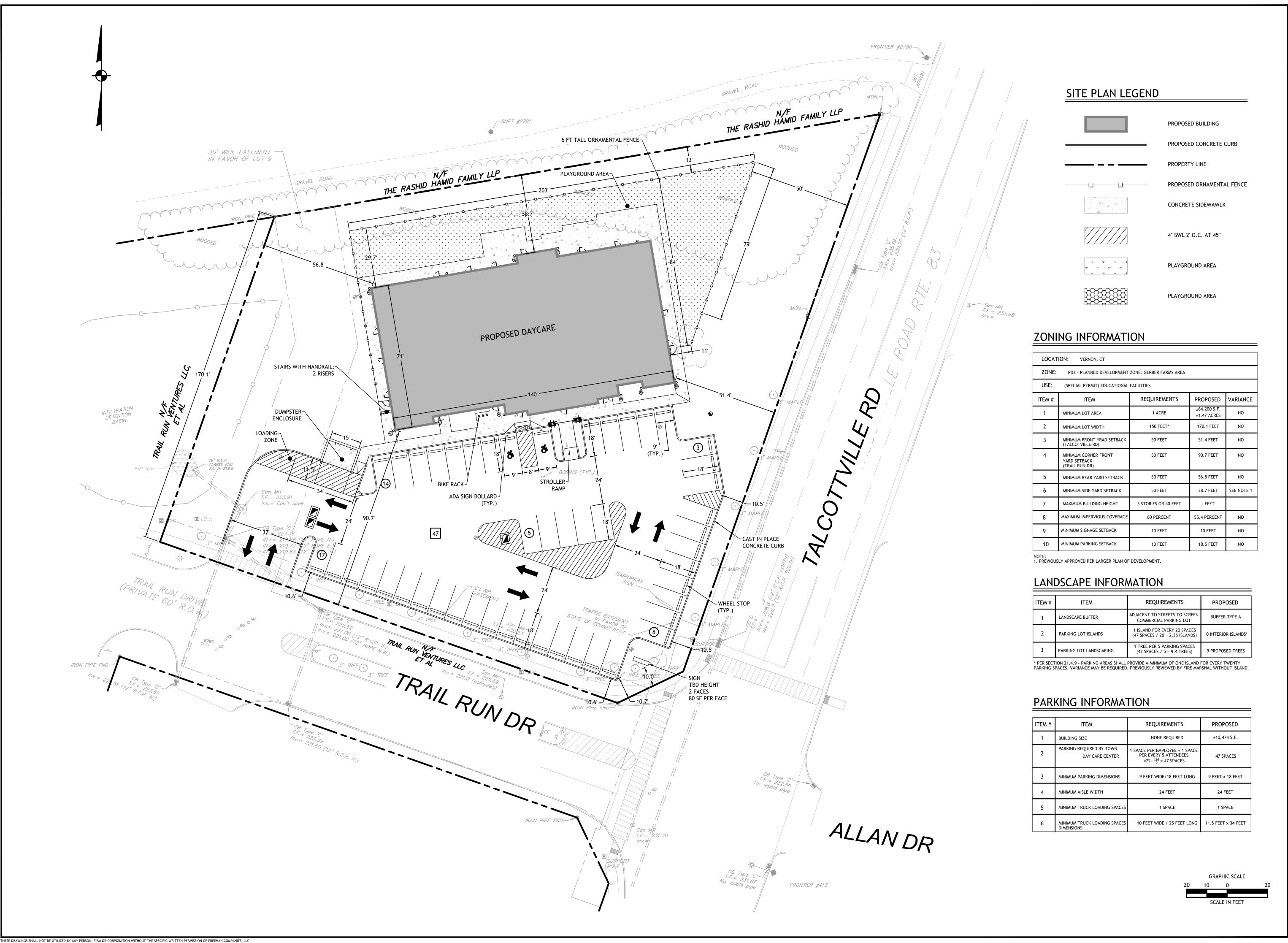
TO: 273 TALCOTTVILLE LLC AND FIRST AMERICAN TITLE INSURANCE COMPANY, AND THEIR SUCCESSORS AND ASSIGNS:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1,2, 3, 4, 5, 6, 8, 11, 13, 14, 16, 17, 18, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON APRIL 20, 2022.

DATE

PETER PARIZO, P.L.S. 14653

NO DECLARATION IS EXPRESSED OR IMPLIED BY THIS MAP OR COPIES THEREOF UNLESS IT BEARS THE SEAL AND SIGNATURE OF THE SURVEYOR WHOSE NAME AND REGISTRATION NUMBER APPEAR. ANY CHANGES MADE TO THIS PLAN WITHOUT THE KNOWLEDGE OF THE SIGNER INVALIDATES THESE DECLARATIONS.



PREPARED FOR

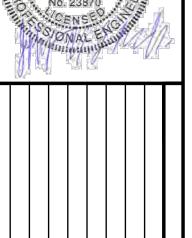
INSITE REAL ESTATE

1400 16TH STREET, SUITE 300

OAK BROOK, IL 60523-8854

(630) 617-9100

EFF PS A STANDARD STA



PREEMAN

O M P A N I E S

DBE | DAS | MBE | GNMSDC CERTIFIED

CIVIL ENGINEERS | LAND SURVEYORS

ENVIRONMENTAL SCIENTISTS

FREEMAN COMPANIES, LLC

36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
(860)251-9550
FAX:(860)986-7161

ELEVATE YOUR EXPECTATION

LEARNING CENTER
E RD (CONN. RTE. NO. 83)
CONNECTICUT

 DESIGNED:
 N.V.G.

 DRAFTED:
 N.V.G.

 CHECKED:
 J.N.L.

 APPROVED:
 J.N.L.

 SCALE:
 1" = 20"

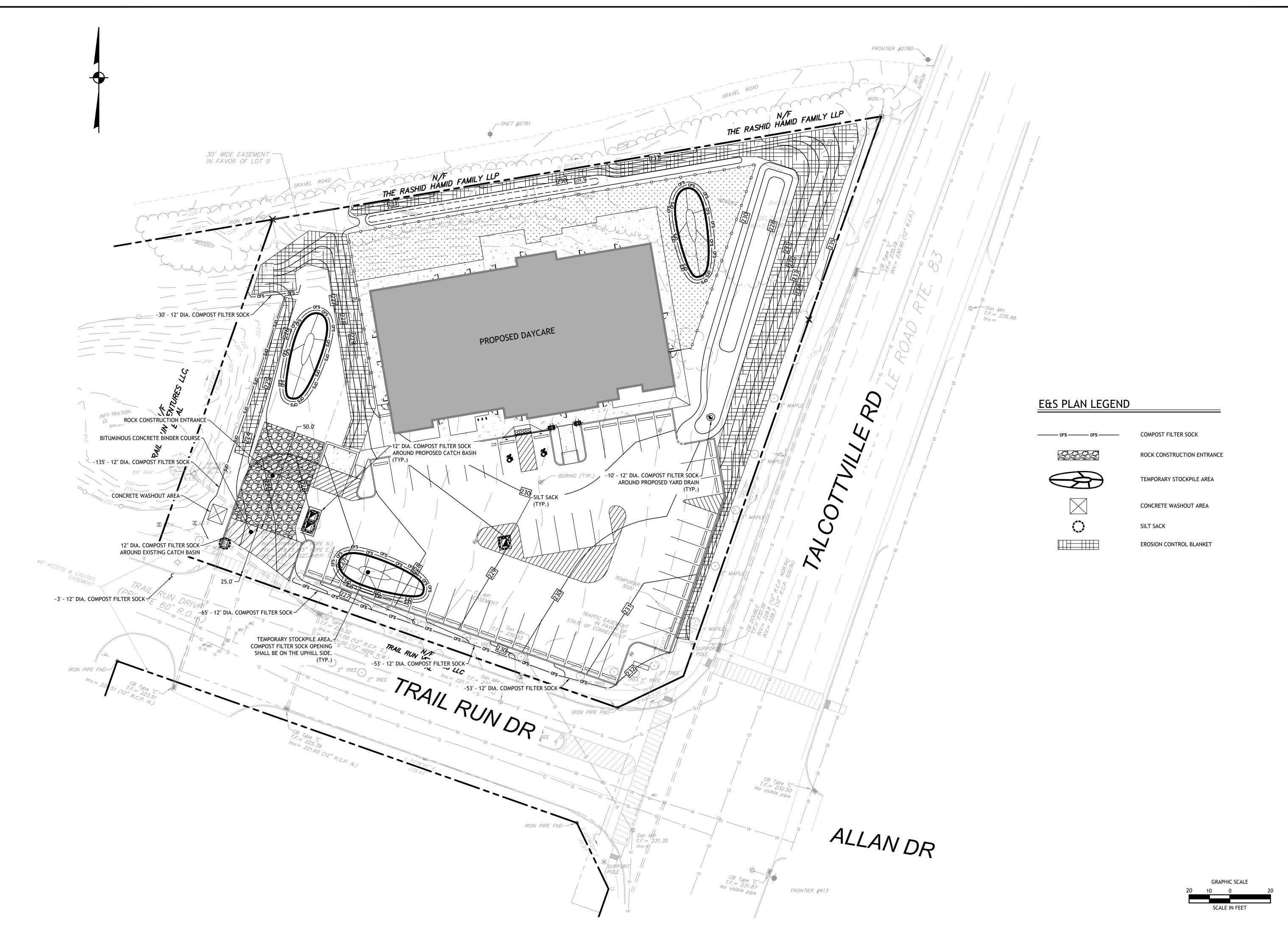
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 2022-0303

 DATE:
 06/29/2022

 CAD FILE:
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SITE PLAN

311212/



INSITE REAL ESTATE 1400 16TH STREET, SUITE 300 OAK BROOK, IL 60523-8854 (630) 617-9100

DBE | DAS | MBE | GNMSDC CERTIFIED CIVIL ENGINEERS | LAND SURVEYORS ENVIRONMENTAL SCIENTISTS

FREEMAN COMPANIES, LLC

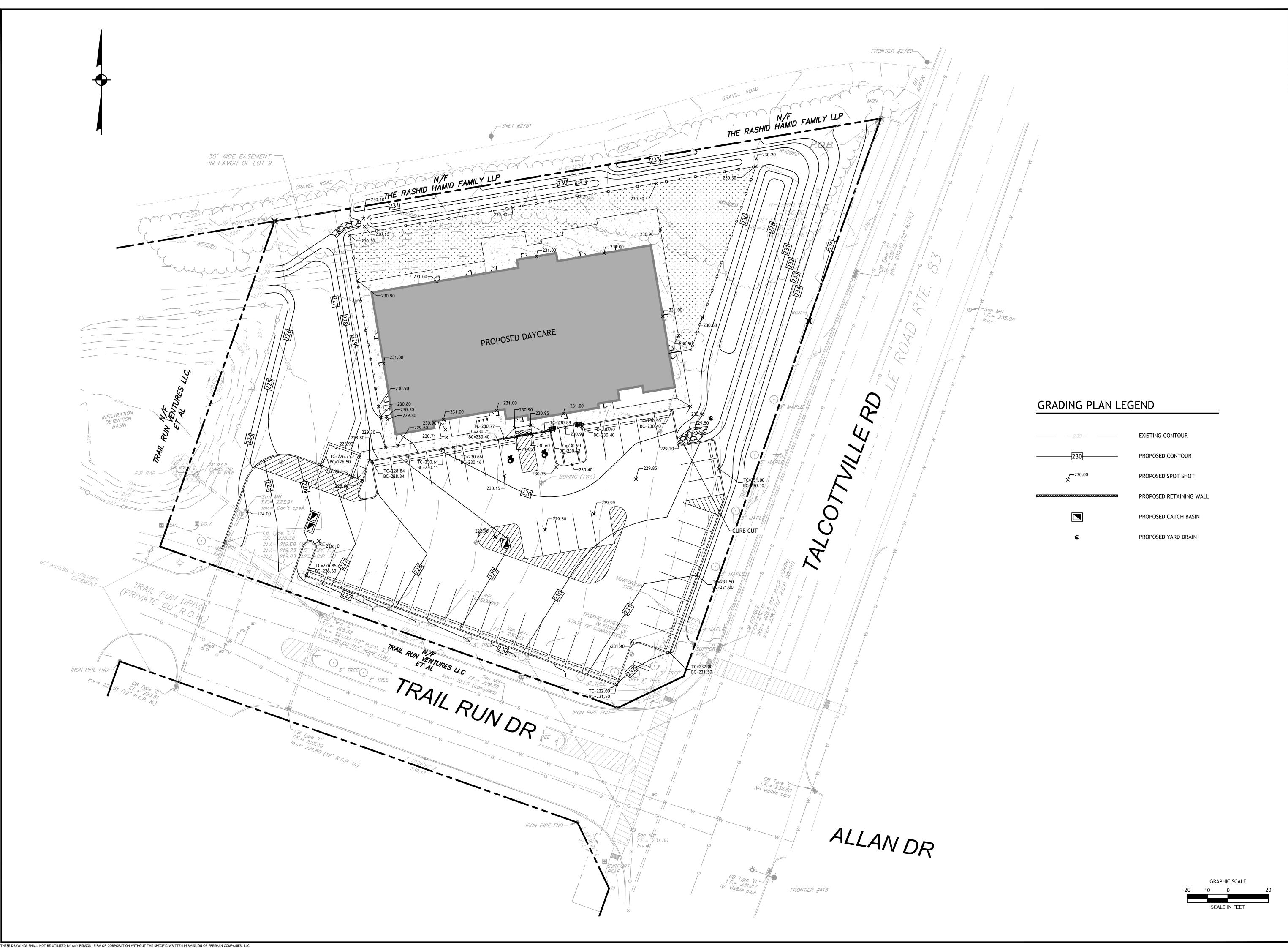
36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
(860)251-9550
FAX:(860)986-7161 **ELEVATE YOUR EXPECTATION** 

83) CENTER LEARNING TALCOTTVILLE F VERNON, C KINDERCARE

DRAFTED: CHECKED: APPROVED: SCALE: FC PROJECT NO.: 2022-0303 06/29/2022 2022-0303 E&S.dw CAD FILE:

E&S PLAN

SHEET NUMBER: C1.02



INSITE REAL ESTATE
1400 16TH STREET, SUITE 300
OAK BROOK, IL 60523-8854
(630) 617-9100

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CIVIL ENGINEERS | LAND SURVEYORS

ENVIRONMENTAL SCIENTISTS

FREEMAN COMPANIES, LLC

36 JOHN STREET

HARTFORD, CT 06106

WWW.FREEMANCOS.COM

(860)251-9550

FAX:(860)986-7161

ELEVATE YOUR EXPECTATION

KINDERCARE LEARNING CENTER
'3 TALCOTTVILLE RD (CONN. RTE. NO. 83)
VERNON, CONNECTICUT

DESIGNED: N.V.G.

DRAFTED: N.V.G.

CHECKED: J.N.L.

APPROVED: J.N.L.

SCALE: 1" = 20'

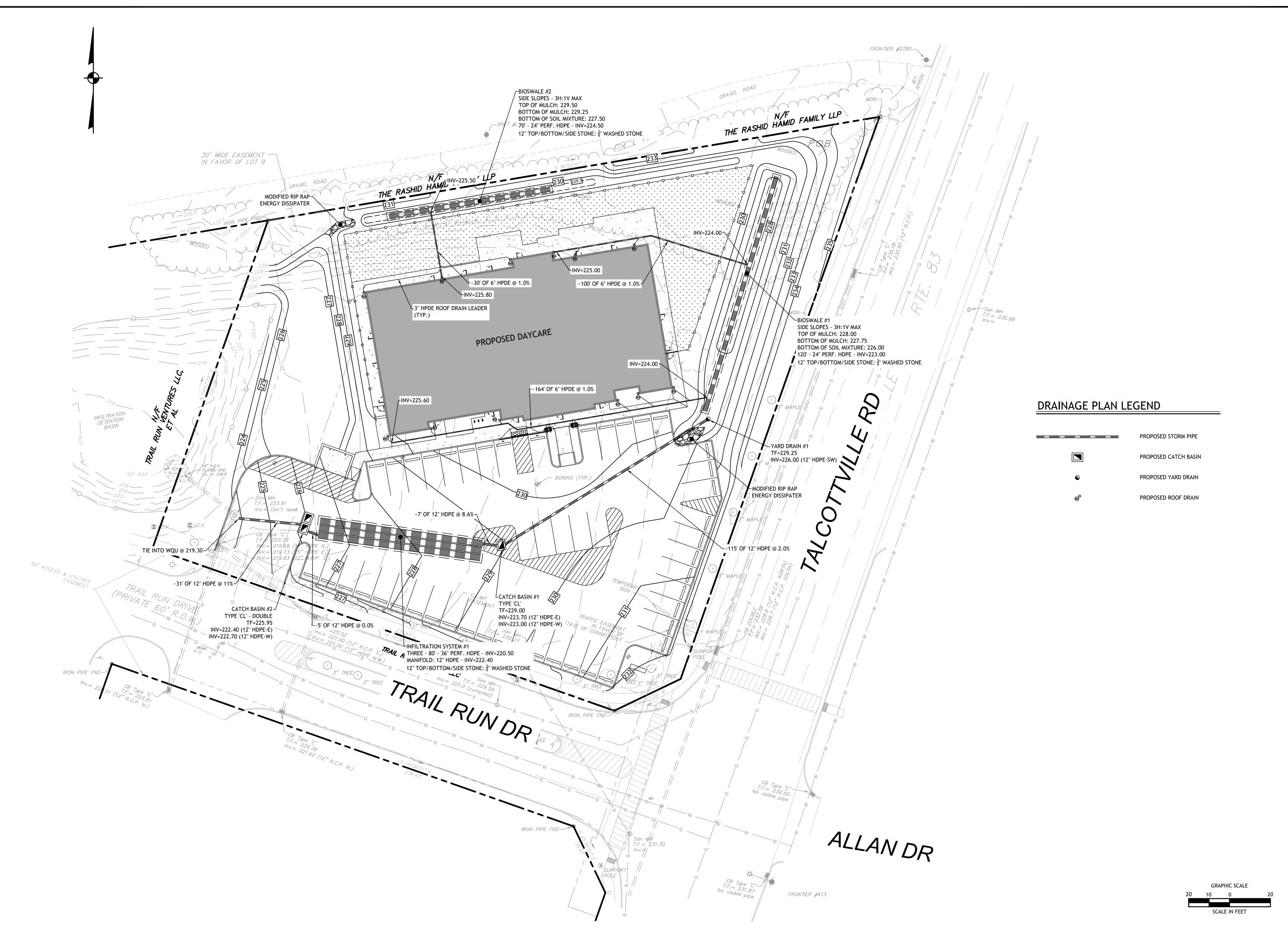
FC PROJECT NO.: 2022-0303

DATE: 06/29/2022

CAD FILE: 2022-0303 G&D.dwg

GRADING PLAN

SHEET NUMBER:



THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

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DBE | DAS | MBE | GNMSDC CERTIFIED CIVIL ENGINEERS | LAND SURVEYORS ENVIRONMENTAL SCIENTISTS FREEMAN COMPANIES, LLC

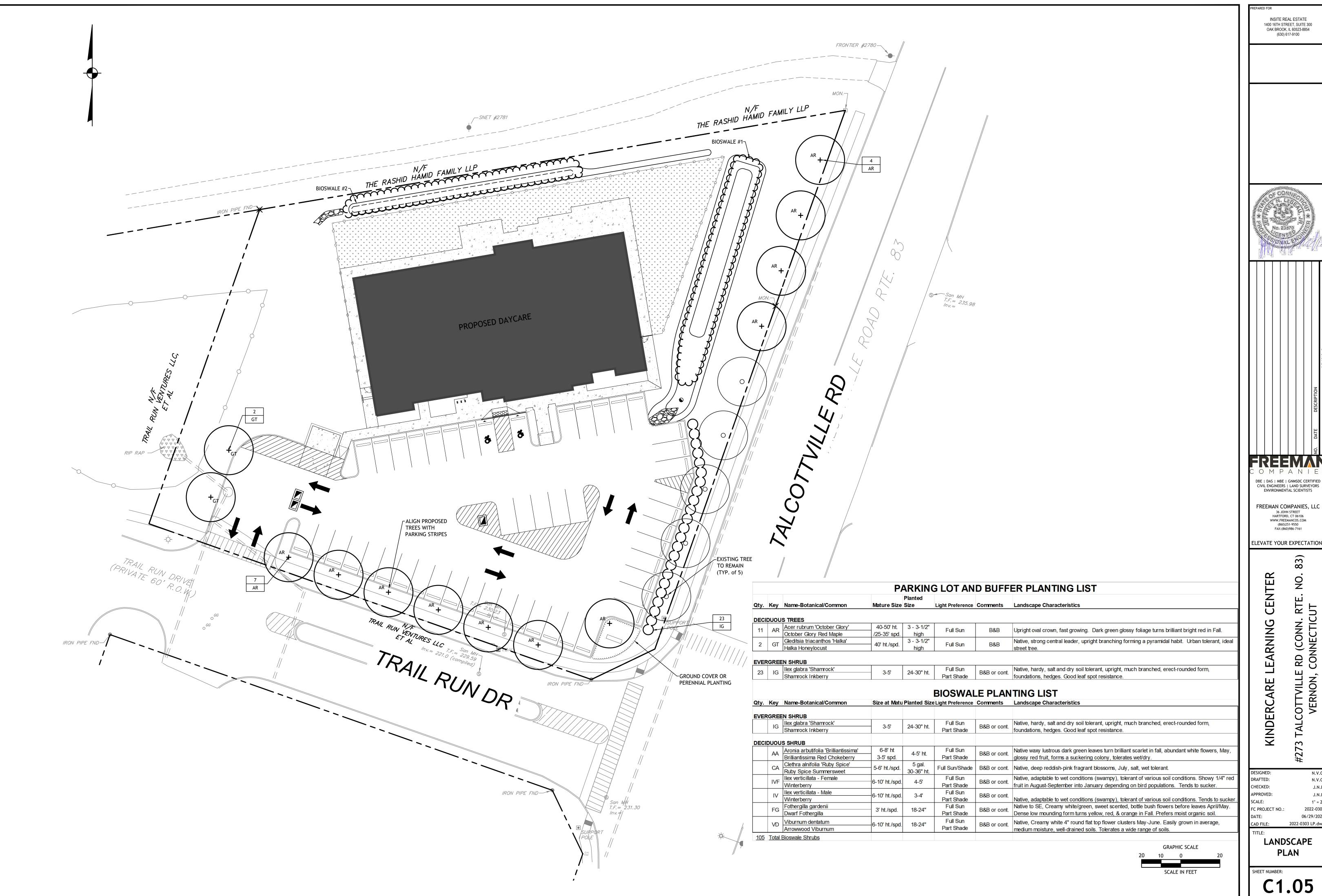
36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX:(860)986-7161 **ELEVATE YOUR EXPECTATION** 

83) CENTER نىب E RD (CONN. RTE CONNECTICUT LEARNING TALCOTTVILLE F KINDERCARE

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DRAINAGE PLAN

SHEET NUMBER: C1.04



THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

INSITE REAL ESTATE 1400 16TH STREET, SUITE 300 OAK BROOK, IL 60523-8854

FREEMAN COMPANIES, LLC 36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX:(860)986-7161

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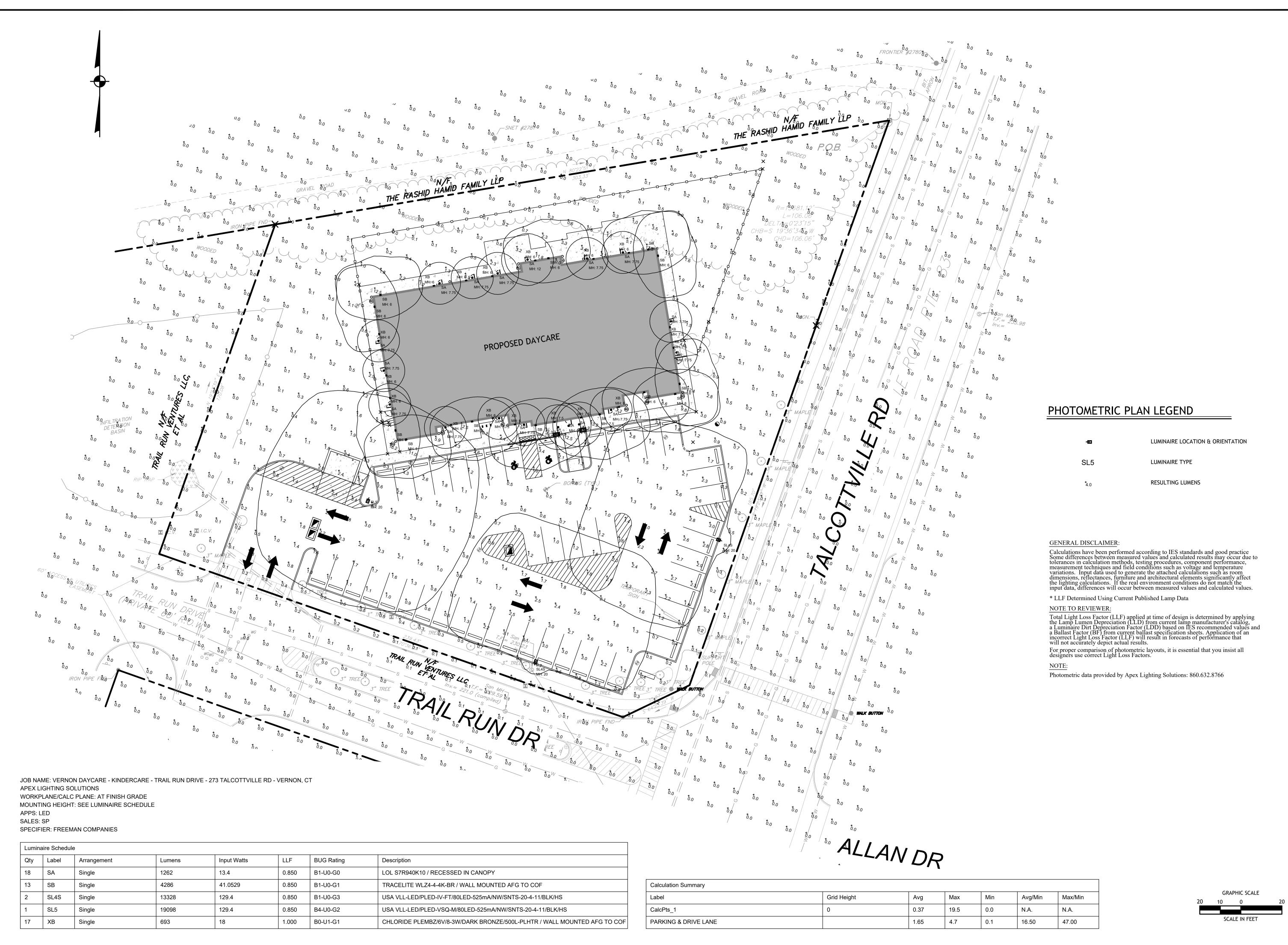
TALCOTTVILLE VERNON, KINDERCARE

DRAFTED: CHECKED: APPROVED: FC PROJECT NO.: 2022-0303 06/29/2022

2022-0303 LP.dwg

LANDSCAPE

PLAN



1400 16TH STREET, SUITE 300 OAK BROOK, IL 60523-8854

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CIVIL ENGINEERS | LAND SURVEYORS ENVIRONMENTAL SCIENTISTS

FREEMAN COMPANIES, LLC 36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX: (860)986-7161

ELEVATE YOUR EXPECTATION  $\infty$ 

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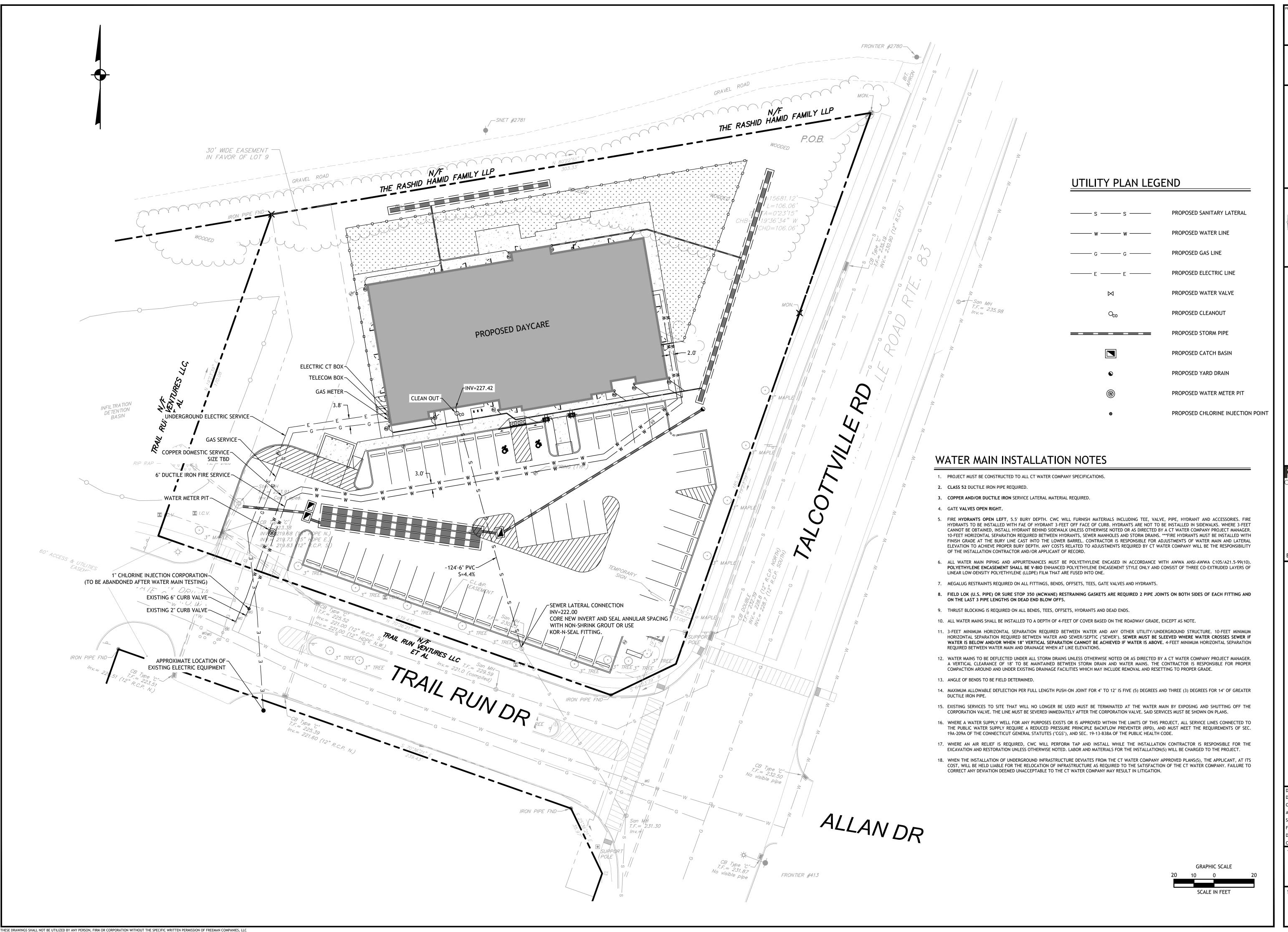
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**PHOTOMETRIC** PLAN

2022-0303 PP.dwg

SHEET NUMBER:

CAD FILE:



1400 16TH STREET, SUITE 300 OAK BROOK, IL 60523-8854

DBE | DAS | MBE | GNMSDC CERTIFIED CIVIL ENGINEERS | LAND SURVEYORS ENVIRONMENTAL SCIENTISTS

FREEMAN COMPANIES, LLC 36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX: (860)986-7161

ELEVATE YOUR EXPECTATION

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**UT PLAN** 

SHEET NUMBER:

#### SITE PLAN NOTES

- 1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT SPECIFICATION MANUAL, TOWN OF VERNON AND CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
- 2. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL LOCAL CONSTRUCTION PERMITS, INCLUDING CONNECTICUT DOT PERMITS AND SEWER AND WATER CONNECTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
- 3. INFORMATION ON ALL EXISTING SITE FEATURES, INCLUDING UTILITIES AND STORM DRAINAGE, IS TAKEN FROM A PLAN ENTITLED, "ALTA/NSPS LAND TITLE SURVEY PREPARED FOR, 273 TALCOTVILLE LLC, #273 TALCOTVILLE ROAD (CONN. RTE. NO. 83), VERNON, CONNECTICUT", AS PREPARED BY FREEMAN COMPANIES, LLC DATED 4/22/2022. EXISTING SITE FEATURES, INCLUDING UTILITIES AND STORM DRAINAGE, ARE NOT GUARANTEED CORRECT OR COMPLETE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL SITE FEATURES, INCLUDING UTILITIES AND STORM DRAINAGE.
- 4. REFER TO THE CIVIL ENGINEERING PLANS AND DETAILS, AS PREPARED BY FREEMAN COMPANIES, AND ARCHITECTURAL PLANS AND DETAILS, PREPARED BY OTHERS, FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE ENGINEER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING/CONSTRUCTION. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
- 5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS PER PLANS AND SPECIFICATIONS TO THE OWNER AND ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
- 6. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDED SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE EROSION CONTROL PLAN OR SUBMIT AN ALTERNATE PLAN FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
- 7. THE CONTRACTOR SHALL REFERENCE THE ARCHITECTURAL PLANS FOR EXACT DIMENSIONS AND CONSTRUCTION DETAILS OF BUILDING.
- 8. SHOULD ANY UNKNOWN OR INCORRECTLY LOCATED EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE CIVIL ENGINEER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
- 9. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE OWNER OR OTHERS DURING OCCUPIED HOURS, EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE OWNER AND THE LOCAL MUNICIPALITY. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
- 10. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL DEVICES FOR PROTECTION OF VEHICLES AND PEDESTRIANS CONSISTING OF DRUMS, BARRIERS, SIGNS, LIGHTS, FENCES, TRAFFICMEN AND UNIFORMED TRAFFIC OFFICERS AS REQUIRED OR AS ORDERED BY THE ENGINEER, AS REQUIRED BY THE LOCAL GOVERNING AUTHORITIES OR AS REQUIRED BY
- 11. REFER TO DETAIL SHEETS FOR PAVEMENT, CURBING, AND SIDEWALK INFORMATION.
- 12. TRAFFIC CONTROL SIGNAGE SHALL CONFORM TO THE STATE DOT STANDARD DETAIL SHEETS AND THE CURRENT EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS SHALL BE INSTALLED PLUMB WITH THE EDGE OF THE SIGN 2' OFF THE FACE OF THE CURB, AND WITH 7' VERTICAL CLEARANCE UNLESS OTHERWISE DETAILED OR NOTED.
- 13. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
- 14. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
- 15. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, LANDSCAPED AREAS OR SIGNS DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER. AS APPROVED BY THE ENGINEER.
- 16. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE OWNER AT THE END OF CONSTRUCTION.
- 17. THE ARCHITECT AND ENGINEER ARE NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ARCHITECT AND ENGINEER HAVE NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OF PERSONNEL OR TO SUPERVISE SAFETY AND DO NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
- 18. THE CONTRACTOR SHALL COMPLY WITH OSHA CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.
- 19. ALTERNATIVE METHODS AND PRODUCTS, OTHER THAN THOSE SPECIFIED, MAY BE USED IF REVIEWED AND APPROVED BY THE OWNER, ENGINEER, AND APPROPRIATE REGULATORY
- 20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT (800) 922-4455 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROPOSED UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
- 21. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.
- 22. NO PART OF THE PROJECT PARCEL IS LOCATED WITHIN ANY FEMA DESIGNATED FLOOD HAZARD AREAS.
- 23. ANY BOUNDARY MONUMENTS DISTURBED DURING CONSTRUCTION SHALL BE RESET OR REPLACED, AS APPLICABLE, UNDER THE DIRECTION OF A LAND SURVEYOR LICENSED IN THE STATE OF CONNECTICUT AT NO COST TO THE OWNER.

#### GRADING AND DRAINGE PLAN NOTES

AGENCY PRIOR TO INSTALLATION DURING THE BIDDING/CONSTRUCTION PROCESS.

- THE GRADING PLAN AND DRAINAGE PLAN ARE INTENDED TO DESCRIBE GRADING AND DRAINAGE ONLY. REFER TO SITE PLAN FOR GENERAL INFORMATION, AND DETAIL SHEETS FOR
  DETAILS. SEE MEP AND ARCHITECTURAL DRAWINGS, PREPARED BY OTHERS, FOR BUILDING CONNECTION LOCATIONS AND DETAILS.
- 2. THE CONTRACTOR SHALL PRESERVE EXISTING VEGETATION WHERE POSSIBLE AND/OR AS NOTED ON THE DRAWINGS. REFER TO EROSION & SEDIMENT CONTROL PLANS FOR LIMIT OF DISTURBANCE AND EROSION CONTROL NOTES.
- 3. TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE FOR USE IN FINAL LANDSCAPING.
- 4. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS REQUIRED BY FEDERAL, STATE AND LOCAL AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY CONSTRUCTION PERMITS FROM THE TOWN OF VERNON REQUIRED TO PERFORM ALL REQUIRED WORK, INCLUDING STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR
- 5. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR WETLANDS IN ACCORDANCE WITH THE REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION GUIDELINES FOR SOIL EROSION AND SEDIMENT POLLUTION CONTROL. IN ADDITION, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE "EROSION & SEDIMENT CONTROL PLAN" CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY THE LOCAL MUNICIPALITY, WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
- 6. ALL DISTURBANCE INCURRED TO TOWN OF VERNON PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE
- 7. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT SPECIFICATIONS MANUAL AND THE LOCAL MUNICIPALITY'S STANDARDS AND COUNTY STANDARDS AND STATE OF CONNECTICUT DOT SPECIFICATIONS AS APPLICABLE FOR THE LOCATION OF THE WORK. ALL CONSTRUCTION WITHIN A DOT RIGHT OF WAY SHALL COMPLY WITH ALL DEPARTMENT OF TRANSPORTATION STANDARDS. WHERE SPECIFICATIONS OR STANDARDS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION OR STANDARD SHALL BE SUPERIOR.
- AND/OR OWNER'S ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE OWNER AND/OR OWNER'S ENVIRONMENTAL CONSULTANT.

8. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE OWNER

- 9. MANHOLE RIMS AND CATCH BASIN GRATES SHALL BE SET TO ELEVATIONS SHOWN. SET ALL EXISTING MANHOLE RIMS AND VALVE COVERS TO BE RAISED OR LOWERED FLUSH WITH FINAL GRADE AS NECESSARY.
- 10. ALL CATCH BASINS TO BE FITTED WITH 2 FOOT DEEP SUMPS AND HOODED OUTLETS, UNLESS OTHERWISE NOTED OR DIRECTED.
- 11. POLY VINYL CHLORIDE PIPE (PVCP) FOR STORM PIPING SHALL HAVE BUILT-IN RUBBER GASKET JOINTS. PVCP SHALL CONFORM TO ASTIM D-304 (SDR53) WITH COMPRESSION JOINTS AND MOLDED FITTINGS. PVCP SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS; ASTM-D231 AND MANUFACTURER'S RECOMMENDED PROCEDURE.

#### **EROSION & SEDIMENT CONTROL PLAN NOTES**

- 1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF VERNON. THE CONTRACTOR SHALL KEEP A COPY OF THE CURRENT GUIDELINES ON-SITE FOR REFERENCE DURING CONSTRUCTION. ALL SEDIMENTATION AND EROSION CONTROL MEASURES, INCLUDING THE CONSTRUCTION OF TEMPORARY SEDIMENTATION TRAPS, TEMPORARY DIVERSION SWALES AND ANTI-TRACKING PADS, SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.
- 2. THE EROSION & SEDIMENT CONTROL PLAN IS ONLY INTENDED TO DESCRIBE THE EROSION AND SEDIMENT CONTROL MEASURES FOR THIS SITE. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN IN A GENERAL SIZE AND LOCATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS WHEN DIRECTED BY THE ENGINEER. SEE SEDIMENT AND EROSION CONTROL DETAILS AND SUGGESTED CONSTRUCTION SEQUENCE FOR MORE INFORMATION. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.
- 3. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE SEDIMENT AND EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE PROPER INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED WITH CONSTRUCTION ON THE SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, INFORMING THE GOVERNING AUTHORITY OR INLAND WETLANDS AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE SEDIMENT & EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED. COMPLY WITH REQUIREMENTS OF CGS SECTION 22A, 430B FOR STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES AND WITH DEEP RECORD KEEPING AND INSPECTION REQUIREMENTS.
- 4. A BOND MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.
- 5. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE EROSION AND SEDIMENT CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.
- 6. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.2 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS WHERE NECESSARY.
- 7. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (HAY BALES, COMPOST FILTER SOCK, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.
- 8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING AT THE DRIP LINE, OR AS DETAILED, WITH SNOW FENCE, ORANGE SAFETY FENCE, OR EQUIVALENT FENCING. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.
- 9. CONSTRUCTION ENTRANCE SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED.
- 10. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER. STAKED HAY BALES OR COMPOST FILTER SOCK SHALL ALSO BE INSTALLED AT THE DOWNHILL SIDES OF BUILDING EXCAVATIONS, DEWATERING PUMP DISCHARGES, AND MATERIAL STOCKPILES.
- 11. INSTALL TEMPORARY DIVERSION DITCHES, PLUNGE POOLS, TEMPORARY SEDIMENT TRAPS/BASINS, AND DEWATERING PITS AS SHOWN OR AS NECESSARY DURING VARIOUS PHASES OF CONSTRUCTION TO CONTROL RUNOFF UNTIL UPHILL AREAS ARE STABILIZED. LOCATION OF TEMPORARY SEDIMENT TRAPS/BASINS WILL REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND GOVERNING OFFICIAL. DEWATERING SETTLING TRAPS SHALL BE USED IF GROUND WATER IS ENCOUNTERED. NO RUNOFF SHALL BE ALLOWED TO EXIT THE SITE PRIOR TO TREATMENT FOR SEDIMENT REMOVAL.
- 12. AS GENERAL GRADING OPERATIONS PROGRESS, THE TEMPORARY DIVERSION DITCHES SHALL BE RAISED OR LOWERED AND RELOCATED, AS CUT AND FILL SLOPES DICTATE, TO DIVERT SURFACE RUNOFF TO THE SEDIMENT TRAPS/BASINS.
- 13. TEMPORARY SEDIMENT TRAPS SHALL PROVIDE 134 CUBIC YARDS OF SEDIMENT STORAGE PER DISTURBED ACRE CONTRIBUTING TO THE TRAP/BASIN. PROVIDE TRAP/BASIN VOLUMES FOR ALL DISTURBANCE ON SITE.
- 14. PERIODICALLY CHECK ACCUMULATED SEDIMENT LEVELS IN SEDIMENT TRAPS DURING CONSTRUCTION AND CLEAN ACCUMULATED SILT WHEN NECESSARY OR WHEN ONE FOOT OF SEDIMENT HAS ACCUMULATED. CLEAN ACCUMULATED SEDIMENT FROM CATCH BASIN SUMPS AS NECESSARY. REMOVE ACCUMULATED SEDIMENT FROM BEHIND HAY BALES AND COMPOST FILTER SOCK. EXCAVATED MATERIAL FROM TEMPORARY SEDIMENT TRAPS/BASINS MUST BE STOCKPILED ON UPHILL SIDE OF COMPOST FILTER SOCK.
- 15. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR USE IN FINAL LANDSCAPING. ALL EARTH STOCKPILES SHALL HAVE HAY BALES OR COMPOST FILTER SOCK AROUND THE LIMIT OF PILE. PILES SHALL BE TEMPORARILY SEEDED IF PILE IS TO REMAIN IN PLACE AND UNDISTURBED FOR MORE THAN 30 DAYS.
- 16. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS, AND VEGETATION. ALL SLOPES SHALL BE SEEDED, AND THE ROAD SHOULDER AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.
- 17. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE SUCH AS TEMPORARY SEDIMENT TRAPS OR GRASS FILTERS WITHIN THE APPROVED LIMIT OF DISTURBANCE. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE ENGINEER.
- 18. BLOCK THE OPEN UPSTREAM ENDS OF SEDIMENT TRAP OUTLET CONTROL ORIFICES UNTIL SITE IS STABILIZED AND BLOCK END OF STORM DRAINS IN EXPOSED TRENCHES WITH BOARDS AND SANDBAGS AT THE END OF EACH WORKING DAY WHEN RAIN IS EXPECTED.
- 19. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.
- 20. COVERED METAL WASTE CONTAINERS SHALL BE PROVIDED AT THE SITE TO FACILITATE THE COLLECTION OF REFUSE MATERIAL GENERATED FROM CONSTRUCTION ACTIVITIES. SUCH MATERIAL SHALL NOT BE BURIED OR BURNED AT THE SITE.
- MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.
- 22. MAINTAIN EXISTING PAVED AREAS FOR CONSTRUCTION STAGING FOR AS LONG AS POSSIBLE. UPON REMOVAL OF ALL PAVEMENT, THE CONTRACTOR SHALL PLACE STONE OVER DISTURBED AREAS TO SERVE AS STAGING AREAS TO THE SATISFACTION OF THE ENGINEER.
- 23. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVEL WAYS TO KEEP THE TRAVEL WAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.
- 24. TURF ESTABLISHMENT SHALL BE PERFORMED OVER ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.
- 25. TWO WEEKS BEFORE THE FALL SEEDING SEASON BEGINS (AUGUST 15 TO OCTOBER 15), THE CONTRACTOR SHALL SCHEDULE A MEETING WITH TOWN OF VERNON STAFF TO DISCUSS STABILIZING THE SITE FOR WINTER MONTHS. MEASURES SUCH AS MULCHING AND/OR SEEDING MAY BE REQUIRED.
- 26. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP PARKING LOTS, CLEAN THE STORM DRAINAGE SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM TOWN OF VERNON AND/OR ENGINEER.

#### UTILITY PLAN NOTES

AUTHORITIES OR AS REQUIRED BY PERMIT STIPULATIONS.

- 1. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE TOWN OF VERNON TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.
- 2. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL DEVICES FOR PROTECTION OF VEHICLES AND PEDESTRIANS CONSISTING OF DRUMS, BARRIERS, SIGNS, LIGHTS, FENCES AND UNIFORMED TRAFFIC CONTROLLERS AND UNIFORMED TRAFFIC MEN AS REQUIRED, OR AS ORDERED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL GOVERNING
- 3. THE UTILITY PLAN DETAILS SITE INSTALLED PIPES UP TO 5' FROM THE BUILDING FACE. REFER TO ARCHITECTURAL AND MEP DRAWINGS, PREPARED BY OTHERS, FOR BUILDING CONNECTIONS. THE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT.
- 4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS, SUCH AS GROUND PENETRATING RADAR, PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROPOSED SANITARY SEWERS AND WHERE PROPOSED STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE ENGINEER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
- 5. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
- 6. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
- 7. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
- 8. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE OWNER HAVING JURISDICTION.
- 9. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
- 10. SANITARY LATERAL SHALL MAINTAIN (10' MIN. HORIZONTAL AND 1.5' VERTICAL MIN.) SEPARATION DISTANCE FROM WATER LINES, OR ADDITIONAL PROTECTION MEASURES WILL BE REQUIRED WHERE PERMITTED, WHICH SHALL INCLUDE CONCRETE ENCASEMENT OF PIPING, UNLESS OTHERWISE DIRECTED BY THE UTILITY PROVIDERS AND ENGINEER.
- 11. RELOCATION OF UTILITY PROVIDER FACILITIES, SUCH AS POLES, SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
- 12. THE CONTRACTOR SHALL COMPACT PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.
- 13. BUILDING UTILITY PENETRATIONS AND LOCATIONS ARE SHOWN FOR THE CONTRACTOR'S INFORMATION AND SHALL BE VERIFIED WITH THE BUILDING MEP DRAWINGS AND WITH THE OWNER'S CONSTRUCTION MANAGER.
- 14. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
- 15. A 1-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A 6-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER.
- 16. THE CONTRACTOR SHALL PROVIDE ALL BENDS, FITTINGS, ADAPTERS, ETC., AS REQUIRED FOR PIPE CONNECTIONS TO BUILDING STUB OUTS, INCLUDING ROOF/FOOTING DRAIN CONNECTIONS TO ROOF LEADERS AND TO STORM DRAINAGE SYSTEM.
- 17. MANHOLE RIMS AND CATCH BASIN GRATES SHALL BE SET TO ELEVATIONS SHOWN. SET ALL EXISTING MANHOLE RIMS AND VALVE COVERS TO BE RAISED OR LOWERED FLUSH WITH FINAL GRADE AS NECESSARY.
- 18. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUIT AND CABLES FOR SITE LIGHTING WITH THE BUILDING ELECTRICAL CONTRACTOR.
- 19. THE CONTRACTOR SHALL COORDINATE INSTALLATION FOR ELECTRICAL SERVICES TO PYLON SIGNS AND SITE LIGHTING WITH THE BUILDING ELECTRICAL CONTRACTOR.
- 20. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER AND THE TOWN OF VERNON.
- 21. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT (800) 922-4455 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROPOSED UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
- 22. ALL WATER MAINS AND WATER SERVICES SHALL BE CONSTRUCTED TO THE APPROPRIATE REGULATORY AUTHORITY'S STANDARDS AND SPECIFICATIONS, AS WELL AS TO OTHER APPLICABLE INDUSTRY CODES AND PROJECT SPECIFICATIONS FOR POTABLE WATER SYSTEMS.
- 23. ALL SANITARY SEWER LATERALS SHALL CONFORM TO THE APPROPRIATE REGULATORY AUTHORITY'S STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE REGULATORY AUTHORITY.
- 24. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE OWNER, ENGINEER, AND APPROPRIATE REGULATORY AGENCIES PRIOR TO INSTALLATION.
- 25. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE OWNERS, THE CIVIL ENGINEER, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.
- 26. IF ANY EXISTING POTABLE WATER WELL AND/OR ANY SEPTIC TANKS/ABSORPTION AREAS ARE FOUND AND REQUIRE ABANDONMENT AND/OR REMOVAL, THAT WORK SHALL BE PERFORMED PER TOWN OF VERNON AND CONNECTICUT DEPARTMENT OF HEALTH REQUIREMENTS.

27. POLY VINYL CHLORIDE PIPE (PVCP) FOR SANITARY PIPING SHALL HAVE BUILT-IN RUBBER GASKET JOINTS. PVCP SHALL CONFORM TO ASTIM D-304 (SDR53) WITH COMPRESSION JOINTS

- AND MOLDED FITTINGS. PVCP SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS; ASTM-D231 AND MANUFACTURER'S RECOMMENDED PROCEDURE.

  28. COPPER PIPE SHALL BE PER WATER COMPANY REQUIREMENTS.
- 29. GAS PIPE MATERIAL SHALL BE PER GAS COMPANY REQUIREMENTS.

INSITE REAL ESTATE 1400 16TH STREET, SUITE 300 OAK BROOK, IL 60523-8854 (630) 617-9100

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FREEMAN C O M P A N I E DBE | DAS | MBE | GNMSDC CERTIFIED

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CIVIL ENGINEERS | LAND SURVEYORS

ENVIRONMENTAL SCIENTISTS

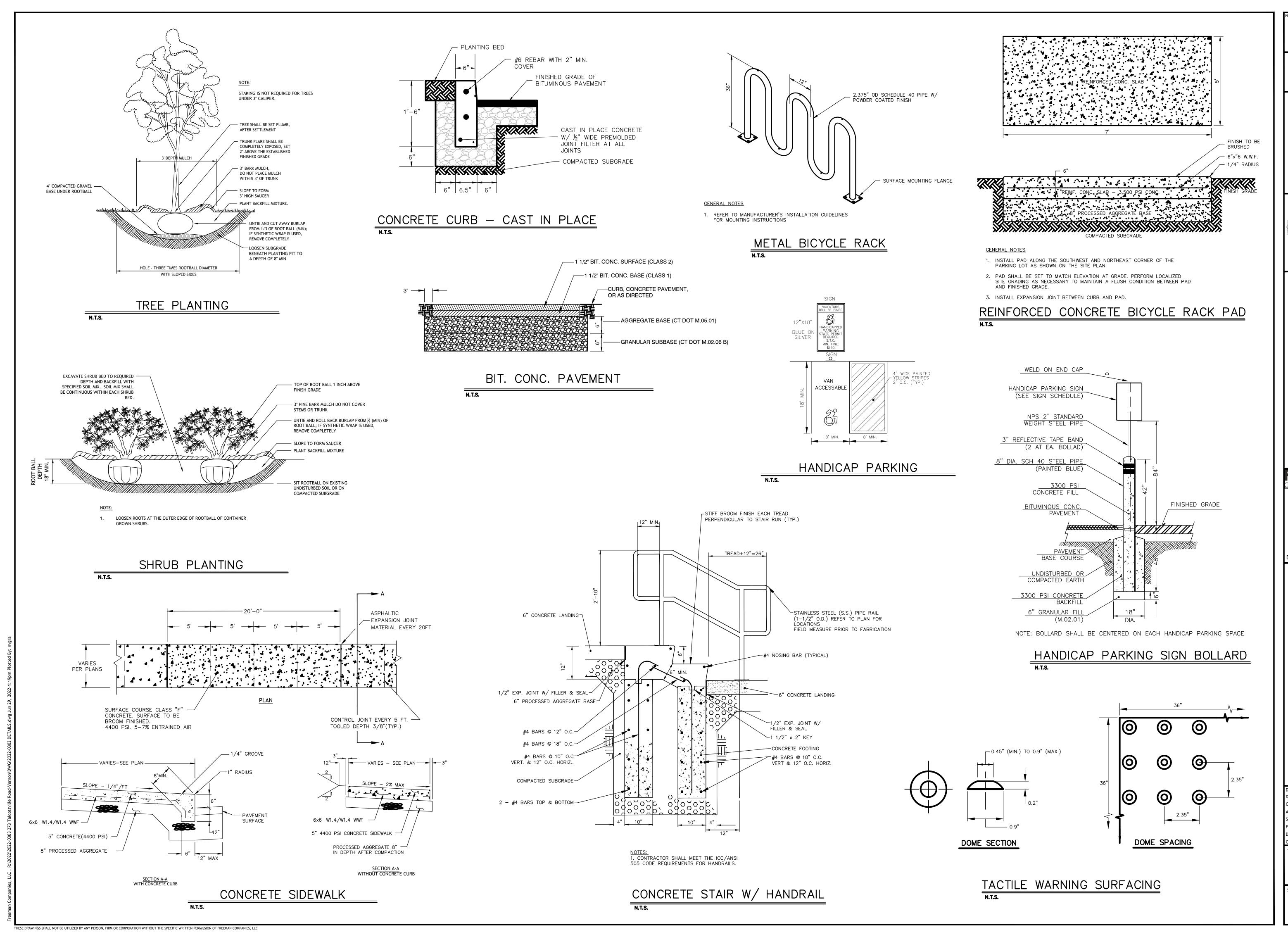
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TTVILLE RD (CONN. RTE. NO. 83)
ERNON, CONNECTICUT

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SCALE: 1" = 20
FC PROJECT NO.: 2022-0303
DATE: 06/29/2022

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1400 16TH STREET, SUITE 300
OAK BROOK, IL 60523-8854
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KINDERCARE LEARNING CENTER

3 TALCOTTVILLE RD (CONN. RTE. NO. 83)

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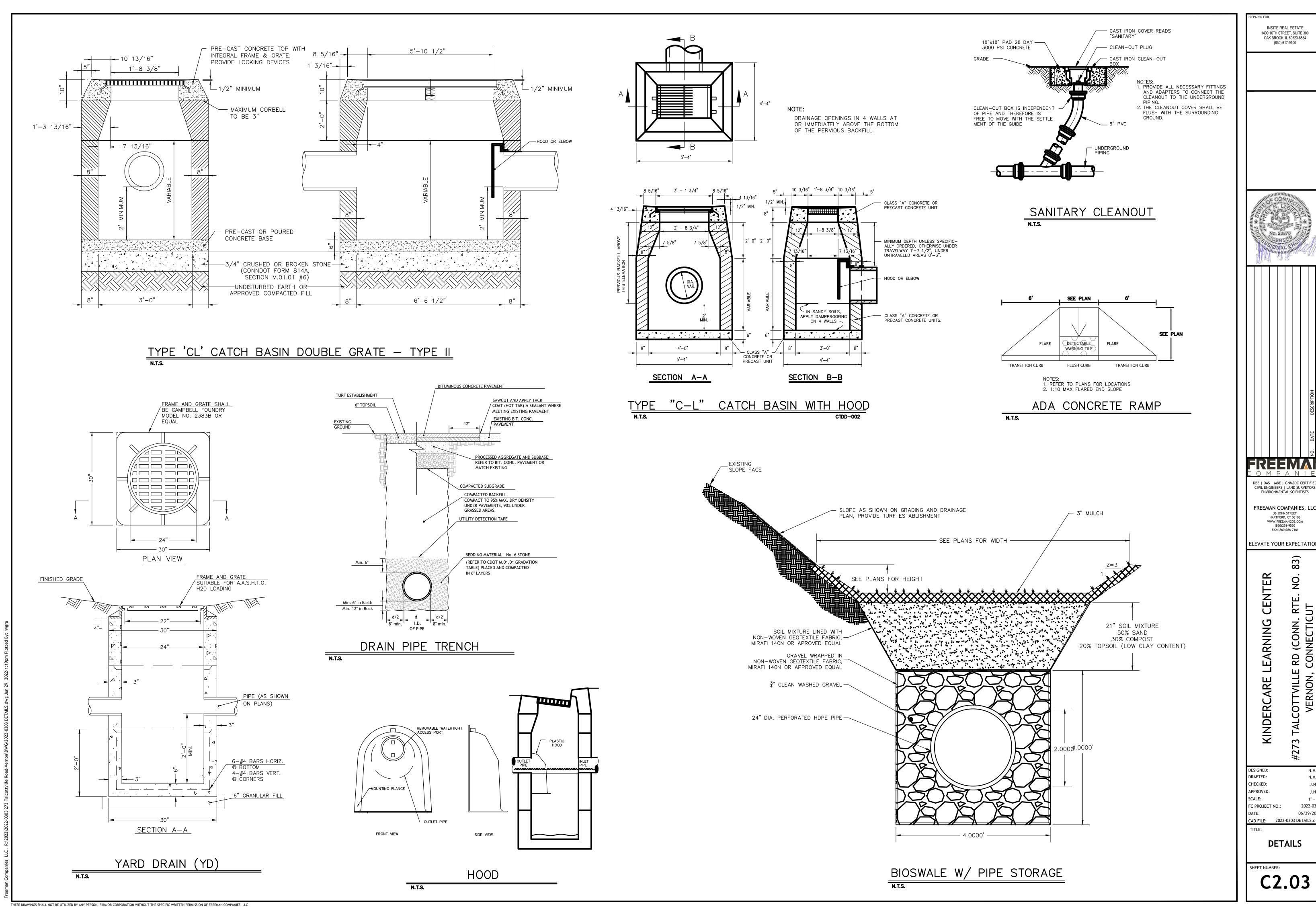
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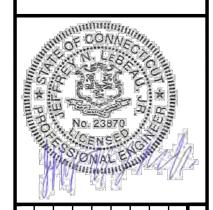
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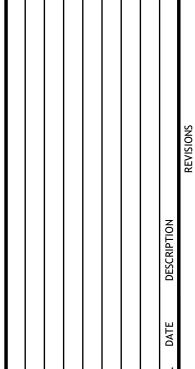
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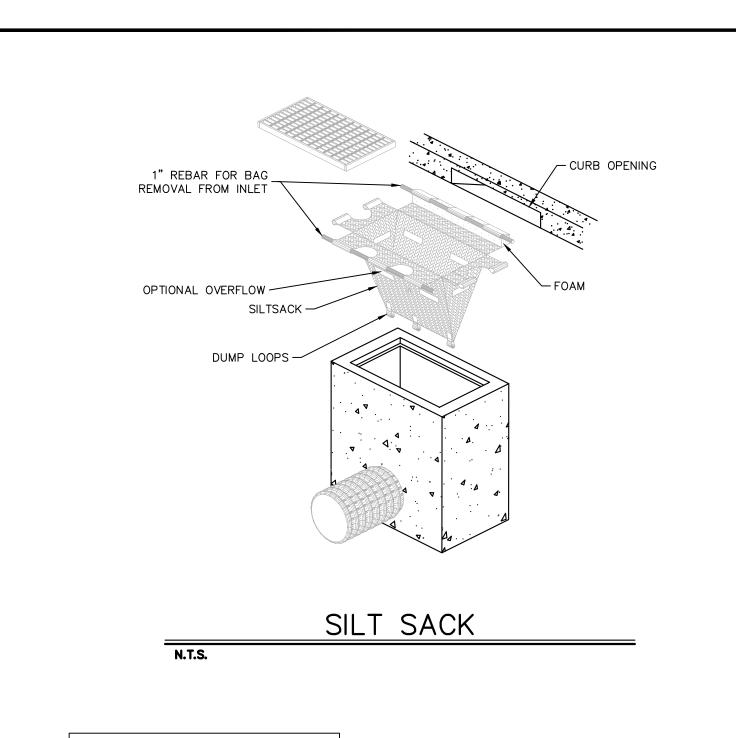
36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX: (860)986-7161

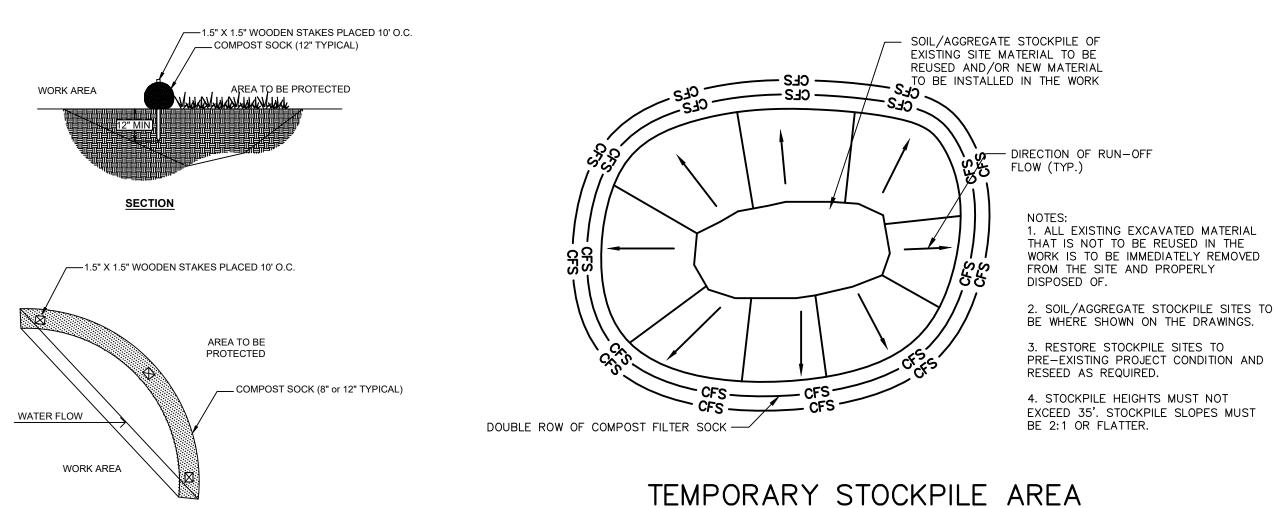
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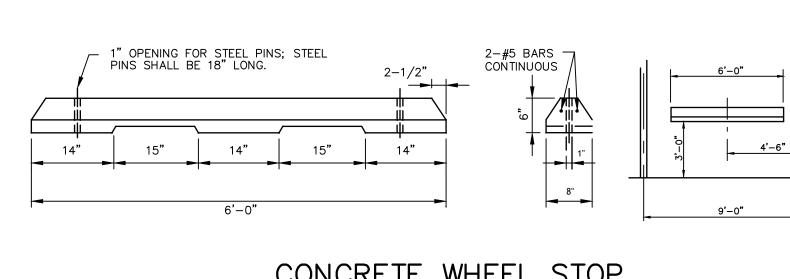
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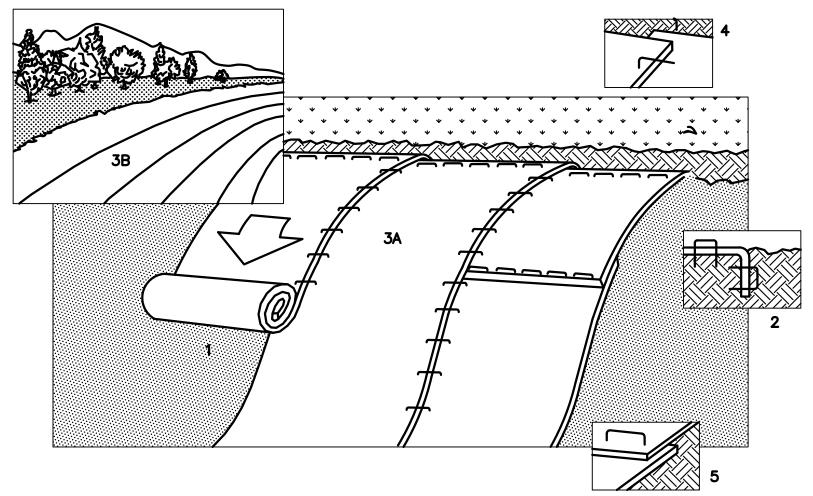
CONCRETE WHEEL STOP

COMPOST FILTER SOCK N.T.S.

ALL MATERIAL TO MEET SPECIFICATIONS.

ENGINEER.

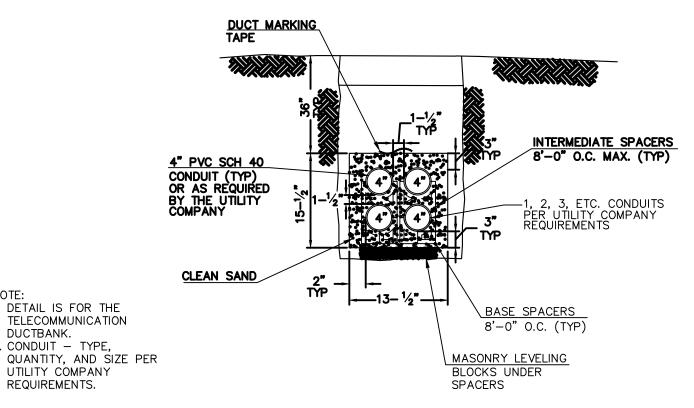
COMPOST SOCKS FILL TO MEET APPLICATION REQUIREMENTS. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY



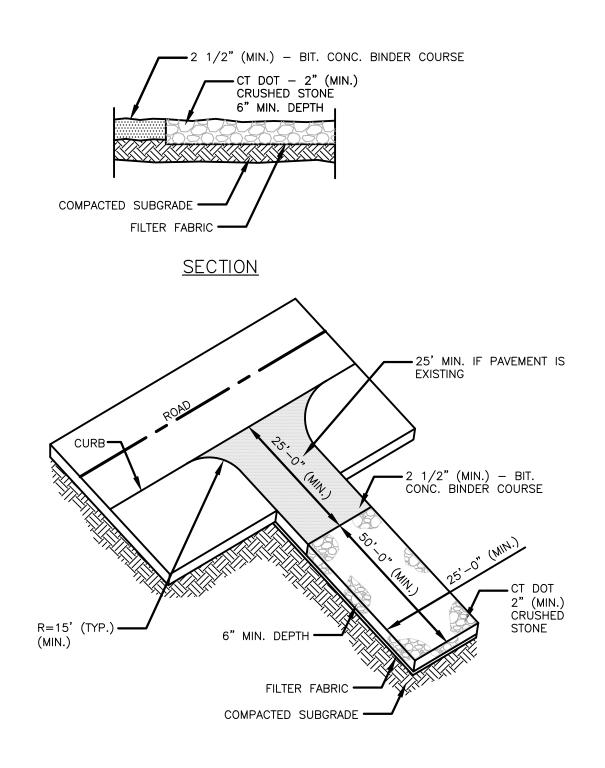
- 1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED.
- 2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- 3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE.
- 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
- 5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED ARÉA, APPROXIMATELY 12" APART.

6. EROSION CONTROL MATTING SHALL BE TENSAR NORTH AMERICAN GREEN

#### EROSION CONTROL BLANKET N.T.S.

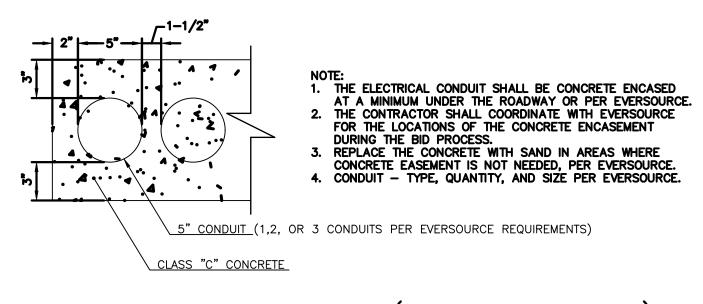


TELECOMMUNICATION DUCTBANK (DIRECT BURIED) N.T.S.

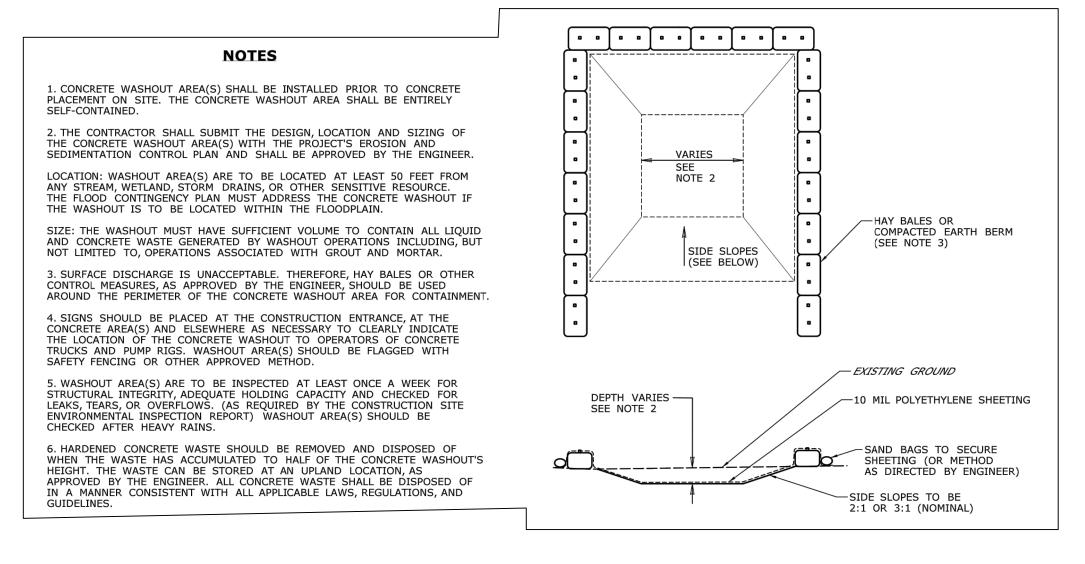


ROCK CONSTRUCTION ENTRANCE

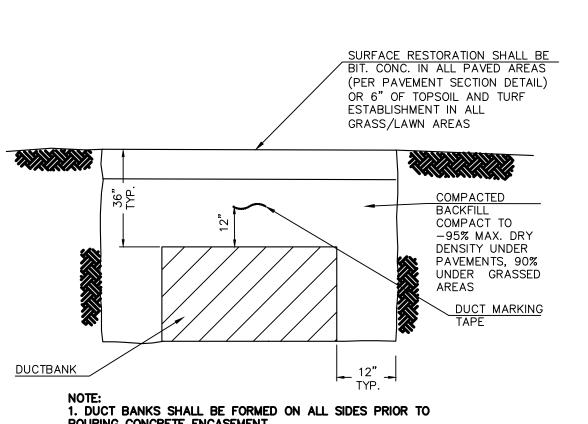
<u>PLAN</u>



ELECTRICAL DUCTBANK (CONC. ENCASED)

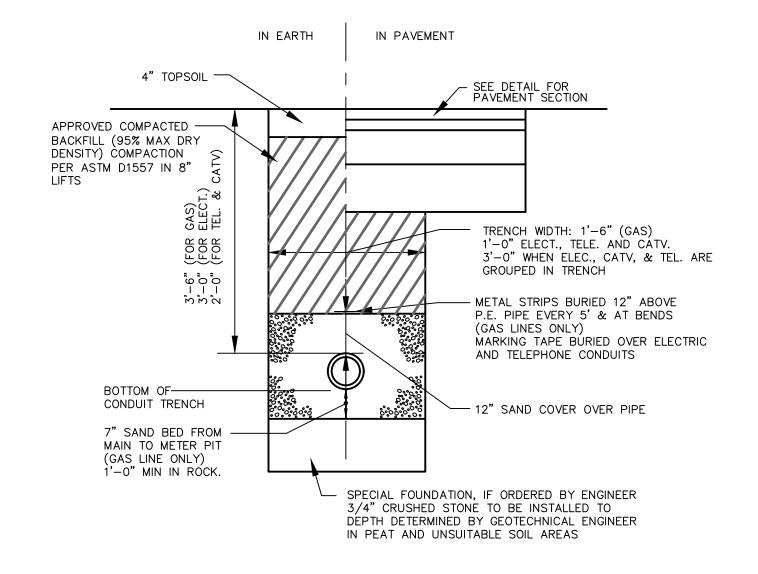


CONCRETE WASHOUT AREA



1. DUCT BANKS SHALL BE FORMED ON ALL SIDES PRIOR TO POURING CONCRETE ENCASEMENT. 2. COVER CAN BE REDUCED TO 30" MIN. WHERE NEEDED TO PROVIDE CLEARANCE CROSSING EXISTING UTILITIES.
3. REPLACE ALL EXISTING PAVEMENT, GRASS, AND CURBING OVER THE DUCTBANK WITH MATCHING MATERIAL.

DUCTBANK TRENCH



ELECTRICAL, TELEPHONE AND GAS TRENCH DETAIL OAK BROOK, IL 60523-8854

INSITE REAL ESTATE 1400 16TH STREET, SUITE 300

DBE | DAS | MBE | GNMSDC CERTIFIED CIVIL ENGINEERS | LAND SURVEYORS ENVIRONMENTAL SCIENTISTS

> FREEMAN COMPANIES, LLC 36 JOHN STREET HARTFORD, CT 06106 WWW.FREEMANCOS.COM (860)251-9550 FAX:(860)986-7161

**ELEVATE YOUR EXPECTATION**  $\infty$ 

ĽĽ E RD (CONN. RT) CONNECTICUT COTTVILLE VERNON,

DRAFTED: CHECKED: APPROVED: FC PROJECT NO.: 2022-0303 06/29/2022 CAD FILE: 2022-0303 DETAILS.dw

**DETAILS** 

SHEET NUMBER:

THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF FREEMAN COMPANIES, LLC

1. DETAIL IS FOR THE

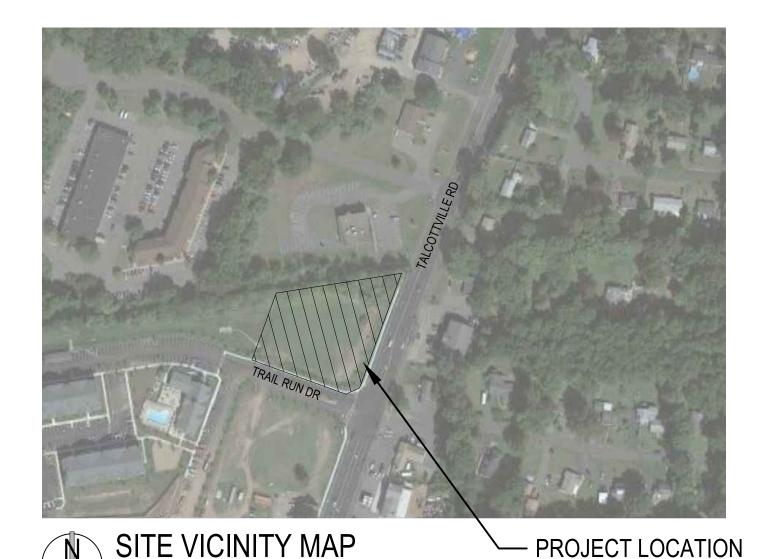
DUCTBANK.

2. CONDUIT — TYPE,

UTILITY COMPANY REQUIREMENTS.

TELECOMMUNICATION

C2.04



# KinderCare Education

PROJECT LOCATION:

# VERNON, CT

# InSite

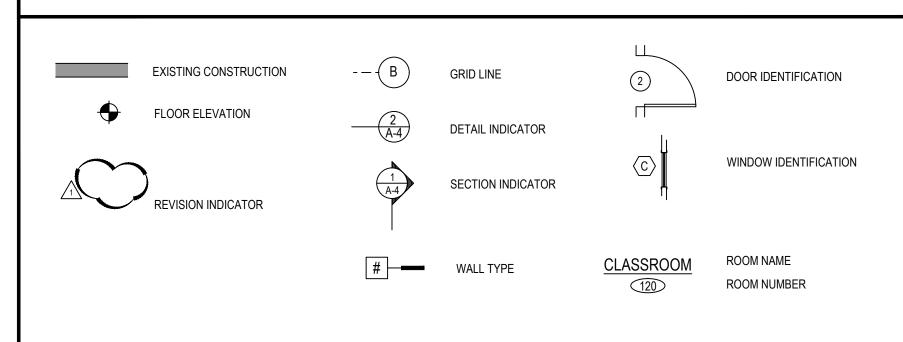
#### **GENERAL NOTES**

- ALL FINISHES TO BE AS NOTED AND SHALL NOT HAVE SMOKE DEVELOPED RATINGS GREATER THAN 450.
   INTERIOR FINISHES OF WALLS AND CEILINGS IN ALL ROOMS OR ENCLOSED SPACES SHALL HAVE A CLASS C FLAME SPREAD INDEX 76-200; SMOKE DEVELOPED INDEX 0-450. INTERIOR FINISHES OF EXIT ENCLOSURES AND EXIT PASSAGEWAYS SHALL HAVE A CLASS B FLAME SPREAD INDEX 26-75; SMOKE DEVELOPED INDEX 0-450. ASTM E 84. IFC TABLE 803.3.
- 3. MATERIALS USED AS INTERIOR TRIM SHALL HAVE A MINIMUM CLASS C FLAME SPREAD AND SMOKE DEVELOPED INDEX AND SHALL COMPLY WITH ASTM E 84. COMBUSTIBLE TRIM SHALL NOT EXCEED 10% OF THE AGGREGATE WALL OR CEILING AREA IN WHICH IT IS LOCATED. IFC 804.
- INTERIOR WALL AND CEILING FINISHES SHALL COMPLY WITH NFPA 286 TESTING MEASURES. INTERIOR FLOOR FINISHES
   SHALL COMPLY WITH NFPA 253 WITH A CLASS 2 CRITICAL RADIANT FLUX > 0.22 WATTS / CM2. FLOOR FINISHES IN EXIT /
   ACCESS CORRIDORS SHALL BE CLASS 1 CRITICAL RADIANT FLUX > 0.45 WATTS / CM2.
- 5. INTERIOR FINISH MATERIALS SHALL BE APPLIED SO THAT THEY WILL NOT BECOME READILY DETACHED WHERE SUBJECTED TO 200 DEGREES F. FOR NOT LESS THAN 30 MINUTES. IFC 803.2.
- 6. THE REQUIRED FLAME SPREAD OR SMOKE DEVELOPED INDEX OF SURFACES IN EXISTING BUILDINGS MAY BE ACHIEVED BY APPLICATION OF APPROVED FIRE RETARDANT COATINGS AND SHALL COMPLY WITH NFPA 703. IFC 803.4.
- 8. AT THE TIME OF SUBMITTING A BID, THE CONTRACTOR IS TO HAVE CONFIRMED ALL FIELD MEASUREMENTS AND HAVE REVIEWED ALL FIELD CONDITIONS.
- GENERAL CONTRACTOR SHALL VERIFY ALL RELEVANT DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS
  BEFORE PROCEEDING WITH THE AFFECTED WORK AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES IMMEDIATELY
  ALL DISCREPANCIES SHALL BE RESOLVED PRIOR TO CONTRACTOR PROCEEDING WITH AFFECTED WORK.
- 10. GENERAL CONTRACTOR SHALL BID COMPLETE OPERATIONAL ASSEMBLIES WHETHER SHOWN IN THEIR ENTIRETY OR NOT.
- 11. THE CONTRACT WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, TOOLS, LABOR AND SERVICES NECESSARY FOR COMPLETION OF THE PROJECT, UNLESS NOTED OTHERWISE.
- 12. THE GENERAL CONTRACTOR SHALL PERFORM ALL WORK IN CONFORMITY WITH THOSE LAWS HAVING JURISDICTION WHETHER OR NOT SUCH WORK IS SPECIFICALLY SHOWN ON THESE DRAWINGS, INCLUDING ALL SEISMIC REQUIREMENTS.

  THE GENERAL CONTRACTOR SHALL PROCURE AND PAY FOR ALL NECESSARY BUILDING PERMITS AND SHALL BE
  PRIMBURSED FOR GENERAL BUILDING PERMIT COSTS BY OWNER. BUSINESS LICENSE COSTS ARE NOT PEIMBURSABLE.
- REIMBURSED FOR GENERAL BUILDING PERMIT COSTS BY OWNER. BUSINESS LICENSE COSTS ARE NOT REIMBURSABLE.

  13. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY OF WORKMANSHIP AND FOR COMPLIANCE WITH
  THE DESIGN. THE GENERAL CONTRACTOR SHALL CORRECT ALL ERRORS AND DEVIATIONS AS REQUESTED BY THE
- 14. THE GENERAL CONTRACTOR SHALL CONTACT THE OWNER / TENANT IMMEDIATELY IF THEY ENCOUNTER ANY HAZARDOUS MATERIALS.
- 15. THE GENERAL CONTRACTOR SHALL ESTABLISH CONTROL LINES 2'-0" O.C. FROM ALL COLUMNS. LINES TO BE PERMANENT AND REESTABLISHED DURING CONSTRUCTION AS NEEDED.
- 16. EXACT LOCATIONS OF PIPING, DUCTWORK, CONDUIT AND FIXTURES SHALL BE COORDINATED BETWEEN CONTRACTORS AND SUBCONTRACTORS TO AVOID INTERFERENCE.
- 17. ALL SPRINKLER HEADS SHOWN ARE CONCEPTUAL ONLY. GENERAL CONTRACTOR TO HIRE A LICENSED SPRINKLER CONTRACTOR TO DESIGN AND INSTALL / MODIFY SPRINKLER SYSTEM. HEAD REPLACEMENT TO MEET ALL LOCAL AND NATIONAL CODES INCLUDING NFPA-13.
- 18. AFTER COMPLETION OF THE WORK, PARTS OF THE BUILDING SHALL BE CLEANED WHERE EVER SUCH CLEANING IS REQUIRED, INCLUDING AREAS OF THE BUILDING MADE DIRTY BY CONSTRUCTION WORK. THE GENERAL CONTRACTOR SHALL REMOVE FROM THE PREMISES TRASH, RUBBISH, TOOLS, EQUIPMENT AND EXCESS MATERIALS. THE BUILDING IS TO BE LEFT IN PERFECTLY CLEAN CONDITION.
- 19. ALL ELECTRICAL WORK SHALL CONFORM TO LOCAL CODES, THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, & NFPA 72.
- 20. EACH CONTRACTOR SHALL COORDINATE ARCHITECTURAL DRAWINGS WITH THE PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS AND ALL SPECIFICATIONS BEFORE PROCEEDING WITH THE WORK AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES OR CONFLICTS IMMEDIATELY. ALL DISCREPANCIES SHALL BE RESOLVED PRIOR TO THE CONTRACTOR PROCEEDING WITH AFFECTED WORK.

#### MATERIALS KEY & GRAPHIC SYMBOLS



#### NATIONAL ACCOUNT VENDORS

DOORS AND HARDWARE
GC TO PROVIDE

FIXTURES AND FURNITURE

LIGHTING FIXTURES, LAMPS, & CONTROLS VILLA LIGHTING CONTACT: DAN LATIN

PHONE: (480) 343-6424
EMAIL: DAN.LATIN@VILLALIGHTING.COM
PLUMBING FIXTURES
HAINES JONES & CADRURY I.I.C.

HAINES, JONES & CADBURY LLC CONTACT: SUSAN CASTRONOVA PHONE: (800) 459-7099 EXT 5990 MOBILE: (479) 319-8777 EMAIL: KC@HJCINC.COM

WARMING PANTRY
PRO LOAD
CONTACT: DERRICK HARRIS
PHONE: (301) 595-0000
MOBILE: (443) 924-1051

MOBILE: (443) 924-1051
EMAIL: PROLOAD@VERIZON.NET

CORNER GUARDS
CONSTRUCTION SPECIALTIES NATIONAL ACCOUNTS

PHONE: (425) 229-3479 EMAIL: KYHEDRICK@C-SGROUP.COM

CONTACT: KYIAN HEDRICK

PLAYGROUND EQUIPMENT & SURFACE
PLAY POWER INC.

CLIENT

CONTACT: JENNY MOENNIG PHONE: (417) 354-2678 EMAIL: JENNY.MOENNIG@PLAYPOWER.COM

FLOORING
FORBO FLOORING SYSTEMS
CONTACT: JAMIE THORN
PHONE: (570) 926-1201

ECOLAB DISPENSERS
ECOLAB
CONTACT: CHRIS MARSH
PHONE: (727) 242-3758
EMAIL: CHRIS.MARSH@ECOLAB.COM

PAPER AND SOAP DISPENSERS
VON DREHLE
CONTACT: SUESANNE NOBLE
PHONE: (828) 345-5120
EMAIL: SUESANNE.NOBLE@VONDREHLE.COM

# ABBREVIATIONS

ACT	ACOUSTICAL CEILING TILE	EA	EACH	OC	ON CENTER
AFF	ABOVE FINISHED FLOOR	EJ	<b>EXPANSION JOINT</b>	PL	PLATE/PROPERTY LINE
ALUM	ALUMINUM	ELEC	ELECTRICAL	RCP	REFLECTED CEILING PLAN
ANOD	ANODIZED	ELEV	ELEVATOR	RD	ROOF DRAIN
ARCH	ARCHITECTURAL	EQ	EQUAL	RO	ROUGH OPENING
BLDG	BUILDING	(E)	EXISTING	RTU	ROOF TOP UNIT
ВО	BOTTOM OF	FD	FLOOR DRAIN	S.C.	SOLID CORE
BD	BOARD	F.F.	FINISH FLOOR	SIM	SIMILAR
CJ	CONTROL JOINT	GL	GLASS	SPECS	SPECIFICATIONS
CL	CENTERLINE	GYP	GYPSUM	TBD	TO BE DETERMINED
CLG	CEILING	HM	HOLLOW METAL	TO	TOP OF
CLR	CLEAR	KC	KINDERCARE	TOF	TOP OF FOOTING
CMU	CONCRETE MASONRY UNIT	LAM	LAMINATED	TOM	TOP OF MASONRY
COL	COLUMN	MAX	MAXIMUM	TOS	TOP OF STEEL
CPT	CARPET	MANUF	MANUFACTURER	TV	TELEVISION
CT	CERAMIC TILE	MECH	MECHANICAL	TYP	TYPICAL
DF	DRINKING FOUNTAIN	MIN	MINIMUM	UNO	UNLESS NOTED OTHERWIS
DIA	DIAMETER	MISC	MISCELLANEOUS	VCT	VINYL COMPOSITION TILE
DS	DOWNSPOUT	NIC	NOT IN CONTRACT	VIF	VERIFY IN FIELD
DWG	DRAWING	NTS	NOT TO SCALE	VT	VINYL TILE

#### CODE AND BUILDING DATA

BUILDING CODE:

MECHANICAL CODE:

PLUMBING CODE:

FIRE CODE:

**ELECTRICAL CODE:** 

ACCESSIBILITY:

2015 IBC 2015 IMC 2015 IPC 2018 CT FIRE CODE 2017 NEC 2009 ICC/ ANSI A117.1

USE and OCCUPANCY CLASSIFICATION
DAY CARE: EDUCATIONAL (E)
BUSINESS GROUP (B)

BUILDING AREA: 10,000 SF

■ CONSTRUCTION CLASSIFICATION (TYPE)

TYPE V-B WITH AUTOMATIC SPRINKLER SYSTEM

SEE SHEET A0.1 FOR ADDITIONAL INFORMATION

#### SCOPE OF WORK

PROJECT DIRECTORY

INSITE REAL ESTATE

OAK BROOKE, IL 60523

jkyes@insiterealestate.com

KINDERCARE EDUCATION

650 N.E. HOLLADAY STREET, SUITE 1400

**DESIGN & CONSTRUCTION** 

PORTLAND, OR. 97232

ADA ARCHITECTS, INC.

17710 DETROIT AVE.

LAKEWOOD, OH 44107

jkassay@adaarchitects.cc

■ STRUCT. ENGINEER: THORSON BAKER + ASSOCIATES

RICHFIELD. OH 44286

dschehl@thorsonbaker.com

3030 W. STREETSBORO RD.

DONALD SCHEHL

(330) 659-6688

■ MECH. / PLUMBING ENGINEER: APEX ENGINEERING

ADAM BROWN

P.O. BOX 5221

BOISE, ID 83705

adam@apexeng.com

**BRIAN SCHULER** 

(216) 521-5134

(216) 521-4824

17710 DETROIT AVE.

LAKEWOOD, OH 44107

bschuler@adaarchitects.cc

(208) 989-2572

(630) 617-9144

CHRIS WALSH

JIM KASSAY

(216) 521-4824

1400 16TH STREET, SUITE 300

CONTACT

PHONE

EMAIL:

■ TENANT:

CONTACT:

ARCHITECT

CONTACT:

CONTACT:

ADDRESS:

PHONE:

CONTACT:

ADDRESS:

■ ELEC. ENGINEER:

CONTACT:

ADDRESS:

PHONE:

FAX:

EMAIL:

PHONE:

EMAIL:

EMAIL:

THE SCOPE OF WORK INCLUDES CONSTRUCTION OF A 10,000 SF GROUND UP DAY CARE CENTER AND AN 7,122 SF PLAYGROUND. NEW CONSTRUCTION INCLUDES FULL SHELL AND TENANT INTERIOR BUILD OUT.

# DRAWING INDEX

**ARCHITECTURAL** 

			A-0.0	COVER SHEET
		•	A-0.1	EGRESS/ EVACUATION PLAN
		•	AS-1.0	ARCHITECTURAL SITE PLAN
		•	AS-1.1	PLAYGROUND PLAN AND DETAILS
		•	AS-1.2	PLAYGROUND DETAILS AND SECTIONS
		•	A-1.0	FLOOR PLAN
		•	A-1.1	FLOOR FINISH PLAN
		•	A-1.2	CASEWORK AND EQUIPMENT PLAN
		•	A-1.3	ENLARGED PLANS AND CASEWORK & EQUIPMENT SCHEDULES
		•	A-1.4	ENLARGED PLANS
		•	A-2.0	REFLECTED CEILING PLAN
		•	A-2.1	ATTIC PLAN
		•	A-3.0	ROOF PLAN
		•	A-4.0	EXTERIOR ELEVATIONS
		•	A-5.0	BUILDING SECTIONS
		•	A-5.1	WALL SECTIONS
		•	A-5.2	WALL SECTION
		•	A-5.3	WALL SECTION AND DETAILS
			A-6.0	INTERIOR DETAILS

A-6.0 INTERIOR DETAILS

A-7.0 INTERIOR ELEVATION DETAILS

A-7.1 INTERIOR ELEVATIONS

A-7.2 INTERIOR ELEVATIONS

A-7.3 INTERIOR ELEVATIONS

A-8.0 DOOR AND WINDOW SCHEDULES

A-9.0 SPECIFICATIONS

A-9.1 SPECIFICATIONS

A-9.2 SPECIFICATIONS

A-9.3 SPECIFICATIONS

A-9.4 SPECIFICATIONS

A-9.5 SPECIFICATIONS

A-9.6 SPECIFICATIONS

A-9.7 SPECIFICATIONS

A-9.8 SPECIFICATIONS

A-9.8 SPECIFICATIONS

A-9.9 SPECIFICATIONS

A-9.9 SPECIFICATIONS

## STRUCTURAL S-0.1 GENERAL NOTES & SPECIFICATIONS

	S-0.2	GENERAL NOTES & SPECIFICATIONS
•	S-0.3	GENERAL NOTES & SPECIFICATIONS
	S-1.0	FOUNDATION PLAN
	S-1.1	ROOF FRAMING PLAN
	S-1.2	MECHANICAL ATTIC FLOOR FRAMING PLAN
	S-2.0	FOUNDATION SECTIONS & DETAILS
	S-3.0	TYPICAL WOOD FRAMING DETAILS
	S-3.1	TYPICAL WOOD FRAMING DETAILS
	S-3.2	WOOD FRAMING SECTIONS
	S-3.3	WOOD FRAMING SECTIONS
	S-4.0	SHEAR WALL DETAILS AND TRUSS PROFILES

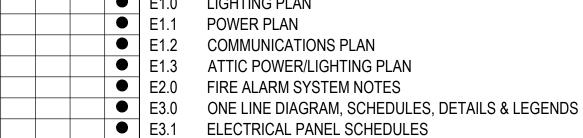
#### MECHANICAL M-0.0 MECHANICAL COVER SHEET

		_	101-0.0	MEDIAMONE OUVER OFFEE
		•	M-0.1	MECHANICAL SCHEDULES
		•	M-0.2	MECHANICAL DETAILS
		•	M-1.0	MECHANICAL PLAN
		•	M-1.1	MECHANICAL ATTIC PLAN
		•	M-3.0	MECHANICAL SPECIFICATION

#### P-0.1 PLUMBING COVER SHEET

		•	P-0.2	PLUMBING DETAILS
		•	P-1.0	PLUMBING PLAN - WASTE & VENT
		•	P-2.0	PLUMBING PLAN - WATER & GAS
		•	P-3.0	PLUMBING SPECIFICATIONS
			•	

# ELECTRICAL E0.1 ELECTRICAL SPECIFICATIONS E0.2 ELECTRICAL SITE PLAN E1.0 LIGHTING PLAN



• E3.2 ELECTRICAL DETAILS

• E3.3

**ELECTRICAL DETAILS** 

OF CONNECTION OF

**InSite** 

RCHITECTS
710 Detroit Avenue Lakewood, Ohio 44107

VERNON, CT AR

EARNING CENTER
VON, CT

ERCARE LEARNING
VERNON, CT
RD.

295 TALCOTTVILLE RD.

SAOISIONS

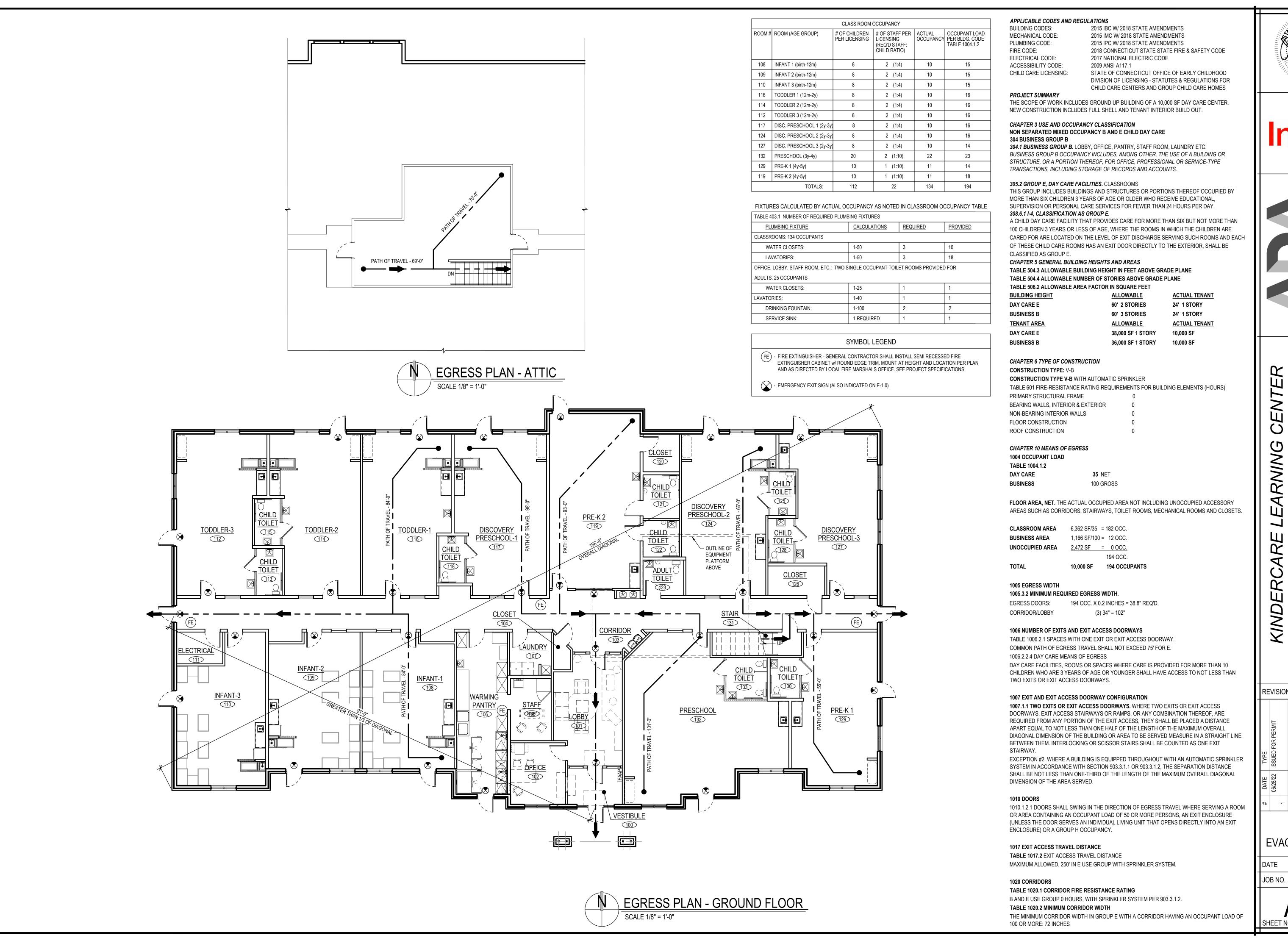
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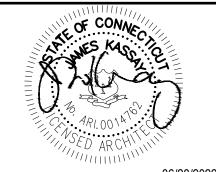
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COVER SHEET

DATE 06/01/22 JOB NO. 21399

A-0.C





REVISIONS

EGRESS/ **EVACUATION PLAN** 

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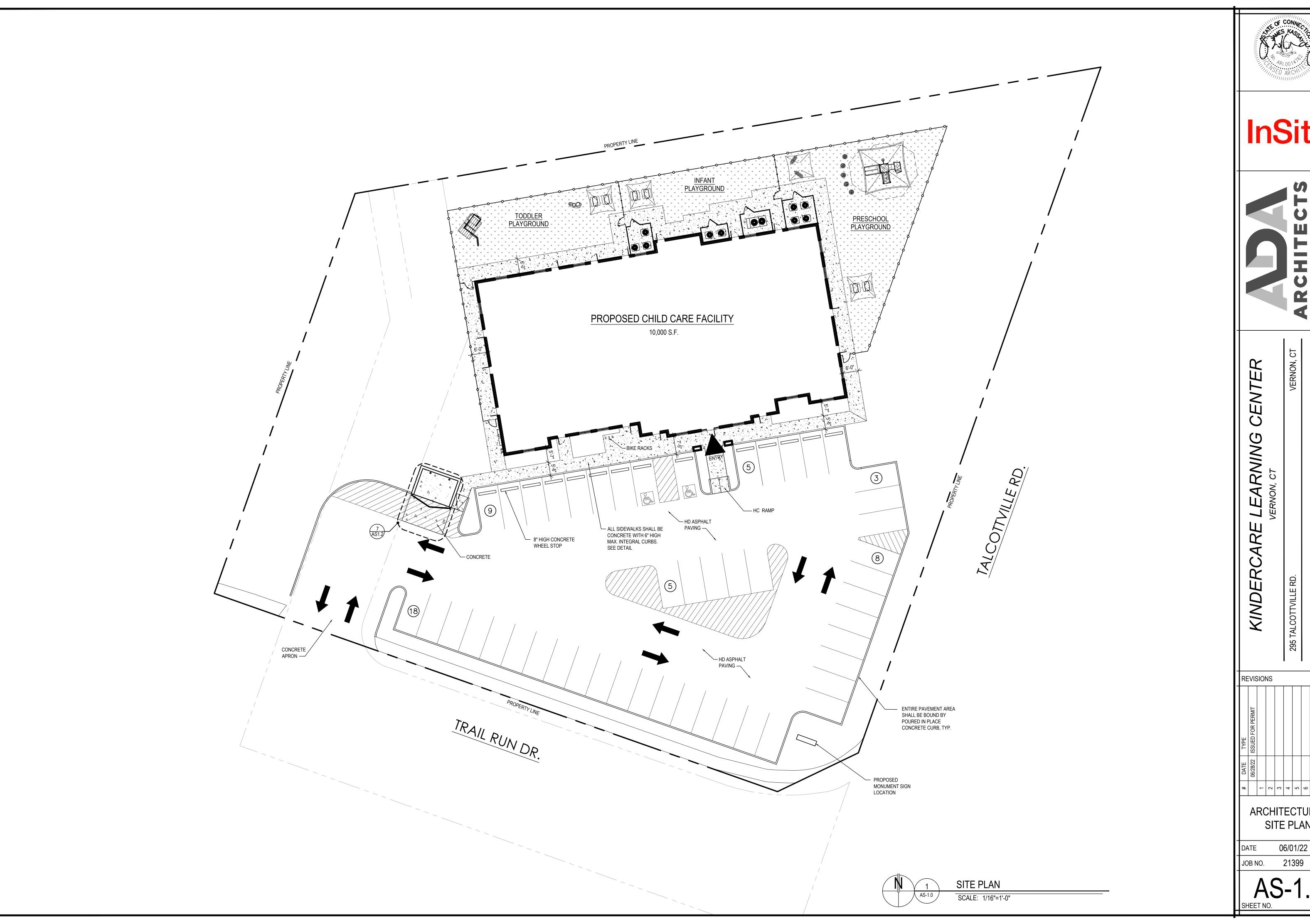
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06/01/22

SURFACE LEGEND											
MATERIAL	MATERIAL SYMBOL MANUFACTURER MODEL# NOTE:										
					T/T	T/C	C/C				
CONCRETE				BROOM FINISH			•				
SYNTHETIC TURF / FALL SURFACE	\(\psi\) \(\psi\) \(\psi\) \(\psi\)	PLAY POWER INC.	1.55" XGRASS PRIME SYNTHETIC TURF W/ ENVIROFILL	ASTM F1292 AND F1951 COMPLIANT			•				
WOOD CHIP		FIBAR OR APPROVED EQUAL	ENGINEERED WOOD FIBER (EWF)	ASTM F1292, F2075, AND F1951 COMPLIANT			•				
FALL ZONE				SEE DETAIL 3 THIS SHEET							

	EQUIPMENT	C = CONTRACTOR  PROVIDED/INSTALLEI							
	PRODUCT	MANUFACTURER	MODEL#	NOTE	PROVIDED/INSTALLE				
					1/1	1/0	<u> </u>		
Α	ART EASEL	LTC	100011755	-			•		
В	NOT USED								
С	NU EDGE STUMP PINE SHORT	LTC	200202720	-			•		
D	NOT USED								
Е	SHADE STRUCTURE	LTC	LTPSP026	10'x10'x8' PYRAMID INDEPENDENT SHADE STRUCTURE			•		
F	JUNIOR PICNIC TABLE	LTC	200200419	FREESTANDING JR PICNIC TABLE			•		
G	LT PB PRESCHOOL UNIT WITH SHADE TOPPER	LTC	QU070583	-			•		
Н	LT PB INFANT UNIT WITH NU EGDE ROOF	LTC	QU070584	-			•		
J	OUTDOOR DRUM SET	PLAYWORLD	ZZUN5049	20" HEIGHT AT INFANT/TODDLER, 6 MONTHS - 2 YEARS			•		
			ZZYY9395	30" HEIGHT AT PRESCHOOL, 2-5 YEARS			•		
K	NOT USED								

NOTE: ALL PLAY EQUIPMENT TO BE PURCHASED THRU THE NATIONAL ACCOUNT VENDER - REFER TO SHEET A-0.0

#### **GENERAL NOTES**

1. ENTRAPMENT: THE DISTANCE BETWEEN ANY OPPOSING SURFACES OR OBJECTS SHALL NOT BE GREATER THAN 3 1/2" AND LESS THAN 9".

2. CONTRACTOR TO FURNISH, ASSEMBLE AND INSTALL PER. MANUFACTURERS INSTRUCTIONS ALL EQUIPMENT SHOWN ON THIS PLAN UNLESS OTHERWISE NOTED.

3. THE PLAYGROUND EQUIPMENT LAYOUT IS MEANT FOR GENERAL PLACEMENT OF THE EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PLACE OR ADJUST ALL EQUIPMENT TO COMPLY WITH LOCAL CODES AND FIT WITHIN THE AREAS SPECIFIED.

4. KINDERCARE EDUCATION SHALL REVIEW AND APPROVE EQUIPMENT PACKAGE PRIOR TO ORDERING.

5. FALL ABSORBING GROUND COVER IS REQUIRED UNDER AND AROUND ALL PLAY EQUIPMENT. REFER TO SPECIFICATIONS FOR MATERIAL AND DESIGN. ALL PLAY EQUIPMENT THAT REQUIRES A FALL ZONE TO BE PLACED ON SAFETY SURFACE.

6. THE MINIMUM RECOMMENDED FALL ZONE AROUND THE ENTIRE PLAY STRUCTURE IS SHOWN (DASHED). THE ZONE IS TO BE FREE OF ALL TRIPPING OR COLLISION HAZARDS (I.E. ROCKS, BORDER MATERIAL, ETC.)

7. ENSURE ALL PLAY STRUCTURE(S) MEET THE PERFORMANCE AND SAFETY REQUIREMENTS OF ASTM FOR CHILDREN IN THE SPECIFIED AGE GROUP. NOT ALL EQUIPMENT MAY BE APPROPRIATE FOR ALL CHILDREN. SUPERVISION IS REQUIRED.

8. ALL PLAY EQUIPMENT AND SHADE STRUCTURES SHALL BE PROVIDED AND INSTALLED BY GENERAL CONTRACTOR.

9. GENERAL CONTRACTOR TO COORDINATE EQUIPMENT DELIVERY TIME WITH SURFACING. EQUIPMENT TO BE DELIVERED WITHOUT DAMAGED AND TO BE CLEANED UP. NO TOUCH UP PAINT WILL BE EXPECTED.

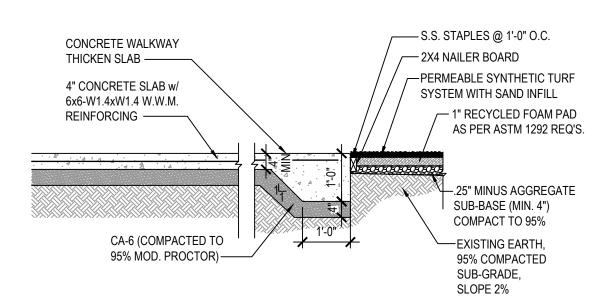
PERMEABLE SYNTHETIC TURF
SYSTEM WITH SAND INFILL

1" FOAM PAD AS PER ASTM 1292
REQUIREMENTS

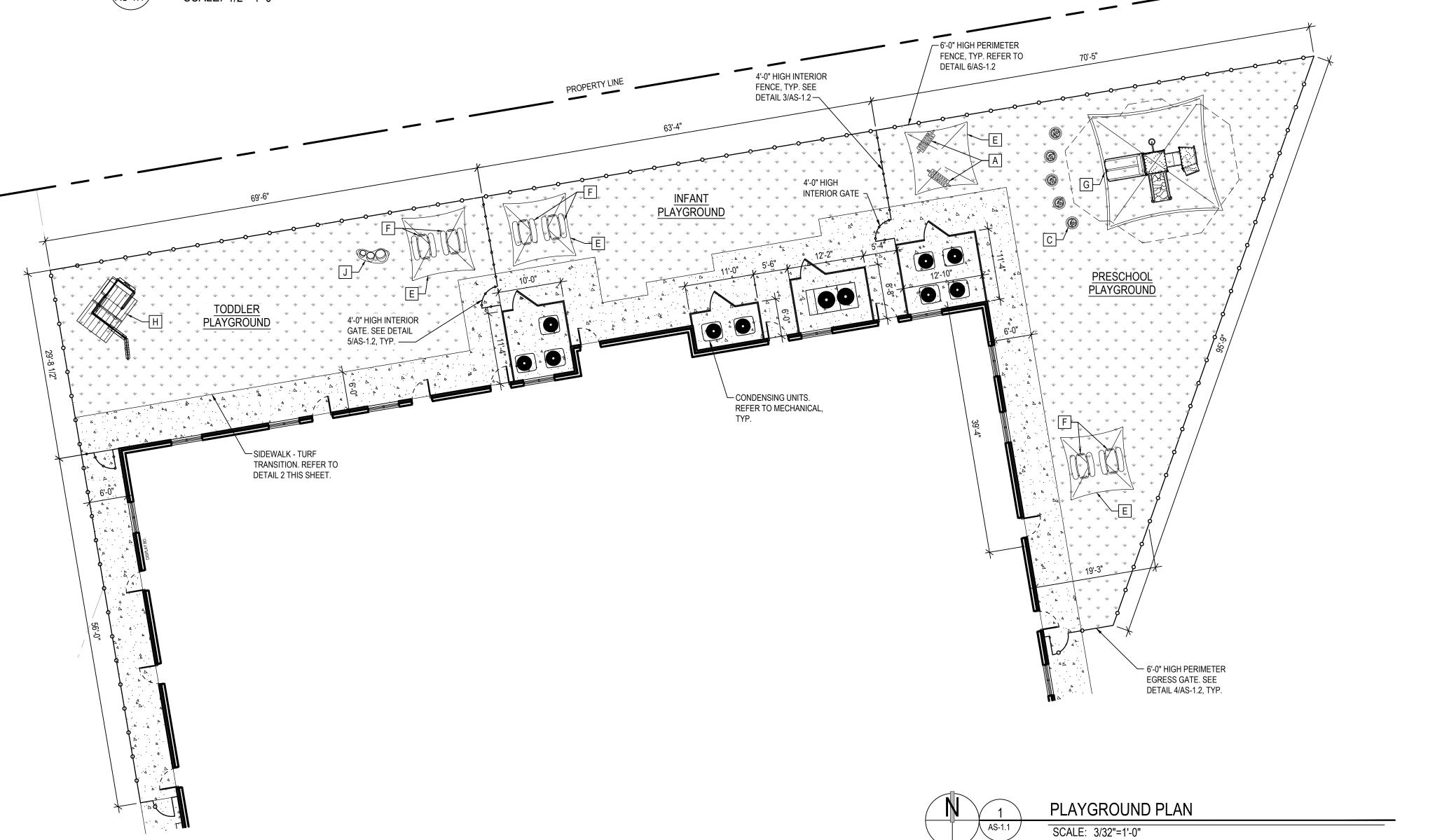
.25" MINUS AGGREGATE SUB-BASE
(MIN. 4") COMPACT TO 95%

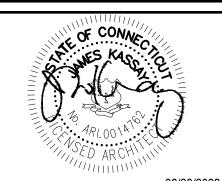
SUBGRADE- UNDISTURBED OR
COMPACTED

FALL ZONE DETAIL
SCALE: 3/4"=1'-0"









**InSite** 

RCHITECTS
7710 Detroit Avenue Lakewood, Ohio 44107
hone (216) 521-5134 Fax (216) 521-4824

SNON, CT ARC

, CT VERI

TVILLE RD.

295 TALCOTTVI

REVISIONS

# DATE TYPE

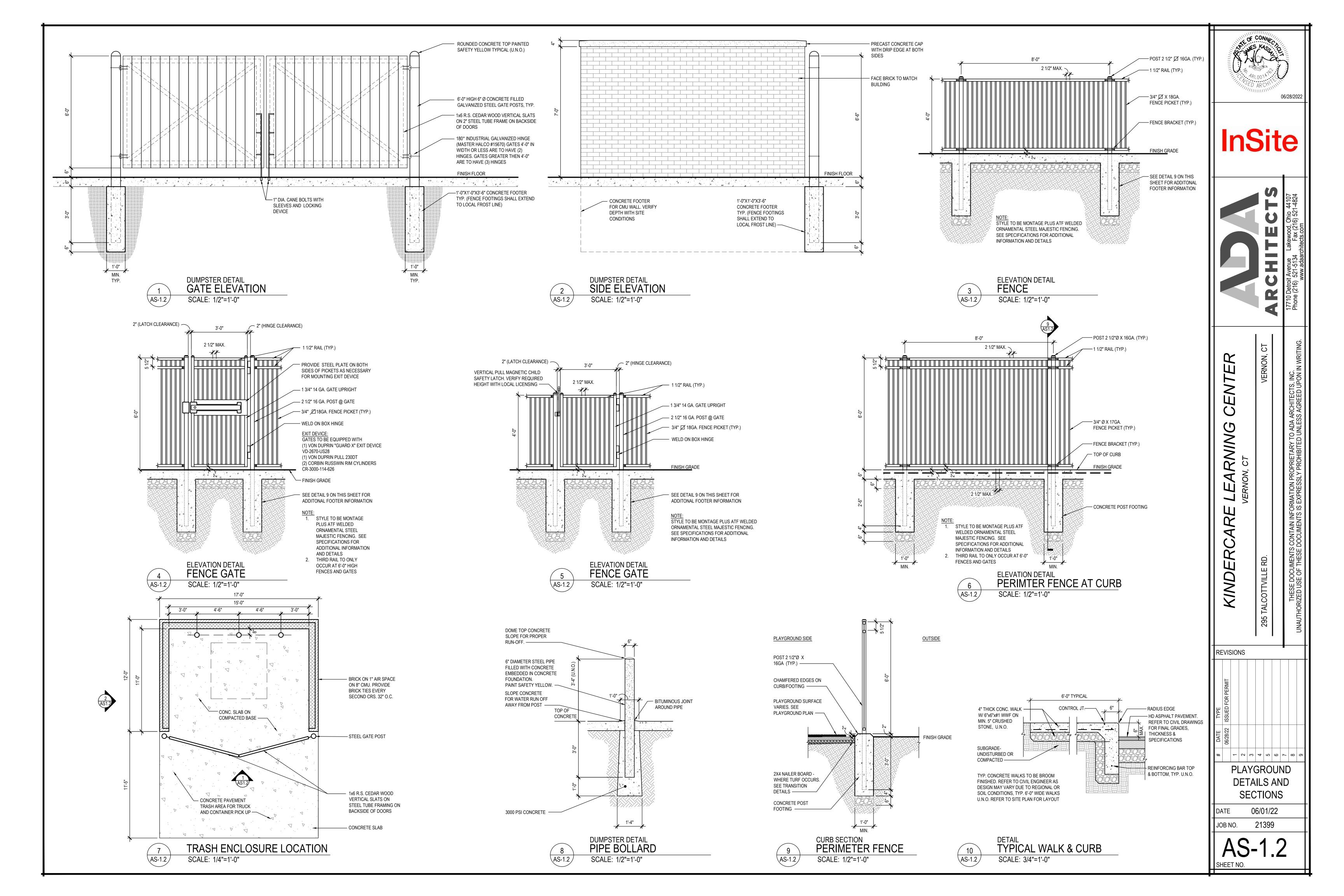
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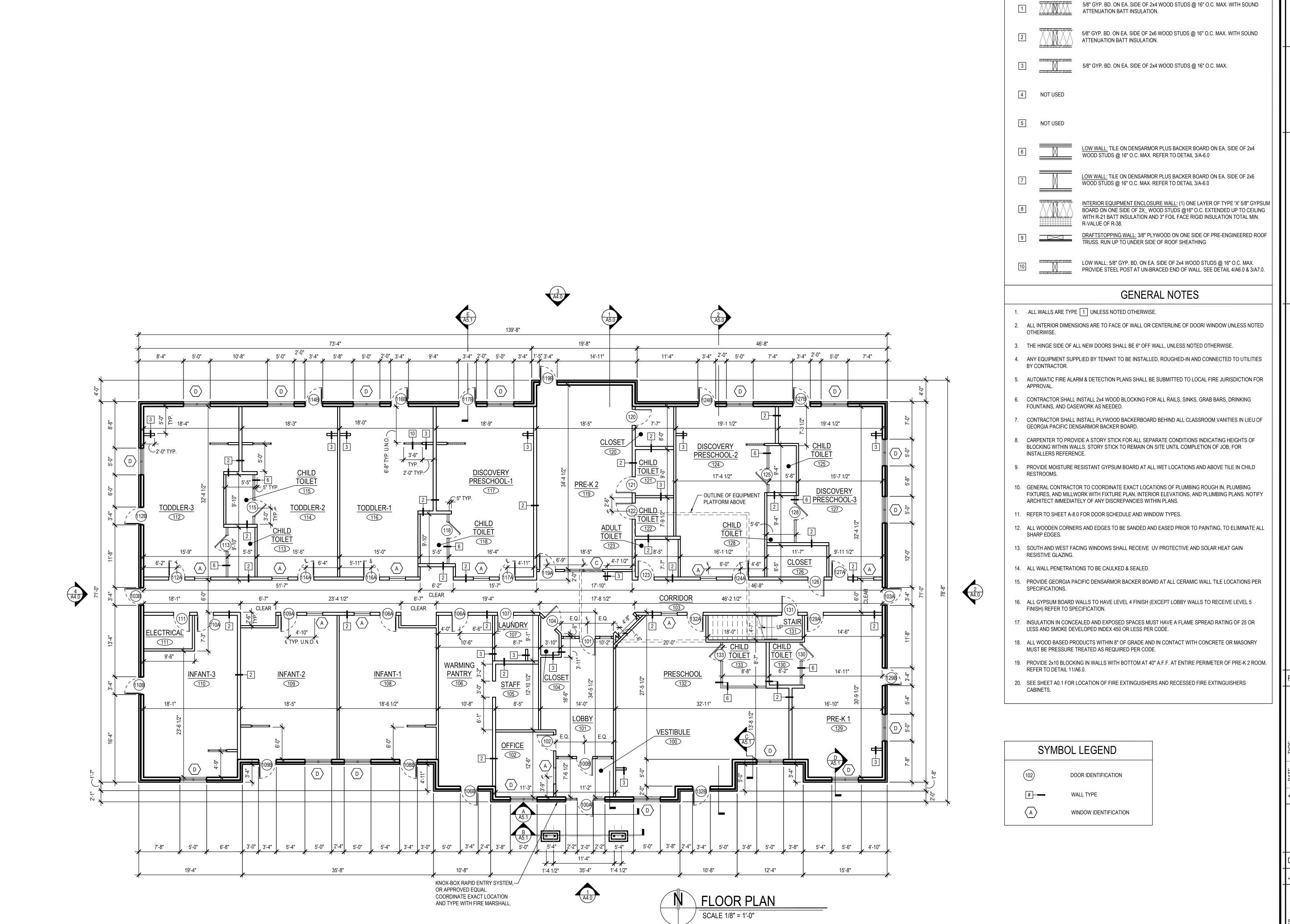
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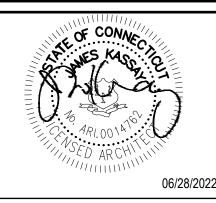
PLAYGROUND PLAN AND DETAILS

DATE 06/01/22 JOB NO. 21399

AS-1.1







#

WALL TYPES

TAG PLAN VIEW DESCRIPTION

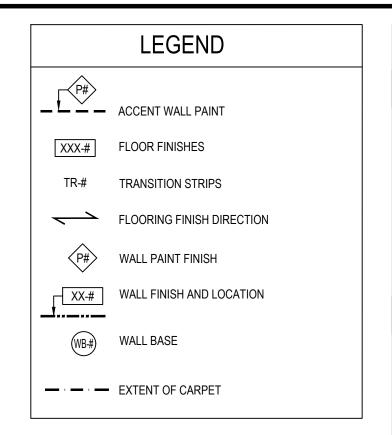
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REVISIONS

FLOOR PLAN

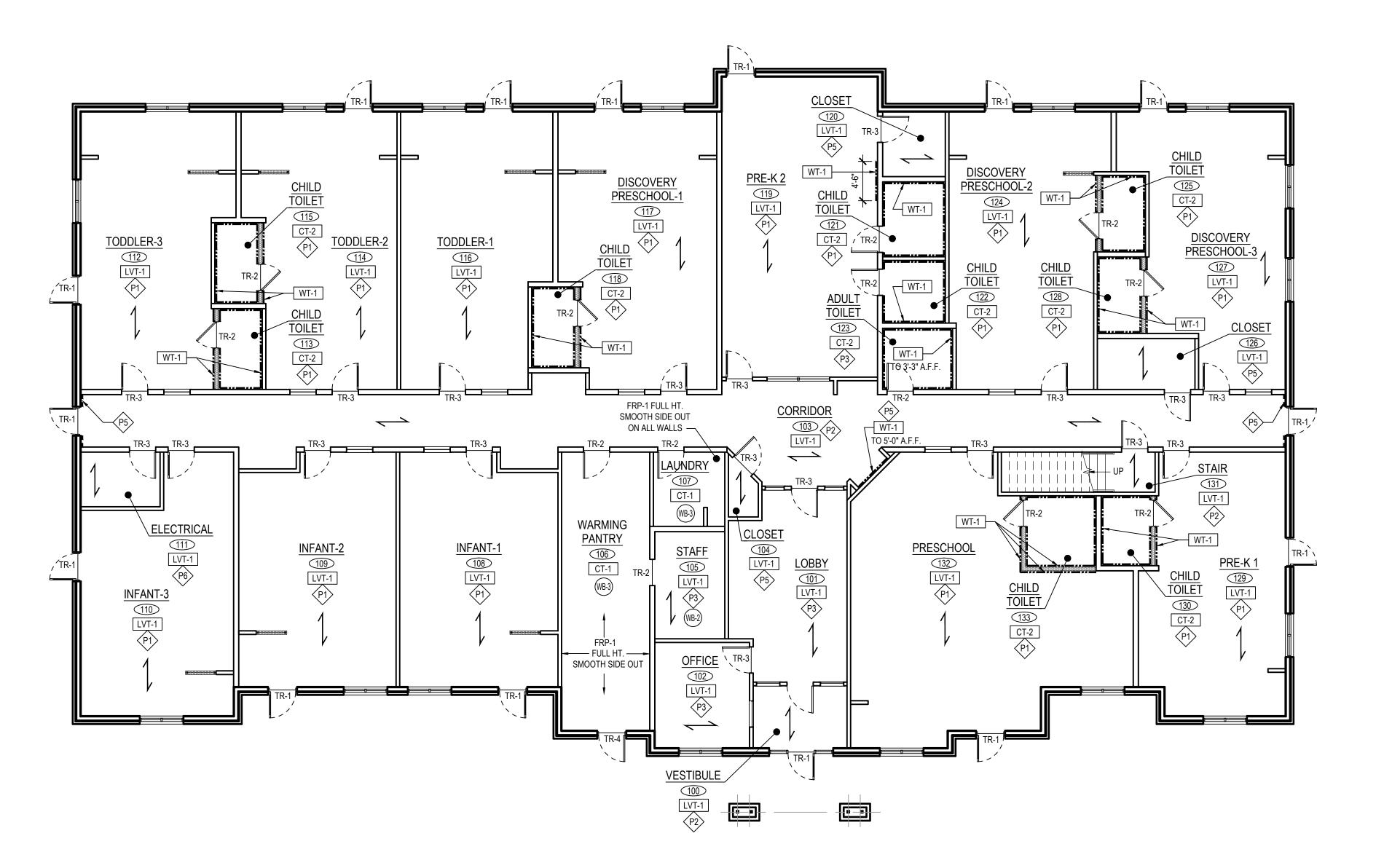
06/01/22 21399 JOB NO.

SHEET NO.



	TRANSITION STRIPS	TRANSITION STRIPS						
TR-1	ALUMINUM THRESHOLD / LVT	TR-3	LVT / LVT					
DOOR SI	DOOR ALUMINUM THRESHOLD PER A.D.A. REQUIREMENTS  LUXURY VINYL TILE (LVT)  LINE OF CONC. SLAB	JOHNSONITE CTA-45-N TRANISTION STRIP LUXURY VINYL TILE (LVT)  2-1/2						
TR-2	LVT / CERAMIC TILE	TR-4	ALUMINUM THRESHOLD / CERAMIC TILE					
LUX	SCHLUTER RENO-U TRANSITION STRIP COLOR: ALUMINUM  CERAMIC TILE (CT)	DOOR SI	DOOR  ALUMINUM THRESHOLD PER  A.D.A. REQUIREMENTS CERAMIC TILE (CT)  LINE OF CONC. SLAB					

PROVIDE CONCRETE MOISTURE & RH TEST. OBTAIN ADHESIVE RECOMMENDATIONS FROM THE PROVIDER (FORBO)





FINISH SCHEDULE									
	FL	LOORS							
MARK	DESCRIPTION	MANUFACTURER/COLOR							
CT-1	CERAMIC TILE	12"x12" UNPOLISHED FLOOR TILE  COLOR: SERENE HM20 STYLE: HARMONIST AS MANUFACTURED BY  DALTILE W/ EPOXY GROUT COLOR: #01 ALABASTER							
CT-2 CERAMIC TILE		14"x16" HEXAGON  COLOR: LUNGARNO ANTHRACITE MANUFACTURED BY DALTILE W/ EPOXY GROUT COLOR: LATICRETE #45 RAVEN							
LVT-1	59"x 11" SOLID VINYL FLOOR PLANK	MFR: FORBO, ALLURA, COLOR: W60300 CENTRAL OAK							
	WAL	L BASE							
MARK	DESCRIPTION	MANUFACTURER/COLOR							
WB-1	4" RUBBER (ROLLED MATERIAL WITH NO SEAMS AND PREFORMED CORNERS)	COLOR: C06 ALUMINUM AS MANUFACTURED BY FORBO TYPICAL FOR ALL ROOMS EXCEPT WARMING PANTRY, TOILET ROOMS AND WHERE NOTED OTHERWISE							
WB-2	6" RUBBER (ROLLED MATERIAL WITH NO SEAMS AND PREFORMED CORNERS)	COLOR: C06 ALUMINUM AS MANUFACTURED BY FORBO							
WB-3	CERAMIC TILE	12"x12" UNPOLISHED COVE BASE  COLOR: SERENE HM20 STYLE: HARMONIST AS MANUFACTURED BY DALTILE W/ EPOXY GROUT COLOR: #01 ALABASTER							

WALLS										
MARK	DESCRIPTION	MANUFACTURER/COLOR								
CG-1	48" CORNER GUARD	'SSM 20' SERIES AS MANUFACTURED BY CONSTRUCTION SPECIALTIES NATIONAL ACCOUNTS. COLOR: 929 OYSTER GRAY								
WT-1	PORCELAIN TILE	12"x24" PORCELAIN TILE SERIES: DAL MERIT - COLOR : LIGHT GRAY AS MANUFACTURED BY AMERICAN OLEAN W/ EPOXY GROUT COLOR: #14 BISCUIT								
FRP-1	FIBERGLASS REINFORCED PANEL	SMOOTH FRP (S100G) WHITE AS MANUF. BY MARLITE								
P1	PAINT	SW6427 "SPROUT" AS MANUFACTURED BY SHERWIN WILLIAMS								
P2	PAINT	SW0050 "CLASSIC LIGHT BUFF" AS MANUFACTURED BY SHERWIN WILLIAMS								
P3	PAINT	SW6476 "GLIMMER" AS MANUFACTURED BY SHERWIN WILLIAMS								
P4	PAINT	NOT USED								
P5	PAINT	SW6429 "BAIZE GREEN" AS MANUFACTURED BY SHERWIN WILLIAMS								
P6	PAINT	SW6147 "PANDA WHITE" AS MANUFACTURED BY SHERWIN WILLIAMS								
P7	PAINT	SW8917 "SHELL WHITE" AS MANUFACTURED BY SHERWIN WILLIAMS								
	CASE	WORK								
MARK	DESCRIPTION	MANUFACTURER/COLOR								
PL-1	PLASTIC LAM., CABINETS	WILSONART - L-33 SEROTINA WITH TRIO FINISH								

1. ALL INTERIOR FINISHES SHALL COMPLY WITH THE AHJ.

SOLID SURFACE, COUNTERTOP

PL-2 PLASTIC LAM., COUNTERTOP

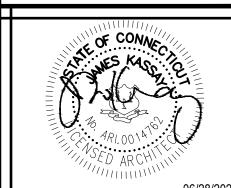
- 2. INTERIOR FINISH MATERIALS APPLIED TO WALLS AND CEILINGS SHALL BE TESTED IN ACCORDANCE WITH AHJ. 3. ANY DECORATIONS SHALL BE NON-COMBUSTIBLE OR FLAME-RETARDANT TREATED IN AN APPROVED MANNER (CURTAINS,
- DRAPES SHADES, HANGINGS, ETC.) 4. TOILET ROOM FLOORS SHALL HAVE A SMOOTH, HARD NON-ABSORBENT SURFACE SUCH CERAMIC TILE OR OTHER APPROVED MATERIAL THAT EXTENDS UPWARD ONTO THE WALLS AT LEAST 4"

SOLID SURFACING - LUNA SAND

FORMICA - 5787-NG TAUPE WALNUT NATURAL GRAIN

#### **GENERAL NOTES**

- 1. FLOORING SHALL BE CONTINUOUS UNDER CHANGING TABLES, SINKS AND COUNTERS.
- 2. PROVIDE RUBBER TRANSITIONS AT ALL FLOOR FINISH CHANGES (MAX. 1/2" HT.) SEE SCHEDULE THIS SHEET.
- 3. ALL PAINT SHALL BE SHERWIN WILLIAMS.
- 4. WALLS TO BE PAINTED AS NOTED ON ROOM NAME TAGS. UNLESS NOTED AS AN ACCENT WALL, ACCENT WALL TO BE PAINTED PER
- 5. ALL WOOD/ MDF TRIM TO BE PAINTED P-7 SEMI-GLOSS FINISH (INCLUDING BUT NOT LIMITED TO DISPLAY BOARDS, PARENT BOARDS,
- 6. ALL GYP. BD. CEILING TO BE PAINTED P-6 U.N.O.
- 7. INTERIOR WALLS: SHERWIN WILLIAMS LATEX SATIN FINISH; ALL WOOD TRIM TO RECEIVE SEMI-GLOSS FINISH.
- 8. INTERIOR WOOD DOORS AND FRAMES: PRE-FINISHED AND SUPPLIED THROUGH VENDOR. REFER TO DOOR SCHEDULE
- 9. PROVIDE CORNER GUARDS AT ALL OUTSIDE CORNERS, WHETHER CALLED FOR OR NOT CALLED FOR. SEE CG-1 THIS SHEET. 10. PAINT TOUCH UP WILL NOT BE ACCEPTED, ANY TOUCH UP TO SPAN FULL LENGTH OF WALL. GENERAL CONTRACTOR TO ENSURE NO BLEMISHES OR PATTERNS ARE APPARENT IN PAINT JOB.
- 11. GENERAL CONTRACTOR TO PROVIDE RAM BOARD OVER TOP OF ALL FLOORING AFTER INSTALLATION FOR PROTECTION OF SURFACE DURING CONSTRUCTION.
- 12. ALL COUNTERTOPS TO BE SS-1 U.N.O.



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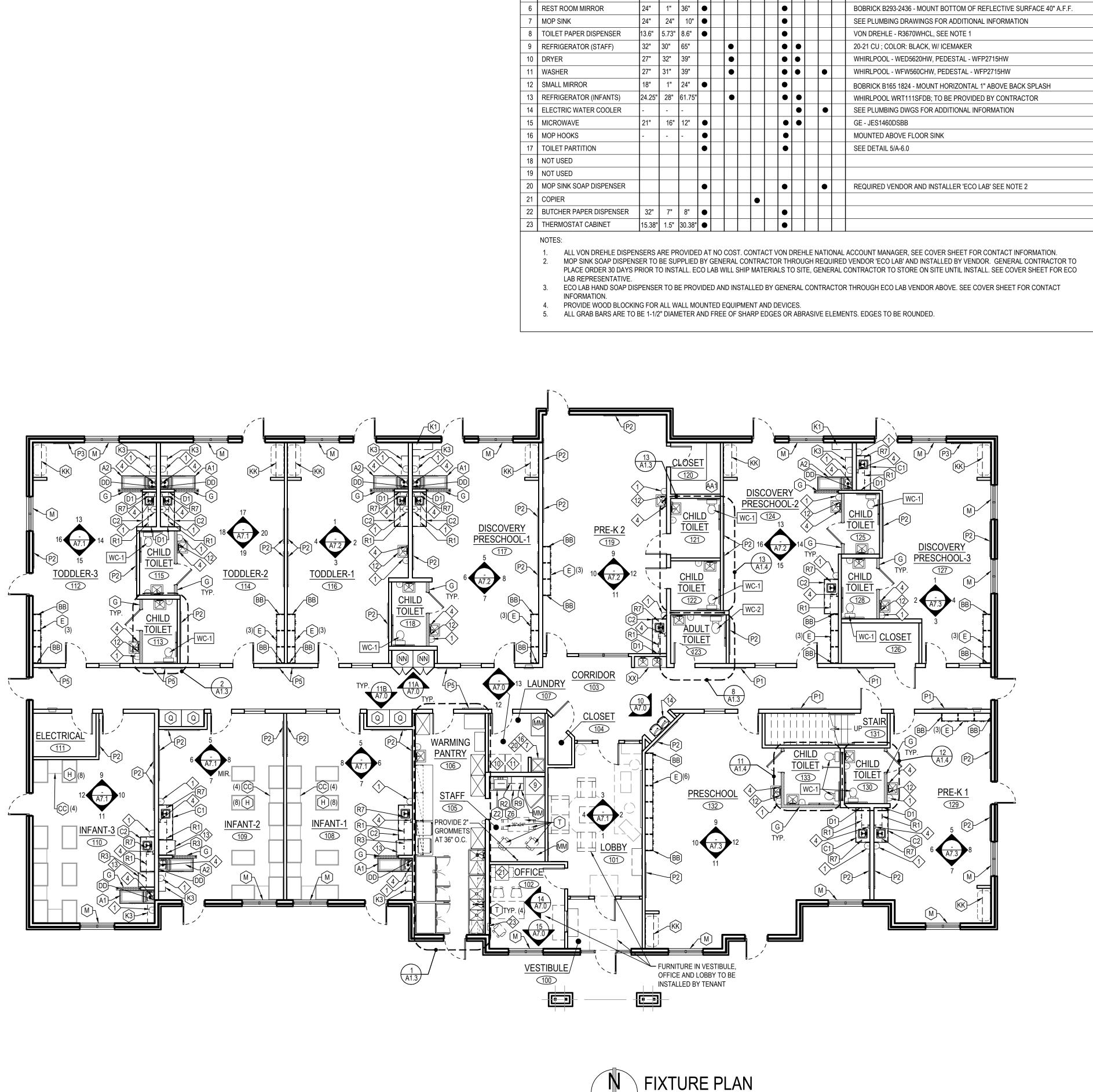
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FLOOR FINISH PLAN

 8

06/01/22 21399 JOB NO.

SHEET NO.



SCALE 1/8" = 1'-0"

EQUIPMENT SCHEDULE ①

VON DREHLE - T600-W; VERIFY INSTALLATION ALLOWS DOOR TO OPEN FULLY

SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION

SEE SHEET A-1.3 FOR SIZES AND MOUNTING HEIGHTS

REQUIRED VENDOR 'ECO LAB' SEE NOTE 3

MOUNTING RESPON. SERVICES

PROVIDED/

**DIMENSIONS** 

(INCHES)

DESCRIPTION

PAPER TOWEL DISPENSER

NOT USED
WATER HEATER

4 SOAP DISPENSER

5 GRAB BAR

SYMBOL LEGEND

1) WARMING PANTRY DESIGNATION - REFER TO SHEET A-1.3

(A) CASEWORK DESIGNATION - REFER TO THIS SHEET

1 EQUIPMENT DESIGNATION - REFER TO THIS SHEET

CASEWORK SCHEDULE

| MOUNTING RESPON. SERVICES | PROVIDED/ | | | |

		MAN										OVIDI TALL						
	<b>⊢</b>				DIME	ENSION	IS							ပ	_	<u>១</u>		
폿	DUC IBER	DOR	ER		(INC	CHES)			<u>8</u>	兴				IRI	TELE/DAT	MBIN	띪	NOTEO 6
MARK	PRODUCT NUMBER	VENDOR	OTHER	DESCRIPTION	W	D	Н	WALL	CEILING	FLOOR	1/1	2/2	2/2	ELECTRIC	TELE	PLUMBING	OTHER	NOTES & REFERENCE
A1	8914A	•		CHANGE TABLE RH	60"	23.6"	33.5"			•	Ė	Ė	•			•		NOTE 6, 3/A-7.0
A2	8913A	•		CHANGE TABLE LH	60"	23.6"	33.5"			•			•			•		NOTE 6, 3/A-7.0
В				NOT USED	-	-	-											
C1	KC.0044	•		PREP TABLE W/ SINK RH	60"	23.6"	33.5"			•			•			•		4A & 5A/A-7.0
C2	2911A	•		PREP TABLE W/ SINK LH	60"	23.6"	33.5"			•			•			•		4B & 5B/A-7.0
D		•		SOLID BACKSPLASH	-	-	-	•					•					
D1	2901R	•		SOLID ENDSPLASH	VAR.	0.5"	4"	•					•					NOTE 7
Е	2866A	•		4-UNIT CUBBIE	28"	14"	51.5"	•					•					NOTE 8, 2/A-7.0
F	-			NOT USED														
G	2882R, 2883R,		•	S SS WALL L CAPS	-	-	-						•					NOTE 9, 3/A-6.0
Н	2884R 			CRIB	40"	27"	41"											
J				NOT USED	70	-1	71					_		$\vdash$			$\vdash$	
K1	KC.0007			DIAPER STORAGE	34.6"	14.5"	24.25"	•					•					3/A-7.0
K2	2828A	•		DIAPER STORAGE	46"		24.25"	├										3/A-7.0
K3	KC.0005	•		DIAPER STORAGE	57.25		24.25"	├										3/A-7.0
L1			•	ROOM SIGNAGE	VAR	VAR	VAR	•										NOTE 5, 6A/A-7.0
L2			•	ROOM SIGNAGE	8.5"	-	14.5"	•				•						NOTE 5, 6B/A-7.0
M	5346		•	SS WINDOW SILL	VAR	6"	0.5"											11012 0, 05/111.0
P1			•	DISPLAY BOARD	60.6"	_	36"	•			•							7/A-7.0
P2			•	DISPLAY BOARD	60.6"	_	36"	•			•							7/A-7.0
P3			•	DISPLAY BOARD	36"	_	36"	•			•							7/A-7.0
P4			•	DRY ERASE BOARD	36"	_	24"	•			•							7/A-7.0
P5			•	DISPLAY BOARD	36"	_	36"	•			•							7/A-7.0
Q	KC.0057	•		CAR SEAT STORAGE	38.25"	30"	96"			•			•					
R1	2639A	•		WALL/STEREO CAB.	30"	13.5"	26.5"	•					•	•				
R2	2628A	•		WALL CABINET	30"	13.5"	36"	•					•					
R3	2796A	•		REFRIG. CABINET	28"	13.5"	15"	•					•					
R4	-			NOT USED														
R5	2879A	•		WALL CABINET	30"	9.5"	36"	•					•					
R6				NOT USED														
R7	2638A	•		WALL CABINET	30"	13.5"	26.5"	•					•					
R8				NOT USED														
R9		•		WALL CABINET	15"	13.5"	36"	•					•					
S	-			NOT USED														
Т			•	LOOSE FURN.	-	-	-				•							
Υ	KC.0025	•		BASE CABINET	36"	24"	33"			•			•					
Z1	-			NOT USED														
Z2		•		ADA SINK BASE	32"	24"	23"			•			•			•		
Z3				NOT USED							ldle	_						
Z4	KC.0022	•		BASE CABINET	36"	24"	33"			•			•					
Z5				NOT USED						_	_			_				
Z6	KC-0037	•		BASE CABINET	15"	24"	33"	_	_	•	_	_	•	_			_	
AA1	2810R	•		SHELVING	96"	24"		•		_	_		•	_				11/A-6.0
AA2	2609R	•		SHELVING	96"	14.7"		•					•					8/A-6.0
BB	2867R	•		OVERLAY END PANEL	0.75"	14"	55.5"	•					•					2/A-7.0
СС				INFANT DRESSER	24"	24"	-			-				_				
DD	-			NOT USED														
EE				NOT USED														
FF				NOT USED														
GG	-			NOT USED														
НН				NOT USED														
JJ				NOT USED														

NOTES

PROVIDE WOOD BLOCKING FOR ALL WALL MOUNTED EQUIPMENT AND DEVICES.

PROVIDE LOCK FOR ALL LOWER CABINET DOORS.
 SEE DETAIL 9/A6.0 FOR ALL WALL HUNG CABINETS.

NN KC.0058 ● HALL STORAGE

(4) SINGLE SHELF
CORNER FILLER
HPL COUNTERTOP

4. REFER TO CASEWORK DETAILS AND INTERIOR ELEVATIONS FOR MOUNT HEIGHTS.

5. REFER TO TENANT INTERIOR SIGN DRAWINGS AND COORDINATE WITH SIGN VENDOR.6. FIXTURE WITH POP OUT TRASH AND CONTOURED ENDSPLASH.

7. CUT DOWN IN FIELD WHERE SHORTER THAN COUNTER.

PROVIDE DEEP PLASTIC BASKETS AND OVERLAY PANEL #2967R AT ENDS.
 COMES IN 6' LENGTH, 'T' SHAPE AND 'L' SHAPE- CAP ALL LOW WALLS.

10. ALL MILLWORK WITH DOORS NEXT TO A WALL TO HAVE 1" SCRIBE SPACER AT WALL.11. GENERAL CONTRACTOR SHALL INSTALL ALL ROOM SIGNAGE PROVIDED BY TENANT.

FURNITURE NOTE: ALL VENDOR CASEWORK SHALL BE PL-1 . REFER TO FINISH SCHEDULE ON A-1.1.
COORDINATE WITH CASEWORK MANUFACTURER TO ENSURE THE PROPER FINISHES ARE IN THE CORRECT AREAS. SEE INTERIOR ELEVATIONS FOR EXTENT OF NOTES ON ALL CASEWORK. ALL MILLWORK SHALL HAVE THE EDGES AGAINST WALLS SEALED AND FINISHED WITH A SCRIBE.

#### **GENERAL NOTES**

- 1. THE GENERAL CONTRACTOR SHALL ALLOCATE 24 MAN HOURS TO BE USED IN HANGING PHOTO ART WITH APPROVED FASTENERS, BOLTING DOWN EQUIPMENT AS NEEDED TO FLOORS AND WALLS, I.E. DRESSERS, CROCK POTS, REFRIGERATORS, ETC. AND MISC. ITEMS WHICH THE CENTER DIRECTORS NEED TO HAVE PERMANENTLY ATTACHED TO WALLS FOR FLAT SURFACES.
- 2. SEE INTERIOR ELEVATIONS FOR ANY ADDITIONAL CASEWORK OR EQUIPMENT NOT SHOWN ON THIS PLAN.
- 3. SEE A-6.0 FOR ADDITIONAL DIMENSIONING OF CASEWORK.
- 4. CONTRACTOR SHALL COORDINATE ALL TRADES TO ENSURE THERE ARE NO OUTLETS, INTERCOMS, SWITCHES, THERMOSTATS, ETC. LOCATED IN ANY DISPLAY BOARD (P).
- 5. PROVIDE WOOD BLOCKING FOR ALL WALL MOUNTED FIXTURES, AND EQUIPMENT.
- 6. ALL WORK TABLES, SINKS, TILE, MILLWORK, ETC. TO BE CONTINUOUSLY CAULKED AT EDGES.
- 7. REFER TO ENLARGED PLANS FOR EXTENT OF CASEWORK AND EQUIPMENT IN RESTROOMS.

OF CONNEC

06/28/20

InSite

RCHITECTS
7710 Detroit Avenue, Lakewood, Ohio 44107

VERNON, CT

VOV, CI

ILLE RD.

295 TALCOTTVILLE RD.
THESE DOCUMENTS CONT

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DATE TYPE

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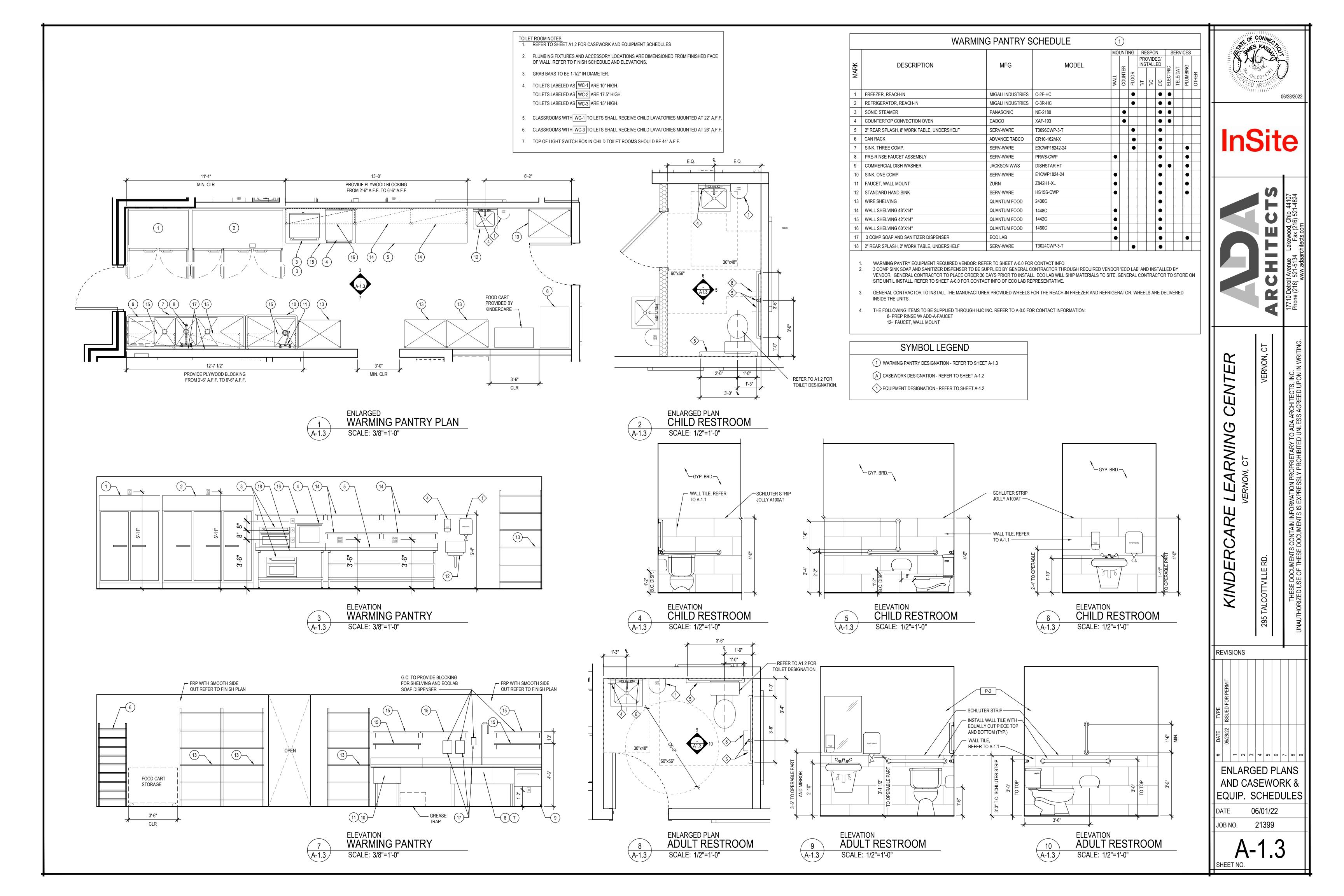
CASEWORK AND EQUIPMENT PLAN

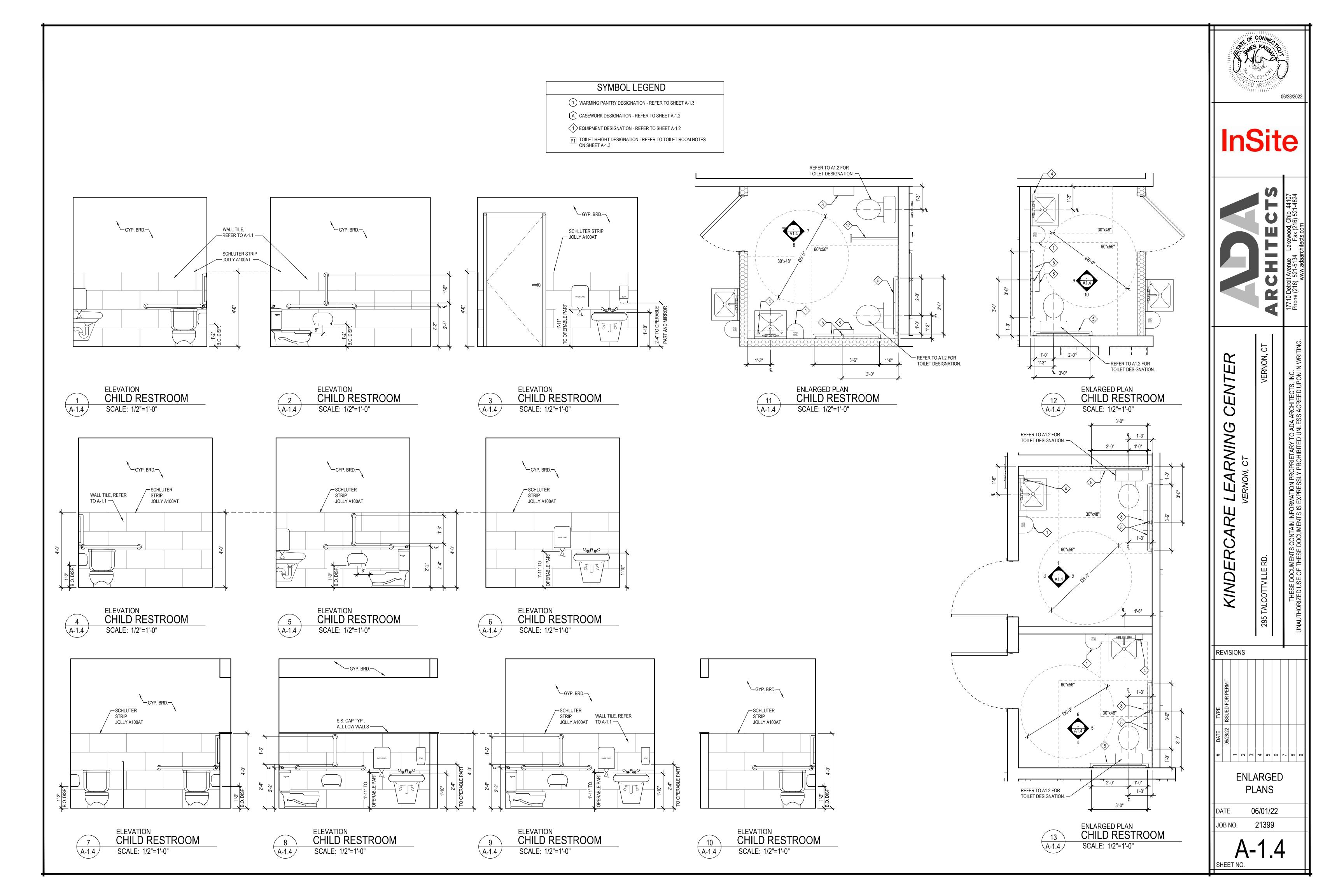
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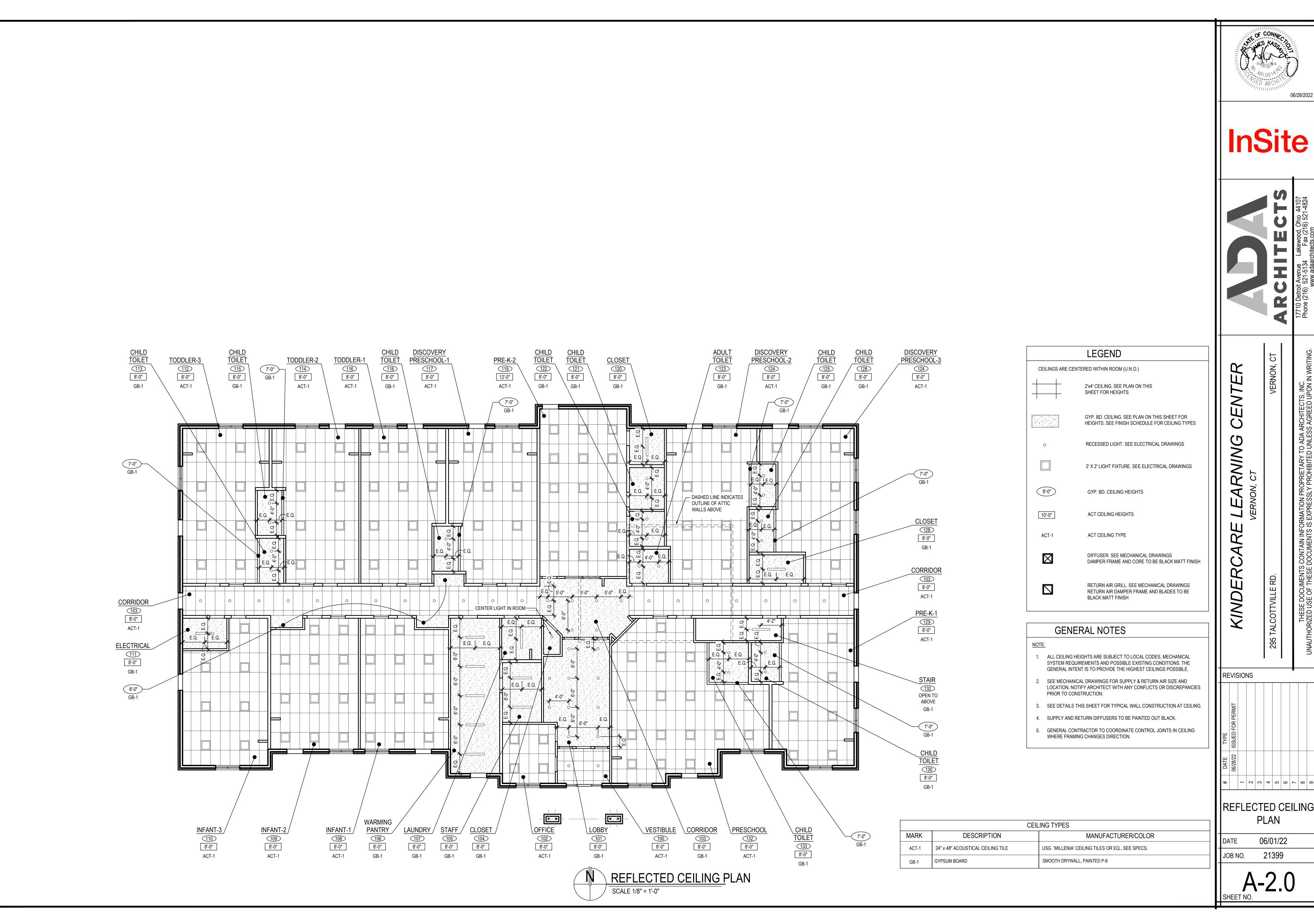
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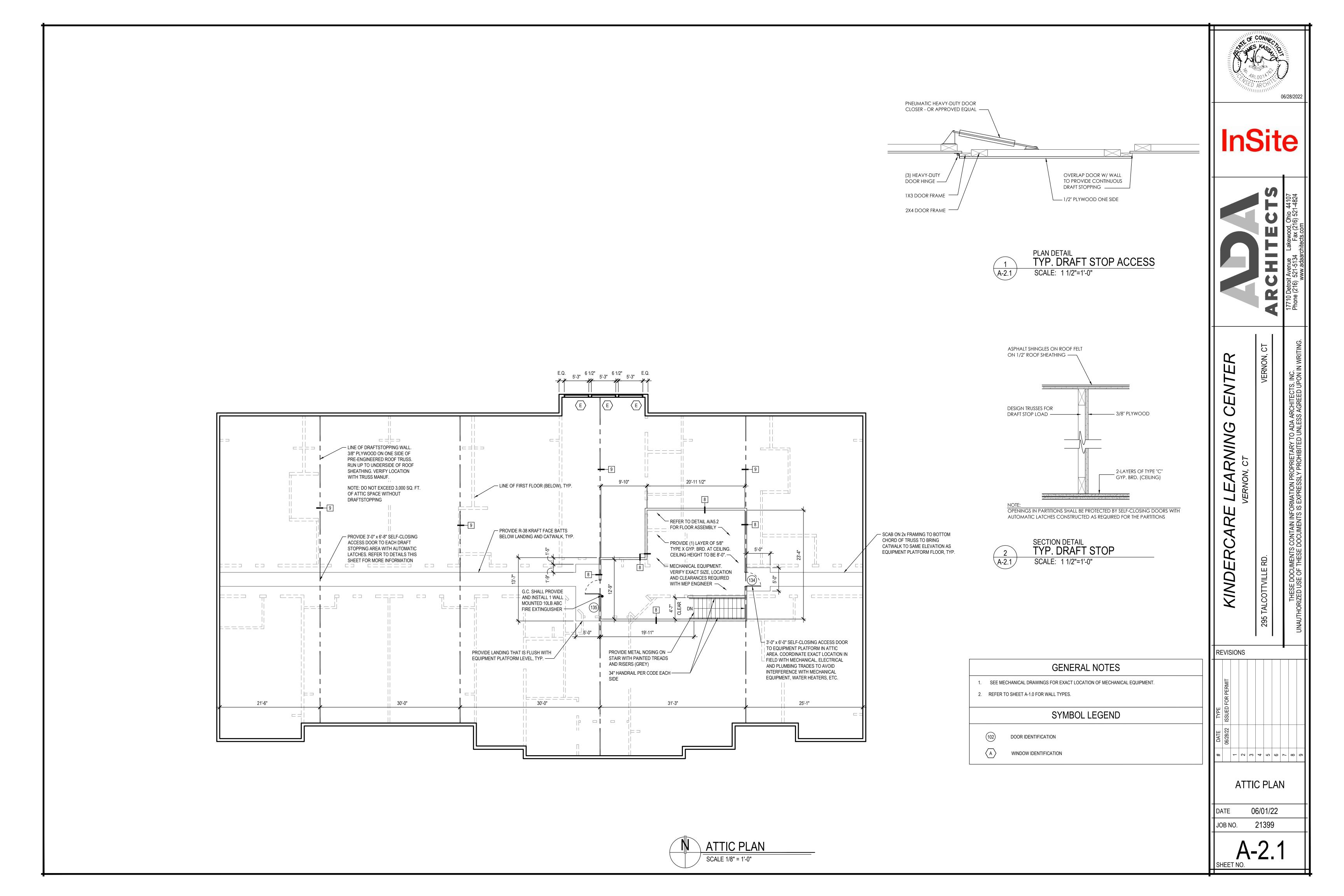
A-1.2

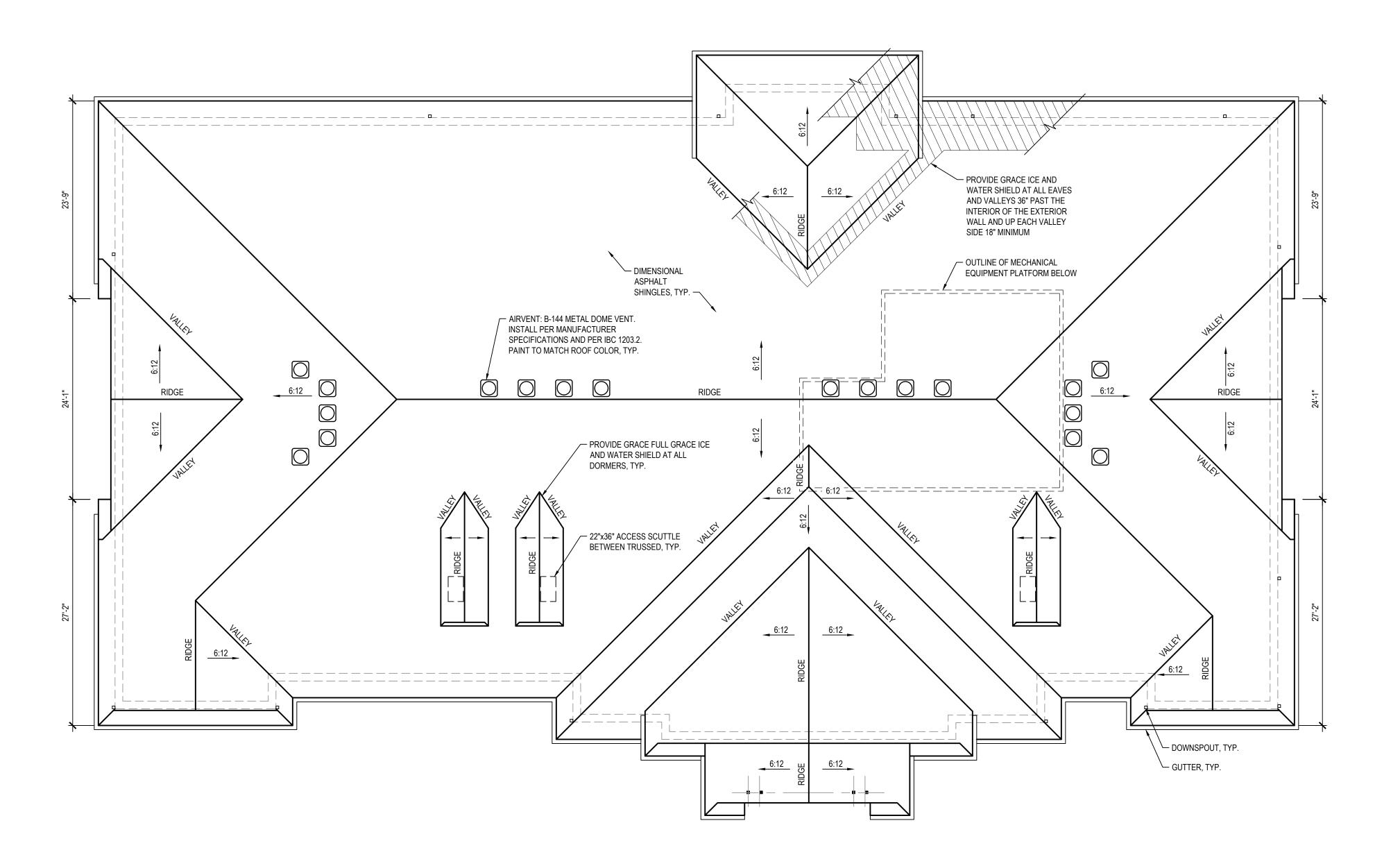




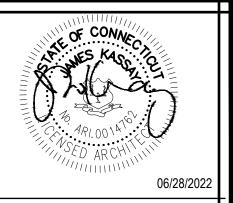








ROOF PLAN



# InSite

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EARNING CE

KINDERCARE LEARN
VERNON, CT

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ROOF PLAN

DATE 06/01/22

JOB NO. 21399

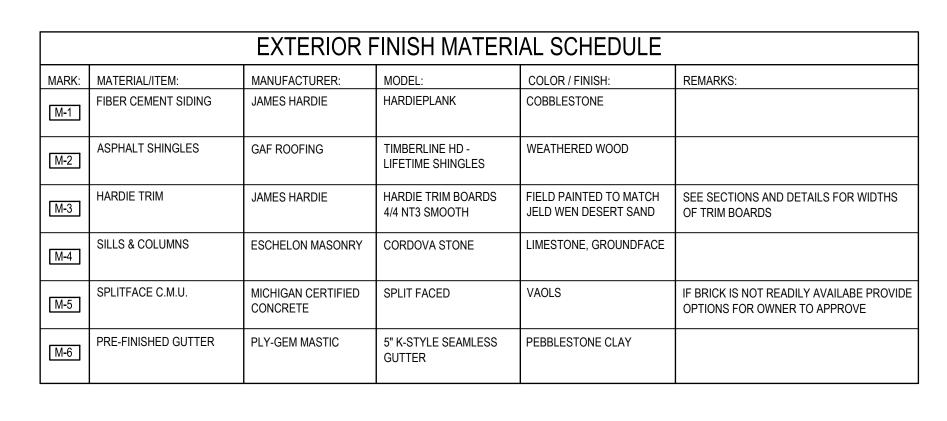
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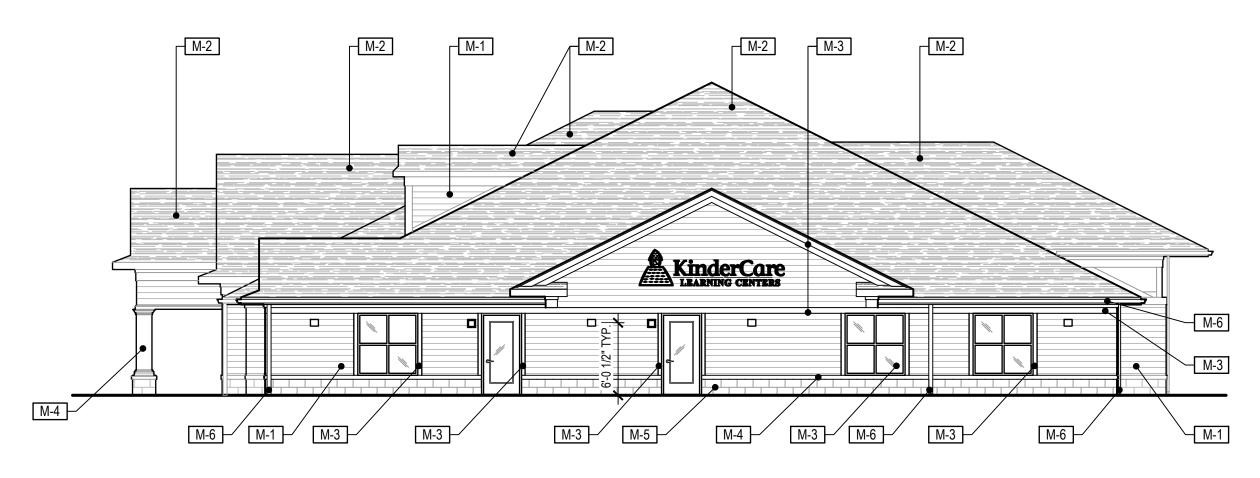
## GENERAL NOTES

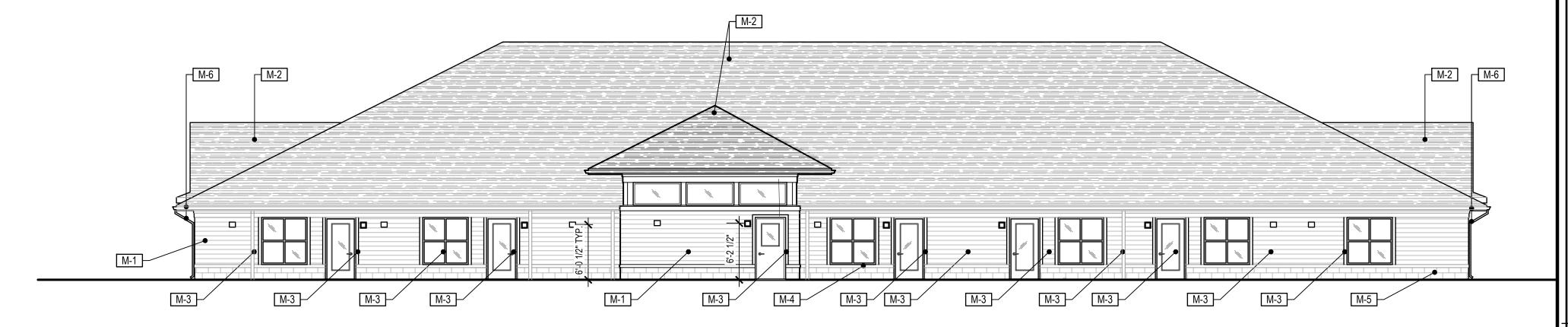
- DO NOT SCALE DRAWING
- 2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO CROSS-CHECK THE M.E.P. DRAWINGS WITH THE ARCHITECTURAL DRAWING PRIOR TO THE ORDERING / INSTALLATION OF MECHANICAL, ELECTRICAL AND PLUMBING WORK. ANY DISCREPANCIES BETWEEN THE ARCHITECTURAL AND M.E.P. DRAWINGS SHALL BE BROUGHT TO THE
- ARCHITECTS' ATTENTION FOR IMMEDIATE CLARIFICATION.

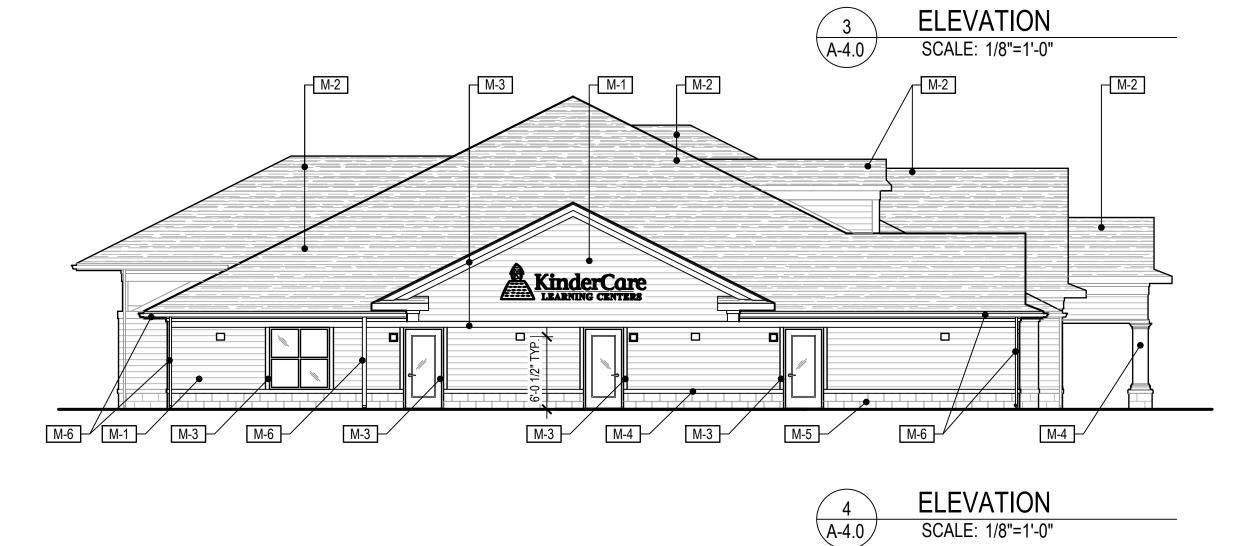
  3. ALL CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE STATE, CITY AND LOCAL CODES AND ORDINANCES IN THE LOCATION OF THE PROJECT.
- 4. SEE CONSTRUCTION SPECIFICATIONS FOR FLASHING NOTES.
- FLASH ALL ROOF PENETRATIONS AS REQUIRED AND PER CODE.
   LOCATE ALL PLUMBING STACKS AT REAR ROOF PLANE. VERIFY THAN NO VENTS ARE VISIBLE FROM THE STREET.
- PROVIDE PRE-FINISHED METAL DRIP EDGE AT ALL ROOF EAVES AND RAKES.
   PROVIDE PRE-FINISHED 6" ALUMINUM GUTTERS AND DOWNSPOUTS (MECHANICALLY FASTENED). COORDINATE DOWNSPOUT LOCATIONS WITH OWNER AND CIVIL ENGINEER IN FIELD.

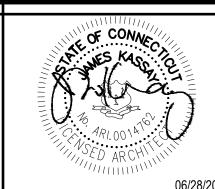










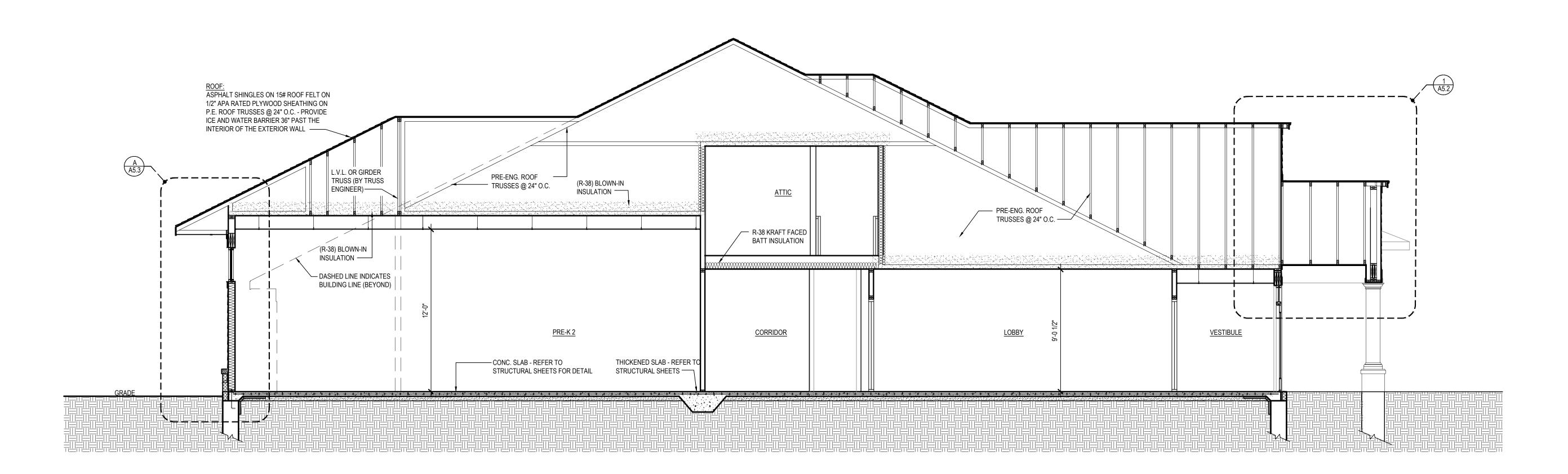


ELEARNING VERNON, CT KINDERCARE

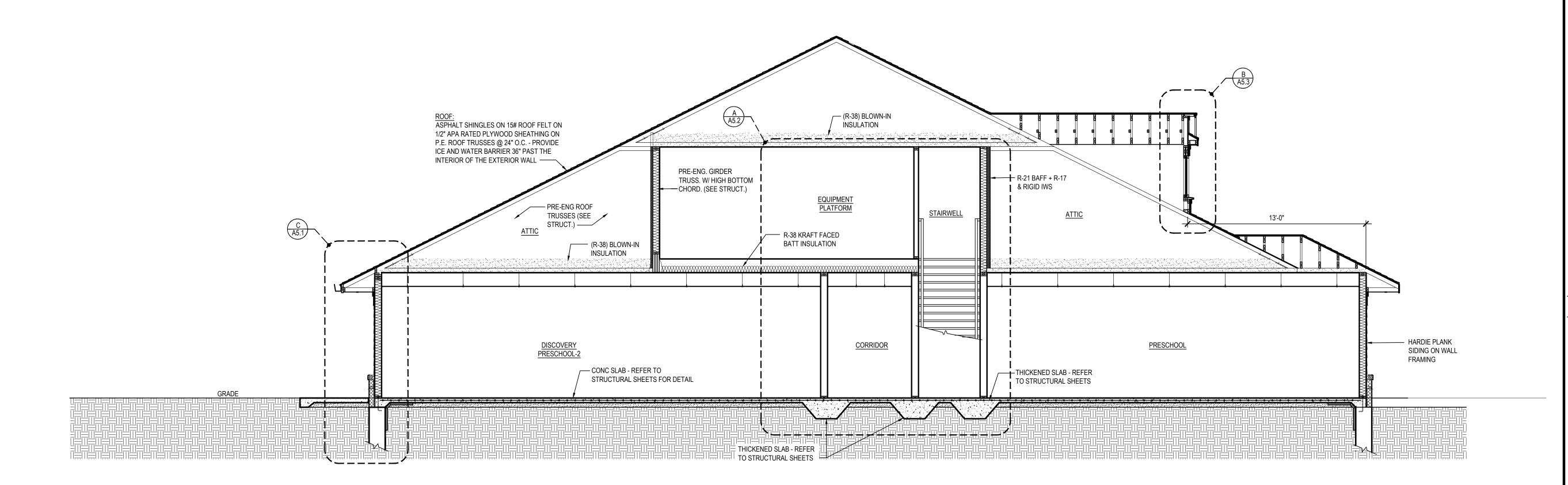
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 -</t **EXTERIOR ELEVATIONS** 06/01/22

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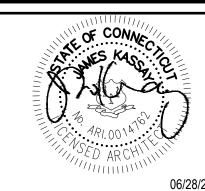
**A-4.0** SHEET NO.







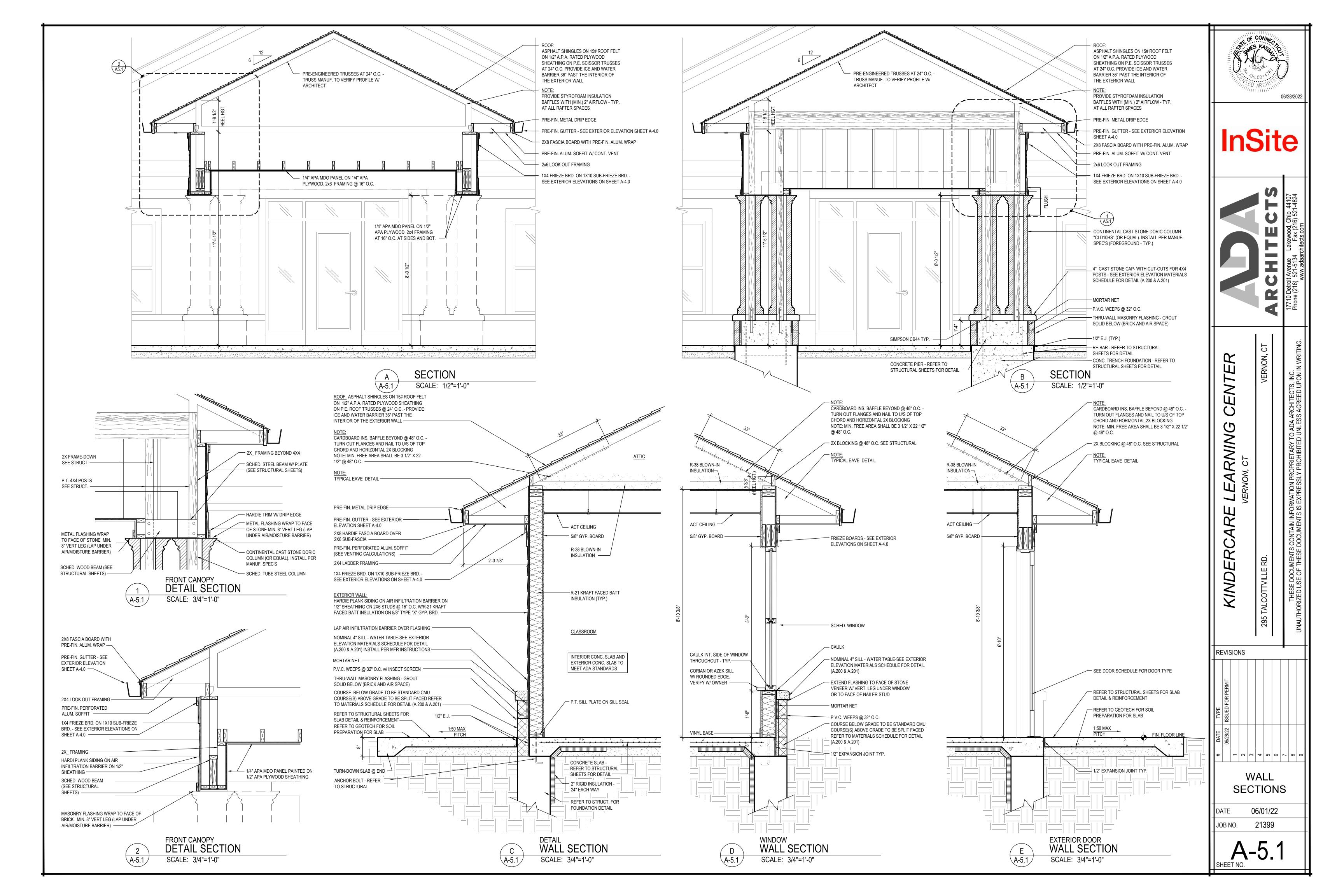


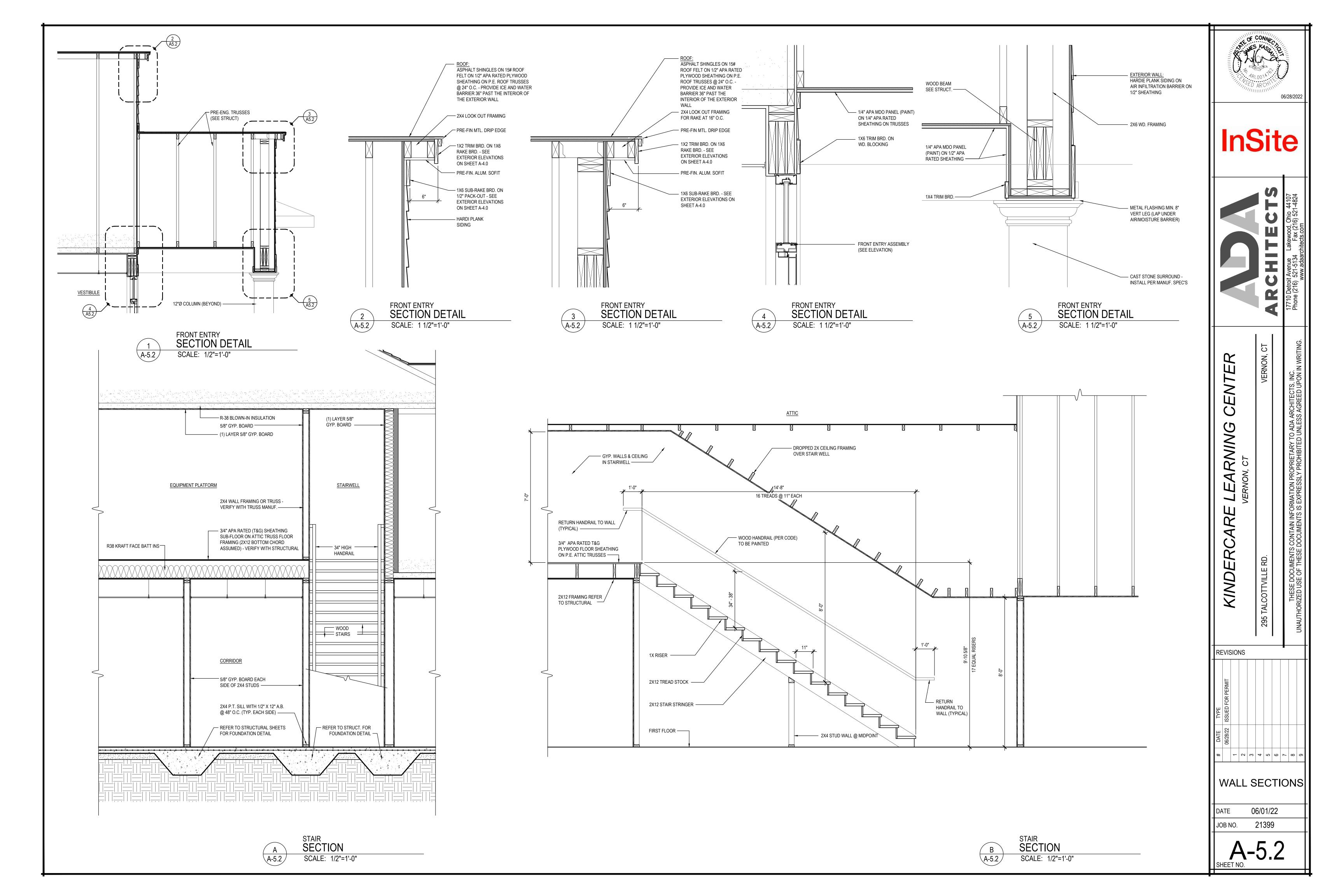


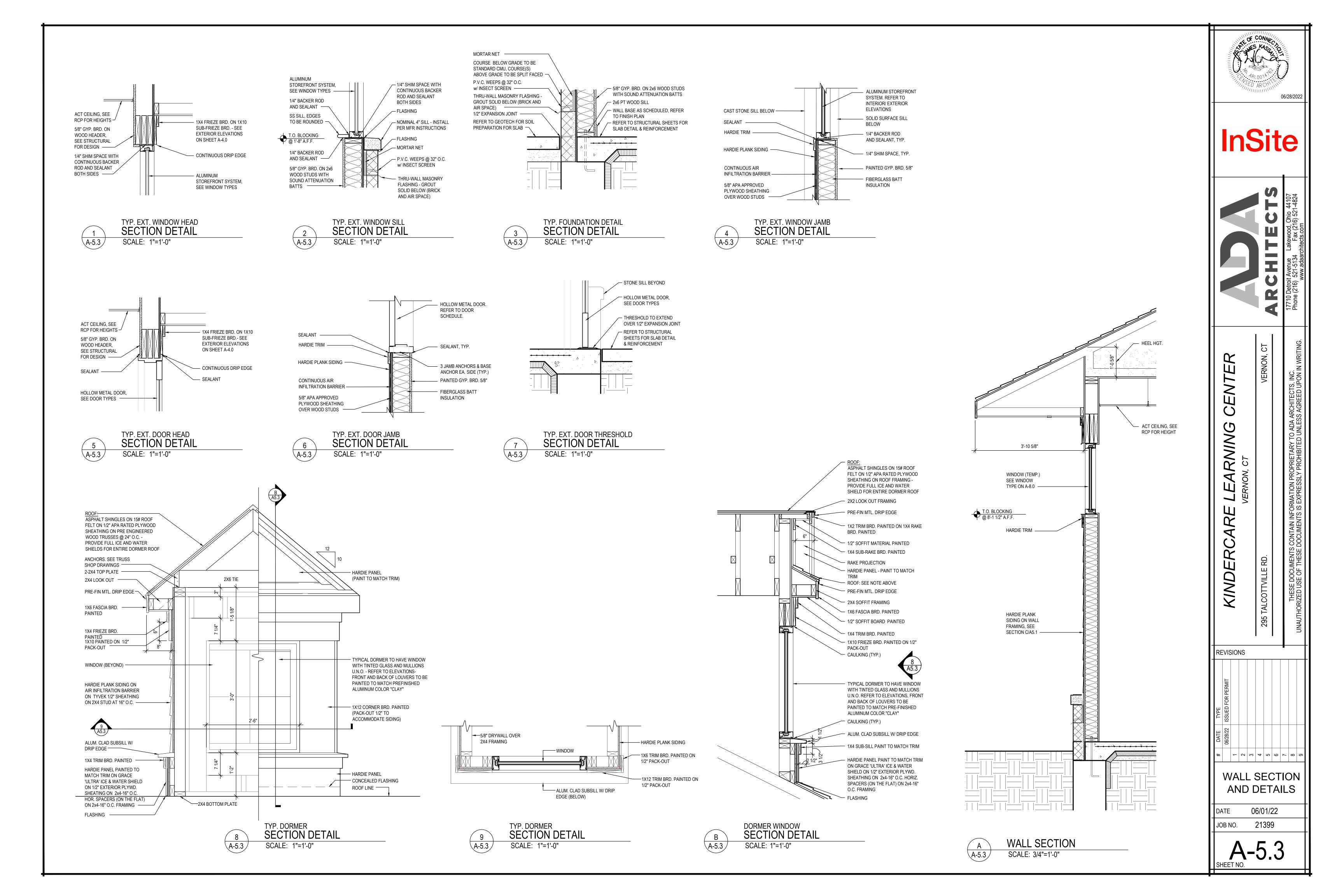
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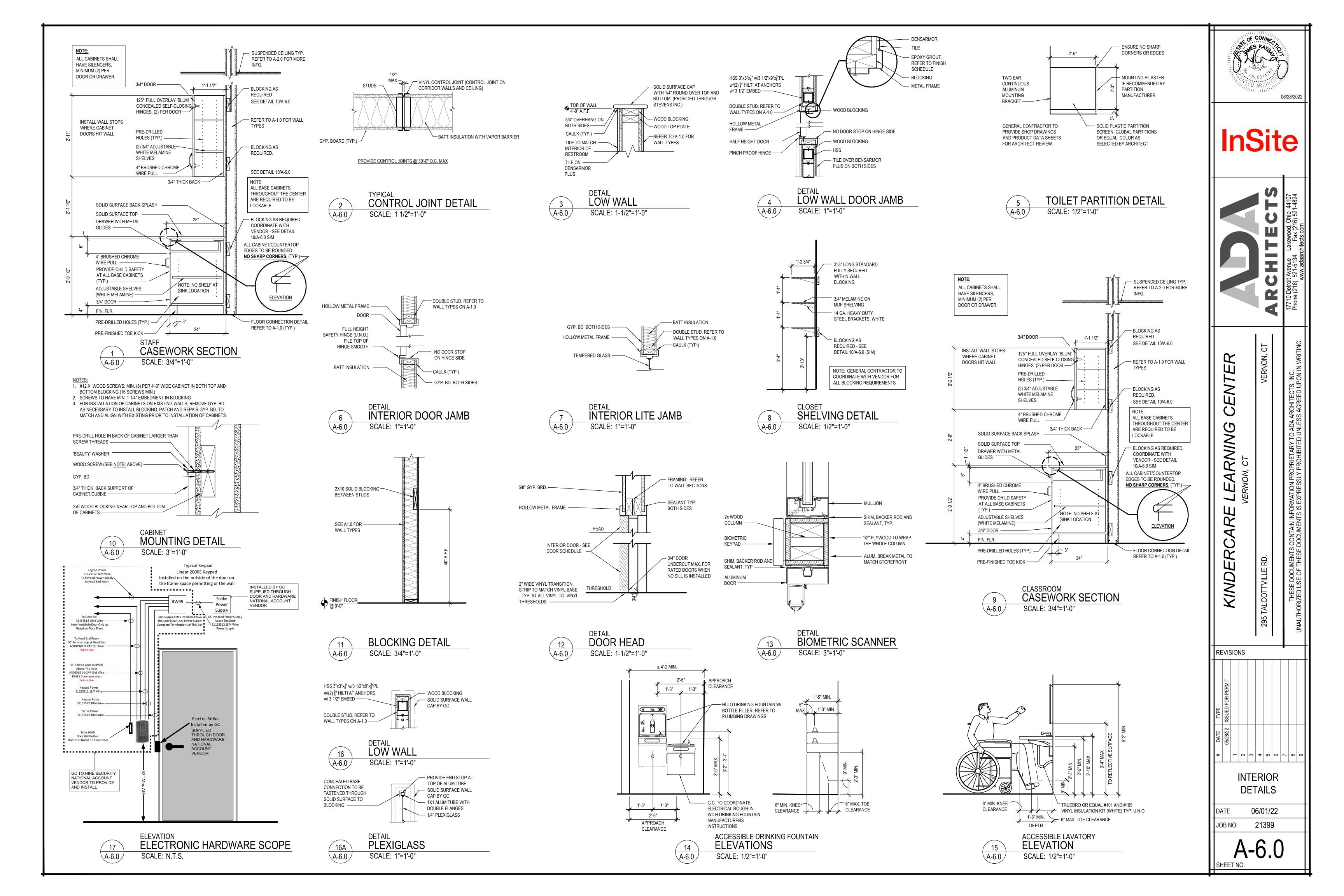
BUILDING SECTIONS

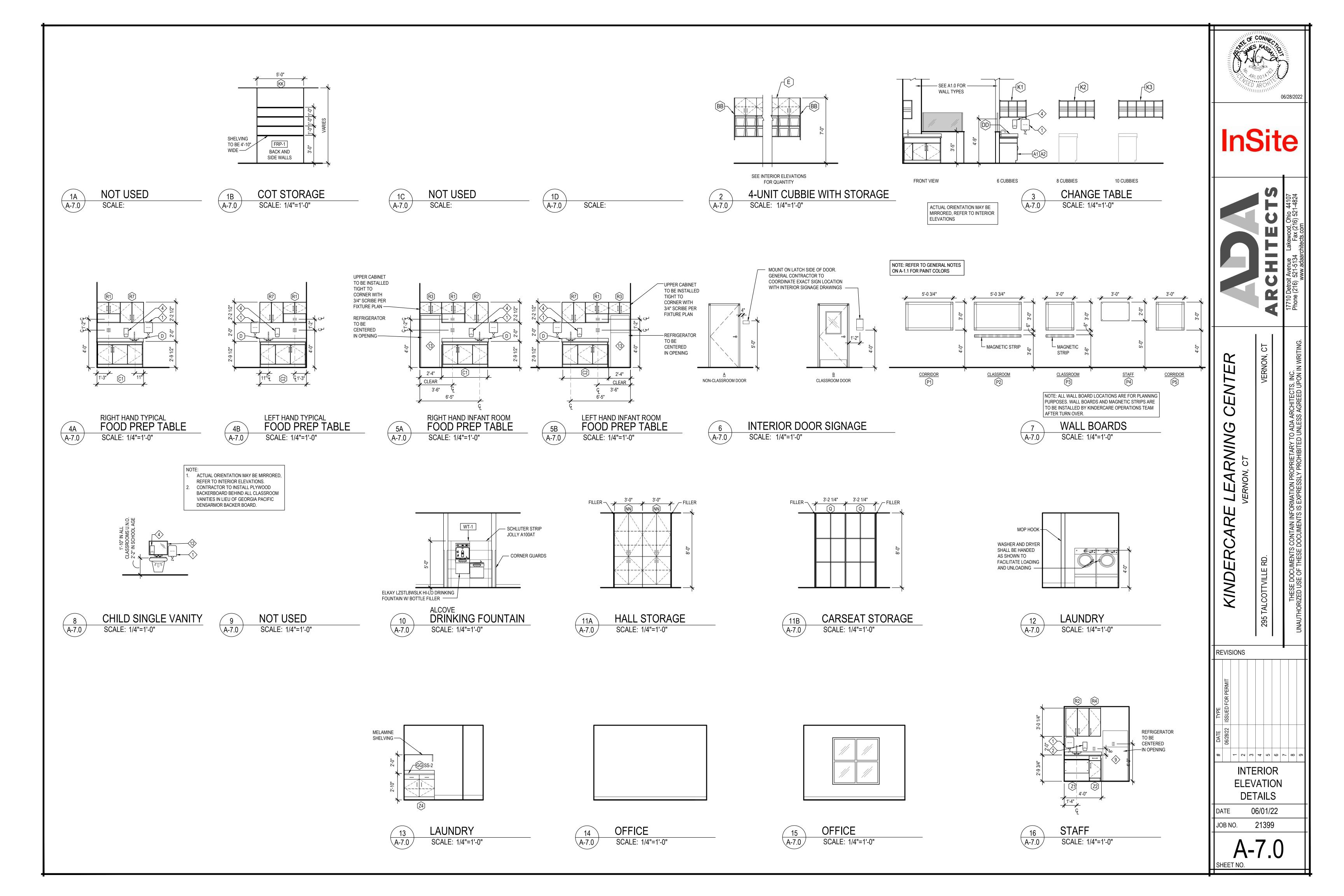
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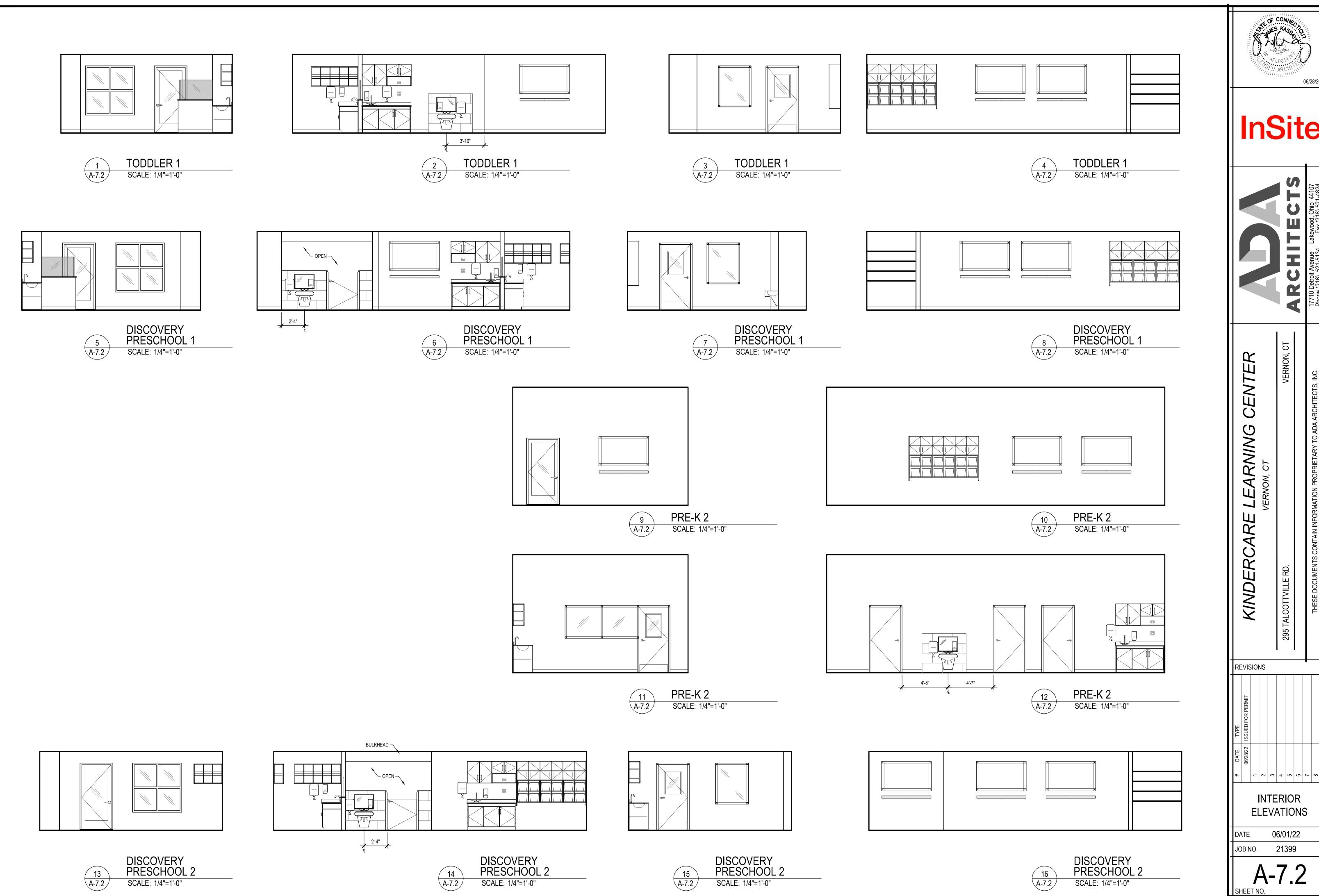


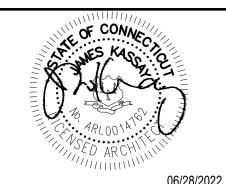








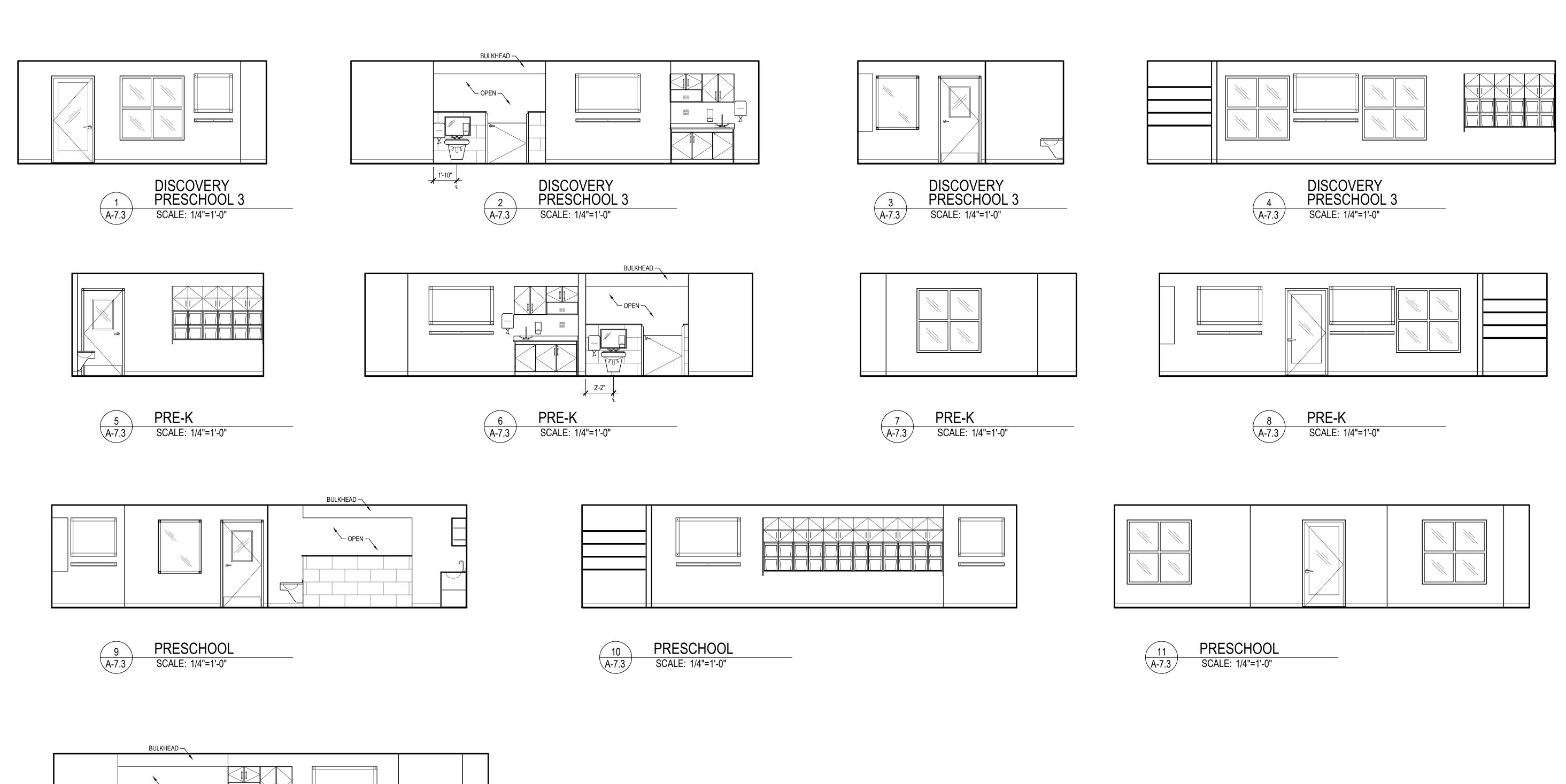


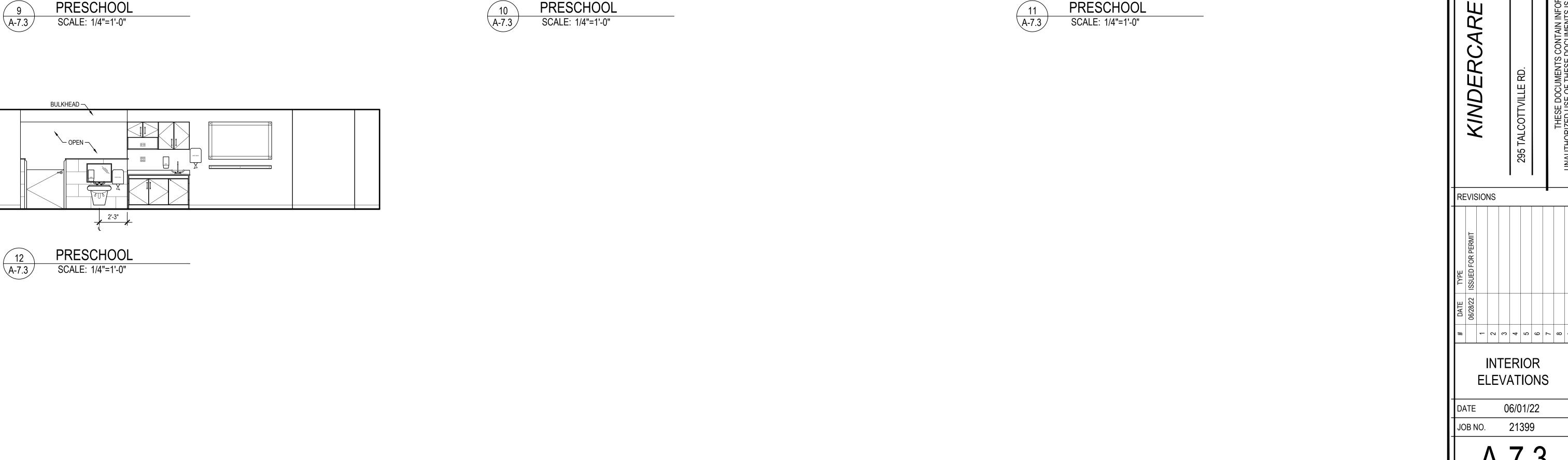


INTERIOR **ELEVATIONS** 

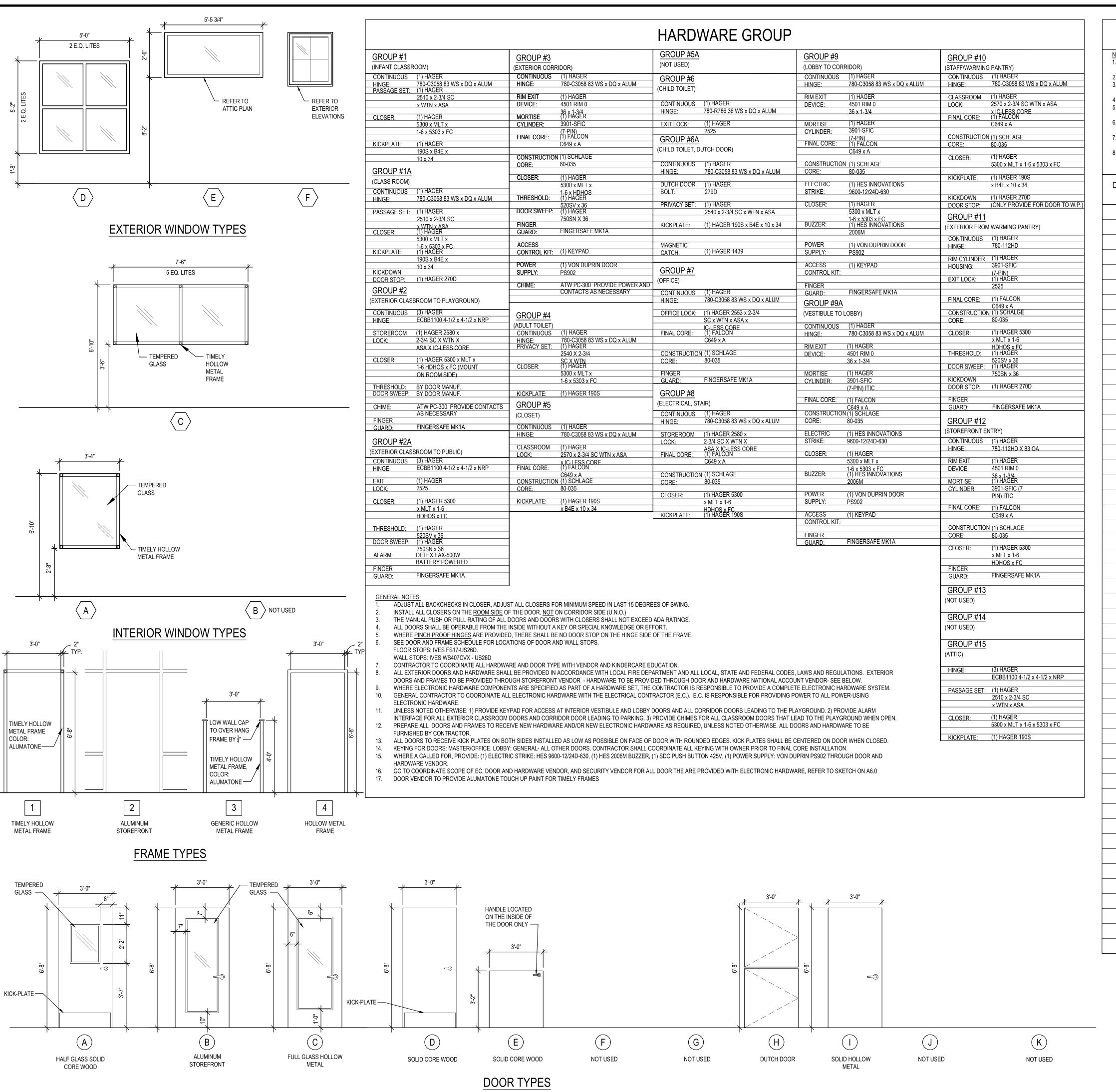
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A-7.2





E LEARNING VERNON, CT



### DOOR AND FRAME SCHEDULE

PER THE AHJ.

EGRESS DOORS WITH LOCKS SHALL ALSO INCLUDE A READILY VISIBLE SIGN STATING "THIS DOOR TO REMAIN UNLOCKED WHEN

BUILDING IS OCCUPIED." SIGN SHALL BE IN ONE INCH LETTERS ON CONTRASTING BACKGROUND. 2. ALL EXTERIOR DOORS TO HAVE HINGES WITH NON-REMOVABLE PINS (NRP).

3. EXIT DOORS THAT ARE NOT ACCESSIBLE TO PERSONS WITH DISABILITIES TO BE PROVIDED WITH A SIGN STATING 'NOT ACCESSIBLE TO PERSONS WITH DISABILITIES'.

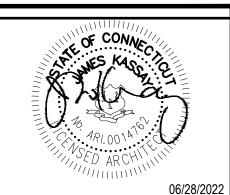
4. MAXIMUM EFFORT TO OPERATE DOORS SHALL NOT EXCEED 5 POUNDS FOR BOTH INTERIOR AND EXTERIOR DOORS.

5. ALL FIRE DOORS TO HAVE SELF OR AUTOMATIC CLOSERS AND COMPLY WITH SMOKE AND DRAFT ASSEMBLY REQUIREMENTS

6. GENERAL CONTRACTOR TO VERIFY RATINGS OF ALL EXISTING DOORS AND MAINTAIN. NEW HARDWARE MAY NOT CHANGE THE EXISTING RATING OF ANY DOORS.

WHERE PINCH PROOF HINGES ARE SPECIFIED, DOORS SHALL BE MANUFACTURED TO ACCOMMODATE THE HINGE SIZE. FIELD CUTTING OF DOORS IS NOT PERMITTED.

DOOR	DOOR	DC	OOR	FR	AME	_ HARDWARE	  HEAD/JAMB	DOOR STO
NO.	TYPE	MAT'L	FINISH	TYPE	MAT'L	GROUP	DETAIL	REQ'D
100A	В	ALUM/ GL.	CLEAR ANOD.	2	ALUM.	12	4/A5.2	-
100B	Α	S.C. WOOD	PRE-FINISHED	1	H.M.	9A	6&12/A6.0	FLOOR
101	А	S.C. WOOD	PRE-FINISHED	1	H.M.	9	6&12/A6.0	FLOOR
102	А	S.C. WOOD	PRE-FINISHED	1	H.M.	7	6&12/A6.0	WALL
103A	С	H.M. /INSUL.	PAINTED	4	H.M.	3	5&6/A5.3	-
103B	С	H.M. /INSUL.	PAINTED	4	H.M.	3	5&6/A5.3	-
104	D	S.C. WOOD	PRE-FINISHED	1	H.M.	5	6&12/A6.0	-
106A	А	S.C. WOOD	PRE-FINISHED	1	H.M.	10	6&12/A6.0	FLOOR
106B	С	H.M. /INSUL.	PAINTED	4	H.M.	11	5&6/A5.3	-
107	D	S.C. WOOD	PRE-FINISHED	1	H.M.	10	6&12/A6.0	WALL
108A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1	6&12/A6.0	WALL
108B	С	H.M. /INSUL.	PAINTED	4	H.M.	2A	5&6/A5.3	-
109A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1	6&12/A6.0	WALL
109B	C	H.M. /INSUL.	PAINTED	4	H.M.	2A	5&6/A5.3	
110A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1	6&12/A6.0	WALL
110B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	
111	D	S.C. WOOD	PRE-FINISHED	1	H.M.	8	6&12/A6.0	WALL
112A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	FLOOR
112B	C	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
113	E	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
		S.C. WOOD	PRE-FINISHED					
114A	A			1	H.M.	1A	6&12/A6.0	FLOOR
114B	C	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
115	E	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
116A	Α	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	FLOOR
116B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
117A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	FLOOR
117B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
118	Е	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
119A	Α	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	WALL
119B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
120	D	S.C. WOOD	PRE-FINISHED	1	H.M.	5	6&12/A6.0	WALL
121	Н	S.C. WOOD	PRE-FINISHED	1	H.M.	6A	6&12/A6.0	FLOOR
122	Н	S.C. WOOD	PRE-FINISHED	1	H.M.	6A	6&12/A6.0	FLOOR
123	D	S.C. WOOD	PRE-FINISHED	1	H.M.	4	6&12/A6.0	WALL
124A	Α	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	FLOOR
124B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
125	E	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
126	D	S.C. WOOD	PRE-FINISHED	1	H.M.	5	6&12/A6.0	-
127A	А	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	WALL
127B	С	H.M. /INSUL.	PAINTED	4	H.M.	2	5&6/A5.3	-
128	E	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
129A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	
129B	С	H.M. /INSUL.	PAINTED	4	H.M.	2A	5&6/A5.3	-
130	E	S.C. WOOD	PRE-FINISHED	3	H.M.	6	4/A6.0	FLOOR
131	D	S.C. WOOD	PRE-FINISHED	1	H.M.	8	6&12/A6.0	-
132A	A	S.C. WOOD	PRE-FINISHED	1	H.M.	1A	6&12/A6.0	WALL
132A 132B	C	H.M. /INSUL.	PAINTED	4	H.M.	2A	5&6/A5.3	-
			PRE-FINISHED	3		6 6	4/A6.0	
133	E	S.C. WOOD			H.M.			WALL
134	ļ	H.M. /INSUL.	PAINTED	4	H.M.	15	-	-





REVISIONS - 2 8 4 5 9 V X

> DOOR AND WINDOW **SCHEDULES**

06/01/22 21399 JOB NO.

PART 1 - GENERAL 1.1 SUMMARY

A. SECTION INCLUDES:

- PROJECT INFORMATION.
- WORK COVERED BY CONTRACT DOCUMENTS.
- PHASED CONSTRUCTION.
- 4. ACCESS TO SITE. 5. COORDINATION WITH OCCUPANTS.
- 6. TENANT-FURNISHED PRODUCTS.
- WORK RESTRICTIONS.
- RELATED REQUIREMENTS:
- 1. SECTION 015000 "TEMPORARY FACILITIES AND CONTROLS" FOR LIMITATIONS AND PROCEDURES GOVERNING TEMPORARY USE OF OWNER'S FACILITIES.
- 1.2 PROJECT INFORMATION
- A. PROJECT IDENTIFICATION: KCE
- PROJECT LOCATION: VERNON, CT
- TENANT: KINDERCARE EDUCATION
- CONTACT: DESIGN & CONSTRUCTION
- ARCHITECT: ADA ARCHITECTS, INC.
- CONTACT: JIM KASSAY
- CONTRACTOR: TO BE DETERMINED.
- PROJECT WEB SITE: A PROJECT WEB SITE ADMINISTERED BY ARCHITECT WILL BE
- USED FOR PURPOSES OF MANAGING COMMUNICATION AND DOCUMENTS DURING THE CONSTRUCTION STAGE.
- 1.3 WORK COVERED BY CONTRACT DOCUMENTS
- . THE WORK OF PROJECT IS DEFINED BY THE CONTRACT DOCUMENTS AND CONSISTS OF THE FOLLOWING:
- 1. FILL-IN:
- a. BUILDING USE GROUP: E
- b. CONSTRUCTION TYPE: V-B c. AREA: 10,000 SF
- TYPE OF CONTRACT.
- PROJECT WILL BE CONSTRUCTED UNDER A SINGLE PRIME CONTRACT.
- 1.4 PHASED CONSTRUCTION
- THE WORK SHALL BE CONDUCTED IN SINGLE PHASE.
- 1.5 ACCESS TO SITE
- . GENERAL: CONTRACTOR SHALL HAVE FULL USE OF PROJECT SITE FOR CONSTRUCTION OPERATIONS DURING CONSTRUCTION PERIOD. CONTRACTOR'S USE OF PROJECT SITE IS LIMITED ONLY BY OWNER'S RIGHT TO PERFORM WORK OR TO RETAIN OTHER CONTRACTORS ON PORTIONS OF PROJECT.
- USE OF SITE: LIMIT USE OF PROJECT SITE TO WORK IN AREAS INDICATED. DO NOT DISTURB PORTIONS OF PROJECT SITE BEYOND AREAS IN WHICH THE WORK IS INDICATED.
- 1. DRIVEWAYS, WALKWAYS AND ENTRANCES: KEEP DRIVEWAYS LOADING AREAS, AND ENTRANCES SERVING PREMISES CLEAR AND AVAILABLE TO OWNER, OWNER'S EMPLOYEES, AND EMERGENCY VEHICLES AT ALL TIMES. DO NOT USE THESE AREAS FOR PARKING OR STORAGE OF MATERIALS
  - a. SCHEDULE DELIVERIES TO MINIMIZE USE OF DRIVEWAYS AND ENTRANCES BY CONSTRUCTION OPERATIONS.
- b. SCHEDULE DELIVERIES TO MINIMIZE SPACE AND TIME REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT ON-SITE.
- CONDITION OF EXISTING BUILDING: MAINTAIN PORTIONS OF EXISTING BUILDING AFFECTED BY CONSTRUCTION OPERATIONS IN A WEATHER TIGHT CONDITION THROUGHOUT CONSTRUCTION PERIOD. REPAIR DAMAGE CAUSED BY CONSTRUCTION OPERATIONS.
- 1.6 COORDINATION WITH OCCUPANTS
- A. FULL OWNER OCCUPANCY: OWNER WILL OCCUPY SITE AND EXISTING AND ADJACENT BUILDING(S) DURING ENTIRE CONSTRUCTION PERIOD. COOPERATE WITH OWNER DURING CONSTRUCTION OPERATIONS TO MINIMIZE CONFLICTS AND FACILITATE OWNER USAGE. PERFORM THE WORK SO AS NOT TO INTERFERE WITH OWNER'S DAY-TO-DAY OPERATIONS. MAINTAIN EXISTING EXITS UNLESS OTHERWISE INDICATED.
  - MAINTAIN ACCESS TO EXISTING WALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT WALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM OWNER AND APPROVAL OF AUTHORITIES HAVING
  - 2. NOTIFY OWNER NOT LESS THAN 72 HOURS IN ADVANCE OF ACTIVITIES THAT WILL AFFECT OWNER'S OPERATIONS.
- TENANT FURNISHED PRODUCTS
- A. TENANT WILL FURNISH PRODUCTS INDICATED. THE WORK INCLUDES RECEIVING, UNLOADING, HANDLING, STORING, PROTECTING, AND INSTALLING
- TENANT-FURNISHED PRODUCTS AND MAKING BUILDING SERVICES CONNECTIONS.
- TENANT-FURNISHED PRODUCTS: MISCELLANEOUS LOOSE FURNISHINGS
- PHONE HARDWARE
- 3. CAMERA WIRING/HARDWARE 1.8 WORK RESTRICTIONS
- . WORK RESTRICTIONS, GENERAL: COMPLY WITH RESTRICTIONS ON CONSTRUCTION OPERATIONS.
- 1. COMPLY WITH LIMITATIONS ON USE OF PUBLIC STREETS AND WITH OTHER REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- ON-SITE WORK HOURS: LIMIT WORK IN THE EXISTING BUILDING TO NORMAL BUSINESS WORKING HOURS OF 8:00 A.M. TO 4:00 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE INDICATED.
- EXISTING UTILITY INTERRUPTIONS: DO NOT INTERRUPT UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING

CONDITIONS AND THEN ONLY AFTER PROVIDING TEMPORARY UTILITY SERVICES

AVOID DELIVERIES AT PEAK DROP-OFF AND PICK-UP TIMES OR AS DIRECTED BY

- ACCORDING TO REQUIREMENTS INDICATED: 1. NOTIFY OWNER NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED UTILITY
- 2. OBTAIN OWNER'S WRITTEN PERMISSION BEFORE PROCEEDING WITH UTILITY INTERRUPTIONS.
- NOISE, VIBRATION, AND ODORS: COORDINATE OPERATIONS THAT MAY RESULT IN HIGH LEVELS OF NOISE AND VIBRATION, ODORS, OR OTHER DISRUPTION TO OWNER OCCUPANCY WITH OWNER.
- 1. NOTIFY OWNER NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED DISRUPTIVE OPERATIONS.

CONTROLLED SUBSTANCES: USE OF TOBACCO PRODUCTS AND OTHER CONTROLLED

SUBSTANCES ON PROJECT SITE IS NOT PERMITTED.

2. OBTAIN OWNER'S WRITTEN PERMISSION BEFORE PROCEEDING WITH DISRUPTIVE OPERATIONS.

- PART 2 -PRODUCTS (NOT USED) EXECUTION (NOT USED) END OF SECTION 011000

### SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

1.1 SUMMARY

- A. SECTION INCLUDES ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR DOCUMENTING THE PROGRESS OF CONSTRUCTION DURING PERFORMANCE OF THE WORK, INCLUDING THE FOLLOWING:
  - CONTRACTOR'S CONSTRUCTION SCHEDULE.
  - CONSTRUCTION SCHEDULE UPDATING REPORTS.
  - DAILY CONSTRUCTION REPORTS.
  - 4. SITE CONDITION REPORTS.
- B. RELATED REQUIREMENTS:
- 1.2 DEFINITIONS A. CPM: CRITICAL PATH METHOD, WHICH IS A METHOD OF PLANNING AND SCHEDULING A CONSTRUCTION PROJECT WHERE ACTIVITIES ARE ARRANGED BASED ON ACTIVITY RELATIONSHIPS. NETWORK CALCULATIONS DETERMINE WHEN ACTIVITIES CAN BE PERFORMED AND THE CRITICAL PATH OF PROJECT.
- 1.3 INFORMATIONAL SUBMITTALS
- A. FORMAT FOR SUBMITTALS: SUBMIT REQUIRED SUBMITTALS IN THE FOLLOWING FORMAT:
- 1. WORKING ELECTRONIC COPY OF SCHEDULE FILE, WHERE INDICATED.
- PDF ELECTRONIC FILE. B. CONTRACTOR'S CONSTRUCTION SCHEDULE: INITIAL SCHEDULE, OF SIZE REQUIRED
- TO DISPLAY ENTIRE SCHEDULE FOR ENTIRE CONSTRUCTION PERIOD. 1. SUBMIT A WORKING ELECTRONIC COPY OF SCHEDULE, USING SOFTWARE A. ELECTRIC SERVICE: COMPLY WITH NECA, NEMA, AND UL STANDARDS AND INDICATED, AND LABELED TO COMPLY WITH REQUIREMENTS FOR SUBMITTALS.
- INCLUDE TYPE OF SCHEDULE (INITIAL OR UPDATED) AND DATE ON LABEL C. CONSTRUCTION SCHEDULE UPDATING REPORTS: SUBMIT WITH APPLICATIONS FOR
- PAYMENT. D. DAILY CONSTRUCTION REPORTS: SUBMIT AT WEEKLY INTERVALS WITH FULL PHOTOS.
- E. SITE CONDITION REPORTS: SUBMIT AT TIME OF DISCOVERY OF DIFFERING CONDITIONS.
- 1.4 COORDINATION
- A. COORDINATE CONTRACTOR'S CONSTRUCTION SCHEDULE WITH THE SCHEDULE OF VALUES, LIST OF SUBCONTRACTS, SUBMITTAL SCHEDULE, PROGRESS REPORTS, PAYMENT REQUESTS, AND OTHER REQUIRED SCHEDULES AND REPORTS.
  - 1. SECURE TIME COMMITMENTS FOR PERFORMING CRITICAL ELEMENTS OF THE WORK FROM ENTITIES INVOLVED.
- 2. COORDINATE EACH CONSTRUCTION ACTIVITY IN THE NETWORK WITH OTHER ACTIVITIES AND SCHEDULE THEM IN PROPER SEQUENCE.
- PRODUCTS
- 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)
- A. GANTT-CHART SCHEDULE: SUBMIT A COMPREHENSIVE, FULLY DEVELOPED, HORIZONTAL, GANTT-CHART-TYPE, CONTRACTOR'S CONSTRUCTION SCHEDULE WITHIN 30 DAYS OF DATE ESTABLISHED FOR THE NOTICE TO PROCEED.
- B. PREPARATION: INDICATE EACH SIGNIFICANT CONSTRUCTION ACTIVITY SEPARATELY
- IDENTIFY FIRST WORKDAY OF EACH WEEK WITH A CONTINUOUS VERTICAL LINE. 1. FOR CONSTRUCTION ACTIVITIES THAT REQUIRE THREE MONTHS OR LONGER TO COMPLETE, INDICATE AN ESTIMATED COMPLETION PERCENTAGE IN 10
- PERCENT INCREMENTS WITHIN TIME BAR. 2.2 REPORTS
- A. DAILY CONSTRUCTION REPORTS: PREPARE A DAILY CONSTRUCTION REPORT
- RECORDING THE FOLLOWING INFORMATION CONCERNING EVENTS AT PROJECT SITE:
- LIST OF SUBCONTRACTORS AT PROJECT SITE.
- LIST OF SEPARATE CONTRACTORS AT PROJECT SITE. 3. APPROXIMATE COUNT OF PERSONNEL AT PROJECT SITE.
- 4. EQUIPMENT AT PROJECT SITE.
- MATERIAL DELIVERIES
- 6. HIGH AND LOW TEMPERATURES AND GENERAL WEATHER CONDITIONS, INCLUDING PRESENCE OF RAIN OR SNOW.
- 7. ACCIDENTS.
- 8. MEETINGS AND SIGNIFICANT DECISIONS.
- UNUSUAL EVENTS.
- 10. STOPPAGES, DELAYS, SHORTAGES, AND LOSSES. 11. METER READINGS AND SIMILAR RECORDINGS.
- 12. EMERGENCY PROCEDURES.
- 13. ORDERS AND REQUESTS OF AUTHORITIES HAVING JURISDICTION.
- 14. CHANGE ORDERS RECEIVED AND IMPLEMENTED.
- 15. CONSTRUCTION CHANGE DIRECTIVES RECEIVED AND IMPLEMENTED. 16. SERVICES CONNECTED AND DISCONNECTED
- 17. EQUIPMENT OR SYSTEM TESTS AND STARTUPS.
- PARTIAL COMPLETIONS AND OCCUPANCIES.
- 19. SUBSTANTIAL COMPLETIONS AUTHORIZED
- 20. PHOTOS. B. SITE CONDITION REPORTS: IMMEDIATELY ON DISCOVERY OF A DIFFERENCE BETWEEN SITE CONDITIONS AND THE CONTRACT DOCUMENTS, PREPARE AND SUBMIT A DETAILED REPORT. SUBMIT WITH A REQUEST FOR INFORMATION. INCLUDE A DETAILED DESCRIPTION OF THE DIFFERING CONDITIONS, TOGETHER WITH

RECOMMENDATIONS FOR CHANGING THE CONTRACT DOCUMENTS.

EXECUTION

RESPONSIBILITY.

- 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE
- A. CONTRACTOR'S CONSTRUCTION SCHEDULE UPDATING: AT MONTHLY INTERVALS, UPDATE SCHEDULE TO REFLECT ACTUAL CONSTRUCTION PROGRESS AND ACTIVITIES. ISSUE SCHEDULE ONE WEEK BEFORE EACH REGULARLY SCHEDULED PROGRESS MEETING.
- 1. REVISE SCHEDULE IMMEDIATELY AFTER EACH MEETING OR OTHER ACTIVITY WHERE REVISIONS HAVE BEEN RECOGNIZED OR MADE. ISSUE UPDATED SCHEDULE CONCURRENTLY WITH THE REPORT OF EACH SUCH MEETING.
- 2. INCLUDE A REPORT WITH UPDATED SCHEDULE THAT INDICATES EVERY CHANGE, INCLUDING, BUT NOT LIMITED TO, CHANGES IN LOGIC, DURATIONS, ACTUAL STARTS AND FINISHES, AND ACTIVITY DURATIONS.

3. AS THE WORK PROGRESSES, INDICATE FINAL COMPLETION PERCENTAGE FOR

- EACH ACTIVITY. B. DISTRIBUTION: DISTRIBUTE COPIES OF APPROVED SCHEDULE TO ARCHITECT, OWNER, SEPARATE CONTRACTORS, TESTING AND INSPECTING AGENCIES, AND OTHER PARTIES IDENTIFIED BY CONTRACTOR WITH A NEED-TO-KNOW SCHEDULE
  - 1. POST COPIES IN PROJECT MEETING ROOMS AND TEMPORARY FIELD OFFICES.
  - 2. WHEN REVISIONS ARE MADE, DISTRIBUTE UPDATED SCHEDULES TO THE SAME PARTIES AND POST IN THE SAME LOCATIONS. DELETE PARTIES FROM DISTRIBUTION WHEN THEY HAVE COMPLETED THEIR ASSIGNED PORTION OF

THE WORK AND ARE NO LONGER INVOLVED IN PERFORMANCE OF CONSTRUCTION ACTIVITIES.

END OF SECTION 013200

### **SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS**

GENERAL

- 1.1 SUMMARY A. SECTION INCLUDES REQUIREMENTS FOR TEMPORARY UTILITIES, SUPPORT FACILITIES, AND SECURITY AND PROTECTION FACILITIES.
- B. RELATED REQUIREMENTS: 1. SECTION 011000 "SUMMARY" FOR WORK RESTRICTIONS AND LIMITATIONS ON
  - UTILITY INTERRUPTIONS.
- 1.2 USE CHARGES A. GENERAL: INSTALLATION AND REMOVAL OF AND USE CHARGES FOR TEMPORARY FACILITIES SHALL BE INCLUDED IN THE CONTRACT SUM UNLESS OTHERWISE INDICATED. ALLOW OTHER ENTITIES TO USE TEMPORARY SERVICES AND FACILITIES WITHOUT COST, INCLUDING, BUT NOT LIMITED TO, OWNER'S CONSTRUCTION FORCES, ARCHITECT, OCCUPANTS OF PROJECT, TESTING AGENCIES, AND AUTHORITIES HAVING JURISDICTION.
- B. WATER AND SEWER SERVICE FROM EXISTING SYSTEM: WATER FROM OWNER'S EXISTING WATER SYSTEM IS AVAILABLE FOR USE WITHOUT METERING AND WITHOUT PAYMENT OF USE CHARGES. PROVIDE CONNECTIONS AND EXTENSIONS OF SERVICES AS REQUIRED FOR CONSTRUCTION OPERATIONS.
- C. ELECTRIC POWER SERVICE FROM EXISTING SYSTEM: ELECTRIC POWER FROM OWNER'S EXISTING SYSTEM IS AVAILABLE FOR USE WITHOUT METERING AND WITHOUT PAYMENT OF USE CHARGES. PROVIDE CONNECTIONS AND EXTENSIONS OF SERVICES AS REQUIRED FOR CONSTRUCTION OPERATIONS.
- REGULATIONS FOR TEMPORARY ELECTRIC SERVICE. INSTALL SERVICE TO COMPLY WITH NFPA 70.
- B. TESTS AND INSPECTIONS: ARRANGE FOR AUTHORITIES HAVING JURISDICTION TO TEST AND INSPECT EACH TEMPORARY UTILITY BEFORE USE. OBTAIN REQUIRED CERTIFICATIONS AND PERMITS.

C. ACCESSIBLE TEMPORARY EGRESS: COMPLY WITH APPLICABLE PROVISIONS IN THE

U.S. ARCHITECTURAL & TRANSPORTATION BARRIERS COMPLIANCE BOARD'S ADA-ABA

ACCESSIBILITY GUIDELINES AND ICC/ANSI A117.1. PRODUCTS

1.3 QUALITY ASSURANCE

- PART 2 -2.1 MATERIALS
- A. CHAIN-LINK FENCING: MINIMUM 2-INCH, 0.148-INCH-THICK, GALVANIZED-STEEL CHAIN-LINK FABRIC FENCING; MINIMUM 6 FEET HIGH WITH GALVANIZED-STEEL PIPE POSTS; MINIMUM 2-3/8-INCH-OD LINE POSTS AND 2-7/8-INCH-OD CORNER AND PULL
- POSTS, WITH 1-5/8-INCH-OD TOP RAILS. B. PORTABLE CHAIN-LINK FENCING: MINIMUM 2-INCH, 0.148-INCH-THICK, GALVANIZED-STEEL, CHAIN-LINK FABRIC FENCING; MINIMUM 6 FEET HIGH WITH GALVANIZED-STEEL PIPE POSTS; MINIMUM 2-3/8-INCH-OD LINE POSTS AND 2-7/8-INCH-OD CORNER AND PULL POSTS, WITH 1-5/8-INCH-OD TOP AND BOTTOM RAILS. PROVIDE GALVANIZED-STEEL BASES FOR SUPPORTING POSTS.
- 2.2 TEMPORARY FACILITIES A. FIELD OFFICES, GENERAL: PREFABRICATED OR MOBILE UNITS WITH SERVICEABLE FINISHES, TEMPERATURE CONTROLS, AND FOUNDATIONS ADEQUATE FOR NORMAL
- LOADING.
- A. FIRE EXTINGUISHERS: PORTABLE, UL RATED; WITH CLASS AND EXTINGUISHING AGENT AS REQUIRED BY LOCATIONS AND CLASSES OF FIRE EXPOSURES.
- B.  $\,$  HVAC EQUIPMENT: UNLESS OWNER AUTHORIZES USE OF PERMANENT HVAC SYSTEN PROVIDE VENTED, SELF-CONTAINED, LIQUID-PROPANE-GAS OR FUEL-OIL HEATERS WITH INDIVIDUAL SPACE THERMOSTATIC CONTROL.
- 1. USE OF GASOLINE-BURNING SPACE HEATERS, OPEN-FLAME HEATERS, OR SALAMANDER-TYPE HEATING UNITS IS PROHIBITED. 2. HEATING UNITS: LISTED AND LABELED FOR TYPE OF FUEL BEING CONSUMED,
- BY A QUALIFIED TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED LOCATION AND APPLICATION. 3. PERMANENT HVAC SYSTEM: IF OWNER AUTHORIZES USE OF PERMANENT HVAC SYSTEM FOR TEMPORARY USE DURING CONSTRUCTION, PROVIDE FILTER WITH MERV OF 8 AT EACH RETURN-AIR GRILLE IN SYSTEM AND REMOVE AT END OF

CONSTRUCTION AND CLEAN HVAC SYSTEM AS REQUIRED IN SECTION 017700

- "CLOSEOUT PROCEDURES".
- EXECUTION
- 3.1 INSTALLATION, GENERAL A. LOCATE FACILITIES WHERE THEY WILL SERVE PROJECT ADEQUATELY AND RESULT IN MINIMUM INTERFERENCE WITH PERFORMANCE OF THE WORK. RELOCATE AND
- MODIFY FACILITIES AS REQUIRED BY PROGRESS OF THE WORK. B. PROVIDE EACH FACILITY READY FOR USE WHEN NEEDED TO AVOID DELAY. DO NOT REMOVE UNTIL FACILITIES ARE NO LONGER NEEDED OR ARE REPLACED BY
- AUTHORIZED USE OF COMPLETED PERMANENT FACILITIES.
- 3.2 TEMPORARY UTILITY INSTALLATION
- A. GENERAL: INSTALL TEMPORARY SERVICE OR CONNECT TO EXISTING SERVICE. 1. ARRANGE WITH UTILITY COMPANY, OWNER, AND EXISTING USERS FOR TIME WHEN SERVICE CAN BE INTERRUPTED, IF NECESSARY, TO MAKE CONNECTIONS
- FOR TEMPORARY SERVICES. B. SANITARY FACILITIES: PROVIDE TEMPORARY TOILETS, WASH FACILITIES, AND DRINKING WATER FOR USE OF CONSTRUCTION PERSONNEL. COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION FOR TYPE, NUMBER, LOCATION, OPERATION, AND MAINTENANCE OF FIXTURES AND FACILITIES.
- C. HEATING AND COOLING: PROVIDE TEMPORARY HEATING AND COOLING REQUIRED BY CONSTRUCTION ACTIVITIES FOR CURING OR DRYING OF COMPLETED INSTALLATIONS OR FOR PROTECTING INSTALLED CONSTRUCTION FROM ADVERSE EFFECTS OF LOW TEMPERATURES OR HIGH HUMIDITY. SELECT EQUIPMENT THAT WILL NOT HAVE A
- HARMFUL EFFECT ON COMPLETED INSTALLATIONS OR ELEMENTS BEING INSTALLED. D. VENTILATION AND HUMIDITY CONTROL: PROVIDE TEMPORARY VENTILATION REQUIRED BY CONSTRUCTION ACTIVITIES FOR CURING OR DRYING OF COMPLETED INSTALLATIONS OR FOR PROTECTING INSTALLED CONSTRUCTION FROM ADVERSE EFFECTS OF HIGH HUMIDITY. SELECT EQUIPMENT THAT WILL NOT HAVE A HARMFUL EFFECT ON COMPLETED INSTALLATIONS OR ELEMENTS BEING INSTALLED COORDINATE VENTILATION REQUIREMENTS TO PRODUCE AMBIENT CONDITION
- REQUIRED AND MINIMIZE ENERGY CONSUMPTION. E. ELECTRIC POWER SERVICE: CONNECT TO OWNER'S EXISTING ELECTRIC POWER
- SERVICE. MAINTAIN EQUIPMENT IN A CONDITION ACCEPTABLE TO OWNER. F. LIGHTING: PROVIDE TEMPORARY LIGHTING WITH LOCAL SWITCHING THAT PROVIDES ADEQUATE ILLUMINATION FOR CONSTRUCTION OPERATIONS, OBSERVATIONS, INSPECTIONS, AND TRAFFIC CONDITIONS.
- 3.3 SUPPORT FACILITIES INSTALLATION A. GENERAL: COMPLY WITH THE FOLLOWING: 1. PROVIDE CONSTRUCTION FOR TEMPORARY OFFICES, SHOPS, AND SHEDS

PROTECTION REQUIREMENTS WITHOUT OPERATING ENTIRE SYSTEM.

- LOCATED WITHIN CONSTRUCTION AREA OR WITHIN 30 FEET OF BUILDING LINES THAT IS NONCOMBUSTIBLE ACCORDING TO ASTM E 136. COMPLY WITH C. TEMPORARY FACILITY CHANGEOVER: DO NOT CHANGE OVER FROM USING
- 2. MAINTAIN SUPPORT FACILITIES UNTIL ARCHITECT SCHEDULES SUBSTANTIAL COMPLETION INSPECTION. REMOVE BEFORE SUBSTANTIAL COMPLETION. PERSONNEL REMAINING AFTER SUBSTANTIAL COMPLETION WILL BE PERMITTED TO USE PERMANENT FACILITIES, UNDER CONDITIONS ACCEPTABLE TO OWNER.
- B. PARKING: PROVIDE TEMPORARY PARKING AREAS FOR CONSTRUCTION PERSONNEL. C. WASTE DISPOSAL FACILITIES: PROVIDE WASTE-COLLECTION CONTAINERS IN SIZES ADEQUATE TO HANDLE WASTE FROM CONSTRUCTION OPERATIONS. COMPLY WITH
- REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- D. LIFTS AND HOISTS: PROVIDE FACILITIES NECESSARY FOR HOISTING MATERIALS AND PERSONNEL.

1. TRUCK CRANES AND SIMILAR DEVICES USED FOR HOISTING MATERIALS ARE

- CONSIDERED "TOOLS AND EQUIPMENT" AND NOT TEMPORARY FACILITIES. SECURITY AND PROTECTION FACILITIES INSTALLATION A. PROTECTION OF EXISTING FACILITIES: PROTECT EXISTING VEGETATION, EQUIPMENT
- STRUCTURES, UTILITIES, AND OTHER IMPROVEMENTS AT PROJECT SITE AND ON ADJACENT PROPERTIES, EXCEPT THOSE INDICATED TO BE REMOVED OR ALTERED. REPAIR DAMAGE TO EXISTING FACILITIES. B. ENVIRONMENTAL PROTECTION: PROVIDE PROTECTION, OPERATE TEMPORARY
- FACILITIES, AND CONDUCT CONSTRUCTION AS REQUIRED TO COMPLY WITH ENVIRONMENTAL REGULATIONS AND THAT MINIMIZE POSSIBLE AIR, WATERWAY, AND SUBSOIL CONTAMINATION OR POLLUTION OR OTHER UNDESIRABLE EFFECTS. C. SITE ENCLOSURE FENCE: BEFORE CONSTRUCTION OPERATIONS BEGIN, FURNISH
- AND INSTALL SITE ENCLOSURE FENCE IN A MANNER THAT WILL PREVENT PEOPLE AND ANIMALS FROM EASILY ENTERING SITE EXCEPT BY ENTRANCE GATES. 1. EXTENT OF FENCE: AS REQUIRED TO ENCLOSE ENTIRE PROJECT SITE OR
- D. TEMPORARY ENCLOSURES: PROVIDE TEMPORARY ENCLOSURES FOR PROTECTION OF CONSTRUCTION, IN PROGRESS AND COMPLETED, FROM EXPOSURE, FOUL
- WEATHER, OTHER CONSTRUCTION OPERATIONS, AND SIMILAR ACTIVITIES, PROVIDE TEMPORARY WEATHERTIGHT ENCLOSURE FOR BUILDING EXTERIOR. 1. WHERE HEATING OR COOLING IS NEEDED AND PERMANENT ENCLOSURE IS NOT
- COMPLETE, INSULATE TEMPORARY ENCLOSURES TEMPORARY PARTITIONS: PROVIDE FLOOR-TO-CEILING DUSTPROOF PARTITIONS TO LIMIT DUST AND DIRT MIGRATION AND TO SEPARATE AREAS OCCUPIED BY OWNER AND TENANTS FROM FUMES AND NOISE.
- 1. CONSTRUCT DUSTPROOF PARTITIONS WITH GYPSUM WALLBOARD WITH JOINTS A. GENERAL TAPED ON OCCUPIED SIDE, AND FIRE-RETARDANT-TREATED PLYWOOD ON CONSTRUCTION OPERATIONS SIDE.

2. WHERE FIRE-RESISTANCE-RATED TEMPORARY PARTITIONS ARE INDICATED OR

- ARE REQUIRED BY AUTHORITIES HAVING JURISDICTION, CONSTRUCT PARTITIONS ACCORDING TO THE RATED ASSEMBLIES. 3. INSULATE PARTITIONS TO CONTROL NOISE TRANSMISSION TO OCCUPIED
- AREAS. 4. SEAL JOINTS AND PERIMETER. EQUIP PARTITIONS WITH GASKETED DUSTPROOF
- DOORS AND SECURITY LOCKS WHERE OPENINGS ARE REQUIRED. PROTECT AIR-HANDLING EQUIPMENT 6. PROVIDE WALK-OFF MATS AT EACH ENTRANCE THROUGH TEMPORARY
- PARTITION. F. TEMPORARY FIRE PROTECTION: INSTALL AND MAINTAIN TEMPORARY FIRE-PROTECTION FACILITIES OF TYPES NEEDED TO PROTECT AGAINST REASONABLY PREDICTABLE AND CONTROLLABLE FIRE LOSSES. COMPLY WITH NFPA 241; MANAGE
- FIRE PREVENTION PROGRAM.
- 1. PROHIBIT SMOKING ON SITE. 2. SUPERVISE WELDING OPERATIONS, COMBUSTION-TYPE TEMPORARY HEATING UNITS, AND SIMILAR SOURCES OF FIRE IGNITION ACCORDING TO
- REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. 3. DEVELOP AND SUPERVISE AN OVERALL FIRE-PREVENTION AND -PROTECTION C. PROGRAM FOR PERSONNEL AT PROJECT SITE. REVIEW NEEDS WITH LOCAL FIRE DEPARTMENT AND ESTABLISH PROCEDURES TO BE FOLLOWED. INSTRUCT PERSONNEL IN METHODS AND PROCEDURES. POST WARNINGS AND
- 4. PROVIDE TEMPORARY STANDPIPES AND HOSES FOR FIRE PROTECTION. HANG HOSES WITH A WARNING SIGN STATING THAT HOSES ARE FOR FIRE-PROTECTION PURPOSES ONLY AND ARE NOT TO BE REMOVED. MATCH
- HOSE SIZE WITH OUTLET SIZE AND EQUIP WITH SUITABLE NOZZLES. 3.5 MOISTURE AND MOLD CONTROL A. CONTRACTOR'S MOISTURE PROTECTION PLAN: AVOID TRAPPING WATER IN FINISHED WORK. DOCUMENT VISIBLE SIGNS OF MOLD THAT MAY APPEAR DURING
- CONSTRUCTION. B. EXPOSED CONSTRUCTION PHASE: BEFORE INSTALLATION OF WEATHER BARRIERS, WHEN MATERIALS ARE SUBJECT TO WETTING AND EXPOSURE AND TO AIRBORNE MOLD SPORES, PROTECT MATERIALS FROM WATER DAMAGE AND KEEP POROUS AND

ORGANIC MATERIALS FROM COMING INTO PROLONGED CONTACT WITH CONCRETE.

C. PARTIALLY ENCLOSED CONSTRUCTION PHASE: AFTER INSTALLATION OF WEATHER

- BARRIERS BUT BEFORE FULL ENCLOSURE AND CONDITIONING OF BUILDING, WHEN INSTALLED MATERIALS ARE STILL SUBJECT TO INFILTRATION OF MOISTURE AND AMBIENT MOLD SPORES, PROTECT AS FOLLOWS: 1. DO NOT LOAD OR INSTALL DRYWALL OR OTHER POROUS MATERIALS OR 3.2 FINAL CLEANING
- ENCLOSED BUILDING.
- 2. KEEP INTERIOR SPACES REASONABLY CLEAN AND PROTECTED FROM WATER 3. DISCARD OR REPLACE WATER-DAMAGED AND WET MATERIAL
- 4. DISCARD, REPLACE, OR CLEAN STORED OR INSTALLED MATERIAL THAT BEGINS TO GROW MOLD. 5. PERFORM WORK IN A SEQUENCE THAT ALLOWS ANY WET MATERIALS ADEQUATE TIME TO DRY BEFORE ENCLOSING THE MATERIAL IN DRYWALL OR
- D. CONTROLLED CONSTRUCTION PHASE OF CONSTRUCTION: AFTER COMPLETING AND SEALING OF THE BUILDING ENCLOSURE BUT PRIOR TO THE FULL OPERATION OF PERMANENT HVAC SYSTEMS, MAINTAIN AS FOLLOWS:
- 1. CONTROL MOISTURE AND HUMIDITY INSIDE BUILDING BY MAINTAINING EFFECTIVE DRY-IN CONDITIONS. 2. REMOVE MATERIALS THAT CANNOT BE COMPLETELY RESTORED TO THEIR
- MINIMIZE WASTE AND ABUSE, LIMIT AVAILABILITY OF TEMPORARY FACILITIES TO ESSENTIAL AND INTENDED USES. 1. INSTALL AND OPERATE TEMPORARY LIGHTING THAT FULFILLS SECURITY AND B. MAINTENANCE: MAINTAIN FACILITIES IN GOOD OPERATING CONDITION UNTIL

MANUFACTURED MOISTURE LEVEL WITHIN 48 HOURS.

OTHER INTERIOR FINISHES.

3.6 OPERATION, TERMINATION, AND REMOVAL

1. MAINTAIN OPERATION OF TEMPORARY ENCLOSURES, HEATING, COOLING, HUMIDITY CONTROL, VENTILATION, AND SIMILAR FACILITIES ON A 24-HOUR BASIS WHERE REQUIRED TO ACHIEVE INDICATED RESULTS AND TO AVOID

A. SUPERVISION: ENFORCE STRICT DISCIPLINE IN USE OF TEMPORARY FACILITIES. TO

POSSIBILITY OF DAMAGE.

CANNOT BE SATISFACTORILY REPAIRED.

- TEMPORARY SECURITY AND PROTECTION FACILITIES TO PERMANENT FACILITIES UNTIL SUBSTANTIAL COMPLETION.
- D. TERMINATION AND REMOVAL: REMOVE EACH TEMPORARY FACILITY WHEN NEED FOR ITS SERVICE HAS ENDED, WHEN IT HAS BEEN REPLACED BY AUTHORIZED USE OF A PERMANENT FACILITY, OR NO LATER THAN SUBSTANTIAL COMPLETION. COMPLETE OR, IF NECESSARY, RESTORE PERMANENT CONSTRUCTION THAT MAY HAVE BEEN DELAYED BECAUSE OF INTERFERENCE WITH TEMPORARY FACILITY. REPAIR DAMAGED WORK, CLEAN EXPOSED SURFACES, AND REPLACE CONSTRUCTION THAT
  - MATERIALS AND FACILITIES THAT CONSTITUTE TEMPORARY FACILITIES ARE PROPERTY OF CONTRACTOR. OWNER RESERVES RIGHT TO TAKE POSSESSION OF PROJECT IDENTIFICATION SIGNS.
  - 2. AT SUBSTANTIAL COMPLETION, REPAIR, RENOVATE, AND CLEAN PERMANENT FACILITIES USED DURING CONSTRUCTION PERIOD. COMPLY WITH FINAL CLEANING REQUIREMENTS SPECIFIED IN SECTION 017700 "CLOSEOUT PROCEDURES."

#### END OF SECTION 015000

#### **SECTION 017100 - CLEANING**

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS,
- APPLY TO THIS SECTION.
- 1.2 SUMMARY THROUGHOUT THE CONSTRUCTION PERIOD, MAINTAIN THE BUILDINGS AND SITE PORTION DETERMINED SUFFICIENT TO ACCOMMODATE CONSTRUCTION
  - IN A STANDARD OF CLEANLINESS AS DESCRIBED IN THIS SECTION 1.3 QUALITY ASSURANCE
  - A. CONDUCT DAILY INSPECTION, AND MORE OFTEN IF NECESSARY, TO VERIFY THAT REQUIREMENTS FOR CLEANLINESS ARE BEING MET.

A. PROVIDE REQUIRED PERSONNEL, EQUIPMENT AND MATERIALS NEEDED TO

- 2.1 CLEANING MATERIALS AND EQUIPMENT
- MAINTAIN THE SPECIFIED STANDARD OF CLEANLINESS. PART 3 - EXECUTION

PART 2 - PRODUCTS

- 3.1 PROGRESS CLEANING 1. RETAIN STORED ITEMS IN AN ORDERLY ARRANGEMENT ALLOWING MAXIMUN ACCESS, NOT IMPEDING TRAFFIC OR DRAINAGE, AND PROVIDING REQUIRED
  - PROTECTION OF MATERIALS. DO NOT ALLOW ACCUMULATION OF SCRAP, DEBRIS, WASTE MATERIAL, AND
  - OTHER ITEMS NOT REQUIRED FOR CONSTRUCTION OF THIS WORK. AT LEAST ONCE EACH WEEK, AND MORE OFTEN IF NECESSARY COMPLETELY REMOVE ALL SCRAP, DEBRIS, AND WASTE MATERIAL FROM THE
- JOB SITE. 4. PROVIDE ADEQUATE STORAGE FOR ALL ITEMS AWAITING REMOVAL FROM THE JOB SITE, OBSERVING REQUIREMENTS FOR FIRE PROTECTION AND PROTECTION OF THE ECOLOGY.
- DAILY, AND MORE OFTEN IF NECESSARY, INSPECT THE SITE AND PICK UF ALL SCRAP, DEBRIS AND WASTE MATERIAL. REMOVE SUCH ITEMS TO THE PLACE DESIGNATED FOR THEIR STORAGE OR DISPOSAL.

2. WEEKLY, AND MORE OFTEN IF NECESSARY, INSPECT ALL ARRANGEMENTS OF

MATERIALS STORED ON THE SITE RESTACK, TIDY OR OTHERWISE SERVIC ARRANGEMENTS TO MEET THE REQUIREMENTS OF SUBPARAGRAPH 3.01-A-1

THE PLACE DESIGNATED FOR THEIR STORAGE.

- 3. MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION AT ALL TIMES. WEEKLY, AND MORE OFTEN IF NECESSARY, INSPECT THE STRUCTURES AND PICK UP ALL SCRAP, DEBRIS, AND WASTE MATERIAL. REMOVE SUCH ITEMS TO
- 2. WEEKLY AND MORE OFTEN IF NECESSARY, SWEEP INTERIOR SPACES CLEAN. "CLEAN", FOR THE PURPOSE OF THIS SUBPARAGRAPH, SHALL BE INTERPRETED AS MEANING FREE FROM DUST AND OTHER MATERIAL CAPABLE OF BEING REMOVED BY USE OF REASONABLE EFFORT AND A HAND-HELD BROOM. 3. AS REQUIRED PREPARATORY TO INSTALLATION OF SUCCEEDING MATERIALS

CLEAN THE STRUCTURES OR PERTINENT PORTIONS THEREOF TO THE DEGREE

OF CLEANLINESS RECOMMENDED BY THE MANUFACTURER OF THE

FINISH FLOOR MATERIAL. USE FLOOR PROTECTION AS NEEDED TO PROTECT

- SUCCEEDING MATERIAL, USING EQUIPMENT AND MATERIALS REQUIRED TO ACHIEVE THE NECESSARY CLEANLINESS. 4. FOLLOWING THE INSTALLATION OF FINISH FLOOR MATERIALS. CLEAN THE FINISH FLOOR DAILY (AND MORE OFTEN IF NECESSARY) AT ALL TIMES WHILE WORK IS BEING PERFORMED IN THE SPACE IN WHICH FINISH MATERIALS ARE BEING INSTALLED. "CLEAN", FOR THE PURPOSE OF THIS SUBPARAGRAPH SHALL BE INTERPRETED AS MEANING FREE FROM FOREIGN MATERIAL WHICH, IN THE OPINION OF THE ARCHITECT OR OWNER, MAY BE INJURIOUS TO THE
- INSTALLED FLOORING. COMPONENTS, OR ITEMS WITH HIGH ORGANIC CONTENT, INTO PARTIALLY A. "CLEAN", FOR THE PURPOSE OF THIS ARTICLE, AND EXCEPT AS MAY BE SPECIFICALLY PROVIDED OTHERWISE, SHALL BE INTERPRETED AS MEANING THE LEVEL OF

CLEANLINESS GENERALLY PROVIDED BY SKILLED CLEANERS USING COMMERCIAL

QUALITY BUILDING MAINTENANCE EQUIPMENT AND MATERIALS.

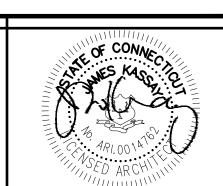
SURPLUS MATERIALS, EQUIPMENT, SCRAP, DEBRIS, AND WASTE. CONDUCT FINAL PROGRESS CLEANING AS DESCRIBED IN ARTICLE 3.01 ABOVE. C. SITE: UNLESS OTHERWISE SPECIFICALLY DIRECTED BY THE ARCHITECT, BROOM CLEAN PAVED AREAS ON THE SITE AND PUBLIC PAVED AREAS ADJACENT TO THE

B. PRIOR TO COMPLETION OF THE WORK, REMOVE FROM THE JOB SITE, ALL TOOLS,

- D. STRUCTURES:
  - 1. EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES, AND OTHER FOREIGN MATTER REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE. IN THE EVENT OF STUBBORN STAINS NOT REMOVABLE WITH WATER, THE ARCHITECT MAY REQUIRE LIGHT SANDBLASTING OR OTHER CLEANING AT NO ADDITIONAL COST TO THE OWNER.
  - OF SOIL, WASTE MATERIALS, SMUDGES, AND OTHER FOREIGN MATTER. REMOVE ALL TRACES OF SPLASHED MATERIAL FROM ADJACENT SURFACES REMOVE PAINT DRIPPINGS, SPOTS, STAINS AND DIRT FROM FINISHED

2. INTERIOR. VISUALLY INSPECT INTERIOR SURFACES AND REMOVE ALL TRACES

3. POLISHED SURFACES: TO SURFACES REQUIRING ROUTINE APPLICATION OF BUFFED POLISH, APPLY THE POLISH RECOMMENDED BY THE MANUFACTURER OF THE MATERIAL BEING POLISHED.



REVISIONS

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- SCHEDULE FINAL CLEANING AS APPROVED BY THE OWNER TO ENABLE THE ACCEPTANCE OF A COMPLETELY CLEAN WORK.
- COMPLETE THE FOLLOWING CLEANING OPERATIONS BEFORE REQUESTING INSPECTION FOR CERTIFICATION OF SUBSTANTIAL COMPLETION FOR ENTIRE PROJECT OR FOR A DESIGNATED PORTION OF PROJECT:
- 1.1. CLEAN PROJECT SITE, YARD, AND GROUNDS, IN AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, INCLUDING LANDSCAPE DEVELOPMENT AREAS, OF RUBBISH, WASTE MATERIAL, LITTER, AND OTHER FOREIGN SUBSTANCES.
- REMOVE TOOLS, CONSTRUCTION EQUIPMENT, MACHINERY, AND SURPLUS MATERIAL FROM PROJECT SITE.
- CLEAN EXPOSED EXTERIOR AND INTERIOR HARD-SURFACED FINISHES TO A DIRT-FREE CONDITION, FREE OF STAINS, FILMS, AND SIMILAR FOREIGN SUBSTANCES. AVOID DISTURBING NATURAL WEATHERING OF EXTERIOR SURFACES. RESTORE REFLECTIVE SURFACES TO THEIR ORIGINAL CONDITION.
- REMOVE DEBRIS AND SURFACE DUST FROM LIMITED ACCESS SPACES. INCLUDING ROOFS, PLENUMS, SHAFTS, TRENCHES. EQUIPMENT VAULTS, MANHOLES, ATTICS, AND SIMILAR SPACES.
- SWEEP CONCRETE FLOORS BROOM CLEAN IN UNOCCUPIED SPACES.
- VACUUM CARPET AND SIMILAR SOFT SURFACES, REMOVING DEBRIS AND EXCESS NAP; SHAMPOO IF VISIBLE SOIL OR STAINS REMAIN.
- CLEAN TRANSPARENT MATERIALS, INCLUDING MIRRORS AND GLASS IN DOORS AND WINDOWS. REMOVE GLAZING COMPOUNDS AND OTHER NOTICEABLE, VISION-OBSCURING MATERIALS. REPLACE CHIPPED OR BROKEN GLASS AND OTHER DAMAGED TRANSPARENT MATERIALS. POLISH MIRRORS AND GLASS, TAKING CARE NOT TO SCRATCH SURFACES.
- REMOVE LABELS THAT ARE NOT PERMANENT.
- TOUCH UP AND OTHERWISE REPAIR AND RESTORE MARRED, EXPOSED FINISHES AND SURFACES. REPLACE FINISHES AND SURFACES THAT CANNOT BE SATISFACTORILY REPAIRED OR RESTORED OR THAT ALREADY SHOW EVIDENCE OF REPAIR OR RESTORATION.
- 1.10. DO NOT PAINT OVER "UL" AND SIMILAR LABELS, INCLUDING MECHANICAL AND ELECTRICAL NAMEPLATES
- 1.11. WIPE SURFACES OF MECHANICAL AND ELECTRICAL EQUIPMENT AND SIMILAR EQUIPMENT. REMOVE EXCESS LUBRICATION, PAINT AND MORTAR DROPPINGS, AND OTHER FOREIGN SUBSTANCES.
- 1.12. REPLACE PARTS SUBJECT TO UNUSUAL OPERATING CONDITIONS.
- 1.13. CLEAN LIGHT FIXTURES, LAMPS, GLOBES, AND REFLECTORS TO FUNCTION WITH FULL EFFICIENCY. REPLACE BURNED-OUT BULBS, AND THOSE NOTICEABLY DIMMED BY HOURS OF USE. AND DEFECTIVE AND NOISY STARTERS IN FLUORESCENT AND MERCURY VAPOR FIXTURES TO COMPLY WITH REQUIREMENTS FOR NEW FIXTURES.
- 1.14. LEAVE PROJECT CLEAN AND READY FOR OCCUPANCY 1.15. PERFORM CLEANING AT TURN-OVER. PERFORM FINAL CLEANING
- AFTER FIXTURING (BEFORE OPENING).
- CLEANING DURING OWNER'S OCCUPANCY
- SHOULD THE OWNER OCCUPY THE WORK OR ANY PORTION THEREOF PRIOR TO ITS COMPLETION BY THE CONTRACTOR AND ACCEPTANCE BY THE OWNER, RESPONSIBILITIES FOR INTERIM AND FINAL CLEANING SHALL BE AS DETERMINED BY THE ARCHITECT IN ACCORDANCE WITH THE GENERAL CONDITIONS OF THE CONTRACT

### END OF SECTION -017100

### **SECTION 017700 - CLOSEOUT PROCEDURES**

#### PART 1 - GENERAL 1.1 SUMMARY

- SECTION INCLUDES ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR CONTRACT CLOSEOUT, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
- SUBSTANTIAL COMPLETION PROCEDURES.
- FINAL COMPLETION PROCEDURES.
- WARRANTIES.
- 4. REPAIR OF THE WORK
- RELATED REQUIREMENTS:
  - 1. SECTION 017823 "OPERATION AND MAINTENANCE DATA" FOR OPERATION AND MAINTENANCE MANUAL REQUIREMENTS.
  - 2. SECTION 017839 "PROJECT RECORD DOCUMENTS" FOR SUBMITTING RECORD DRAWINGS, RECORD SPECIFICATIONS, AND RECORD PRODUCT
  - 3. SECTION 017100 "CLEANING" FOR FINAL CLEANING REQUIREMENTS. 4. SECTION 017900 "DEMONSTRATION AND TRAINING" FOR REQUIREMENTS
- FOR INSTRUCTING OWNER'S PERSONNEL 1.2 SUBSTANTIAL COMPLETION PROCEDURES
- . CONTRACTOR'S LIST OF INCOMPLETE ITEMS: PREPARE AND SUBMIT A LIST OF ITEMS TO BE COMPLETED AND CORRECTED (CONTRACTOR'S PUNCH LIST), INDICATING THE VALUE OF EACH ITEM ON THE LIST AND REASONS WHY THE WORK IS INCOMPLETE.
- SUBMITTALS PRIOR TO SUBSTANTIAL COMPLETION: COMPLETE THE FOLLOWING A MINIMUM OF 10 DAYS PRIOR TO REQUESTING INSPECTION FOR DETERMINING DATE OF SUBSTANTIAL COMPLETION. LIST ITEMS BELOW THAT ARE INCOMPLETE AT TIME OF REQUEST
- 1. SUBMIT CLOSEOUT SUBMITTALS SPECIFIED IN OTHER DIVISION 01 SECTIONS, INCLUDING PROJECT RECORD DOCUMENTS, OPERATION AND MAINTENANCE MANUALS, FINAL COMPLETION CONSTRUCTION PHOTOGRAPHIC DOCUMENTATION, DAMAGE OR SETTLEMENT SURVEYS, PROPERTY SURVEYS, AND SIMILAR FINAL RECORD INFORMATION.
- 2. SUBMIT CLOSEOUT SUBMITTALS SPECIFIED IN INDIVIDUAL SECTIONS, INCLUDING SPECIFIC WARRANTIES, WORKMANSHIP BONDS, MAINTENANCE SERVICE AGREEMENTS, FINAL CERTIFICATIONS, AND SIMILAR DOCUMENTS.
- SUBMIT TEST/ADJUST/BALANCE RECORDS.
- PROCEDURES PRIOR TO SUBSTANTIAL COMPLETION: COMPLETE THE FOLLOWING A MINIMUM OF 10 DAYS PRIOR TO REQUESTING INSPECTION FOR DETERMINING DATE OF SUBSTANTIAL COMPLETION. LIST ITEMS BELOW THAT ARE INCOMPLETE AT TIME OF REQUEST.
- 1. ADVISE OWNER OF PENDING INSURANCE CHANGEOVER REQUIREMENTS

- 2. MAKE FINAL CHANGEOVER OF PERMANENT LOCKS AND DELIVER KEYS TO OWNER. ADVISE OWNER'S PERSONNEL OF CHANGEOVER IN SECURITY PROVISIONS.
- COMPLETE STARTUP AND TESTING OF SYSTEMS AND EQUIPMENT.
- 4. PERFORM PREVENTIVE MAINTENANCE ON EQUIPMENT USED PRIOR TO SUBSTANTIAL COMPLETION.
- 5. INSTRUCT OWNER'S PERSONNEL IN OPERATION, ADJUSTMENT, AND A. COMPLETE REPAIR AND RESTORATION OPERATIONS BEFORE REQUESTING MAINTENANCE OF PRODUCTS, EQUIPMENT, AND SYSTEMS. SUBMIT DEMONSTRATION AND TRAINING VIDEO RECORDINGS SPECIFIED IN SECTION 017900 "DEMONSTRATION AND TRAINING."
- 6. ADVISE OWNER OF CHANGEOVER IN HEAT AND OTHER UTILITIES.
- 7. PARTICIPATE WITH OWNER IN CONDUCTING INSPECTION AND WALKTHROUGH WITH LOCAL EMERGENCY RESPONDERS.
- 8. TERMINATE AND REMOVE TEMPORARY FACILITIES FROM PROJECT SITE, ALONG WITH MOCKUPS, CONSTRUCTION TOOLS, AND SIMILAR **ELEMENTS**
- 9. COMPLETE FINAL CLEANING REQUIREMENTS, INCLUDING TOUCHUP PAINTING.
- 10. TOUCH UP AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES TO ELIMINATE VISUAL DEFECTS.
- D. INSPECTION: SUBMIT A WRITTEN REQUEST FOR INSPECTION TO DETERMINE SUBSTANTIAL COMPLETION A MINIMUM OF 10 DAYS PRIOR TO DATE THE WORK WILL BE COMPLETED AND READY FOR FINAL INSPECTION AND TESTS. ON RECEIPT OF REQUEST, ARCHITECT WILL EITHER PROCEED WITH INSPECTION OR NOTIFY CONTRACTOR OF UNFULFILLED REQUIREMENTS. ARCHITECT WILL PREPARE THE CERTIFICATE OF SUBSTANTIAL COMPLETION AFTER INSPECTION OR WILL NOTIFY CONTRACTOR OF ITEMS, EITHER ON CONTRACTOR'S LIST OR ADDITIONAL ITEMS IDENTIFIED BY ARCHITECT, THAT MUST BE COMPLETED OR CORRECTED BEFORE CERTIFICATE WILL BE ISSUED.
- REINSPECTION: REQUEST REINSPECTION WHEN THE WORK IDENTIFIED IN PREVIOUS INSPECTIONS AS INCOMPLETE IS COMPLETED OR CORRECTED
- 2. RESULTS OF COMPLETED INSPECTION WILL FORM THE BASIS OF REQUIREMENTS FOR FINAL COMPLETION.

### 1.3 FINAL COMPLETION PROCEDURES

- A. PRELIMINARY PROCEDURES: BEFORE REQUESTING FINAL INSPECTION FOR DETERMINING FINAL COMPLETION, COMPLETE THE FOLLOWING:
  - SUBMIT A FINAL APPLICATION FOR PAYMENT.
- 2. CERTIFIED LIST OF INCOMPLETE ITEMS: SUBMIT CERTIFIED COPY OF ARCHITECT'S SUBSTANTIAL COMPLETION INSPECTION LIST OF ITEMS TO BE COMPLETED OR CORRECTED (PUNCH LIST), ENDORSED AND DATED BY ARCHITECT. CERTIFIED COPY OF THE LIST SHALL STATE THAT EACH ITEM HAS BEEN COMPLETED OR OTHERWISE RESOLVED FOR 1.2 CLOSEOUT SUBMITTALS ACCEPTANCE.
- 3. CERTIFICATE OF INSURANCE: SUBMIT EVIDENCE OF FINAL, CONTINUING INSURANCE COVERAGE COMPLYING WITH INSURANCE REQUIREMENTS.
- B. INSPECTION: SUBMIT A WRITTEN REQUEST FOR FINAL INSPECTION TO DETERMINE ACCEPTANCE. ON RECEIPT OF REQUEST, ARCHITECT WILL EITHER PROCEED WITH INSPECTION OR NOTIFY CONTRACTOR OF UNFULFILLED REQUIREMENTS. ARCHITECT WILL PREPARE A FINAL CERTIFICATE FOR PAYMENT AFTER INSPECTION OR WILL NOTIFY CONTRACTOR OF CONSTRUCTION THAT MUST BE COMPLETED OR CORRECTED BEFORE CERTIFICATE WILL BE ISSUED.
- REINSPECTION: REQUEST REINSPECTION WHEN THE WORK IDENTIFIED IN PREVIOUS INSPECTIONS AS INCOMPLETE IS COMPLETED OR CORRECTED.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. ORGANIZATION OF LIST: INCLUDE NAME AND IDENTIFICATION OF EACH SPACE AND AREA AFFECTED BY CONSTRUCTION OPERATIONS FOR INCOMPLETE ITEMS AND ITEMS NEEDING CORRECTION INCLUDING, IF NECESSARY, AREAS DISTURBED BY CONTRACTOR THAT ARE OUTSIDE THE LIMITS OF CONSTRUCTION.
  - 1. ORGANIZE LIST OF SPACES IN SEQUENTIAL ORDER, STARTING WITH EXTERIOR AREAS FIRST AND PROCEEDING FROM LOWEST FLOOR TO
  - 2. ORGANIZE ITEMS APPLYING TO EACH SPACE BY MAJOR ELEMENT, INCLUDING CATEGORIES FOR CEILING, INDIVIDUAL WALLS, FLOORS, EQUIPMENT, AND BUILDING SYSTEMS.
  - 3. SUBMIT LIST OF INCOMPLETE ITEMS IN THE FOLLOWING FORMAT:
- a. PDF ELECTRONIC FILE. ARCHITECT WILL RETURN ANNOTATED COPY. 1.5 SUBMITTAL OF PROJECT WARRANTIES
- A. TIME OF SUBMITTAL: SUBMIT WRITTEN WARRANTIES ON REQUEST OF ARCHITECT FOR DESIGNATED PORTIONS OF THE WORK WHERE COMMENCEMENT OF WARRANTIES OTHER THAN DATE OF SUBSTANTIAL COMPLETION IS INDICATED, OR WHEN DELAY IN SUBMITTAL OF WARRANTIES MIGHT LIMIT OWNER'S RIGHTS UNDER WARRANTY.
- B. ORGANIZE WARRANTY DOCUMENTS INTO AN ORDERLY SEQUENCE BASED ON THE TABLE OF CONTENTS OF THE PROJECT MANUAL
  - 1. BIND WARRANTIES AND BONDS IN HEAVY-DUTY, THREE-RING, VINYL-COVERED. LOOSE-LEAF BINDERS. THICKNESS AS NECESSARY TO ACCOMMODATE CONTENTS, AND SIZED TO RECEIVE 8-1/2-BY-11-INCH PAPER.
  - 2. PROVIDE HEAVY PAPER DIVIDERS WITH PLASTIC-COVERED TABS FOR EACH SEPARATE WARRANTY. MARK TAB TO IDENTIFY THE PRODUCT OR INSTALLATION. PROVIDE A TYPED DESCRIPTION OF THE PRODUCT OR INSTALLATION, INCLUDING THE NAME OF THE PRODUCT AND THE NAME, ADDRESS, AND TELEPHONE NUMBER OF INSTALLER.
  - 3. IDENTIFY EACH BINDER ON THE FRONT AND SPINE WITH THE TYPED OR D. TABLE OF CONTENTS: LIST EACH PRODUCT INCLUDED IN MANUAL, IDENTIFIED BY PRINTED TITLE "WARRANTIES," PROJECT NAME, AND NAME OF CONTRACTOR.
  - 4. WARRANTY ELECTRONIC FILE: SCAN WARRANTIES AND BONDS AND ASSEMBLE COMPLETE WARRANTY AND BOND SUBMITTAL PACKAGE INTO A SINGLE INDEXED ELECTRONIC PDF FILE WITH LINKS ENABLING NAVIGATION TO EACH ITEM. PROVIDE BOOKMARKED TABLE OF CONTENTS AT BEGINNING OF DOCUMENT.
- C. PROVIDE ADDITIONAL COPIES OF EACH WARRANTY TO INCLUDE IN OPERATION AND MAINTENANCE MANUALS.
- PART 2 -PRODUCTS
- 2.1 MATERIALS
- A. CLEANING AGENTS: USE CLEANING MATERIALS AND AGENTS RECOMMENDED BY MANUFACTURER OR FABRICATOR OF THE SURFACE TO BE CLEANED. DO

NOT USE CLEANING AGENTS THAT ARE POTENTIALLY HAZARDOUS TO HEALTH OR PROPERTY OR THAT MIGHT DAMAGE FINISHED SURFACES.

PART 3 - EXECUTION

3.1 FINAL CLEANING A. SEE SECTION 017100

3.2 REPAIR OF THE WORK

- INSPECTION FOR DETERMINATION OF SUBSTANTIAL COMPLETION
- B. REPAIR OR REMOVE AND REPLACE DEFECTIVE CONSTRUCTION. REPAIRING INCLUDES REPLACING DEFECTIVE PARTS, REFINISHING DAMAGED SURFACES, TOUCHING UP WITH MATCHING MATERIALS, AND PROPERLY ADJUSTING OPERATING EQUIPMENT. WHERE DAMAGED OR WORN ITEMS CANNOT BE REPAIRED OR RESTORED, PROVIDE REPLACEMENTS. REMOVE AND REPLACE OPERATING COMPONENTS THAT CANNOT BE REPAIRED. RESTORE DAMAGED CONSTRUCTION AND PERMANENT FACILITIES USED DURING CONSTRUCTION TO SPECIFIED CONDITION.
  - 1. REMOVE AND REPLACE CHIPPED, SCRATCHED, AND BROKEN GLASS REFLECTIVE SURFACES, AND OTHER DAMAGED TRANSPARENT MATERIALS.
  - 2. TOUCH UP AND OTHERWISE REPAIR AND RESTORE MARRED OR EXPOSED FINISHES AND SURFACES. REPLACE FINISHES AND SURFACES THAT THAT ALREADY SHOW EVIDENCE OF REPAIR OR RESTORATION.
  - a. DO NOT PAINT OVER "UL" AND OTHER REQUIRED LABELS AND IDENTIFICATION, INCLUDING MECHANICAL AND ELECTRICAL NAMEPLATES. REMOVE PAINT APPLIED TO REQUIRED LABELS AND IDENTIFICATION.
  - 3. REPLACE PARTS SUBJECT TO OPERATING CONDITIONS DURING CONSTRUCTION THAT MAY IMPEDE OPERATION OR REDUCE LONGEVITY.
  - 4. REPLACE BURNED-OUT BULBS, BULBS NOTICEABLY DIMMED BY HOURS OF USE, AND DEFECTIVE AND NOISY STARTERS IN FLUORESCENT AND MERCURY VAPOR FIXTURES TO COMPLY WITH REQUIREMENTS FOR NEW FIXTURES.
- END OF SECTION 017700

### SECTION 017823 - OPERATION AND MAINTENANCE DATA

#### GENERAL

- 1.1 SUMMARY
- A. SECTION INCLUDES ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR PREPARING OPERATION AND MAINTENANCE MANUALS, INCLUDING THE FOLLOWING:
- OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY.
- OPERATION MANUALS FOR SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.
- 3. PRODUCT MAINTENANCE MANUALS
- SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS.
- A. MANUAL CONTENT: OPERATIONS AND MAINTENANCE MANUAL CONTENT IS SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS TO BE REVIEWED AT THE TIME OF SECTION
  - REQUIRED BY THIS SECTION. 1. ARCHITECT WILL COMMENT ON WHETHER CONTENT OF OPERATIONS AND

SUBMITTALS. SUBMIT REVIEWED MANUAL CONTENT FORMATTED AND ORGANIZED AS

- MAINTENANCE SUBMITTALS ARE ACCEPTABLE 2. WHERE APPLICABLE, CLARIFY AND UPDATE REVIEWED MANUAL CONTENT TO CORRESPOND TO REVISIONS AND FIELD CONDITIONS
- B. FORMAT: SUBMIT OPERATIONS AND MAINTENANCE MANUALS IN THE FOLLOWING FORMAT:
  - PDF ELECTRONIC FILE. ASSEMBLE EACH MANUAL INTO A COMPOSITE ELECTRONICALLY INDEXED FILE. SUBMIT ON DIGITAL MEDIA ACCEPTABLE TO ARCHITECT.
  - a. NAME EACH INDEXED DOCUMENT FILE IN COMPOSITE ELECTRONIC INDEX WITH APPLICABLE ITEM NAME. INCLUDE A COMPLETE ELECTRONICALLY LINKED OPERATION AND MAINTENANCE DIRECTORY.
  - b. ENABLE INSERTED REVIEWER COMMENTS ON DRAFT SUBMITTALS. 2. TWO PAPER COPIES. INCLUDE A COMPLETE OPERATION AND MAINTENANCE DIRECTORY. ENCLOSE TITLE PAGES AND DIRECTORIES IN CLEAR PLASTIC SLEEVES.

### **PRODUCTS**

- 2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS
- A. DIRECTORY: PREPARE A SINGLE, COMPREHENSIVE DIRECTORY OF EMERGENCY, OPERATION, AND MAINTENANCE DATA AND MATERIALS, LISTING ITEMS AND THEIR LOCATION TO FACILITATE READY ACCESS TO DESIRED INFORMATION.
- B. ORGANIZATION: UNLESS OTHERWISE INDICATED, ORGANIZE EACH MANUAL INTO A SEPARATE SECTION FOR EACH SYSTEM AND SUBSYSTEM, AND A SEPARATE SECTION FOR EACH PIECE OF EQUIPMENT NOT PART OF A SYSTEM. EACH MANUAL SHALL CONTAIN THE FOLLOWING MATERIALS, IN THE ORDER LISTED:
- TITLE PAGE.
- TABLE OF CONTENTS.
- MANUAL CONTENTS.
- C. TITLE PAGE: INCLUDE THE FOLLOWING INFORMATION:
- SUBJECT MATTER INCLUDED IN MANUAL.
- NAME AND ADDRESS OF PROJECT.
- 3. NAME AND ADDRESS OF OWNER. 4. DATE OF SUBMITTAL.
- NAME AND CONTACT INFORMATION FOR CONTRACTOR.
- NAME AND CONTACT INFORMATION FOR CONSTRUCTION MANAGER.
- NAME AND CONTACT INFORMATION FOR ARCHITECT.
- 8. NAME AND CONTACT INFORMATION FOR COMMISSIONING AUTHORITY 9. NAMES AND CONTACT INFORMATION FOR MAJOR CONSULTANTS TO THE ARCHITECT THAT DESIGNED THE SYSTEMS CONTAINED IN THE MANUALS.
- 10. CROSS-REFERENCE TO RELATED SYSTEMS IN OTHER OPERATION AND MAINTENANCE MANUALS.
- PRODUCT NAME, INDEXED TO THE CONTENT OF THE VOLUME, AND CROSS-REFERENCED TO SPECIFICATION SECTION NUMBER IN PROJECT MANUAL.

E. MANUALS, ELECTRONIC FILES: SUBMIT MANUALS IN THE FORM OF A MULTIPLE FILE

- COMPOSITE ELECTRONIC PDF FILE FOR EACH MANUAL TYPE REQUIRED. 1. ELECTRONIC FILES: USE ELECTRONIC FILES PREPARED BY MANUFACTURER WHERE AVAILABLE. WHERE SCANNING OF PAPER DOCUMENTS IS REQUIRED,
- CONFIGURE SCANNED FILE FOR MINIMUM READABLE FILE SIZE 2. FILE NAMES AND BOOKMARKS: ENABLE BOOKMARKING OF INDIVIDUAL DOCUMENTS BASED ON FILE NAMES. NAME DOCUMENT FILES TO CORRESPOND TO SYSTEM, SUBSYSTEM, AND EQUIPMENT NAMES USED IN MANUAL DIRECTORY AND TABLE OF CONTENTS. GROUP DOCUMENTS FOR EACH SYSTEM AND SUBSYSTEM INTO INDIVIDUAL COMPOSITE BOOKMARKED FILES, THEN CREATE COMPOSITE MANUAL, SO THAT RESULTING BOOKMARKS REFLECT THE SYSTEM. SUBSYSTEM. AND EQUIPMENT NAMES IN A READILY NAVIGATED FILE TREE. CONFIGURE ELECTRONIC MANUAL TO DISPLAY BOOKMARK PANEL ON

### OPENING FILE.

- F. MANUALS. PAPER COPY: SUBMIT MANUALS IN THE FORM OF HARD COPY, BOUND AND LABELED VOLUMES.
  - 1. BINDERS: HEAVY-DUTY, THREE-RING, VINYL-COVERED, LOOSE-LEAF BINDERS, IN THICKNESS NECESSARY TO ACCOMMODATE CONTENTS. SIZED TO HOLD 8-1/2-BY-11-INCH PAPER; WITH CLEAR PLASTIC SLEEVE ON SPINE TO HOLD LABEL DESCRIBING CONTENTS AND WITH POCKETS INSIDE COVERS TO HOLD C. MANUFACTURERS' MAINTENANCE DOCUMENTATION: MANUFACTURERS' FOLDED OVERSIZE SHEETS.
  - a. IDENTIFY EACH BINDER ON FRONT AND SPINE, WITH PRINTED TITLE "OPERATION AND MAINTENANCE MANUAL," PROJECT TITLE OR NAME SUBJECT MATTER OF CONTENTS. INDICATE VOLUME NUMBER FOR MULTIPLE-VOLUME SETS
  - 2. DIVIDERS: HEAVY-PAPER DIVIDERS WITH PLASTIC-COVERED TABS FOR EACH SECTION OF THE MANUAL. MARK EACH TAB TO INDICATE CONTENTS. INCLUDE TYPED LIST OF PRODUCTS AND MAJOR COMPONENTS OF EQUIPMENT INCLUDED IN THE SECTION ON EACH DIVIDER, CROSS-REFERENCED TO SPECIFICATION SECTION NUMBER AND TITLE OF PROJECT MANUAL
  - 3. PROTECTIVE PLASTIC SLEEVES: TRANSPARENT PLASTIC SLEEVES DESIGNED TO ENCLOSE DIAGNOSTIC SOFTWARE STORAGE MEDIA FOR COMPUTERIZED ELECTRONIC EQUIPMENT.
  - 4. DRAWINGS: ATTACH REINFORCED, PUNCHED BINDER TABS ON DRAWINGS AND BIND WITH TEXT. a. IF OVERSIZE DRAWINGS ARE NECESSARY, FOLD DRAWINGS TO SAME SIZE
  - AS TEXT PAGES AND USE AS FOLDOUTS. b. IF DRAWINGS ARE TOO LARGE TO BE USED AS FOLDOUTS, FOLD AND PLACE DRAWINGS IN LABELED ENVELOPES AND BIND ENVELOPES IN REAR OF MANUAL. AT APPROPRIATE LOCATIONS IN MANUAL, INSERT TYPEWRITTEN PAGES INDICATING DRAWING TITLES, DESCRIPTIONS OF
- 2.2 OPERATION MANUALS A. CONTENT: IN ADDITION TO REQUIREMENTS IN THIS SECTION, INCLUDE OPERATION DATA REQUIRED IN INDIVIDUAL SPECIFICATION SECTIONS AND THE FOLLOWING

CONTENTS, AND DRAWING LOCATIONS.

- INFORMATION: 1. SYSTEM, SUBSYSTEM, AND EQUIPMENT DESCRIPTIONS. USE DESIGNATIONS
- FOR SYSTEMS AND EQUIPMENT INDICATED ON CONTRACT DOCUMENTS 2. PERFORMANCE AND DESIGN CRITERIA IF CONTRACTOR IS DELEGATED DESIGN RESPONSIBILITY.
- OPERATING STANDARDS.
- 4. OPERATING PROCEDURES.
- OPERATING LOGS.
- WIRING DIAGRAMS
- CONTROL DIAGRAMS PIPED SYSTEM DIAGRAMS.
- PRECAUTIONS AGAINST IMPROPER USE. 10. LICENSE REQUIREMENTS INCLUDING INSPECTION AND RENEWAL DATES.
- B. DESCRIPTIONS: INCLUDE THE FOLLOWING:
- PRODUCT NAME AND MODEL NUMBER. USE DESIGNATIONS FOR PRODUCTS INDICATED ON CONTRACT DOCUMENTS
- MANUFACTURER'S NAME. 3. EQUIPMENT IDENTIFICATION WITH SERIAL NUMBER OF EACH COMPONENT
- 4. EQUIPMENT FUNCTION.
- OPERATING CHARACTERISTICS. LIMITING CONDITIONS.
- PERFORMANCE CURVES 8. ENGINEERING DATA AND TESTS
- COMPLETE NOMENCLATURE AND NUMBER OF REPLACEMENT PARTS. C. OPERATING PROCEDURES: INCLUDE THE FOLLOWING, AS APPLICABLE:
  - STARTUP PROCEDURES.
- EQUIPMENT OR SYSTEM BREAK-IN PROCEDURES.
- 3. ROUTINE AND NORMAL OPERATING INSTRUCTIONS.
- REGULATION AND CONTROL PROCEDURES.
- INSTRUCTIONS ON STOPPING
- NORMAL SHUTDOWN INSTRUCTIONS.
- SEASONAL AND WEEKEND OPERATING INSTRUCTIONS. 8. REQUIRED SEQUENCES FOR ELECTRIC OR ELECTRONIC SYSTEMS. 9. SPECIAL OPERATING INSTRUCTIONS AND PROCEDURES.
- D. SYSTEMS AND EQUIPMENT CONTROLS: DESCRIBE THE SEQUENCE OF OPERATION, AND DIAGRAM CONTROLS AS INSTALLED.
- E. PIPED SYSTEMS: DIAGRAM PIPING AS INSTALLED, AND IDENTIFY COLOR-CODING WHERE REQUIRED FOR IDENTIFICATION.
- 2.3 PRODUCT MAINTENANCE MANUALS A. CONTENT: ORGANIZE MANUAL INTO A SEPARATE SECTION FOR EACH PRODUCT, MATERIAL, AND FINISH. INCLUDE SOURCE INFORMATION, PRODUCT INFORMATION, MAINTENANCE PROCEDURES, REPAIR MATERIALS AND SOURCES, AND WARRANTIES
- AND BONDS, AS DESCRIBED BELOW. B. SOURCE INFORMATION: LIST EACH PRODUCT INCLUDED IN MANUAL, IDENTIFIED BY PRODUCT NAME AND ARRANGED TO MATCH MANUAL'S TABLE OF CONTENTS. FOR EACH PRODUCT, LIST NAME, ADDRESS, AND TELEPHONE NUMBER OF INSTALLER OR SUPPLIER AND MAINTENANCE SERVICE AGENT, AND CROSS-REFERENCE
- C. PRODUCT INFORMATION: INCLUDE THE FOLLOWING, AS APPLICABLE: PRODUCT NAME AND MODEL NUMBER.

  - MANUFACTURER'S NAME. 3. COLOR, PATTERN, AND TEXTURE.

RECOMMENDATIONS AND THE FOLLOWING:

- 4. MATERIAL AND CHEMICAL COMPOSITION.
- 5. REORDERING INFORMATION FOR SPECIALLY MANUFACTURED PRODUCTS. D. MAINTENANCE PROCEDURES: INCLUDE MANUFACTURER'S WRITTEN

SPECIFICATION SECTION NUMBER AND TITLE IN PROJECT MANUAL

- INSPECTION PROCEDURES. TYPES OF CLEANING AGENTS TO BE USED AND METHODS OF CLEANING.
- PRODUCT. 4. SCHEDULE FOR ROUTINE CLEANING AND MAINTENANCE.
- 5. REPAIR INSTRUCTIONS. E. REPAIR MATERIALS AND SOURCES: INCLUDE LISTS OF MATERIALS AND LOCAL SOURCES OF MATERIALS AND RELATED SERVICES.
- F. WARRANTIES AND BONDS: INCLUDE COPIES OF WARRANTIES AND BONDS AND LISTS OF CIRCUMSTANCES AND CONDITIONS THAT WOULD AFFECT VALIDITY OF WARRANTIES OR BONDS.

3. LIST OF CLEANING AGENTS AND METHODS OF CLEANING DETRIMENTAL TO

- 2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS
- A. CONTENT: FOR EACH SYSTEM, SUBSYSTEM, AND PIECE OF EQUIPMENT NOT PART OF A SYSTEM, INCLUDE SOURCE INFORMATION, MANUFACTURERS' MAINTENANCE DOCUMENTATION, MAINTENANCE PROCEDURES, MAINTENANCE AND SERVICE SCHEDULES, SPARE PARTS LIST AND SOURCE INFORMATION, MAINTENANCE SERVICE CONTRACTS, AND WARRANTY AND BOND INFORMATION, AS DESCRIBED BELOW.

- B. SOURCE INFORMATION: LIST EACH SYSTEM, SUBSYSTEM, AND PIECE OF EQUIPMENT INCLUDED IN MANUAL, IDENTIFIED BY PRODUCT NAME AND ARRANGED TO MATCH MANUAL'S TABLE OF CONTENTS. FOR EACH PRODUCT, LIST NAME, ADDRESS, AND TELEPHONE NUMBER OF INSTALLER OR SUPPLIER AND MAINTENANCE SERVICE AGENT, AND CROSS-REFERENCE SPECIFICATION SECTION NUMBER AND TITLE IN PROJECT MANUAL
- MAINTENANCE DOCUMENTATION INCLUDING THE FOLLOWING INFORMATION FOR EACH COMPONENT PART OR PIECE OF EQUIPMENT:
  - STANDARD MAINTENANCE INSTRUCTIONS AND BULLETINS.
  - 2. DRAWINGS, DIAGRAMS, AND INSTRUCTIONS REQUIRED FOR MAINTENANCE INCLUDING DISASSEMBLY AND COMPONENT REMOVAL, REPLACEMENT, AND
- ASSEMBLY.
- IDENTIFICATION AND NOMENCLATURE OF PARTS AND COMPONENTS. 4. LIST OF ITEMS RECOMMENDED TO BE STOCKED AS SPARE PARTS.
- D. MAINTENANCE PROCEDURES: INCLUDE THE FOLLOWING INFORMATION AND ITEMS THAT DETAIL ESSENTIAL MAINTENANCE PROCEDURES:
  - TEST AND INSPECTION INSTRUCTIONS.
  - TROUBLESHOOTING GUIDE.
  - PRECAUTIONS AGAINST IMPROPER MAINTENANCE
  - 4. DISASSEMBLY; COMPONENT REMOVAL, REPAIR, AND REPLACEMENT; AND REASSEMBLY INSTRUCTIONS.

  - ALIGNING, ADJUSTING, AND CHECKING INSTRUCTIONS 6. DEMONSTRATION AND TRAINING VIDEO RECORDING, IF AVAILABLE
- E. MAINTENANCE AND SERVICE SCHEDULES: INCLUDE SERVICE AND LUBRICATION REQUIREMENTS, LIST OF REQUIRED LUBRICANTS FOR EQUIPMENT, AND SEPARATE SCHEDULES FOR PREVENTIVE AND ROUTINE MAINTENANCE AND SERVICE WITH STANDARD TIME ALLOTMENT.
- F. SPARE PARTS LIST AND SOURCE INFORMATION: INCLUDE LISTS OF REPLACEMENT AND REPAIR PARTS, WITH PARTS IDENTIFIED AND CROSS-REFERENCED TO MANUFACTURERS' MAINTENANCE DOCUMENTATION AND LOCAL SOURCES OF MAINTENANCE MATERIALS AND RELATED SERVICES
- G. MAINTENANCE SERVICE CONTRACTS: INCLUDE COPIES OF MAINTENANCE AGREEMENTS WITH NAME AND TELEPHONE NUMBER OF SERVICE AGENT.
- H. WARRANTIES AND BONDS: INCLUDE COPIES OF WARRANTIES AND BONDS AND LISTS OF CIRCUMSTANCES AND CONDITIONS THAT WOULD AFFECT VALIDITY OF WARRANTIES OR BONDS

### EXECUTION

- 3.1 MANUAL PREPARATION A. EMERGENCY MANUAL: ASSEMBLE A COMPLETE SET OF EMERGENCY INFORMATION INDICATING PROCEDURES FOR USE BY EMERGENCY PERSONNEL AND BY OWNER'S
- OPERATING PERSONNEL FOR TYPES OF EMERGENCIES INDICATED B. PRODUCT MAINTENANCE MANUAL: ASSEMBLE A COMPLETE SET OF MAINTENANCE DATA INDICATING CARE AND MAINTENANCE OF EACH PRODUCT, MATERIAL, AND FINISH INCORPORATED INTO THE WORK.
- C. OPERATION AND MAINTENANCE MANUALS: ASSEMBLE A COMPLETE SET OF OPERATION AND MAINTENANCE DATA INDICATING OPERATION AND MAINTENANCE OF EACH SYSTEM, SUBSYSTEM, AND PIECE OF EQUIPMENT NOT PART OF A SYSTEM.
- D. MANUFACTURERS' DATA: WHERE MANUALS CONTAIN MANUFACTURERS' STANDARD PRINTED DATA, INCLUDE ONLY SHEETS PERTINENT TO PRODUCT OR COMPONENT INSTALLED. MARK EACH SHEET TO IDENTIFY EACH PRODUCT OR COMPONENT INCORPORATED INTO THE WORK. IF DATA INCLUDE MORE THAN ONE ITEM IN A TABULAR FORMAT, IDENTIFY EACH ITEM USING APPROPRIATE REFERENCES FROM THE CONTRACT DOCUMENTS. IDENTIFY DATA APPLICABLE TO THE WORK AND DELETE REFERENCES TO INFORMATION NOT APPLICABLE.
- E. DRAWINGS: PREPARE DRAWINGS SUPPLEMENTING MANUFACTURERS' PRINTED DATA TO ILLUSTRATE THE RELATIONSHIP OF COMPONENT PARTS OF EQUIPMENT AND SYSTEMS AND TO ILLUSTRATE CONTROL SEQUENCE AND FLOW DIAGRAMS. COORDINATE THESE DRAWINGS WITH INFORMATION CONTAINED IN RECORD DRAWINGS TO ENSURE CORRECT ILLUSTRATION OF COMPLETED INSTALLATION.
- 1. DO NOT USE ORIGINAL PROJECT RECORD DOCUMENTS AS PART OF OPERATION AND MAINTENANCE MANUALS. F. COMPLY WITH SECTION 017700 "CLOSEOUT PROCEDURES" FOR SCHEDULE FOR

## END OF SECTION 017823

- SECTION 017839 PROJECT RECORD DOCUMENTS
- PART 1 GENERAL 1.1 SUMMARY A. SECTION INCLUDES ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR

SUBMITTING OPERATION AND MAINTENANCE DOCUMENTATION.

PROJECT RECORD DOCUMENTS, INCLUDING THE FOLLOWING: RECORD DRAWINGS

B. RELATED REQUIREMENTS:

FOLLOWS:

a. FINAL SUBMITTAL:

- SECTION 017823 "OPERATION AND MAINTENANCE DATA" FOR OPERATION AND MAINTENANCE MANUAL REQUIREMENTS.
- 1.2 CLOSEOUT SUBMITTALS A. RECORD DRAWINGS: COMPLY WITH THE FOLLOWING:
- RECORD PRINTS. 2. NUMBER OF COPIES: SUBMIT COPIES OF RECORD DRAWINGS A

1. NUMBER OF COPIES: SUBMIT ONE ORIGINAL SET(S) OF MARKED-U

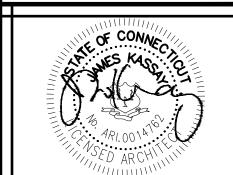
1) SUBMIT ONE PAPER-COPY SET(S) OF MARKED-UP RECORD 2) SUBMIT PDF ELECTRONIC FILES OF SCANNED RECORD PRINTS

#### 3) PRINT EACH DRAWING, WHETHER OR NOT CHANGES AND ADDITIONAL INFORMATION WERE RECORDED

### PART 2 - PRODUCTS

2.1 RECORD DRAWINGS A. RECORD PRINTS: MAINTAIN ONE SET OF MARKED-UP PAPER COPIES OF THE CONTRACT DRAWINGS AND SHOP DRAWINGS. INCORPORATING NEW AND REVISED DRAWINGS AS MODIFICATIONS ARE ISSUED

- 1. PREPARATION: MARK RECORD PRINTS TO SHOW THE ACTUAL INSTALLATION WHERE INSTALLATION VARIES FROM THAT SHOWN ORIGINALLY. REQUIRE INDIVIDUAL OR ENTITY WHO OBTAINED RECORD DATA, WHETHER INDIVIDUAL OR ENTITY IS INSTALLER, SUBCONTRACTOR. OR SIMILAR ENTITY, TO PROVIDE INFORMATION FOR PREPARATION OF CORRESPONDING MARKED-UP RECORD PRINTS.
- a. GIVE PARTICULAR ATTENTION TO INFORMATION ON CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO IDENTIFY OR MEASURE AND RECORD LATER.
- b. RECORD DATA AS SOON AS POSSIBLE AFTER OBTAINING IT.
- c. RECORD AND CHECK THE MARKUP BEFORE ENCLOSING CONCEALED INSTALLATIONS.



06/28/202

REVISIONS

- 2 E 4 3 P 8 **SPECIFICATIONS** 

06/01/22

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- 2. MARK THE CONTRACT DRAWINGS AND SHOP DRAWINGS COMPLETELY SECTION 024119 SELECTIVE DEMOLITION AND ACCURATELY. USE PERSONNEL PROFICIENT AT RECORDING GRAPHIC INFORMATION IN PRODUCTION OF MARKED-UP RECORD
- 3. MARK RECORD SETS WITH ERASABLE. RED-COLORED PENCIL. USE OTHER COLORS TO DISTINGUISH BETWEEN CHANGES FOR DIFFERENT CATEGORIES OF THE WORK AT SAME LOCATION.
- 4. NOTE CONSTRUCTION CHANGE DIRECTIVE NUMBERS, ALTERNATE NUMBERS, CHANGE ORDER NUMBERS, AND SIMILAR IDENTIFICATION, WHERE APPLICABLE
- RECORD DIGITAL DATA FILES: IMMEDIATELY BEFORE INSPECTION FOR CERTIFICATE OF SUBSTANTIAL COMPLETION, REVIEW MARKED-UP RECORD PRINTS WITH ARCHITECT. WHEN AUTHORIZED, PREPARE A FULL SET OF CORRECTED DIGITAL DATA FILES OF THE CONTRACT DRAWINGS, AS FOLLOWS:
- FORMAT: ANNOTATED PDF ELECTRONIC FILE. 2. INCORPORATE CHANGES AND ADDITIONAL INFORMATION PREVIOUSLY MARKED ON RECORD PRINTS. DELETE, REDRAW, AND ADD DETAILS AND
- NOTATIONS WHERE APPLICABLE. REFER INSTANCES OF UNCERTAINTY TO ARCHITECT FOR RESOLUTION. 4. ARCHITECT WILL FURNISH CONTRACTOR ONE SET OF DIGITAL DATA FILES OF THE CONTRACT DRAWINGS FOR USE IN RECORDING
- INFORMATION. FORMAT: IDENTIFY AND DATE EACH RECORD DRAWING; INCLUDE THE

DESIGNATION "PROJECT RECORD DRAWING" IN A PROMINENT LOCATION.

- 1. RECORD PRINTS: ORGANIZE RECORD PRINTS AND NEWLY PREPARED RECORD DRAWINGS INTO MANAGEABLE SETS. BIND EACH SET WITH DURABLE PAPER COVER SHEETS. INCLUDE IDENTIFICATION ON COVER SHEETS.
- 2. FORMAT: ANNOTATED PDF ELECTRONIC FILE.
- 3. RECORD DIGITAL DATA FILES: ORGANIZE DIGITAL DATA INFORMATION INTO SEPARATE ELECTRONIC FILES THAT CORRESPOND TO EACH SHEET OF THE CONTRACT DRAWINGS. NAME EACH FILE WITH THE SHEET IDENTIFICATION. INCLUDE IDENTIFICATION IN EACH DIGITAL DATA FILE.
- 4. IDENTIFICATION: AS FOLLOWS:
- a. PROJECT NAME.
- b. DATE.
- c. DESIGNATION "PROJECT RECORD DRAWINGS."
- d. NAME OF ARCHITECT.
- e. NAME OF CONTRACTOR.
- 2.2 MISCELLANEOUS RECORD SUBMITTALS
- . ASSEMBLE MISCELLANEOUS RECORDS REQUIRED BY OTHER SPECIFICATION SECTIONS FOR MISCELLANEOUS RECORD KEEPING AND SUBMITTAL IN CONNECTION WITH ACTUAL PERFORMANCE OF THE WORK. BIND OR FILE MISCELLANEOUS RECORDS AND IDENTIFY EACH, READY FOR CONTINUED USE AND REFERENCE
- FORMAT: SUBMIT MISCELLANEOUS RECORD SUBMITTALS AS PDF ELECTRONIC FILE.

#### PART 3 -**EXECUTION**

- 3.1 RECORDING AND MAINTENANCE
- RECORDING: MAINTAIN ONE COPY OF EACH SUBMITTAL DURING THE CONSTRUCTION PERIOD FOR PROJECT RECORD DOCUMENT PURPOSES. POST CHANGES AND REVISIONS TO PROJECT RECORD DOCUMENTS AS THEY OCCUR; DO NOT WAIT UNTIL END OF PROJECT
- MAINTENANCE OF RECORD DOCUMENTS AND SAMPLES: STORE RECORD DOCUMENTS AND SAMPLES IN THE FIELD OFFICE APART FROM THE CONTRACT DOCUMENTS USED FOR CONSTRUCTION. DO NOT USE PROJECT RECORD DOCUMENTS FOR CONSTRUCTION PURPOSES. MAINTAIN RECORD DOCUMENTS IN GOOD ORDER AND IN A CLEAN, DRY, LEGIBLE CONDITION, PROTECTED FROM DETERIORATION AND LOSS. PROVIDE ACCESS TO PROJECT RECORD DOCUMENTS FOR ARCHITECT'S REFERENCE DURING NORMAL WORKING HOURS.

END OF SECTION 017839

### **SECTION 017900 - DEMONSTRATION AND TRAINING**

PART 1 - GENERAL 1.1 SUMMARY

- . SECTION INCLUDES ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR INSTRUCTING OWNER'S PERSONNEL, INCLUDING THE FOLLOWING:
- 1. DEMONSTRATION OF OPERATION OF SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.
- 2. TRAINING IN OPERATION AND MAINTENANCE OF SYSTEMS, SUBSYSTEMS, AND EQUIPMENT
- 1.2 COORDINATION
- COORDINATE INSTRUCTION SCHEDULE WITH OWNER'S OPERATIONS. ADJUST SCHEDULE AS REQUIRED TO MINIMIZE DISRUPTING OWNER'S OPERATIONS AND TO ENSURE AVAILABILITY OF OWNER'S PERSONNEL
- PART 2 -PRODUCTS
- 2.1 INSTRUCTION PROGRAM
- A. PROGRAM STRUCTURE: DEVELOP AN INSTRUCTION PROGRAM THAT INCLUDES INDIVIDUAL TRAINING MODULES FOR EACH SYSTEM AND FOR EQUIPMENT NOT PART OF A SYSTEM, AS REQUIRED BY INDIVIDUAL SPECIFICATION SECTIONS.

### PART 3 - EXECUTION

- 3.1 PREPARATION
- ASSEMBLE EDUCATIONAL MATERIALS NECESSARY FOR INSTRUCTION, INCLUDING DOCUMENTATION AND TRAINING MODULE. ASSEMBLE TRAINING MODULES INTO A TRAINING MANUAL ORGANIZED IN COORDINATION WITH REQUIREMENTS IN SECTION 017823 "OPERATION AND MAINTENANCE DATA."
- 3.2 INSTRUCTION
- A. ENGAGE QUALIFIED INSTRUCTORS TO INSTRUCT OWNER'S PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN SYSTEMS, SUBSYSTEMS, AND EQUIPMENT NOT PART OF A SYSTEM.
- SCHEDULING: PROVIDE INSTRUCTION AT MUTUALLY AGREED ON TIMES. FOR EQUIPMENT THAT REQUIRES SEASONAL OPERATION, PROVIDE SIMILAR INSTRUCTION AT START OF EACH SEASON.
- 1. SCHEDULE TRAINING WITH OWNER WITH AT LEAST SEVEN DAYS' ADVANCE NOTICE.
- END OF SECTION 017900

### GENERAL

- SUMMARY
- A. SECTION INCLUDES:
  - 1. DEMOLITION AND REMOVAL OF SELECTED PORTIONS OF BUILDING OR STRUCTURE.
  - DEMOLITION AND REMOVAL OF SELECTED SITE ELEMENTS.
- 1.2 MATERIALS OWNERSHIP
- A. UNLESS OTHERWISE INDICATED, DEMOLITION WASTE BECOMES PROPERTY OF CONTRACTOR.
- 1.3 FIELD CONDITIONS
- A. OWNER WILL OCCUPY PORTIONS OF BUILDING IMMEDIATELY ADJACENT TO SELECTIVE DEMOLITION AREA. CONDUCT SELECTIVE DEMOLITION SO OWNER'S OPERATIONS WILL NOT BE DISRUPTED.
- B. NOTIFY ARCHITECT OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS BEFORE PROCEEDING WITH SELECTIVE DEMOLITION.
- C. HAZARDOUS MATERIALS: IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK.
  - HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER BEFORE START OF THE WORK.
  - 2. IF SUSPECTED HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB: IMMEDIATELY NOTIFY ARCHITECT AND OWNER. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER UNDER A SEPARATE
- CONTRACT D. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
- E. UTILITY SERVICE: MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE **DEMOLITION OPERATIONS**
- MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING SELECTIVE **DEMOLITION OPERATIONS.**
- F. ARRANGE SELECTIVE DEMOLITION SCHEDULE SO AS NOT TO INTERFERE WITH OWNER'S OPERATIONS.
- 1.4 WARRANTY
- A. EXISTING WARRANTIES: REMOVE, REPLACE, PATCH, AND REPAIR MATERIALS AND SURFACES CUT OR DAMAGED DURING SELECTIVE DEMOLITION, BY METHODS AND WITH MATERIALS AND USING APPROVED CONTRACTORS SO AS NOT TO VOID EXISTING WARRANTIES.

### PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. REGULATORY REQUIREMENTS: COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE BEGINNING SELECTIVE DEMOLITION. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- B. STANDARDS: COMPLY WITH ASSE A10.6 AND NFPA 241

### PART 3 - EXECUTION

- 3.1 EXAMINATION
- A. VERIFY THAT UTILITIES HAVE BEEN DISCONNECTED AND CAPPED BEFORE STARTING SELECTIVE DEMOLITION OPERATIONS.
- 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
- A. EXISTING SERVICES/SYSTEMS TO REMAIN: MAINTAIN SERVICES/SYSTEMS INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE.
- B. EXISTING SERVICES/SYSTEMS TO BE REMOVED, RELOCATED, OR ABANDONED: LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED.
  - 1. OWNER WILL ARRANGE TO SHUT OFF INDICATED SERVICES/SYSTEMS WHEN REQUESTED BY CONTRACTOR.
  - 2. IF SERVICES/SYSTEMS ARE REQUIRED TO BE REMOVED, RELOCATED, OR ABANDONED. PROVIDE TEMPORARY SERVICES/SYSTEMS THAT BYPASS AREA OF SELECTIVE DEMOLITION AND THAT MAINTAIN CONTINUITY OF SERVICES/SYSTEMS TO OTHER PARTS OF BUILDING.

### 3.3 PROTECTION

- A. TEMPORARY PROTECTION: PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES TO REMAIN.
- B. TEMPORARY SHORING: DESIGN, PROVIDE, AND MAINTAIN SHORING, BRACING, AND STRUCTURAL SUPPORTS AS REQUIRED TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION AND FINISHES TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED.
- C. REMOVE TEMPORARY BARRICADES AND PROTECTIONS WHERE HAZARDS NO LONGER EXIST.

### 3.4 SELECTIVE DEMOLITION

- A. GENERAL: DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF **GOVERNING REGULATIONS AND AS FOLLOWS:** 
  - 1. NEATLY CUT OPENINGS AND HOLES PLUMB, SQUARE, AND TRUE TO DIMENSIONS REQUIRED. USE CUTTING METHODS LEAST LIKELY TO DAMAGE CONSTRUCTION TO REMAIN OR ADJOINING CONSTRUCTION. USE HAND TOOLS OR SMALL POWER TOOLS DESIGNED FOR SAWING OR GRINDING, NOT HAMMERING AND CHOPPING. TEMPORARILY COVER OPENINGS TO REMAIN.
  - 2. CUT OR DRILL FROM THE EXPOSED OR FINISHED SIDE INTO CONCEALED SURFACES TO AVOID MARRING EXISTING FINISHED SURFACES
  - 3. DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. AT CONCEALED SPACES, SUCH AS DUCT AND PIPE INTERIORS, VERIFY CONDITION AND CONTENTS OF HIDDEN SPACE BEFORE STARTING FLAME-CUTTING OPERATIONS. MAINTAIN PORTABLE FIRE-SUPPRESSION DEVICES DURING FLAME-CUTTING OPERATIONS.
  - 4. LOCATE SELECTIVE DEMOLITION EQUIPMENT AND REMOVE DEBRIS AND MATERIALS SO AS NOT TO IMPOSE EXCESSIVE LOADS ON SUPPORTING WALLS, FLOORS, OR FRAMING.
  - 5. DISPOSE OF DEMOLISHED ITEMS AND MATERIALS PROMPTLY.
- B. SITE ACCESS AND TEMPORARY CONTROLS: CONDUCT SELECTIVE DEMOLITION AND DEBRIS-REMOVAL OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS, WALKWAYS, AND OTHER ADJACENT OCCUPIED AND USED FACILITIES.

- C. EXISTING ITEMS TO REMAIN: PROTECT CONSTRUCTION INDICATED TO REMAIN AGAINST DAMAGE AND SOILING DURING SELECTIVE DEMOLITION. WHEN PERMITTED BY ARCHITECT, ITEMS MAY BE REMOVED TO A SUITABLE. PROTECTED STORAGE LOCATION DURING SELECTIVE DEMOLITION AND CLEANED AND REINSTALLED IN THEIR ORIGINAL LOCATIONS AFTER SELECTIVE **DEMOLITION OPERATIONS ARE COMPLETE**
- 3.5 CLEANING
- A. REMOVE DEMOLITION WASTE MATERIALS FROM PROJECT SITE AND DISPOSE OF THEM IN AN EPA-APPROVED CONSTRUCTION AND DEMOLITION WASTE LANDFILL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
  - DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE 2. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT
- SPILLAGE ON ADJACENT SURFACES AND AREAS. 3. REMOVE DEBRIS FROM ELEVATED PORTIONS OF BUILDING BY CHUTE, HOIST, OR OTHER DEVICE THAT WILL CONVEY DEBRIS TO GRADE LEVEL IN A CONTROLLED DESCENT
- B. BURNING: DO NOT BURN DEMOLISHED MATERIALS.
- C. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS BEGAN.

END OF SECTION 024119

### SECTION 033000 - CAST-IN-PLACE CONCRETE

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES CAST-IN-PLACE CONCRETE, INCLUDING FORMWORK, REINFORCEMENT, CONCRETE MATERIALS, MIXTURE DESIGN, PLACEMENT PROCEDURES, AND FINISHES.
- 1.2 ACTION SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. B. DESIGN MIXTURES: FOR EACH CONCRETE MIXTURE.
- C. STEEL REINFORCEMENT SHOP DRAWINGS: PLACING DRAWINGS THAT DETAIL FABRICATION, BENDING, AND PLACEMENT
- 1.3 QUALITY ASSURANCE
- A. MANUFACTURER QUALIFICATIONS: A FIRM EXPERIENCED IN MANUFACTURING READY-MIXED CONCRETE PRODUCTS AND THAT COMPLIES WITH ASTM C 94/C 94M REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT.
- B. TESTING AGENCY QUALIFICATIONS: AN INDEPENDENT AGENCY, ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, QUALIFIED ACCORDING TO ASTM C 1077 AND ASTM E 329 FOR TESTING INDICATED.
- PART 2 PRODUCTS
- 2.1 STEEL REINFORCEMENT
- A. RECYCLED CONTENT OF STEEL PRODUCTS: POSTCONSUMER RECYCLED CONTENT PLUS ONE-HALF OF PRECONSUMER RECYCLED CONTENT NOT LESS THAN 25 PERCENT.
- B. REINFORCING BARS: ASTM A 615/A 615M, GRADE 60, DEFORMED.
- 1. EPOXY-COATED REINFORCING BARS: ASTM A 775/A 775M, EPOXY COATED, WITH LESS THAN 2 PERCENT DAMAGED COATING IN EACH 3.4 CONCRETE PLACEMENT 12-INCH BAR LENGTH.
- C. PLAIN-STEEL WELDED WIRE REINFORCEMENT: ASTM A 185/A 185M. PLAIN. FABRICATED FROM AS-DRAWN STEEL WIRE INTO FLAT SHEETS
- D. DEFORMED-STEEL WELDED WIRE REINFORCEMENT: ASTM A 497/A 497M. FLAT E. EPOXY-COATED WELDED WIRE REINFORCEMENT: ASTM A 884/A 884M, CLASS A
- COATED, TYPE 1, DEFORMED STEEL F. BAR SUPPORTS: BOLSTERS. CHAIRS. SPACERS. AND OTHER DEVICES FOR SPACING, SUPPORTING, AND FASTENING REINFORCING BARS AND WELDED WIRE REINFORCEMENT IN PLACE. MANUFACTURE BAR SUPPORTS FROM STEEL WIRE, PLASTIC, OR PRECAST CONCRETE ACCORDING TO CRSI'S "MANUAL OF STANDARD PRACTICE.

### 2.2 CONCRETE MATERIALS

- A. CEMENTITIOUS MATERIAL: USE THE FOLLOWING CEMENTITIOUS MATERIALS, OF THE SAME TYPE, BRAND, AND SOURCE, THROUGHOUT PROJECT:
  - 1. PORTLAND CEMENT: ASTM C 150, TYPE I OR TYPE II, GRAY. SUPPLEMENT 3.7 CONCRETE SURFACE REPAIRS WITH THE FOLLOWING:

a. FLY ASH: ASTM C 618, CLASS F OR C.

- b. GROUND GRANULATED BLAST-FURNACE SLAG: ASTM C 989. GRADE 100 OR 120.
- B. NORMAL-WEIGHT AGGREGATES: ASTM C 33, GRADED

  - 1. MAXIMUM COARSE-AGGREGATE SIZE: 3/4 INCH NOMINAL. 2. FINE AGGREGATE: FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.
- C. LIGHTWEIGHT AGGREGATE: ASTM C 330, 3/8-INCH NOMINAL MAXIMUM AGGREGATE SIZE.
- D. WATER: ASTM C 94/C 94M AND POTABLE
- 2.3 ADMIXTURES A. AIR-ENTRAINING ADMIXTURE: ASTM C 260.
- B. CHEMICAL ADMIXTURES: PROVIDE ADMIXTURES CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES AND THAT WILL NOT CONTRIBUTE WATER-SOLUBLE CHLORIDE IONS EXCEEDING THOSE PERMITTED IN HARDENED CONCRETE. DO NOT USE CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE.
- 2.4 CURING MATERIALS

C. WATER: POTABLE.

- A. ABSORPTIVE COVER: AASHTO M 182, CLASS 2, BURLAP CLOTH MADE FROM JUTE OR KENAF, WEIGHING APPROXIMATELY 9 OZ./SQ. YD. WHEN DRY.
- B. MOISTURE-RETAINING COVER: ASTM C 171, POLYETHYLENE FILM OR WHITE BURLAP-POLYETHYLENE SHEET.

D. CLEAR, WATERBORNE, MEMBRANE-FORMING CURING COMPOUND:

E. CLEAR, SOLVENT-BORNE, MEMBRANE-FORMING CURING AND SEALING COMPOUND: ASTM C 1315, TYPE 1, CLASS A.

ASTM C 309, TYPE 1, CLASS B, DISSIPATING.

- 2.5 RELATED MATERIALS A. EXPANSION- AND ISOLATION-JOINT-FILLER STRIPS: ASTM D 1751 ASPHALT-SATURATED CELLULOSIC FIBER.
- 2.6 CONCRETE MIXTURES
- A. PREPARE DESIGN MIXTURES FOR EACH TYPE AND STRENGTH OF CONCRETE,

- PROPORTIONED ON THE BASIS OF LABORATORY TRIAL MIXTURE OR FIELD TEST DATA, OR BOTH, ACCORDING TO ACI 301
- B. CEMENTITIOUS MATERIALS: USE FLY ASH, POZZOLAN, GROUND GRANULATED BLAST-FURNACE SLAG. AND SILICA FUME AS NEEDED TO REDUCE THE TOTAL AMOUNT OF PORTLAND CEMENT, WHICH WOULD OTHERWISE BE USED, BY NOT LESS THAN 40 PERCENT.
- C. ADMIXTURES: USE ADMIXTURES ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
- D. PROPORTION NORMAL-WEIGHT CONCRETE MIXTURE AS FOLLOWS:
  - FOOTINGS, 4000 PSI AT 28 DAYS, FOR ALL CONCRETE EXCEPT AS NOTED
- E. PROPORTION STRUCTURAL LIGHTWEIGHT CONCRETE MIXTURE AS FOLLOWS: 1. MINIMUM COMPRESSIVE STRENGTH: 3500 PSI AT 28 DAYS.
- 2.7 FABRICATING REINFORCEMENT
- A. FABRICATE STEEL REINFORCEMENT ACCORDING TO CRSI'S "MANUAL OF STANDARD PRACTICE.
- 2.8 CONCRETE MIXING
- A. READY-MIXED CONCRETE: MEASURE, BATCH, MIX, AND DELIVER CONCRETE ACCORDING TO ASTM C 94/C 94M AND ASTM C 1116/C 1116M, AND FURNISH BATCH TICKET INFORMATION.
- PART 3 EXECUTION

#### 3.1 FORMWORK

- A. DESIGN, ERECT, SHORE, BRACE, AND MAINTAIN FORMWORK, ACCORDING TO ACI 301. TO SUPPORT VERTICAL, LATERAL, STATIC, AND DYNAMIC LOADS, AND CONSTRUCTION LOADS THAT MIGHT BE APPLIED, UNTIL STRUCTURE CAN SUPPORT SUCH LOADS.
- B. CHAMFER EXTERIOR CORNERS AND EDGES OF PERMANENTLY EXPOSED CONCRETE.
- 3.2 VAPOR RETARDERS
- A. SHEET VAPOR RETARDERS: PLACE, PROTECT, AND REPAIR SHEET VAPOR RETARDER ACCORDING TO ASTM E 1643 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - 1. LAP JOINTS 6 INCHES AND SEAL WITH MANUFACTURER'S RECOMMENDED TAPE.

### 3.3 JOINTS

- A. GENERAL: CONSTRUCT JOINTS TRUE TO LINE WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE
- B. CONSTRUCTION JOINTS: INSTALL SO STRENGTH AND APPEARANCE OF CONCRETE ARE NOT IMPAIRED, AT LOCATIONS INDICATED OR AS APPROVED BY ARCHITECT.
- C. CONTRACTION JOINTS IN SLABS-ON-GRADE: FORM WEAKENED-PLANE CONTRACTION JOINTS, SECTIONING CONCRETE INTO AREAS AS INDICATED. CONSTRUCT CONTRACTION JOINTS FOR A DEPTH EQUAL TO AT LEAST
- ONE-FOURTH OF CONCRETE THICKNESS AS FOLLOWS 1. SAWED JOINTS: FORM CONTRACTION JOINTS WITH POWER SAWS EQUIPPED WITH SHATTERPROOF ABRASIVE OR DIAMOND-RIMMED BLADES. CUT 1/8-INCH- WIDE JOINTS INTO CONCRETE WHEN CUTTING ACTION WILL NOT TEAR. ABRADE. OR OTHERWISE DAMAGE SURFACE
- AND BEFORE CONCRETE DEVELOPS RANDOM CONTRACTION CRACKS.
- A. BEFORE PLACING CONCRETE, VERIFY THAT INSTALLATION OF FORMWORK, REINFORCEMENT, AND EMBEDDED ITEMS IS COMPLETE AND THAT REQUIRED
- INSPECTIONS HAVE BEEN PERFORMED B. COLD-WEATHER PLACEMENT: COMPLY WITH ACI 306.1
- C. HOT-WEATHER PLACEMENT: COMPLY WITH ACI 301
- 3.5 FINISHING FLOORS AND SLABS A. GENERAL: COMPLY WITH ACI 302.1R RECOMMENDATIONS FOR SCREEDING

RESTRAIGHTENING. AND FINISHING OPERATIONS FOR CONCRETE SURFACES.

- DO NOT WET CONCRETE SURFACES
- 3.6 CONCRETE PROTECTING AND CURING A. GENERAL: PROTECT FRESHLY PLACED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE COLD OR HOT TEMPERATURES. COMPLY WITH ACI 306.1 FOR COLD-WEATHER PROTECTION AND ACI 301 FOR HOT-WEATHER PROTECTION
- **DURING CURING.**
- B. CURE CONCRETE ACCORDING TO ACI 308.1:
- A. DEFECTIVE CONCRETE: REPAIR AND PATCH DEFECTIVE AREAS WHEN APPROVED BY ARCHITECT. REMOVE AND REPLACE CONCRETE THAT CANNOT BE REPAIRED AND PATCHED TO ARCHITECT'S APPROVAL.
- 3.8 FIELD QUALITY CONTROL
- A. TESTING AND INSPECTING: OWNER WILL ENGAGE A QUALIFIED TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS

## END OF SECTION 033000

- **SECTION 042000 UNIT MASONRY**
- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES: CONCRETE MASONRY UNITS.
  - DECORATIVE CONCRETE MASONRY UNITS CLAY FACE BRICK.
  - MORTAR AND GROUT. STEEL REINFORCING BARS
  - MASONRY-JOINT REINFORCEMENT. 7. TIES AND ANCHORS.

8. EMBEDDED FLASHING

- 1.2 ACTION SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT. B. SAMPLES FOR VERIFICATION: FOR EACH TYPE AND COLOR OF THE **FOLLOWING:** 
  - DECORATIVE CMUS.

1.3 INFORMATIONAL SUBMITTALS

- 2. CLAY FACE BRICK, IN THE FORM OF STRAPS OF FIVE OR MORE BRICKS. 3. PIGMENTED AND COLORED-AGGREGATE MORTAR. MAKE SAMPLES USING SAME SAND AND MORTAR INGREDIENTS TO BE USED ON PROJECT.
- A. MIX DESIGNS: FOR EACH TYPE OF MORTAR AND GROUT. 1.4 DELIVERY, STORAGE, AND HANDLING

- A. STORE MASONRY UNITS AND MATERIALS ON ELEVATED PLATFORMS IN A DRY LOCATION. IF UNITS ARE NOT STORED IN AN ENCLOSED LOCATION, COVER TOPS AND SIDES OF STACKS WITH WATERPROOF SHEETING, SECURELY TIED. IF UNITS BECOME WET, DO NOT INSTALL UNTIL THEY ARE DRY.
- 1.5 FIELD CONDITIONS
- A. PROTECTION OF MASONRY: DURING CONSTRUCTION, COVER TOPS OF WALLS. PROJECTIONS, AND SILLS WITH WATERPROOF SHEETING AT END OF EACH DAY'S WORK. COVER PARTIALLY COMPLETED MASONRY WHEN CONSTRUCTION IS NOT IN PROGRESS.
- 1. MINIMUM COMPRESSIVE STRENGTH: 3000 PSI AT 28 DAYS FOR B. COLD-WEATHER REQUIREMENTS: DO NOT USE FROZEN MATERIALS OR MATERIALS MIXED OR COATED WITH ICE OR FROST. DO NOT BUILD ON FROZEN SUBSTRATES. REMOVE AND REPLACE UNIT MASONRY DAMAGED BY FROST OR BY FREEZING CONDITIONS. COMPLY WITH COLD-WEATHER CONSTRUCTION REQUIREMENTS CONTAINED IN TMS 602/ACI 530.1/ASCE 6.
  - COLD-WEATHER CLEANING: USE LIQUID CLEANING METHODS ONLY WHE AIR TEMPERATURE IS 40 DEG F AND HIGHER AND WILL REMAIN SO UNTIL MASONRY HAS DRIED, BUT NOT LESS THAN SEVEN DAYS AFTER
  - COMPLETING CLEANING. C. HOT-WEATHER REQUIREMENTS: COMPLY WITH HOT-WEATHER

CONSTRUCTION REQUIREMENTS CONTAINED IN TMS 602/ACI 530.1/ASCE 6

### PART 2 - PRODUCTS

- 2.1 MANUFACTURERS A. SOURCE LIMITATIONS FOR MASONRY UNITS: OBTAIN EXPOSED MASONRY UNITS OF A UNIFORM TEXTURE AND COLOR. OR A UNIFORM BLEND WITHIN THE RANGES ACCEPTED FOR THESE CHARACTERISTICS, FROM SINGLE
- SOURCE FROM SINGLE MANUFACTURER FOR EACH PRODUCT REQUIRED. 2.2 PERFORMANCE REQUIREMENTS
- A. PROVIDE UNIT MASONRY THAT DEVELOPS INDICATED NET-AREA
- COMPRESSIVE STRENGTHS AT 28 DAYS. 1. DETERMINE NET-AREA COMPRESSIVE STRENGTH OF MASONRY FROM AVERAGE NET-AREA COMPRESSIVE STRENGTHS OF MASONRY UNITS AND MORTAR TYPES (UNIT-STRENGTH METHOD) ACCORDING TO
- TMS 602/ACI 530.1/ASCE 6. 2. DETERMINE NET-AREA COMPRESSIVE STRENGTH OF MASONRY BY TESTING MASONRY PRISMS ACCORDING TO ASTM C 1314.
- 2.3 UNIT MASONRY, GENERAL

2.4 CONCRETE MASONRY UNITS

- A. MASONRY STANDARD: COMPLY WITH TMS 602/ACI 530.1/ASCE 6, EXCEPT AS MODIFIED BY REQUIREMENTS IN THE CONTRACT DOCUMENTS
- A. SHAPES: PROVIDE SHAPES INDICATED, WITH EXPOSED SURFACES MATCHING EXPOSED FACES OF ADJACENT UNITS UNLESS OTHERWISE INDICATED. 1. PROVIDE SPECIAL SHAPES FOR LINTELS, CORNERS, JAMBS, SASHES
- MOVEMENT JOINTS, HEADERS, BONDING, AND OTHER SPECIAL 2. PROVIDE SQUARE-EDGED UNITS FOR OUTSIDE CORNERS UNLESS
- OTHERWISE INDICATED. B. INTEGRAL WATER REPELLENT: PROVIDE UNITS MADE WITH INTEGRAL WATER REPELLENT FOR EXPOSED UNITS.
- 1. INTEGRAL WATER REPELLENT: LIQUID POLYMERIC, INTEGRA WATER-REPELLENT ADMIXTURE THAT DOES NOT REDUCE FLEXURAL BOND STRENGTH. UNITS MADE WITH INTEGRAL WATER REPELLENT, WHEN TESTED ACCORDING TO ASTM E 514/E 514M AS A WALL ASSEMBLY MADE WITH MORTAR CONTAINING INTEGRAL WATER-REPELLENT MANUFACTURER'S MORTAR ADDITIVE, WITH TEST PERIOD EXTENDED TO 24 HOURS, SHALL SHOW NO VISIBLE WATER OR LEAKS ON THE BACK OF
- TEST SPECIMEN.
- C. CMUS: ASTM C 90. D. DECORATIVE CMUS: ASTM C 90.
- 2.5 BRICK A. GENERAL: PROVIDE SHAPES INDICATED AND AS FOLLOWS, WITH EXPOSED SURFACES MATCHING FINISH AND COLOR OF EXPOSED FACES OF ADJACENT
- 1. FOR ENDS OF SILLS AND CAPS AND FOR SIMILAR APPLICATIONS THAT WOULD OTHERWISE EXPOSE UNFINISHED BRICK SURFACES, PROVIDE UNITS WITHOUT CORES OR FROGS AND WITH EXPOSED SURFACES FINISHED.
- B. CLAY FACE BRICK: FACING BRICK COMPLYING WITH ASTM C 216 OR HOLLOW BRICK COMPLYING WITH ASTM C 652, CLASS H40V (VOID AREAS BETWEEN 25 AND 40 PERCENT OF GROSS CROSS-SECTIONAL AREA).
- A. PORTLAND CEMENT: ASTM C 150/C 150M, TYPE I OR II, EXCEPT TYPE III MAY BE USED FOR COLD-WEATHER CONSTRUCTION. PROVIDE NATURAL COLOR OR WHITE CEMENT AS REQUIRED TO PRODUCE MORTAR COLOR INDICATED.
- B. HYDRATED LIME: ASTM C 207, TYPE S.

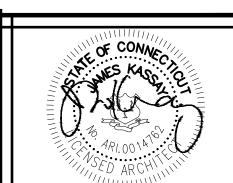
ACCORDING TO ASTM C 114.

2.6 MORTAR AND GROUT MATERIALS

C. PORTLAND CEMENT-LIME MIX: PACKAGED BLEND OF PORTLAND CEMENT AND HYDRATED LIME CONTAINING NO OTHER INGREDIENTS. D. MASONRY CEMENT: ASTM C 91/C 91M.

E. COLORED CEMENT PRODUCTS: PACKAGED BLEND MADE FROM PORTLAND

- ALL COMPLYING WITH SPECIFIED REQUIREMENTS, AND CONTAINING NO
- OTHER INGREDIENTS. F. AGGREGATE FOR MORTAR: ASTM C 144.
- G. AGGREGATE FOR GROUT: ASTM C 404. H. COLD-WEATHER ADMIXTURE: NONCHLORIDE, NONCORROSIVE, ACCELERATING ADMIXTURE COMPLYING WITH ASTM C 494/C 494M, TYPE C, AND RECOMMENDED BY MANUFACTURER FOR USE IN MASONRY MORTAR OF
- COMPOSITION INDICATED. I. WATER-REPELLENT ADMIXTURE: LIQUID WATER-REPELLENT MORTAR ADMIXTURE INTENDED FOR USE WITH CMUS CONTAINING INTEGRAL WATER REPELLENT FROM SAME MANUFACTURER.
- J. WATER: POTABLE.
- 2.7 REINFORCEMENT
- A. UNCOATED-STEEL REINFORCING BARS: ASTM A 615/A 615M OR ASTM A 996/A 996M, GRADE 60.
- B. MASONRY-JOINT REINFORCEMENT, GENERAL: ASTM A 951/A 951M. C. MASONRY-JOINT REINFORCEMENT FOR VENEERS ANCHORED WITH SEISMIC
- MASONRY-VENEER ANCHORS: SINGLE 0.187-INCH-DIAMETER, HOT-DIP GALVANIZED CARBON OR STAINLESS-STEEL CONTINUOUS WIRE.



SHEET NO.

1. ALKALI CONTENT SHALL NOT BE MORE THAN 0.1 PERCENT WHEN TESTED REVISIONS CEMENT AND HYDRATED LIME OR MASONRY CEMENT AND MORTAR PIGMENTS, - 2 8 4 5 9 <del>6</del> 8 **SPECIFICATIONS** 

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- A. GENERAL: TIES AND ANCHORS SHALL EXTEND AT LEAST 1-1/2 INCHES INTO VENEER BUT WITH AT LEAST A 5/8-INCH COVER ON OUTSIDE FACE
- MATERIALS: PROVIDE TIES AND ANCHORS SPECIFIED IN THIS ARTICLE THAT ARE MADE FROM MATERIALS THAT COMPLY WITH THE FOLLOWING UNLESS OTHERWISE INDICATED:
- 1. MILL-GALVANIZED, CARBON-STEEL WIRE: ASTM A 82/A 82M, WITH ASTM A 641/A 641M, CLASS 1 COATING.
- 2. HOT-DIP GALVANIZED, CARBON-STEEL WIRE: ASTM A 82/A 82M, WITH ASTM A 153/A 153M, CLASS B-2 COATING.
- STEEL PLATES, SHAPES, AND BARS: ASTM A 36/A 36M
- ADJUSTABLE ANCHORS FOR CONNECTING TO STRUCTURAL STEEL FRAMING PROVIDE ANCHORS THAT ALLOW VERTICAL OR HORIZONTAL ADJUSTMENT BUT RESIST TENSION AND COMPRESSION FORCES PERPENDICULAR TO PLANE OF WALL.
- . ADJUSTABLE MASONRY-VENEER ANCHORS:
- 1. GENERAL: PROVIDE ANCHORS THAT ALLOW VERTICAL ADJUSTMENT BUT RESIST A 100-LBF LOAD IN BOTH TENSION AND COMPRESSION PERPENDICULAR TO PLANE OF WALL WITHOUT DEFORMING OR DEVELOPING PLAY IN EXCESS OF 1/16 INCH
- 2.9 EMBEDDED FLASHING MATERIALS
- A. METAL FLASHING: PROVIDE METAL FLASHING COMPLYING WITH SMACNA'S "ARCHITECTURAL SHEET METAL MANUAL".
- 2.10 MISCELLANEOUS MASONRY ACCESSORIES
- A. COMPRESSIBLE FILLER: PREMOLDED FILLER STRIPS COMPLYING WITH ASTM D 1056, GRADE 2A1; COMPRESSIBLE UP TO 35 PERCENT; OF WIDTH AND THICKNESS INDICATED; FORMULATED FROM NEOPRENE, URETHANE OR PVC.
- PREFORMED CONTROL-JOINT GASKETS: MADE FROM STYRENE-BUTADIENE-RUBBER COMPOUND, COMPLYING WITH ASTM D 2000.
- WEEP/CAVITY VENT PRODUCTS: USE ONE OF THE FOLLOWING UNLESS OTHERWISE INDICATED:
- 1. RECTANGULAR PLASTIC WEEP/VENT TUBING: CLEAR BUTYRATE, 3/8 BY 1-1/2 BY 3-1/2 INCHES LONG.
  - 2. CELLULAR PLASTIC WEEP/VENT: ONE-PIECE, FLEXIBLE EXTRUSION MADE FROM UV-RESISTANT POLYPROPYLENE COPOLYMER, FULL HEIGHT AND WIDTH OF HEAD JOINT AND DEPTH 1/8 INCH LESS THAN DEPTH OF OUTER WYTHE, IN COLOR SELECTED FROM MANUFACTURER'S STANDARD.
  - 3. MESH WEEP/VENT: FREE-DRAINING MESH; MADE FROM POLYETHYLENE STRANDS, FULL HEIGHT AND WIDTH OF HEAD JOINT AND DEPTH 1/8 INCH LESS THAN DEPTH OF OUTER WYTHE; IN COLOR SELECTED FROM MANUFACTURER'S STANDARD.
- ). CAVITY DRAINAGE MATERIAL: FREE-DRAINING MESH, MADE FROM POLYMER STRANDS THAT WILL NOT DEGRADE WITHIN THE WALL CAVITY.
- 2.11 MASONRY CLEANERS
- A. PROPRIETARY ACIDIC CLEANER: MANUFACTURER'S STANDARD-STRENGTH CLEANER DESIGNED FOR REMOVING MORTAR/GROUT STAINS. EFFLORESCENCE, AND OTHER NEW CONSTRUCTION STAINS FROM NEW MASONRY WITHOUT DISCOLORING OR DAMAGING MASONRY SURFACES. USE PRODUCT EXPRESSLY APPROVED FOR INTENDED USE BY CLEANER MANUFACTURER AND MANUFACTURER OF MASONRY UNITS BEING CLEANED. 2.12 MORTAR AND GROUT MIXES
- A. GENERAL: DO NOT USE ADMIXTURES, INCLUDING PIGMENTS, AIR-ENTRAINING AGENTS, ACCELERATORS, RETARDERS, WATER-REPELLENT AGENTS, ANTIFREEZE COMPOUNDS, OR OTHER ADMIXTURES UNLESS OTHERWISE
- DO NOT USE CALCIUM CHLORIDE IN MORTAR OR GROUT.
- MORTAR FOR UNIT MASONRY: COMPLY WITH ASTM C 270
- COLORED-AGGREGATE MORTAR: PRODUCE REQUIRED MORTAR COLOR BY USING COLORED AGGREGATES AND NATURAL COLOR OR WHITE CEMENT AS NECESSARY TO PRODUCE REQUIRED MORTAR COLOR.
- GROUT FOR UNIT MASONRY: COMPLY WITH ASTM C 476.
- PART 3 EXECUTION

INDICATED.

- 3.1 INSTALLATION, GENERAL
- A. USE FULL-SIZE UNITS WITHOUT CUTTING IF POSSIBLE. IF CUTTING IS REQUIRED TO PROVIDE A CONTINUOUS PATTERN OR TO FIT ADJOINING CONSTRUCTION, CUT UNITS WITH MOTOR-DRIVEN SAWS: PROVIDE CLEAN. SHARP, UNCHIPPED EDGES, ALLOW UNITS TO DRY BEFORE LAYING UNLESS WETTING OF UNITS IS SPECIFIED. INSTALL CUT UNITS WITH CUT SURFACES AND, WHERE POSSIBLE, CUT EDGES CONCEALED
- WETTING OF BRICK: WET BRICK BEFORE LAYING IF INITIAL RATE OF ABSORPTION EXCEEDS 30 G/30 SQ. IN. PER MINUTE WHEN TESTED ACCORDING TO ASTM C 67. ALLOW UNITS TO ABSORB WATER SO THEY ARE DAMP BUT NOT WET AT TIME OF LAYING.
- 3.2 TOLERANCES
- A. DIMENSIONS AND LOCATIONS OF ELEMENTS:
- 1. FOR DIMENSIONS IN CROSS SECTION OR ELEVATION, DO NOT VARY BY MORE THAN PLUS 1/2 INCH OR MINUS 1/4 INCH.
- 2. FOR LOCATION OF ELEMENTS IN PLAN, DO NOT VARY FROM THAT INDICATED BY MORE THAN PLUS OR MINUS 1/2 INCH.
- 3. FOR LOCATION OF ELEMENTS IN ELEVATION, DO NOT VARY FROM THAT A. SECTION INCLUDES: INDICATED BY MORE THAN PLUS OR MINUS 1/4 INCH IN A STORY HEIGHT OR 1/2 INCH TOTAL
- 3.3 LAYING MASONRY WALLS
- A. LAY OUT WALLS IN ADVANCE FOR ACCURATE SPACING OF SURFACE BOND PATTERNS WITH UNIFORM JOINT THICKNESSES AND FOR ACCURATE LOCATION OF OPENINGS, MOVEMENT-TYPE JOINTS, RETURNS, AND OFFSETS. AVOID USING LESS-THAN-HALF-SIZE UNITS, PARTICULARLY AT CORNERS, JAMBS, AND, WHERE POSSIBLE, AT OTHER LOCATIONS.
- BOND PATTERN FOR EXPOSED MASONRY: UNLESS OTHERWISE INDICATED, LAY EXPOSED MASONRY IN RUNNING BOND: DO NOT USE UNITS WITH LESS-THAN-NOMINAL 4-INCH HORIZONTAL FACE DIMENSIONS AT CORNERS OR
- 3.4 ANCHORED MASONRY VENEERS
- A. ANCHOR MASONRY VENEERS TO WALL FRAMING WITH MASONRY-VENEER ANCHORS TO COMPLY WITH THE FOLLOWING REQUIREMENTS:
- 1. FASTEN SCREW-ATTACHED AND SEISMIC ANCHORS THROUGH SHEATHING TO WALL FRAMING WITH METAL FASTENERS OF TYPE INDICATED. USE TWO FASTENERS UNLESS ANCHOR DESIGN ONLY USES ONE FASTENER.
- 2. LOCATE ANCHOR SECTIONS TO ALLOW MAXIMUM VERTICAL

- DIFFERENTIAL MOVEMENT OF TIES UP AND DOWN
- 3. SPACE ANCHORS AS INDICATED, BUT NOT MORE THAN 18 INCHES O.C. VERTICALLY AND 24 INCHES O.C. HORIZONTALLY, WITH NOT LESS THAN ONE ANCHOR FOR EACH 2 SQ. FT. OF WALL AREA. INSTALL ADDITIONAL ANCHORS WITHIN 12 INCHES OF OPENINGS AND AT INTERVALS. NOT EXCEEDING 8 INCHES, AROUND PERIMETER.
- a. COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION, OR COMPLY WITH STRUCTURAL REQUIREMENTS IMPOSED BY WIND OR SEISMIC FORCES.
- 3.5 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE
- A. ANCHOR MASONRY TO STRUCTURAL STEEL AND CONCRETE, WHERE MASONRY ABUTS OR FACES STRUCTURAL STEEL OR CONCRETE, TO COMPLY WITH THE FOLLOWING
  - 1. PROVIDE AN OPEN SPACE NOT LESS THAN 1 INCH WIDE BETWEEN MASONRY AND STRUCTURAL STEEL OR CONCRETE UNLESS OTHERWISE INDICATED. KEEP OPEN SPACE FREE OF MORTAR AND OTHER RIGID MATERIALS.
  - 2. ANCHOR MASONRY WITH ANCHORS EMBEDDED IN MASONRY JOINTS AND ATTACHED TO STRUCTURE.
- 3. SPACE ANCHORS AS INDICATED, BUT NOT MORE THAN 24 INCHES O.C. VERTICALLY AND 36 INCHES O.C. HORIZONTALLY
- 3.6 FLASHING, WEEP HOLES, AND CAVITY VENTS
- A. GENERAL: INSTALL EMBEDDED FLASHING AND WEEP HOLES IN MASONRY AT SHELF ANGLES, LINTELS, LEDGES, OTHER OBSTRUCTIONS TO DOWNWARD FLOW OF WATER IN WALL, AND WHERE INDICATED. INSTALL CAVITY VENTS AT SHELF ANGLES, LEDGES, AND OTHER OBSTRUCTIONS TO UPWARD FLOW OF AIR IN CAVITIES, AND WHERE INDICATED.
- B. INSTALL FLASHING AS FOLLOWS UNLESS OTHERWISE INDICATED:
  - 1. PREPARE MASONRY SURFACES SO THEY ARE SMOOTH AND FREE FROM PROJECTIONS THAT COULD PUNCTURE FLASHING. WHERE FLASHING IS WITHIN MORTAR JOINT, PLACE THROUGH-WALL FLASHING ON SLOPING BED OF MORTAR AND COVER WITH MORTAR. BEFORE COVERING WITH MORTAR, SEAL PENETRATIONS IN FLASHING WITH ADHESIVE, SEALANT, OR TAPE AS RECOMMENDED BY FLASHING MANUFACTURER.
- C. INSTALL WEEP HOLES IN EXTERIOR WYTHES AND VENEERS IN HEAD JOINTS OF FIRST COURSE OF MASONRY IMMEDIATELY ABOVE EMBEDDED FLASHING
- USE SPECIFIED WEEP/CAVITY VENT PRODUCTS TO FORM WEEP HOLES
- SPACE WEEP HOLES 24 INCHES O.C. UNLESS OTHERWISE INDICATED. 3. COVER CAVITY SIDE OF WEEP HOLES WITH PLASTIC INSECT SCREENING
- AT CAVITIES INSULATED WITH LOOSE-FILL INSULATION. D. PLACE CAVITY DRAINAGE MATERIAL IN AIRSPACE BEHIND VENEERS TO COMPLY WITH CONFIGURATION REQUIREMENTS FOR CAVITY DRAINAGE
- MATERIAL IN "MISCELLANEOUS MASONRY ACCESSORIES" ARTICLE. E. INSTALL CAVITY VENTS IN HEAD JOINTS IN EXTERIOR WYTHES AT SPACING INDICATED. USE SPECIFIED WEEP/CAVITY VENT PRODUCTS OR OPEN HEAD JOINTS TO FORM CAVITY VENTS.
  - 1. CLOSE CAVITIES OFF VERTICALLY AND HORIZONTALLY WITH BLOCKING IN MANNER INDICATED. INSTALL THROUGH-WALL FLASHING AND WEEP HOLES ABOVE HORIZONTAL BLOCKING.
- 3.7 FIELD QUALITY CONTROL
- A. TESTING AND INSPECTING: OWNER WILL ENGAGE SPECIAL INSPECTORS TO PERFORM TESTS AND INSPECTIONS AND PREPARE REPORTS. ALLOW INSPECTORS ACCESS TO SCAFFOLDING AND WORK AREAS AS NEEDED TO PERFORM TESTS AND INSPECTIONS. RETESTING OF MATERIALS THAT FAIL TO COMPLY WITH SPECIFIED REQUIREMENTS SHALL BE DONE AT CONTRACTOR'S EXPENSE.
- 3.8 REPAIRING, POINTING, AND CLEANING
- A. IN-PROGRESS CLEANING: CLEAN UNIT MASONRY AS WORK PROGRESSES BY DRY BRUSHING TO REMOVE MORTAR FINS AND SMEARS BEFORE TOOLING JOINTS.
- B. FINAL CLEANING: AFTER MORTAR IS THOROUGHLY SET AND CURED, CLEAN **EXPOSED MASONRY AS FOLLOWS:** 
  - 1. REMOVE LARGE MORTAR PARTICLES BY HAND WITH WOODEN PADDLES AND NONMETALLIC SCRAPE HOES OR CHISELS.
  - 2. TEST CLEANING METHODS ON SAMPLE WALL PANEL; LEAVE ONE-HALF OF PANEL UNCLEANED FOR COMPARISON PURPOSES.
  - 3. PROTECT ADJACENT SURFACES FROM CONTACT WITH CLEANER.
  - 4. WET WALL SURFACES WITH WATER BEFORE APPLYING CLEANERS: REMOVE CLEANERS PROMPTLY BY RINSING SURFACES THOROUGHLY WITH CLEAR WATER
  - 5. CLEAN BRICK BY BUCKET-AND-BRUSH HAND-CLEANING METHOD DESCRIBED IN BIA TECHNICAL NOTES 20.
  - 6. CLEAN MASONRY WITH A PROPRIETARY ACIDIC CLEANER APPLIED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

### END OF SECTION 042000

### **SECTION 055213 - PIPE AND TUBE RAILINGS**

- PART 1 GENERAL
- 1.1 SUMMARY
- STEEL PIPE AND TUBE RAILINGS
- 1.2 ACTION SUBMITTALS
- A. SHOP DRAWINGS: INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND
- ATTACHMENTS TO OTHER WORK. PART 2 - PRODUCTS
- 2.1 PERFORMANCE REQUIREMENTS
- A. STRUCTURAL PERFORMANCE: RAILINGS, INCLUDING ATTACHMENT TO BUILDING CONSTRUCTION, SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND THE FOLLOWING LOADS AND STRESSES WITHIN LIMITS AND
- UNDER CONDITIONS INDICATED: 1. HANDRAILS AND TOP RAILS OF GUARDS:
  - a. UNIFORM LOAD OF 50 LBF/ FT. APPLIED IN ANY DIRECTION.
  - b. CONCENTRATED LOAD OF 200 LBF APPLIED IN ANY DIRECTION.
  - c. UNIFORM AND CONCENTRATED LOADS NEED NOT BE ASSUMED TO ACT CONCURRENTLY.
- 2. INFILL OF GUARDS:
- AREA OF 1 SQ. FT.
- b. INFILL LOAD AND OTHER LOADS NEED NOT BE ASSUMED TO ACT CONCURRENTLY

2.2 STEEL AND IRON A. TUBING: ASTM A 500 (COLD FORMED) OR ASTM A 513

SPECIFICATIONS FOR METAL ALLOY WELDED.

- B. PIPE: ASTM A 53/A 53M, TYPE F OR TYPE S, GRADE A, STANDARD WEIGHT (SCHEDULE 40), UNLESS ANOTHER GRADE AND WEIGHT ARE REQUIRED BY
- STRUCTURAL LOADS.
- C. PLATES, SHAPES, AND BARS: ASTM A 36/A 36M. 2.3 FASTENERS
- A. GENERAL: PROVIDE THE FOLLOWING:
- 1. UNGALVANIZED-STEEL RAILINGS: PLATED STEEL FASTENERS COMPLYING WITH ASTM B 633 OR ASTM F 1941, CLASS FE/ZN 5 FOR ZINC COATING 2.4 MISCELLANEOUS MATERIALS
- A. WELDING RODS AND BARE ELECTRODES: SELECT ACCORDING TO AWS
- B. UNIVERSAL SHOP PRIMER: FAST-CURING, LEAD- AND CHROMATE-FREE. UNIVERSAL MODIFIED-ALKYD PRIMER COMPLYING WITH MPI#79 AND COMPATIBLE WITH TOPCOAT.
- C. NONSHRINK, NONMETALLIC GROUT: FACTORY-PACKAGED, NONSTAINING, NONCORROSIVE, NONGASEOUS GROUT COMPLYING WITH ASTM C 1107/C 1107M. PROVIDE GROUT SPECIFICALLY RECOMMENDED BY MANUFACTURER FOR INTERIOR AND EXTERIOR APPLICATIONS
- 2.5 STEEL AND IRON FINISHES
- A. PREPARATION FOR SHOP PRIMING: PREPARE UNCOATED FERROUS-METAL SURFACES TO COMPLY WITH SSPC-SP 3, "POWER TOOL CLEANING."
- B. PRIMER APPLICATION: APPLY SHOP PRIMER TO PREPARED SURFACES OF RAILINGS UNLESS OTHERWISE INDICATED. COMPLY WITH REQUIREMENTS IN SSPC-PA 1. "SHOP. FIELD. AND MAINTENANCE PAINTING OF STEEL." FOR SHOP PAINTING. PRIMER NEED NOT BE APPLIED TO SURFACES TO BE EMBEDDED IN CONCRETE OR MASONRY.
- PART 3 EXECUTION
- 3.1 INSTALLATION, GENERAL A. SET RAILINGS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION;
- MEASURED FROM ESTABLISHED LINES AND LEVELS AND FREE OF RACK. DO NOT WELD, CUT, OR ABRADE SURFACES OF RAILING COMPONENTS THAT ARE COATED OR FINISHED AFTER FABRICATION AND THAT ARE INTENDED FOR FIELD CONNECTION BY MECHANICAL OR OTHER MEANS WITHOUT FURTHER CUTTING OR FITTING.
- 2. SET POSTS PLUMB WITHIN A TOLERANCE OF 1/16 INCH IN 3 FEET (2 MM IN
- 3. ALIGN RAILS SO VARIATIONS FROM LEVEL FOR HORIZONTAL MEMBERS AND VARIATIONS FROM PARALLEL WITH RAKE OF STEPS AND RAMPS FOR SLOPING MEMBERS DO NOT EXCEED 1/4 INCH IN 12 FEET (6 MM IN 3.5 M).
- B. CONTROL OF CORROSION: PREVENT GALVANIC ACTION AND OTHER FORMS OF CORROSION BY INSULATING METALS AND OTHER MATERIALS FROM DIRECT CONTACT WITH INCOMPATIBLE MATERIALS.
- 3.2 ANCHORING POSTS
- A. FORM OR CORE-DRILL HOLES NOT LESS THAN 5 INCHES (125 MM) DEEP AND 3/4 INCH (20 MM) LARGER THAN OD OF POST FOR INSTALLING POSTS IN CONCRETE. CLEAN HOLES OF LOOSE MATERIAL, INSERT POSTS, AND FILL ANNULAR SPACE BETWEEN POST AND CONCRETE WITH NONSHRINK, NONMETALLIC GROUT, MIXED AND PLACED TO COMPLY WITH ANCHORING MATERIAL MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 3.3 ATTACHING RAILINGS
- A. ATTACH RAILINGS TO WALL WITH WALL BRACKETS, EXCEPT WHERE END FLANGES ARE USED. LOCATE BRACKETS AS INDICATED OR, IF NOT INDICATED, AT SPACING REQUIRED TO SUPPORT STRUCTURAL LOADS.
- B. SECURE WALL BRACKETS AND RAILING END FLANGES TO BUILDING CONSTRUCTION AS FOLLOWS:
  - 1. FOR CONCRETE AND SOLID MASONRY ANCHORAGE, USE DRILLED-IN
  - EXPANSION SHIELDS AND HANGER OR LAG BOLTS. FOR HOLLOW MASONRY ANCHORAGE, USE TOGGLE BOLTS.
  - 3. FOR WOOD STUD PARTITIONS, USE HANGER OR LAG BOLTS SET INTO STUDS OR WOOD BACKING BETWEEN STUDS. COORDINATE WITH 2.6 PLYWOOD BACKING PANELS CARPENTRY WORK TO LOCATE BACKING MEMBERS.
  - 4. FOR STEEL-FRAMED PARTITIONS, USE SELF-TAPPING SCREWS FASTENED TO STEEL FRAMING OR TO CONCEALED STEEL REINFORCEMENTS.
- 3.4 ADJUSTING AND CLEANING
- A. TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS BOLTED CONNECTIONS, AND ABRADED AREAS OF SHOP PAINT, AND PAINT EXPOSED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING TO COMPLY WITH SSPC-PA 1 REQUIREMENTS FOR TOUCHING UP SHOP-PAINTED SURFACES.
- **END OF SECTION 055213**

### **SECTION 061000 - ROUGH CARPENTRY**

- PART 1 GENERAL
- 1.1 SUMMARY
- A. THIS SECTION INCLUDES THE FOLLOWING:
  - FRAMING WITH DIMENSION LUMBER.
  - FRAMING WITH ENGINEERED WOOD PRODUCTS. WOOD BLOCKING AND NAILERS.
  - WOOD FURRING AND SLEEPERS.
  - PLYWOOD BACKING PANELS.
- PART 2 PRODUCTS
- 2.1 WOOD PRODUCTS, GENERAL A. LUMBER: DOC PS 20 AND APPLICABLE RULES OF GRADING AGENCIES INDICATED. IF NO GRADING AGENCY IS INDICATED, PROVIDE LUMBER THAT COMPLIES WITH THE APPLICABLE RULES OF ANY RULES-WRITING AGENCY
- GRADE LUMBER UNDER THE RULES INDICATED. B. ENGINEERED WOOD PRODUCTS: PROVIDE ENGINEERED WOOD PRODUCTS ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION AND FOR WHICH CURRENT MODEL CODE RESEARCH OR EVALUATION REPORTS EXIST THAT

CERTIFIED BY THE ALSC BOARD OF REVIEW. PROVIDE LUMBER GRADED BY

AN AGENCY CERTIFIED BY THE ALSC BOARD OF REVIEW TO INSPECT AND

- 2.2 WOOD-PRESERVATIVE-TREATED LUMBER
- a. CONCENTRATED LOAD OF 50 LBF APPLIED HORIZONTALLY ON AN A. PRESERVATIVE TREATMENT BY PRESSURE PROCESS: AWPA C2, EXCEPT THAT LUMBER THAT IS NOT IN CONTACT WITH THE GROUND AND IS CONTINUOUSLY PROTECTED FROM LIQUID WATER MAY BE TREATED

SHOW COMPLIANCE WITH BUILDING CODE IN EFFECT FOR PROJECT

- ACCORDING TO AWPA C31 WITH INORGANIC BORON (SBX).
- B. KILN-DRY LUMBER AFTER TREATMENT TO A MAXIMUM MOISTURE CONTENT OF 19 PERCENT
- 2.3 DIMENSION LUMBER FRAMING
- A. MAXIMUM MOISTURE CONTENT: 19 PERCENT.
- B. NON-LOAD-BEARING INTERIOR PARTITIONS: CONSTRUCTION OR NO. 2 GRADE SPRUCE-PINE-FIR OR APPROVED STRUCTURAL EQUIVALENT.
- C. SIZES 2" THICK X 5" AND WIDER SHALL BE NO. 1 DOUGLAS FIR LARCH OR NO. 1 SOUTHERN PINE OR APPROVED EQUAL WITH THE FOLLOWING MINIMUM **DESIGN VALUES:**
- 1. FB = 1,000 PSI
- 2. E = 1,700,000 PSI
- 3. FV = 90 PSI
- 4. FC = 565 PSI (PERPENDICULAR TO GRAIN)
- FC = 1,500 PSI (PARALLEL TO GRAIN)
- D. SIZES 2" THICK X 4" WIDE SHALL BE CONSTRUCTION GRADE HEM-FIR OR APPROVED EQUAL WITH THE FOLLOWING MINIMUM DESIGN VALUES:
  - 1. FB = 975 PSI
  - 2. E = 1,300,000 PSI
  - 3. FV = 75 PSI 4. FC = 405 PSI (PERPENDICULAR TO GRAIN)
  - FC = 1,550 PSI (PARALLEL TO GRAIN)
- 2.4 ENGINEERED WOOD PRODUCTS A. ENGINEERED WOOD PRODUCTS. GENERAL: PRODUCTS SHALL CONTAIN NO UREA FORMALDEHYDE.
- B. LAMINATED-VENEER LUMBER: STRUCTURAL COMPOSITE LUMBER MADE FROM WOOD VENEERS WITH GRAIN PRIMARILY PARALLEL TO MEMBER LENGTHS, EVALUATED AND MONITORED ACCORDING TO ASTM D 5456 AND MANUFACTURED WITH AN EXTERIOR-TYPE ADHESIVE COMPLYING WITH
- ASTM D 2559. 1. EXTREME FIBER STRESS IN BENDING, EDGEWISE: 2900 PSI FOR 12-INCH
- NOMINAL- DEPTH MEMBERS. 2. MODULUS OF ELASTICITY, EDGEWISE: 2,000,000 PSI.
- C. WOOD I-JOISTS: PREFABRICATED UNITS, I-SHAPED IN CROSS SECTION, MADE WITH SOLID OR STRUCTURAL COMPOSITE LUMBER FLANGES AND WOOD-BASED STRUCTURAL PANEL WEBS, LET INTO AND BONDED TO FLANGES. PROVIDE UNITS COMPLYING WITH MATERIAL REQUIREMENTS OF AND WITH STRUCTURAL CAPACITIES ESTABLISHED AND MONITORED ACCORDING TO ASTM D 5055
- D. RIM BOARDS: PRODUCT DESIGNED TO BE USED AS A LOAD-BEARING MEMBER AND TO BRACE WOOD I-JOISTS AT BEARING ENDS, COMPLYING WITH RESEARCH/EVALUATION REPORT FOR I-JOISTS.

A. GENERAL: PROVIDE MISCELLANEOUS LUMBER INDICATED AND LUMBER FOR

SUPPORT OR ATTACHMENT OF OTHER CONSTRUCTION, INCLUDING THE **FOLLOWING:** 

2.5 MISCELLANEOUS LUMBER

- BLOCKING NAILERS.
- CANTS.

4. FURRING

- B. FOR ITEMS OF DIMENSION LUMBER SIZE, PROVIDE STANDARD, STUD, OR NO. 3 GRADE LUMBER WITH 19 PERCENT MAXIMUM MOISTURE CONTENT OF ANY SPECIES.
- C. FOR CONCEALED BOARDS, PROVIDE LUMBER WITH 19 PERCENT MAXIMUM MOISTURE CONTENT AND ANY OF THE FOLLOWING SPECIES AND GRADES:
  - MIXED SOUTHERN PINE, NO. 2 GRADE; SPIB.
  - 2. EASTERN SOFTWOODS, NO. 2 COMMON GRADE; NELMA. 3. NORTHERN SPECIES, NO. 2 COMMON GRADE; NLGA.
- 4. WESTERN WOODS, CONSTRUCTION OR NO. 2 COMMON GRADE; WCLIB
- A. TELEPHONE AND ELECTRICAL EQUIPMENT BACKING PANELS: DOC PS 1, EXTERIOR, AC, IN THICKNESS INDICATED OR, IF NOT INDICATED, NOT LESS
- THAN 3/4-INCH NOMINAL THICKNESS.
- 2.7 FASTENERS A. GENERAL: PROVIDE FASTENERS OF SIZE AND TYPE INDICATED THAT COMPLY
- WITH REQUIREMENTS SPECIFIED. 1. WHERE ROUGH CARPENTRY IS EXPOSED TO WEATHER, IN GROUND CONTACT, PRESSURE-PRESERVATIVE TREATED, OR IN AREA OF HIGH
- COMPLYING WITH ASTM A 153/A 153M.
- B. POWER-DRIVEN FASTENERS: NES NER-272. C. BOLTS: STEEL BOLTS COMPLYING WITH ASTM A 307, GRADE A; WITH
- ASTM A 563 HEX NUTS AND, WHERE INDICATED, FLAT WASHERS.
- 2.8 METAL FRAMING ANCHORS A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE
- PRODUCTS BY THE FOLLOWING:
- 1. SIMPSON STRONG-TIE CO., INC. B. ALLOWABLE DESIGN LOADS: PROVIDE PRODUCTS WITH ALLOWABLE DESIGN LOADS, AS PUBLISHED BY MANUFACTURER, THAT MEET OR EXCEED THOSE OF PRODUCTS OF MANUFACTURER LISTED. MANUFACTURER'S PUBLISHED VALUES SHALL BE DETERMINED FROM EMPIRICAL DATA OR BY RATIONAL ENGINEERING ANALYSIS AND DEMONSTRATED BY COMPREHENSIVE TESTING PERFORMED BY A QUALIFIED INDEPENDENT TESTING AGENCY.
- PART 3 EXECUTION
- 3.1 INSTALLATION
- A. SET ROUGH CARPENTRY TO REQUIRED LEVELS AND LINES, WITH MEMBERS PLUMB, TRUE TO LINE, CUT, AND FITTED. FIT ROUGH CARPENTRY TO OTHER CONSTRUCTION; SCRIBE AND COPE AS NEEDED FOR ACCURATE FIT. LOCATE FURRING, NAILERS, BLOCKING, AND SIMILAR SUPPORTS TO COMPLY WITH REQUIREMENTS FOR ATTACHING OTHER CONSTRUCTION.
- B. WHERE WOOD-PRESERVATIVE-TREATED LUMBER IS INSTALLED ADJACENT TO METAL DECKING, INSTALL CONTINUOUS FLEXIBLE FLASHING SEPARATOR BETWEEN WOOD AND METAL DECKING. C. FRAMING STANDARD: COMPLY WITH AF&PA'S "DETAILS FOR CONVENTIONAL
- WOOD FRAME CONSTRUCTION," UNLESS OTHERWISE INDICATED. D. FRAMING WITH ENGINEERED WOOD PRODUCTS: INSTALL ENGINEERED WOOD PRODUCTS TO COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

E. METAL FRAMING ANCHORS: INSTALL METAL FRAMING TO COMPLY WITH

- MANUFACTURER'S WRITTEN INSTRUCTIONS.
- F. DO NOT SPLICE STRUCTURAL MEMBERS BETWEEN SUPPORTS, UNLESS OTHERWISE INDICATED.
- G. COMPLY WITH AWPA M4 FOR APPLYING FIELD TREATMENT TO CUT SURFACES

ANCHORING AND FASTENING AS INDICATED, COMPLYING WITH THE

- OF PRESERVATIVE-TREATED LUMBER. H. SECURELY ATTACH ROUGH CARPENTRY WORK TO SUBSTRATE BY
- FOLLOWING:
- NES NER-272 FOR POWER-DRIVEN FASTENERS 2. TABLE 2304.9.1, "FASTENING SCHEDULE," IN ICC'S INTERNATIONAL **BUILDING CODE**

END OF SECTION 061000

SECTION 061600 - SHEATHING PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES: WALL SHEATHING.

- 2. SHEATHING JOINT AND PENETRATION TREATMENT
- PRODUCTS
- 2.1 WOOD PANEL PRODUCTS
- A. PLYWOOD: DOC PS 2.
- B. ORIENTED STRAND BOARD: DOC PS 2
- 2.2 WALL SHEATHING A. PLYWOOD WALL SHEATHING: EXTERIOR, STRUCTURAL I SHEATHING.
- B. ORIENTED-STRAND-BOARD WALL SHEATHING: EXPOSURE 1, STRUCTURAL C. GLASS-MAT GYPSUM WALL SHEATHING: ASTM C 1177/1177M.
- 1. TYPE AND THICKNESS: TYPE X, 5/8 INCH THICK.
- 2. GP DENSGLASS
- 2.3 FASTENERS A. GENERAL: PROVIDE FASTENERS OF SIZE AND TYPE INDICATED THAT COMPLY WITH REQUIREMENTS SPECIFIED IN THIS ARTICLE FOR MATERIAL AND MANUFACTURE
  - 1. FOR ROOF AND WALL SHEATHING, PROVIDE FASTENERS WITH HOT-DIF ZINC COATING COMPLYING WITH ASTM A 153/A 153M
- 2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS
- A. SEALANT FOR GLASS-MAT GYPSUM SHEATHING: SILICONE EMULSION SEALANT COMPLYING WITH ASTM C 834, COMPATIBLE WITH SHEATHING TAPE AND SHEATHING AND RECOMMENDED BY TAPE AND SHEATHING MANUFACTURERS FOR USE WITH GLASS-FIBER SHEATHING TAPE AND FOR COVERING EXPOSED **FASTENERS** 
  - 1. SHEATHING TAPE: SELF-ADHERING GLASS-FIBER TAPE, MINIMUM INCHES WIDE, 10 BY 10 OR 10 BY 20 THREADS/INCH, OF TYPE RECOMMENDED BY SHEATHING AND TAPE MANUFACTURERS FOR USE WITH SILICONE EMULSION SEALANT IN SEALING JOINTS IN GLASS-MAT GYPSUM SHEATHING AND WITH A HISTORY OF SUCCESSFUL IN-SERVICE
- EXECUTION
- 3.1 INSTALLATION, GENERAL A. DO NOT USE MATERIALS WITH DEFECTS THAT IMPAIR QUALITY OF SHEATHING OR PIECES THAT ARE TOO SMALL TO USE WITH MINIMUM NUMBER OF JOINTS
- OR OPTIMUM JOINT ARRANGEMENT. ARRANGE JOINTS SO THAT PIECES DO NOT SPAN BETWEEN FEWER THAN THREE SUPPORT MEMBERS B. SECURELY ATTACH TO SUBSTRATE BY FASTENING AS INDICATED, COMPLYING
- WITH THE FOLLOWING:

NES NER-272 FOR POWER-DRIVEN FASTENERS.

2. TABLE 2304.9.1, "FASTENING SCHEDULE," IN ICC'S "INTERNATIONAL **BUILDING CODE."** C. COORDINATE WALL SHEATHING INSTALLATION WITH FLASHING AND

JOINT-SEALANT INSTALLATION SO THESE MATERIALS ARE INSTALLED IN

SEQUENCE AND MANNER THAT PREVENT EXTERIOR MOISTURE FROM PASSING THROUGH COMPLETED ASSEMBLY. D. DO NOT BRIDGE BUILDING EXPANSION JOINTS: CUT AND SPACE EDGES OF

PANELS TO MATCH SPACING OF STRUCTURAL SUPPORT ELEMENTS.

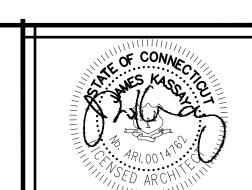
3.2 WOOD STRUCTURAL PANEL INSTALLATION A. GENERAL: COMPLY WITH APPLICABLE RECOMMENDATIONS IN APA FORM

WALL AND ROOF SHEATHING:

NO. E30, "ENGINEERED WOOD CONSTRUCTION GUIDE," FOR TYPES OF STRUCTURAL-USE PANELS AND APPLICATIONS INDICATED. RELATIVE HUMIDITY, PROVIDE FASTENERS WITH HOT-DIP ZINC COATING B. FASTENING METHODS: FASTEN PANELS AS INDICATED BELOW:

a. NAIL TO WOOD FRAMING. APPLY A CONTINUOUS BEAD OF GLUE 1

- FRAMING MEMBERS AT EDGES OF WALL SHEATHING PANELS. b. SPACE PANELS 1/8 INCH APART AT EDGES AND ENDS
- 3.3 GYPSUM SHEATHING INSTALLATION A. COMPLY WITH GA-253 AND WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. B. SEAL SHEATHING JOINTS ACCORDING TO SHEATHING MANUFACTURER'S
- WRITTEN INSTRUCTIONS. END OF SECTION 061600



REVISIONS

**SPECIFICATIONS** 

06/01/22

21399

SHEET NO.

JOB NO.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.
- 1.2 SUMMARY
- .. SECTION INCLUDES:
- WOOD ROOF TRUSSES.
- 2. WOOD GIRDER TRUSSES.
- 3. WOOD TRUSS BRACING.
- METAL TRUSS ACCESSORIES
- RELATED REQUIREMENTS
  - 1. SECTION 061600 "SHEATHING" ROOF SHEATHING AND SUBFLOORING.
  - 2. SECTION 313116 "TERMITE CONTROL" FOR SITE APPLICATION OF BORATE TREATMENT TO WOOD TRUSSES.
- 1.3 ALLOWANCES
- PROVIDE WOOD TRUSS BRACING UNDER THE METAL-PLATE-CONNECTED TRUSS BRACING ALLOWANCE AS SPECIFIED IN SECTION 012100 "ALLOWANCES."
- 1.4 DEFINITIONS
- . METAL-PLATE-CONNECTED WOOD TRUSSES: PLANAR STRUCTURAL UNITS CONSISTING OF METAL-PLATE-CONNECTED MEMBERS FABRICATED FROM DIMENSION LUMBER AND CUT AND ASSEMBLED BEFORE DELIVERY TO PROJECT SITE.
- TYPES OF PREFABRICATED WOOD TRUSSES INCLUDE:
- GABLE-SHAPED TRUSSES
- 2. MONOPITCH TRUSSES
- FLAT-TOP TRUSSES
- 1.5 ACTION SUBMITTALS
- . SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS FOR TRUSSES.
  - 1. SHOW LOCATION, PITCH, SPAN, CAMBER, CONFIGURATION, AND SPACING FOR EACH TYPE OF TRUSS REQUIRED.
  - 2. INDICATE SIZES, STRESS GRADES, AND SPECIES OF LUMBER
  - INDICATE LOCATIONS OF PERMANENT BRACING REQUIRED TO PREVENT BUCKLING OF INDIVIDUAL TRUSS MEMBERS DUE TO DESIGN LOADS.
  - 4. INDICATE LOCATIONS, SIZES, AND MATERIALS FOR PERMANENT BRACING REQUIRED TO PREVENT BUCKLING OF INDIVIDUAL TRUSS MEMBERS DUE TO DESIGN LOADS.
  - 5. INDICATE TYPE, SIZE, MATERIAL, FINISH, DESIGN VALUES, ORIENTATION, AND LOCATION OF METAL CONNECTOR PLATES
  - 6. SHOW SPLICE DETAILS AND BEARING DETAILS.
- DELEGATED-DESIGN SUBMITTAL: FOR METAL-PLATE-CONNECTED WOOD TRUSSES INDICATED TO COMPLY WITH PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA, INCLUDING ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.
- 1.6 INFORMATIONAL SUBMITTALS
- . QUALIFICATION DATA: FOR METAL CONNECTOR-PLATE MANUFACTURER AND FABRICATOR.
- MATERIAL CERTIFICATES: FOR DIMENSION LUMBER SPECIFIED TO COMPLY WITH MINIMUM SPECIFIC GRAVITY. INDICATE SPECIES AND GRADE SELECTED FOR EACH USE AND SPECIFIC GRAVITY.
- PRODUCT CERTIFICATES: FOR METAL-PLATE-CONNECTED WOOD TRUSSES, SIGNED BY OFFICER OF TRUSS FABRICATING FIRM.
- EVALUATION REPORTS: FOR THE FOLLOWING, FROM ICC-ES:
  - METAL-PLATE CONNECTORS.
- 2. METAL TRUSS ACCESSORIES.
- 1.7 QUALITY ASSURANCE
- . METAL CONNECTOR-PLATE MANUFACTURER QUALIFICATIONS: A MANUFACTURER THAT IS A MEMBER OF TPI AND THAT COMPLIES WITH QUALITY-CONTROL PROCEDURES IN TPI 1 FOR MANUFACTURE OF CONNECTOR PLATES.
  - 1. MANUFACTURER'S RESPONSIBILITIES INCLUDE PROVIDING PROFESSIONAL ENGINEERING SERVICES NEEDED TO ASSUME ENGINEERING RESPONSIBILITY.
  - 2. ENGINEERING RESPONSIBILITY: PREPARATION OF SHOP DRAWINGS AND COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER.
- FABRICATOR QUALIFICATIONS: SHOP THAT PARTICIPATES IN A RECOGNIZED QUALITY-ASSURANCE PROGRAM THAT COMPLIES WITH QUALITY-CONTROL PROCEDURES IN TPI 1 AND THAT INVOLVES THIRD-PARTY INSPECTION BY AN INDEPENDENT TESTING AND INSPECTING AGENCY ACCEPTABLE TO ARCHITECT AND AUTHORITIES HAVING JURISDICTION.
- TESTING AGENCY QUALIFICATIONS: FOR TESTING AGENCY PROVIDING CLASSIFICATION MARKING FOR FIRE-RETARDANT TREATED MATERIAL, AN INSPECTION AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION THAT PERIODICALLY PERFORMS INSPECTIONS TO VERIFY THAT THE MATERIAL BEARING THE CLASSIFICATION MARKING IS REPRESENTATIVE OF THE MATERIAL TESTED.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- . HANDLE AND STORE TRUSSES TO COMPLY WITH RECOMMENDATIONS IN TPI BCSI, "BUILDING COMPONENT SAFETY INFORMATION: GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING, RESTRAINING, & BRACING METAL PLATE CONNECTED WOOD TRUSSES."
- STORE TRUSSES FLAT, OFF OF GROUND, AND ADEQUATELY SUPPORTED TO PREVENT LATERAL BENDING.
- 2. PROTECT TRUSSES FROM WEATHER BY COVERING WITH WATERPROOF SHEETING, SECURELY ANCHORED.
- 3. PROVIDE FOR AIR CIRCULATION AROUND STACKS AND UNDER **COVERINGS**

- B. INSPECT TRUSSES SHOWING DISCOLORATION, CORROSION, OR OTHER EVIDENCE OF DETERIORATION. DISCARD AND REPLACE TRUSSES THAT ARE DAMAGED OR DEFECTIVE.
- PART 2 PRODUCTS
- 2.1 PERFORMANCE REQUIREMENTS
- A. DELEGATED DESIGN: ENGAGE A QUALIFIED PROFESSIONAL ENGINEER, AS DEFINED IN SECTION 014000 "QUALITY REQUIREMENTS," TO DESIGN METAL-PLATE-CONNECTED WOOD TRUSSES.
- B. STRUCTURAL PERFORMANCE: PROVIDE METAL-PLATE-CONNECTED WOOD TRUSSES CAPABLE OF WITHSTANDING DESIGN LOADS WITHIN LIMITS AND UNDER CONDITIONS INDICATED. COMPLY WITH REQUIREMENTS IN TPI 1 UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED BELOW.
- DESIGN LOADS: AS INDICATED.
- 2. MAXIMUM DEFLECTION UNDER DESIGN LOADS:
- a. ROOF TRUSSES: VERTICAL DEFLECTION OF 1/240 OF SPAN.
- b. FLOOR TRUSSES: FOR DEFLECTION REQUIREMENTS SEE DRAWINGS. C. COMPLY WITH APPLICABLE REQUIREMENTS AND RECOMMENDATIONS OF THE
- FOLLOWING PUBLICATIONS: 1. TPI 1, "NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION."
- 2. TPI DSB, "RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES."
- 3. TPI BCSI, "BUILDING COMPONENT SAFETY INFORMATION: GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING, RESTRAINING, & BRACING METAL PLATE CONNECTED WOOD TRUSSES."
- D. WOOD STRUCTURAL DESIGN STANDARD: COMPLY WITH APPLICABLE REQUIREMENTS IN AF&PA'S "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION" AND ITS "SUPPLEMENT."
- 2.2 DIMENSION LUMBER
- A. LUMBER: DOC PS 20 AND APPLICABLE RULES OF GRADING AGENCIES INDICATED. IF NO GRADING AGENCY IS INDICATED, PROVIDE LUMBER THAT COMPLIES WITH THE APPLICABLE RULES OF ANY RULES WRITING AGENCY CERTIFIED BY THE ALSC BOARD OF REVIEW. PROVIDE LUMBER GRADED BY AN AGENCY CERTIFIED BY THE ALSC BOARD OF REVIEW TO INSPECT AND GRADE LUMBER UNDER THE RULES INDICATED.
- 1. FACTORY MARK EACH PIECE OF LUMBER WITH GRADE STAMP OF GRADING AGENCY.
- 2. FOR EXPOSED LUMBER INDICATED TO RECEIVE A STAINED OR NATURAL FINISH, OMIT GRADE STAMP AND PROVIDE CERTIFICATES OF GRADE COMPLIANCE ISSUED BY GRADING AGENCY.
- 3. PROVIDE DRESSED LUMBER, S4S.
- 4. PROVIDE DRY LUMBER WITH 15 PERCENT MAXIMUM MOISTURE CONTENT AT TIME OF DRESSING.
- B. PERMANENT BRACING: PROVIDE WOOD BRACING THAT COMPLIES WITH REQUIREMENTS FOR MISCELLANEOUS LUMBER IN SECTION 061000 "ROUGH CARPENTRY.'
- 2.3 METAL CONNECTOR PLATES
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
  - 1. ALPINE ENGINEERED PRODUCTS, INC.; A DIVISION OF ITW BUILDING COMPONENTS GROUP, INC.
  - 2. CHEROKEE METAL PRODUCTS, INC.; MASENGILL MACHINERY COMPANY.
  - COMPUTRUS, INC.
  - 4. EAGLE METAL PRODUCTS
  - 5. JAGER BUILDING SYSTEMS, INC.
- 6. MITEK INDUSTRIES, INC
- 7. ROBBINS ENGINEERING, INC.
- 8. TRUSWAL SYSTEMS CORPORATION B. SOURCE LIMITATIONS: OBTAIN METAL CONNECTOR PLATES FROM SINGLE MANUFACTURER.
- C. GENERAL: FABRICATE CONNECTOR PLATES TO COMPLY WITH TPI 1.
- D. HOT-DIP GALVANIZED-STEEL SHEET: ASTM A 653/A 653M; STRUCTURAL STEEL (SS), HIGH-STRENGTH LOW-ALLOY STEEL TYPE A (HSLAS TYPE A), OR HIGH-STRENGTH LOW-ALLOY STEEL TYPE B (HSLAS TYPE B); G60 COATING DESIGNATION; AND NOT LESS THAN 0.036 INCH THICK.
  - 1. USE FOR INTERIOR LOCATIONS UNLESS OTHERWISE INDICATED.
- E. HOT-DIP HEAVY-GALVANIZED-STEEL SHEET: ASTM A 653/A 653M; STRUCTURAL STEEL (SS), HIGH-STRENGTH LOW-ALLOY STEEL TYPE A (HSLAS TYPE A), OR HIGH-STRENGTH LOW-ALLOY STEEL TYPE B (HSLAS TYPE B); G185 COATING DESIGNATION; AND NOT LESS THAN 0.036 INCH THICK.
- 1. USE FOR WOOD-PRESERVATIVE-TREATED LUMBER AND WHERE INDICATED.
- 2.4 FASTENERS
- A. GENERAL: PROVIDE FASTENERS OF SIZE AND TYPE INDICATED THAT COMPLY WITH REQUIREMENTS SPECIFIED IN THIS ARTICLE FOR MATERIAL AND MANUFACTURE.
- 1. PROVIDE FASTENERS FOR USE WITH METAL FRAMING ANCHORS THAT MANUFACTURER.
- B. NAILS, BRADS, AND STAPLES; ASTM F 1667.
- 2.5 METAL FRAMING ANCHORS AND ACCESSORIES
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
- CLEVELAND STEEL SPECIALTY CO.
- KC METALS PRODUCTS, INC.
- PHOENIX METAL PRODUCTS, INC
- 4. SIMPSON STRONG-TIE CO., INC.

- USP STRUCTURAL CONNECTORS
- B. ALLOWABLE DESIGN LOADS: PROVIDE PRODUCTS WITH ALLOWABLE DESIGN LOADS, AS PUBLISHED BY MANUFACTURER THAT MEET OR EXCEED THOSE INDICATED. MANUFACTURER'S PUBLISHED VALUES SHALL BE DETERMINED FROM EMPIRICAL DATA OR BY RATIONAL ENGINEERING ANALYSIS AND DEMONSTRATED BY COMPREHENSIVE TESTING PERFORMED BY A QUALIFIED INDEPENDENT TESTING AGENCY.
- C. GALVANIZED-STEEL SHEET: HOT-DIP, ZINC-COATED STEEL SHEET COMPLYING
- WITH ASTM A 653/A 653M, G60 COATING DESIGNATION.
- 2.6 MISCELLANEOUS MATERIALS
- A. GALVANIZING REPAIR PAINT: SSPC-PAINT 20, WITH DRY FILM CONTAINING A MINIMUM OF 94 PERCENT ZINC DUST BY WEIGHT.

USE FOR INTERIOR LOCATIONS UNLESS OTHERWISE INDICATED.

- 2.7 FABRICATION
- A. CUT TRUSS MEMBERS TO ACCURATE LENGTHS, ANGLES, AND SIZES TO PRODUCE CLOSE-FITTING JOINTS.
- B. FABRICATE METAL CONNECTOR PLATES TO SIZES, CONFIGURATIONS, THICKNESSES, AND ANCHORAGE DETAILS REQUIRED TO WITHSTAND DESIGN LOADS FOR TYPES OF JOINT DESIGNS INDICATED.
- C. ASSEMBLE TRUSS MEMBERS IN DESIGN CONFIGURATION INDICATED; USE JIGS OR OTHER MEANS TO ENSURE UNIFORMITY AND ACCURACY OF ASSEMBLY WITH JOINTS CLOSELY FITTED TO COMPLY WITH TOLERANCES IN TPI 1. POSITION MEMBERS TO PRODUCE DESIGN CAMBER INDICATED
  - 1. FABRICATE WOOD TRUSSES WITHIN MANUFACTURING TOLERANCES IN TPI 1.
- D. CONNECT TRUSS MEMBERS BY METAL CONNECTOR PLATES LOCATED AND SECURELY EMBEDDED SIMULTANEOUSLY IN BOTH SIDES OF WOOD MEMBERS BY AIR OR HYDRAULIC PRESS.
- 2.8 SOURCE QUALITY CONTROL
- A. SPECIAL INSPECTIONS: OWNER WILL ENGAGE A QUALIFIED SPECIAL INSPECTOR TO PERFORM SPECIAL INSPECTIONS.
- 1. PROVIDE SPECIAL INSPECTOR WITH ACCESS TO FABRICATOR'S DOCUMENTATION OF DETAILED FABRICATION AND QUALITY-CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF 2.4 MISCELLANEOUS MATERIALS THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED **STANDARDS**
- 2. PROVIDE SPECIAL INSPECTOR WITH ACCESS TO PLACES WHERE WOOD TRUSSES ARE BEING FABRICATED TO PERFORM INSPECTIONS.
- B. CORRECT DEFICIENCIES IN WORK THAT SPECIAL INSPECTIONS INDICATE DOES NOT COMPLY WITH THE CONTRACT DOCUMENTS.
- PART 3 EXECUTION
- 3.1 INSTALLATION
- A. INSTALL WOOD TRUSSES ONLY AFTER SUPPORTING CONSTRUCTION IS IN PLACE AND IS BRACED AND SECURED.
- B. IF TRUSSES ARE DELIVERED TO PROJECT SITE IN MORE THAN ONE PIECE ASSEMBLE TRUSSES BEFORE INSTALLING.
- C. HOIST TRUSSES IN PLACE BY LIFTING EQUIPMENT SUITED TO SIZES AND TYPES OF TRUSSES REQUIRED, EXERCISING CARE NOT TO DAMAGE TRUSS MEMBERS OR JOINTS BY OUT-OF-PLANE BENDING OR OTHER CAUSES.
- D. INSTALL AND BRACE TRUSSES ACCORDING TO TPI RECOMMENDATIONS AND AS INDICATED.
- E. INSTALL TRUSSES PLUMB, SQUARE, AND TRUE TO LINE AND SECURELY FASTEN TO SUPPORTING CONSTRUCTION.
- F. SPACE TRUSSES AS INDICATED; ADJUST AND ALIGN TRUSSES IN LOCATION BEFORE PERMANENTLY FASTENING G. ANCHOR TRUSSES SECURELY AT BEARING POINTS; USE METAL TRUSS TIE-DOWNS OR FLOOR TRUSS HANGERS AS APPLICABLE. INSTALL FASTENERS

THROUGH EACH FASTENER HOLE IN METAL FRAMING ANCHORS ACCORDING

- TO MANUFACTURER'S FASTENING SCHEDULES AND WRITTEN INSTRUCTIONS. H. SECURELY CONNECT EACH TRUSS PLY REQUIRED FOR FORMING BUILT-UP
- GIRDER TRUSSES. ANCHOR TRUSSES TO GIRDER TRUSSES AS INDICATED.
- I. INSTALL AND FASTEN PERMANENT BRACING DURING TRUSS ERECTION AND BEFORE CONSTRUCTION LOADS ARE APPLIED. ANCHOR ENDS OF PERMANENT BRACING WHERE TERMINATING AT WALLS OR BEAMS.
- 1. INSTALL BRACING TO COMPLY WITH SECTION 061000 "ROUGH CARPENTRY."
- 2. INSTALL AND FASTEN STRONGBACK BRACING VERTICALLY AGAINST VERTICAL WEB OF PARALLEL-CHORD FLOOR TRUSSES AT CENTERS INDICATED.
- J. INSTALL WOOD TRUSSES WITHIN INSTALLATION TOLERANCES IN TPI 1.
- K. DO NOT ALTER TRUSSES IN FIELD. DO NOT CUT, DRILL, NOTCH, OR REMOVE TRUSS MEMBERS
- L. REPLACE WOOD TRUSSES THAT ARE DAMAGED OR DO NOT MEET REQUIREMENTS
  - 1. DAMAGED TRUSSES MAY BE REPAIRED ACCORDING TO TRUSS REPAIR DETAILS SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR TRUSS DESIGN, WHEN APPROVED BY ARCHITECT.
- REPAIRS AND PROTECTION
- COMPLY WITH WRITTEN RECOMMENDATIONS OF METAL FRAMING A. PROTECT WOOD THAT HAS BEEN TREATED WITH INORGANIC BORON (SBX) FROM WEATHER. IF, DESPITE PROTECTION, INORGANIC BORON-TREATED WOOD BECOMES WET, APPLY EPA-REGISTERED BORATE TREATMENT. APPLY BORATE SOLUTION BY SPRAYING TO COMPLY WITH EPA-REGISTERED LABEL
  - B. PROTECT WOOD TRUSSES FROM WEATHER. IF, DESPITE PROTECTION, WOOD TRUSSES BECOME WET, APPLY EPA-REGISTERED BORATE TREATMENT. APPLY BORATE SOLUTION BY SPRAYING TO COMPLY WITH EPA-REGISTERED LABEL.
  - C. REPAIR DAMAGED GALVANIZED COATINGS ON EXPOSED SURFACES WITH GALVANIZED REPAIR PAINT ACCORDING TO ASTM A 780 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - END OF SECTION 061753

- **SECTION 062023 INTERIOR FINISH CARPENTRY**
- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES:
- SHELVING.

INTERIOR TRIM.

- PART 2 PRODUCTS
- 2.1 MATERIALS, GENERAL A. SOFTWOOD PLYWOOD: DOC PS 1
- B. HARDBOARD: ANSI A135.4
- C. MDF: ANSI A208.2, GRADE 130.
- D. PARTICLEBOARD: ANSI A208.1, GRADE M-2.
- E. MELAMINE-FACED PARTICLEBOARD: PARTICLEBOARD COMPLYING WITH ANSI A208.1, GRADE M-2, FINISHED ON BOTH FACES WITH THERMALLY FUSED, MELAMINE-IMPREGNATED DECORATIVE PAPER AND COMPLYING WITH REQUIREMENTS OF NEMA LD3, GRADE VGL, FOR TEST METHODS 3.3, 3.4, 3.6, 3.8, AND 3.10.
- COLOR: WHITE
- 2.2 INTERIOR TRIM
- A. MOLDINGS FOR OPAQUE FINISH (PAINTED FINISH): MADE TO PATTERNS INCLUDED IN MMPA'S "WM/SERIES WOOD MOULDING PATTERNS."
  - 1. HARDWOOD MOLDINGS: MMPA HWM 4, P-GRADE.
  - a. SPECIES: YELLOW POPLAR.
- b. MAXIMUM MOISTURE CONTENT: 9 PERCENT FINGER JOINTING: NOT ALLOWED.
- 2.3 SHELVING
- A. EXPOSED SHELVING: MADE FROM THE FOLLOWING MATERIAL, 3/4 INCH THICK. 1. MELAMINE-FACED PARTICLEBOARD WITH APPLIED-PVC FRONT EDGE.
- B. SHELF BRACKETS WITHOUT ROD SUPPORT: BHMA A156.16, B04041
- PRIME-PAINTED FORMED STEEL.
- A. LOW-EMITTING MATERIALS: ADHESIVES SHALL COMPLY WITH THE TESTING AND PRODUCT REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S "STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC CHEMICAL EMISSIONS FROM INDOOR SOURCES USING
- **ENVIRONMENTAL CHAMBERS."** B. GLUE: ALIPHATIC-RESIN, POLYURETHANE, OR RESORCINOL WOOD GLUE
- RECOMMENDED BY MANUFACTURER FOR GENERAL CARPENTRY USE. C. MULTIPURPOSE CONSTRUCTION ADHESIVE: FORMULATION COMPLYING WITH ASTM D 3498 THAT IS RECOMMENDED FOR INDICATED USE BY ADHESIVE
- PART 3 EXECUTION

MANUFACTURER.

- 3.1 INSTALLATION, GENERAL A. INSTALL INTERIOR FINISH CARPENTRY LEVEL, PLUMB, TRUE, AND ALIGNED WITH ADJACENT MATERIALS. USE CONCEALED SHIMS WHERE NECESSARY
- FOR ALIGNMENT.
- 3.2 STANDING AND RUNNING TRIM INSTALLATION A. INSTALL WITH MINIMUM NUMBER OF JOINTS PRACTICAL, USING FULL-LENGTH PIECES FROM MAXIMUM LENGTHS OF LUMBER AVAILABLE. DO NOT USE PIECES LESS THAN 24 INCHES LONG, EXCEPT WHERE NECESSARY, STAGGER JOINTS IN ADJACENT AND RELATED STANDING AND RUNNING TRIM. MITER AT RETURNS, MITER AT OUTSIDE CORNERS, AND COPE AT INSIDE CORNERS TO PRODUCE TIGHT-FITTING JOINTS WITH FULL-SURFACE CONTACT THROUGHOUT LENGTH OF JOINT. USE SCARF JOINTS FOR END-TO-END
- JOINTS.
- 3.3 SHELVING AND CLOTHES ROD INSTALLATION A. CUT SHELF CLEATS AT ENDS OF SHELVES ABOUT 1/2 INCH LESS THAN WIDTH OF SHELVES AND SAND EXPOSED ENDS SMOOTH
- B. INSTALL SHELF CLEATS BY FASTENING TO FRAMING OR BACKING WITH FINISH NAILS OR TRIM SCREWS, SET BELOW FACE AND FILLED. SPACE FASTENERS NOT MORE THAN 16 INCHES O.C.
- C. INSTALL SHELF BRACKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS, SPACED NOT MORE THAN 32 INCHES O.C. FASTEN TO FRAMING MEMBERS, BLOCKING, OR METAL BACKING, OR USE TOGGLE BOLTS OR HOLLOW WALL ANCHORS.
- D. CUT SHELVES TO NEATLY FIT OPENINGS WITH ONLY ENOUGH GAP TO ALLOW SHELVES TO BE REMOVED AND REINSTALLED. INSTALL SHELVES, FULLY SEATED ON CLEATS, BRACKETS, AND SUPPORTS.
- **END OF SECTION 062023**

- **SECTION 066400 PLASTIC PANELING**
- PART 1 GENERAL 1.1 SUMMARY
- A. SECTION INCLUDES PLASTIC SHEET PANELING.
- PART 2 PRODUCTS
- PLASTIC SHEET PANELING A. GLASS-FIBER-REINFORCED PLASTIC PANELING: GELCOAT-FINISHED
- GLASS-FIBER-REINFORCED PLASTIC PANELS COMPLYING WITH ASTM D 5319. 1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
- a. MARLITE.
- b. NUDO PRODUCTS, INC.
- c. PARKLAND PLASTICS, INC.
- 2. SURFACE-BURNING CHARACTERISTICS: AS FOLLOWS WHEN TESTED BY A QUALIFIED TESTING AGENCY ACCORDING TO ASTM E 84. IDENTIFY PRODUCTS WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AGENCY.
- a. FLAME-SPREAD INDEX: 25 OR LESS. b. SMOKE-DEVELOPED INDEX: 450 OR LESS.

- 4. SURFACE FINISH: MOLDED PEBBLE TEXTURE

3. NOMINAL THICKNESS: NOT LESS THAN 0.09 INCH.

- COLOR: WHITE
- 2.2 ACCESSORIES
- A. TRIM ACCESSORIES: MANUFACTURER'S STANDARD ONE-PIECE VINYL EXTRUSIONS DESIGNED TO RETAIN AND COVER EDGES OF PANELS. PROVIDE DIVISION BARS, INSIDE CORNERS, OUTSIDE CORNERS, AND CAPS AS NEEDED TO CONCEAL EDGES.
  - 1. COLOR: WHITE TO MATCH PANELS
- B. SEALANT: MILDEW-RESISTANT, SINGLE-COMPONENT, NEUTRAL-CURING SILICONE SEALANT RECOMMENDED BY PLASTIC PANELING MANUFACTURER AND COMPLYING WITH REQUIREMENTS IN SECTION 079200 "JOINT SEALANTS."
- PART 3 -EXECUTION
- 3.1 PREPARATION A. CLEAN SUBSTRATES OF SUBSTANCES THAT COULD IMPAIR ADHESIVE BOND
- INCLUDING OIL, GREASE, DIRT, AND DUST. B. LAY OUT PANELING BEFORE INSTALLING. LOCATE PANEL JOINTS TO PROVIDE EQUAL PANELS AT ENDS OF WALLS NOT LESS THAN HALF THE WIDTH OF FULL PANELS.
- 3.2 INSTALLATION
- A. INSTALL PLASTIC PANELING ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
- B. FILL GROOVES IN TRIM ACCESSORIES WITH SEALANT BEFORE INSTALLING
- PANELS, AND BED INSIDE CORNER TRIM IN A BEAD OF SEALANT. C. MAINTAIN UNIFORM SPACE BETWEEN PANELS AND WALL FIXTURES. FILL
- SPACE WITH SEALANT D. REMOVE EXCESS SEALANT AND SMEARS AS PANELING IS INSTALLED. CLEAN WITH SOLVENT RECOMMENDED BY SEALANT MANUFACTURER AND THEN WIPE
- WITH CLEAN DRY CLOTHS UNTIL NO RESIDUE REMAINS. END OF SECTION 066400

### **SECTION 072100 - BUILDING INSULATION**

- PART 1 GENERAI 1.1 SUMMARY
- A. SECTION INCLUDES:
  - FOAM-PLASTIC BOARD INSULATION.
  - 2. GLASS-FIBER BLANKET INSULATION. VAPOR RETARDERS.
- PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

EXTRUDED-POLYSTYRENE BOARD INSULATION IN FIRST PARAGRAPH BELOW IS ALSO CALLED "XPS INSULATION."

A. EXTRUDED-POLYSTYRENE BOARD INSULATION: ASTM C 578, WITH MAXIMUM

- FLAME-SPREAD AND SMOKE-DEVELOPED INDEXES OF 75 AND 450, RESPECTIVELY, PER ASTM E 84.
- MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- a. DOW CHEMICAL COMPANY (THE)
- b. HUNTER PANELS c. OWENS CORNING
- 2. TYPE IV, 25 PSI. 2.2 GLASS-FIBER BLANKET INSULATION
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE
- PRODUCTS BY ONE OF THE FOLLOWING: CERTAINTEED CORPORATION.
- 2. GUARDIAN BUILDING PRODUCTS, INC JOHNS MANVILLE.
- 4. KNAUF INSULATION. OWENS CORNING B. UNFACED, GLASS-FIBER BLANKET INSULATION: ASTM C 665, TYPE I; WITH
- RESPECTIVELY, PER ASTM E 84; PASSING ASTM E 136 FOR COMBUSTION CHARACTERISTICS. C. KRAFT-FACED, GLASS-FIBER BLANKET INSULATION: ASTM C 665, TYPE II (NON-REFLECTIVE FACED), CLASS C (FACED SURFACE NOT RATED FOR FLAME

MAXIMUM FLAME-SPREAD AND SMOKE-DEVELOPED INDEXES OF 25 AND 50,

PROPAGATION); CATEGORY 1 (MEMBRANE IS A VAPOR BARRIER) D. FOIL-FACED, GLASS-FIBER BLANKET INSULATION: ASTM C 665, TYPE III (REFLECTIVE FACED), CLASS B (FACED SURFACE WITH A FLAME-PROPAGATION RESISTANCE OF 0.12 W/SQ. CM); CATEGORY 1 (MEMBRANE IS A VAPOR BARRIER), FACED WITH FOIL SCRIM, FOIL-SCRIM KRAFT, OR FOIL-SCRIM

RECOMMENDED BY VAPOR-RETARDER MANUFACTURER FOR SEALING JOINTS

POLYETHYLENE.

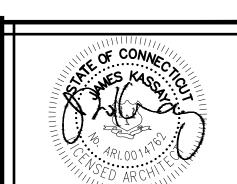
2.3 VAPOR RETARDERS

A. POLYETHYLENE VAPOR RETARDERS: ASTM D 4397, 6 MILS THICK, WITH MAXIMUM PERMEANCE RATING OF 0.13 PERM.

B. VAPOR-RETARDER TAPE: PRESSURE-SENSITIVE TAPE OF TYPE

AND PENETRATIONS IN VAPOR RETARDER

PART 3 -**EXECUTION** 



- 2 E 4 3 P 8 **SPECIFICATIONS** 

SHEET NO.

REVISIONS

06/01/22 21399 JOB NO.

- INSTALLATION, GENERAL
- A. COMPLY WITH INSULATION MANUFACTURER'S WRITTEN INSTRUCTIONS APPLICABLE TO PRODUCTS AND APPLICATIONS INDICATED.
- INSTALL INSULATION THAT IS UNDAMAGED, DRY, AND UNSOILED AND THAT HAS NOT BEEN LEFT EXPOSED TO ICE, RAIN, OR SNOW AT ANY TIME
- EXTEND INSULATION TO ENVELOP ENTIRE AREA TO BE INSULATED. CUT AND FIT TIGHTLY AROUND OBSTRUCTIONS AND FILL VOIDS WITH INSULATION.

REMOVE PROJECTIONS THAT INTERFERE WITH PLACEMENT

- PROVIDE SIZES TO FIT APPLICATIONS INDICATED AND SELECTED FROM MANUFACTURER'S STANDARD THICKNESSES, WIDTHS, AND LENGTHS. APPLY SINGLE LAYER OF INSULATION UNITS TO PRODUCE THICKNESS INDICATED UNLESS MULTIPLE LAYERS ARE OTHERWISE SHOWN OR REQUIRED TO MAKE UP TOTAL THICKNESS.
- 3.2 INSTALLATION OF BELOW-GRADE INSULATION
- . ON VERTICAL SURFACES, SET INSULATION UNITS USING MANUFACTURER'S RECOMMENDED ADHESIVE ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 1. IF NOT OTHERWISE INDICATED, EXTEND INSULATION A MINIMUM OF 36 INCHES BELOW EXTERIOR GRADE LINE.
- ON HORIZONTAL SURFACES, LOOSELY LAY INSULATION UNITS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. STAGGER END JOINTS AND TIGHTLY ABUT INSULATION UNITS.
- 1. IF NOT OTHERWISE INDICATED, EXTEND INSULATION A MINIMUM OF 36 INCHES IN FROM EXTERIOR WALLS.
- 3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION
- . APPLY INSULATION UNITS TO SUBSTRATES BY METHOD INDICATED. COMPLYING WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. IF NO SPECIFIC METHOD IS INDICATED, BOND UNITS TO SUBSTRATE WITH ADHESIVE OR USE MECHANICAL ANCHORAGE TO PROVIDE PERMANENT PLACEMENT AND SUPPORT OF UNITS.
- FOAM-PLASTIC BOARD INSULATION: SEAL JOINTS BETWEEN UNITS BY APPLYING ADHESIVE, MASTIC, OR SEALANT TO EDGES OF EACH UNIT TO FORM A TIGHT SEAL AS UNITS ARE SHOVED INTO PLACE. FILL VOIDS IN COMPLETED INSTALLATION WITH ADHESIVE, MASTIC, OR SEALANT AS RECOMMENDED BY INSULATION MANUFACTURER.
- GLASS-FIBER BLANKET INSULATION: INSTALL IN CAVITIES FORMED BY FRAMING MEMBERS ACCORDING TO THE FOLLOWING REQUIREMENTS
  - 1. USE INSULATION WIDTHS AND LENGTHS THAT FILL THE CAVITIES FORMED BY FRAMING MEMBERS. IF MORE THAN ONE LENGTH IS REQUIRED TO FILL THE CAVITIES, PROVIDE LENGTHS THAT WILL PRODUCE A SNUG FIT BETWEEN ENDS.
  - 2. PLACE INSULATION IN CAVITIES FORMED BY FRAMING MEMBERS TO PRODUCE A FRICTION FIT BETWEEN EDGES OF INSULATION AND ADJOINING FRAMING MEMBERS.
  - 3. MAINTAIN 3-INCH CLEARANCE OF INSULATION AROUND RECESSED LIGHTING FIXTURES NOT RATED FOR OR PROTECTED FROM CONTACT WITH INSULATION.
  - 4. FOR METAL-FRAMED WALL CAVITIES WHERE CAVITY HEIGHTS EXCEED 96 INCHES, SUPPORT UNFACED BLANKETS MECHANICALLY AND SUPPORT FACED BLANKETS BY TAPING FLANGES OF INSULATION TO FLANGES OF 2.4 MISCELLANEOUS MATERIALS METAL STUDS.
  - 5. VAPOR-RETARDER-FACED BLANKETS: TAPE JOINTS AND RUPTURES IN VAPOR-RETARDER FACINGS, AND SEAL EACH CONTINUOUS AREA OF INSULATION TO ENSURE AIRTIGHT INSTALLATION.
  - a. EXTERIOR WALLS: SET UNITS WITH FACING PLACED TOWARD INTERIOR OF CONSTRUCTION.

### END OF SECTION 072100

### **SECTION 07300 - FIBERGLASS SHINGLES**

### PART 1 - GENERAL

 IT IS THE INTENT OF THIS SECTION TO ESTABLISH MINIMUM STANDARDS FOR FIBERGLASS SHINGLE MATERIALS AND INSTALLATION.

### PART 2 - PRODUCTS

- 1. SHINGLES: CLASS "A" FIBERGLASS ASPHALT SHINGLES EQUAL TO GAF TIMBERLINE, OWENS CORNING PRESTIQUE II, OR MANVILLE WOODLANDS. SELF SEALING WITH COLOR AS NOTED ON EXTERIOR COLOR SCHEDULE HEADLAP SHALL BE 2" AND EXPOSURE SHALL BE 5".
- 2. FELT: ONE LAYER OF 15# ASPHALT-SATURATED. ORGANIC. UNPERFORATED FELT, UNLESS OTHERWISE INDICATED. LAP AS RECOMMENDED BY SHINGLE MANUFACTURER.
- 3. FLASHINGS SHALL BE 22 GA. PAINTGRIP GALVANIZED IRON, PAINTED WHERE EXPOSED.
- 4. ALL FASTENERS SHALL BE HOT DIPPED GALVANIZED STEEL WITH NO EXPOSED FASTENERS ALLOWED. STAPLING IS STRICTLY PROHIBITED.
- . RIDGE VENT SHALL BE A CONTINUOUS EXHAUST 12" WIDE MAX. VENT EQUAL TO "SHINGLEVENT 2" BY AIR-VENT INC. OR THE "COBRA-RIDGEVENT 2" BY GAF OR APPROVED EQUAL. PROVIDE ALL RIDGE VENT ACCESSORIES INCLUDING BUT NOT LIMITED TO CAP SHINGLES, END CAPS, AND WEATHER FILTER FABRIC
- 5. WHERE JANUARY AVERAGE DAILY TEMPERATURE IS 25 DEGREES OR LESS, PROVIDE GRACE ICE SHIELD WINTER ICE DAM PROTECTION A MINIMUM OF 6' UP ON ALL EAVES (FROM EXTERIOR WALL LINE BELOW), 3' AROUND ALL ROOF PENETRATIONS. AND 3' TO EITHER SIDE OF ALL VALLEYS.

### PART 3 - EXECUTION

- 1. APPLICATIONS: INSTALL ALL ROOFING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH LOCAL CODES. A MINIMUM OF FOUR NAILS SHALL BE INSTALLED ON EACH THREE FOOT STRIP SHINGLE, MORE AS REQUIRED BY LOCAL CODE.
- 2. GUARANTEE: IN ADDITION TO MANUFACTURER'S STANDARD GUARANTEES, THE ROOFING CONTRACTOR SHALL FURNISH TO THE OWNER, CERTIFICATES THAT ROOFING HAS BEEN INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S DIRECTIONS AND SPECIFICATIONS, AND IN SUCH MANNER SO AS TO RENDER THE

3. EXERCISE CARE WHEN INSTALLING SHINGLES AS NOT TO MAR THE EXPOSED SURFACES. ANY DEFECTS VISIBLE FROM THE GROUND SHALL BE REPLACED AT NO CHARGE TO THE OWNER.

GUARANTEES OF THE FINISHED ROOFS IN FULL FORCE AND EFFECT.

4. INSTALL GRACE ICE SHIELD TO OVERHANG DRIP EDGE 1/4" AND TO EXTEND 12" PAST INTERIOR WALL LINE. MINIMUM WIDTH SHALL BE 6'. IF HORIZONTAL LAP IS REQUIRED, IT SHALL OCCUR OUTSIDE THE WALL LINE.

#### **SECTION 079200 - JOINT SEALANTS**

#### PART 1 - GENERAL

- 1.1 SUMMARY
- A. SECTION INCLUDES: SILICONE SEALANTS.
- 1.2 WARRANT
- A. SPECIAL INSTALLER'S WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH INSTALLER AGREES TO REPAIR OR REPLACE JOINT SEALANTS THAT DO NOT COMPLY WITH PERFORMANCE AND OTHER REQUIREMENTS SPECIFIED IN THIS SECTION WITHIN SPECIFIED WARRANTY PERIOD.
- 1. WARRANTY PERIOD: TWO YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

#### PRODUCTS PART 2 -

### 2.1 MATERIALS, GENERAL

A. STAIN-TEST-RESPONSE CHARACTERISTICS: WHERE SEALANTS ARE SPECIFIED TO BE NONSTAINING TO POROUS SUBSTRATES, PROVIDE PRODUCTS THAT HAVE UNDERGONE TESTING ACCORDING TO ASTM C 1248 AND HAVE NOT STAINED POROUS JOINT SUBSTRATES INDICATED FOR **PROJECT** 

### 2.2 SILICONE JOINT SEALANTS

- A. MILDEW-RESISTANT SILICONE JOINT SEALANT [SS-INT]: ASTM C 920.
- TYPE: SINGLE COMPONENT (S).
- 2. GRADE: NONSAG (NS)
- 3. STRENGTH: 320 PSI
- 4. USES RELATED TO EXPOSURE: NONTRAFFIC (NT)
- 5. COLOR: WHITE, ALMOND OR CLEAR TO MATCH ADJACENT SURFACES.
- B. SILICONE JOINT SEALANT [SS-EXT]: ASTM C 920.
  - TYPE: SINGLE COMPONENT (S).
  - 2. GRADE: NONSAG (NS)
  - 3. STRENGTH: 470 PSI
  - 4. USES RELATED TO EXPOSURE: NONTRAFFIC (NT)
  - COLOR: WHITE, ALMOND OR CLEAR TO MATCH ADJACENT SURFACES.
- 2.3 JOINT SEALANT BACKING
- A. CYLINDRICAL SEALANT BACKINGS: ASTM C 1330, TYPE C (CLOSED-CELL MATERIAL WITH A SURFACE SKIN), AND OF SIZE AND DENSITY TO CONTROL SEALANT DEPTH AND OTHERWISE CONTRIBUTE TO PRODUCING OPTIMUM SEALANT PERFORMANCE.
- B. BOND-BREAKER TAPE: POLYETHYLENE TAPE OR OTHER PLASTIC TAPE RECOMMENDED BY SEALANT MANUFACTURER.
- A. CLEANERS FOR NONPOROUS SURFACES: CHEMICAL CLEANERS ACCEPTABLE TO MANUFACTURERS OF SEALANTS AND SEALANT BACKING MATERIALS.
- B. MASKING TAPE: NONSTAINING. NONABSORBENT MATERIAL COMPATIBLE WITH JOINT SEALANTS AND SURFACES ADJACENT TO JOINTS.

### EXECUTION

- 3.1 PREPARATION
- A. SURFACE CLEANING OF JOINTS: CLEAN OUT JOINTS IMMEDIATELY BEFORE INSTALLING JOINT SEALANTS TO COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - 1. REMOVE LAITANCE AND FORM-RELEASE AGENTS FROM CONCRETE.
  - 2. CLEAN NONPOROUS JOINT SUBSTRATE SURFACES WITH CHEMICAL CLEANERS OR OTHER MEANS THAT DO NOT STAIN, HARM SUBSTRATES. OR LEAVE RESIDUES CAPABLE OF INTERFERING WITH ADHESION OF JOINT SEALANTS.
- B. JOINT PRIMING: PRIME JOINT SUBSTRATES WHERE RECOMMENDED BY JOINT-SEALANT MANUFACTURER OR AS INDICATED BY PRECONSTRUCTION JOINT-SEALANT-SUBSTRATE TESTS OR PRIOR EXPERIENCE. APPLY PRIMER TO COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTRUCTIONS. CONFINE PRIMERS TO AREAS OF JOINT-SEALANT BOND; DO NOT ALLOW SPILLAGE OR MIGRATION ONTO ADJOINING SURFACES.
- 3.2 INSTALLATION
- A. SEALANT INSTALLATION STANDARD: COMPLY WITH RECOMMENDATIONS IN ASTM C 1193 FOR USE OF JOINT SEALANTS AS APPLICABLE TO MATERIALS, APPLICATIONS, AND CONDITIONS INDICATED.
- . INSTALL SEALANT BACKINGS OF KIND INDICATED TO SUPPORT SEALANTS DURING APPLICATION AND AT POSITION REQUIRED TO PRODUCE CROSS-SECTIONAL SHAPES AND DEPTHS OF INSTALLED SEALANTS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.
- 1. DO NOT LEAVE GAPS BETWEEN ENDS OF SEALANT BACKINGS.
- 2. DO NOT STRETCH, TWIST, PUNCTURE, OR TEAR SEALANT BACKINGS.
- 3. REMOVE ABSORBENT SEALANT BACKINGS THAT HAVE BECOME WET BEFORE SEALANT APPLICATION AND REPLACE THEM WITH DRY
- MATERIALS. C. INSTALL BOND-BREAKER TAPE BEHIND SEALANTS WHERE SEALANT BACKINGS
- ARE NOT USED BETWEEN SEALANTS AND BACKS OF JOINTS. D. INSTALL SEALANTS USING PROVEN TECHNIQUES THAT COMPLY WITH THE FOLLOWING AND AT THE SAME TIME BACKINGS ARE INSTALLED:
  - SUBSTRATES. COMPLETELY FILL RECESSES IN EACH JOINT CONFIGURATION.
  - 3. PRODUCE UNIFORM, CROSS-SECTIONAL SHAPES AND DEPTHS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.
- E. TOOLING OF NONSAG SEALANTS: IMMEDIATELY AFTER SEALANT APPLICATION

- AND BEFORE SKINNING OR CURING BEGINS, TOOL SEALANTS ACCORDING TO REQUIREMENTS SPECIFIED IN SUBPARAGRAPHS BELOW TO FORM SMOOTH. UNIFORM BEADS OF CONFIGURATION INDICATED: TO ELIMINATE AIR POCKETS AND TO ENSURE CONTACT AND ADHESION OF SEALANT WITH SIDES OF JOINT
- REMOVE EXCESS SEALANT FROM SURFACES ADJACENT TO JOINTS
- 2. USE TOOLING AGENTS THAT ARE APPROVED IN WRITING BY SEALANT

MANUFACTURER AND THAT DO NOT DISCOLOR SEALANTS OR ADJACENT

- 3. PROVIDE CONCAVE JOINT PROFILE PER FIGURE 8A IN ASTM C 1193, **UNLESS OTHERWISE INDICATED**
- F. CLEAN OFF EXCESS SEALANT OR SEALANT SMEARS ADJACENT TO JOINTS AS THE WORK PROGRESSES BY METHODS AND WITH CLEANING MATERIALS APPROVED IN WRITING BY MANUFACTURERS OF JOINT SEALANTS AND OF PRODUCTS IN WHICH JOINTS OCCUR.
- 3.3 JOINT-SEALANT SCHEDULE

SURFACES.

- A. JOINT-SEALANT APPLICATION SS-INT: FOR INTERIOR JOINTS, UNLESS NOTED OTHERWISE
  - JOINT SEALANT: MILDEW-RESISTANT SILICONE JOINT SEALANT SS-INT
- 2. JOINT-SEALANT COLOR: WHITE, ALMOND OR CLEAR TO MATCH ADJACENT SURFACES.
- B. JOINT-SEALANT APPLICATION SS-EXT: FOR EXTERIOR JOINTS, UNLESS NOTED OTHERWISE
  - JOINT SEALANT: SILICONE JOINT SEALANT SS-EXT
  - 2. JOINT-SEALANT COLOR: WHITE, ALMOND OR CLEAR TO MATCH 2.8 FABRICATION ADJACENT SURFACES.

END OF SECTION 079200

#### SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

- GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES HOLLOW-METAL WORK.
- B. RELATED REQUIREMENTS:
  - 1. SECTION 081416 "FLUSH WOOD DOORS" FOR WOOD DOORS INSTALLED IN HOLLOW-METAL FRAMES.
- 1.2 ACTION SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
- B. SHOP DRAWINGS: INCLUDE ELEVATIONS, DOOR EDGE DETAILS, FRAME PROFILES, METAL THICKNESSES, PREPARATIONS FOR HARDWARE, AND OTHER DETAILS.
- C. SCHEDULE: PREPARED BY OR UNDER THE SUPERVISION OF SUPPLIER, USING SAME REFERENCE NUMBERS FOR DETAILS AND OPENINGS AS THOSE ON DRAWINGS.
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
- 1. STEELCRAFT; AN ALLEGION BRAND.
- 2. S.D.S INDUSTRIES INC., TIMELY FRAMES
- 2.2 ACCOUNT VENDOR
- A. NOT USED GC TO SUPPLY THROUGH THEIR PREFERRED VENDOR
- 2.3 REGULATORY REQUIREMENTS
- A. FIRE-RATED ASSEMBLIES: COMPLYING WITH NFPA 80 AND LISTED AND LABELED BY A QUALIFIED TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR FIRE-PROTECTION RATINGS AND TEMPERATURE-RISE LIMITS INDICATED, BASED ON TESTING AT POSITIVE PRESSURE ACCORDING TO NFPA 252 OR UL 10C.
- 2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES
- A. HEAVY-DUTY DOORS AND FRAMES: SDI A250.8, LEVEL 2. AT LOCATIONS INDICATED IN THE DOOR AND FRAME SCHEDULE.
  - 1. PHYSICAL PERFORMANCE: LEVEL B ACCORDING TO SDI A250.4.
  - 2. DOORS:
  - a. TYPE: AS INDICATED IN THE DOOR AND FRAME SCHEDULE.
  - b. THICKNESS: 1-3/4 INCHES. c. FACE: METALLIC-COATED STEEL SHEET, MINIMUM THICKNESS OF
  - 0.042 INCH, WITH MINIMUM A40 COATING. d. EDGE CONSTRUCTION: MODEL 1, FULL FLUSH.

  - e. CORE: POLYSTYRENE.
  - 3. THERMAL-RATED DOORS: PROVIDE DOORS FABRICATED WITH THERMAL-RESISTANCE VALUE (R-VALUE) OF NOT LESS THAN 2.1 DEG F X H X SQ. FT./BTU WHEN TESTED ACCORDING TO ASTM C 1363.
  - 4. FRAMES:
  - a. MATERIALS: METALLIC-COATED STEEL SHEET, MINIMUM THICKNESS OF 0.053 INCH, WITH MINIMUM A40 COATING.
  - b. CONSTRUCTION: FULL PROFILE WELDED.
- EXPOSED FINISH: PRIME.
- 2.5 INTERIOR FRAMES
- A. STANDARD-DUTY FRAMES: SDI A250.8, LEVEL 1.
  - 1. PHYSICAL PERFORMANCE: LEVEL C ACCORDING TO SDI A250.4 2. MATERIALS: METALLIC-COATED, COLD-ROLLED STEEL SHEET, MINIMUM
- THICKNESS OF 0.042 INCH. 3. CONSTRUCTION: KNOCKED DOWN.
- 4. EXPOSED FINISH: PRIME.
- 2.6 FRAME ANCHORS 1. PLACE SEALANTS SO THEY DIRECTLY CONTACT AND FULLY WET JOINT A. JAMB ANCHORS:
  - 1. MASONRY TYPE: ADJUSTABLE STRAP-AND-STIRRUP OR T-SHAPED ANCHORS TO SUIT FRAME SIZE, NOT LESS THAN 0.042 INCH THICK, WITH CORRUGATED OR PERFORATED STRAPS NOT LESS THAN 2 INCHES WIDE BY 10 INCHES LONG; OR WIRE ANCHORS NOT LESS THAN 0.177 INCH 3.2 ADJUSTING AND CLEANING THICK.
  - 2. STUD-WALL TYPE: DESIGNED TO ENGAGE STUD, WELDED TO BACK OF

- FRAMES: NOT LESS THAN 0.042 INCH THICK.
- 3. COMPRESSION TYPE FOR DRYWALL SLIP-ON FRAMES: ADJUSTABLE **COMPRESSION ANCHORS**
- B. FLOOR ANCHORS: FORMED FROM SAME MATERIAL AS FRAMES, MINIMUM THICKNESS OF 0.042 INCH, AND AS FOLLOWS:
  - 1. MONOLITHIC CONCRETE SLABS: CLIP-TYPE ANCHORS, WITH TWO HOLES TO RECEIVE FASTENERS.
  - 2. SEPARATE TOPPING CONCRETE SLABS: ADJUSTABLE-TYPE ANCHORS WITH EXTENSION CLIPS, ALLOWING NOT LESS THAN 2-INCH HEIGHT ADJUSTMENT. TERMINATE BOTTOM OF FRAMES AT FINISH FLOOR
  - SURFACE. 2.7 MATERIALS
  - 1. COLD-ROLLED STEEL SHEET: ASTM A 1008/A 1008M, COMMERCIAL STEEL (CS), TYPE B: SUITABLE FOR EXPOSED APPLICATIONS.
- C. HOT-ROLLED STEEL SHEET: ASTM A 1011/A 1011M, COMMERCIAL STEEL (CS). TYPE B; FREE OF SCALE, PITTING, OR SURFACE DEFECTS; PICKLED AND OILED.
- D. METALLIC-COATED STEEL SHEET: ASTM A 653/A 653M, COMMERCIAL STEEL (CS), TYPE B.
- E. FRAME ANCHORS: ASTM A 879/A 879M, COMMERCIAL STEEL (CS), 04Z COATING DESIGNATION; MILL PHOSPHATIZED.
- 1. FOR ANCHORS BUILT INTO EXTERIOR WALLS, STEEL SHEET COMPLYING WITH ASTM A 1008/A 1008M OR ASTM A 1011/A 1011M, HOT-DIP GALVANIZED ACCORDING TO ASTM A 153/A 153M, CLASS B.
- A. FABRICATE HOLLOW-METAL WORK TO BE RIGID AND FREE OF DEFECTS WARP, OR BUCKLE, ACCURATELY FORM METAL TO REQUIRED SIZES AND PROFILES, WITH MINIMUM RADIUS FOR METAL THICKNESS. WHERE PRACTICAL, FIT AND ASSEMBLE UNITS IN MANUFACTURER'S PLANT. TO ENSURE PROPER ASSEMBLY AT PROJECT SITE, CLEARLY IDENTIFY WORK THAT CANNOT BE PERMANENTLY FACTORY ASSEMBLED BEFORE SHIPMENT
- **B. HOLLOW-METAL DOORS:** 
  - 1. EXTERIOR DOORS: PROVIDE WEEP-HOLE OPENINGS IN BOTTOMS OF EXTERIOR DOORS TO PERMIT MOISTURE TO ESCAPE. SEAL JOINTS IN TOP EDGES OF DOORS AGAINST WATER PENETRATION.
- C. HOLLOW-METAL FRAMES: WHERE FRAMES ARE FABRICATED IN SECTIONS DUE TO SHIPPING OR HANDLING LIMITATIONS, PROVIDE ALIGNMENT PLATES OR ANGLES AT EACH JOINT, FABRICATED OF SAME THICKNESS METAL AS FRAMES.
  - 1. FRAMES: PROVIDE CLOSED TUBULAR MEMBERS WITH NO VISIBLE FACE SEAMS OR JOINTS, FABRICATED FROM SAME MATERIAL AS DOOR FRAME. FASTEN MEMBERS AT CROSSINGS AND TO JAMBS BY BUTT WELDING.
  - 2. FLOOR ANCHORS: WELD ANCHORS TO BOTTOMS OF JAMBS WITH AT LEAST FOUR SPOT WELDS PER ANCHOR; HOWEVER, FOR SLIP-ON DRYWALL FRAMES. PROVIDE ANCHOR CLIPS OR COUNTERSUNK HOLES AT BOTTOMS OF JAMBS.
  - 3. JAMB ANCHORS: PROVIDE NUMBER AND SPACING OF ANCHORS AS FOLLOWS:
    - a. STUD-WALL TYPE: LOCATE ANCHORS NOT MORE THAN 18 INCHES FROM TOP AND BOTTOM OF FRAME. SPACE ANCHORS NOT MORE THAN 32 INCHES O.C. AND AS FOLLOWS:
    - 1) THREE ANCHORS PER JAMB UP TO 60 INCHES HIGH.
    - 2) FOUR ANCHORS PER JAMB FROM 60 TO 90 INCHES HIGH. 3) FIVE ANCHORS PER JAMB FROM 90 TO 96 INCHES HIGH. 4) FIVE ANCHORS PER JAMB PLUS ONE ADDITIONAL ANCHOR PER JAMB FOR EACH 24 INCHES OR FRACTION THEREOF ABOVE 96
- INCHES HIGH. 4. DOOR SILENCERS: EXCEPT ON WEATHER-STRIPPED FRAMES. DRILL
- STOPS TO RECEIVE DOOR SILENCERS. a. SINGLE-DOOR FRAMES: DRILL STOP IN STRIKE JAMB TO RECEIVE
- b. DOUBLE-DOOR FRAMES: DRILL STOP IN HEAD JAMB TO RECEIVE TWO DOOR SILENCERS. D. HARDWARE PREPARATION: FACTORY PREPARE HOLLOW-METAL WORK TO
- RECEIVE TEMPLATED MORTISED HARDWARE; INCLUDE CUTOUTS, REINFORCEMENT, MORTISING, DRILLING, AND TAPPING ACCORDING TO SDI A250.6, THE DOOR HARDWARE SCHEDULE, AND TEMPLATES. E. STOPS AND MOLDINGS: PROVIDE STOPS AND MOLDINGS AROUND GLAZED

LITES AND LOUVERS WHERE INDICATED. FORM CORNERS OF STOPS AND

MOLDINGS WITH MITERED HAIRLINE JOINTS. 2.9 STEEL FINISHES

THREE DOOR SILENCERS.

A. PRIME FINISH: CLEAN, PRETREAT, AND APPLY MANUFACTURER'S STANDARD

NON-FIRE-RATED STEEL DOORS:

- 1. SHOP PRIMER: SDI A250.10.
- PART 3 EXECUTION
- 3.1 INSTALLATION A. HOLLOW-METAL FRAMES: INSTALL HOLLOW-METAL FRAMES FOR DOORS, TRANSOMS, SIDELITES, BORROWED LITES, AND OTHER OPENINGS, OF SIZE AND PROFILE INDICATED. COMPLY WITH SDI A250.11 OR NAAMM-HMMA 840 AS REQUIRED BY STANDARDS SPECIFIED.
  - 1. SET FRAMES ACCURATELY IN POSITION; PLUMBED, ALIGNED, AND BRACED SECURELY UNTIL PERMANENT ANCHORS ARE SET. AFTER WALL CONSTRUCTION IS COMPLETE, REMOVE TEMPORARY BRACES, LEAVING SURFACES SMOOTH AND UNDAMAGED

B. HOLLOW-METAL DOORS: FIT HOLLOW-METAL DOORS ACCURATELY IN FRAMES,

a. BETWEEN DOOR AND FRAME JAMBS AND HEAD: 1/8 INCH PLUS OR MINUS 1/32 INCH.

WITHIN CLEARANCES SPECIFIED BELOW. SHIM AS NECESSARY

- b. AT BOTTOM OF DOOR: 3/4 INCH PLUS OR MINUS 1/32 INCH. c. BETWEEN DOOR FACE AND STOP: 1/16 INCH TO 1/8 INCH PLUS OR MINUS 1/32 INCH.
- A. FINAL ADJUSTMENTS: CHECK AND READJUST OPERATING HARDWARE ITEMS IMMEDIATELY BEFORE FINAL INSPECTION. LEAVE WORK IN COMPLETE AND

- PROPER OPERATING CONDITION. REMOVE AND REPLACE DEFECTIVE WORK. INCLUDING HOLLOW-METAL WORK THAT IS WARPED, BOWED, OR OTHERWISE **UNACCEPTABLE**
- B. PRIME-COAT TOUCHUP: IMMEDIATELY AFTER ERECTION, SAND SMOOTH RUSTED OR DAMAGED AREAS OF PRIME COAT AND APPLY TOUCHUP OF COMPATIBLE AIR-DRYING, RUST-INHIBITIVE PRIMER.
- **END OF SECTION 081113**

## SECTION 081416 - FLUSH WOOD DOORS

GENERAL

- 1.1 SUMMARY
- A. SECTION INCLUDES: SOLID-CORE DOORS WITH WOOD-VENEER FACES.
  - 2. FACTORY FITTING FLUSH WOOD DOORS TO FRAMES AND FACTOR MACHINING FOR HARDWARE
- B. RELATED REQUIREMENTS:
- 1. SECTION 088000 "GLAZING" FOR GLASS VIEW PANELS IN FLUSH WOOL
- 1.2 ACTION SUBMITTALS A. PRODUCT DATA: FOR EACH TYPE OF DOOR
- B. SHOP DRAWINGS: INDICATE LOCATION, SIZE, AND HAND OF EACH DOOR; ELEVATION OF EACH KIND OF DOOR; CONSTRUCTION DETAILS NOT COVERED IN PRODUCT DATA.
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE
- MARSHFIELD DOOR SYSTEMS, INC 2.2 ACCOUNT VENDOR
- A. NOT USED GC TO SUPPLY THROUGH THEIR PREFERRED VENDOR

PRODUCTS BY THE FOLLOWING:

- 2.3 FLUSH WOOD DOORS, GENERAL A. QUALITY STANDARD: IN ADDITION TO REQUIREMENTS SPECIFIED, COMPLY
- B. WDMA I.S.1-A PERFORMANCE GRADE:
- 2. EXTRA HEAVY DUTY: CLASSROOMS C. FIRE-RATED WOOD DOORS: DOORS COMPLYING WITH NFPA 80 THAT ARE LISTED AND LABELED BY A QUALIFIED TESTING AGENCY, FOR

WITH WDMA I.S.1-A, "ARCHITECTURAL WOOD FLUSH DOORS."

HEAVY DUTY UNLESS OTHERWISE INDICATED

PRESSURE ACCORDING TO NFPA 252. 1. CORES: PROVIDE CORE SPECIFIED OR MINERAL CORE AS NEEDED TO

FIRE-PROTECTION RATINGS INDICATED, BASED ON TESTING AT POSITIVE

- PROVIDE FIRE-PROTECTION RATING INDICATED. D. PARTICLEBOARD-CORE DOORS:
- 1. PARTICLEBOARD: ANSI A208.1, GRADE LD-1 OR GRADE LD-2, MADE WIT BINDER CONTAINING NO UREA-FORMALDEHYDE.
- 2. BLOCKING: PROVIDE WOOD BLOCKING IN PARTICLEBOARD-CORE DOORS AS NEEDED TO ELIMINATE THROUGH-BOLTING HARDWARE. 3. PROVIDE DOORS WITH STRUCTURAL-COMPOSITE-LUMBER CORE
- INSTEAD OF PARTICLEBOARD CORES FOR DOORS INDICATED TO RECEIVE EXIT DEVICES.

E. STRUCTURAL-COMPOSITE-LUMBER-CORE DOORS:

a. SCREW WITHDRAWAL, FACE: 700 LBF.

- 1. STRUCTURAL COMPOSITE LUMBER: WDMA I.S.10.
- b. SCREW WITHDRAWAL, EDGE: 400 LBF.
- 2.4 VENEER-FACED DOORS FOR TRANSPARENT FINISH A. INTERIOR SOLID-CORE DOORS:
- 1. GRADE: CUSTOM (GRADE A FACES)
- 2. SPECIES: SELECT WHITE BIRCH CUT: ROTARY CUT.
- 4. MATCH BETWEEN VENEER LEAVES: PLEASING MATCH. ASSEMBLY OF VENEER LEAVES ON DOOR FACES: RUNNING MATCH.

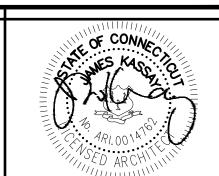
THEN ENTIRE UNIT IS ABRASIVE PLANED BEFORE VENEERING.

6. PAIR AND SET MATCH: PROVIDE FOR DOORS HUNG IN SAME OPENING OR

CORE: STRUCTURAL COMPOSITE LUMBER. 8. CONSTRUCTION: FIVE PLIES. STILES AND RAILS ARE BONDED TO CORE

SEPARATED ONLY BY MULLIONS.

- 2.5 DOORS FOR OPAQUE FINISH
- A. INTERIOR SOLID-CORE DOORS:
- GRADE: CUSTOM. FACES: ANY CLOSED-GRAIN HARDWOOD OF MILL OPTION.
- CORE: PARTICLEBOARD OR STRUCTURAL COMPOSITE LUMBER. 4. CONSTRUCTION: FIVE PLIES. STILES AND RAILS ARE BONDED TO CORE THEN ENTIRE UNIT IS ABRASIVE PLANED BEFORE VENEERING.



06/28/202

**SPECIFICATIONS** 

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REVISIONS

SHEET NO.

JOB NO.

METAL LOUVERS:

- MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
  - a. AIR LOUVERS INC.; A DIVISION OF THE ACTIVAR CONSTRUCTION PRODUCTS GROUP.
  - b. ANEMOSTAT PRODUCTS; A MESTEK COMPANY
  - c. L & L LOUVERS, INC
  - d. LOUVERS & DAMPERS, INC.; A DIVISION OF MESTEK, INC
  - e. MCGILL ARCHITECTURAL PRODUCTS
- 2. METAL AND FINISH: HOT-DIP GALVANIZED STEEL, 0.040 INCH THICK, FACTORY PRIMED FOR PAINT FINISH.
- 2.7 SHOP PRIMING
- A. DOORS FOR OPAQUE FINISH: SHOP PRIME FACES, ALL FOUR EDGES, EDGES OF CUTOUTS, AND MORTISES WITH ONE COAT OF WOOD PRIMER SPECIFIED IN SECTION 099123" INTERIOR PAINTING."
- 2.8 FACTORY FINISHING (CONTRACTOR'S OPTION)
- . GENERAL: COMPLY WITH REFERENCED QUALITY STANDARD FOR FACTORY FINISHING. COMPLETE FABRICATION, INCLUDING FITTING DOORS FOR OPENINGS AND MACHINING FOR HARDWARE THAT IS NOT SURFACE APPLIED, BEFORE FINISHING.
- 1. FINISH FACES, ALL FOUR EDGES, EDGES OF CUTOUTS, AND MORTISES STAINS AND FILLERS MAY BE OMITTED ON BOTTOM EDGES, EDGES OF CUTOUTS, AND MORTISES.
- FACTORY FINISH DOORS THAT ARE INDICATED TO RECEIVE TRANSPARENT FINISH.
- . TRANSPARENT FINISH:
- GRADE: CUSTOM
- 2. FINISH: AWI'S, AWMAC'S, AND WI'S "ARCHITECTURAL WOODWORK STANDARDS" SYSTEM 9, UV CURABLE, ACRYLATED EPOXY, POLYESTER, OR URETHANE.
- 3. STAINING: AS SELECTED BY ARCHITECT FROM MANUFACTURER'S FULL RANGE.
- 4. SHEEN: SATIN PART 3 -EXECUTION
- 3.1 INSTALLATION
- A. HARDWARE: FOR INSTALLATION, SEE SECTION 087100 "DOOR HARDWARE.
- INSTALLATION INSTRUCTIONS: INSTALL DOORS TO COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND REFERENCED QUALITY STANDARD, AND AS INDICATED.
  - 1. INSTALL FIRE-RATED DOORS ACCORDING TO NFPA 80.
- JOB-FITTED DOORS: ALIGN AND FIT DOORS IN FRAMES WITH UNIFORM CLEARANCES AND BEVELS AS INDICATED BELOW; DO NOT TRIM STILES AND RAILS IN EXCESS OF LIMITS SET BY MANUFACTURER OR PERMITTED FOR FIRE-RATED DOORS. MACHINE DOORS FOR HARDWARE. SEAL EDGES OF DOORS, EDGES OF CUTOUTS, AND MORTISES AFTER FITTING AND MACHINING
- CLEARANCES: PROVIDE 1/8 INCH AT HEADS, JAMBS, AND BETWEEN PAIRS OF DOORS. PROVIDE 1/8 INCH FROM BOTTOM OF DOOR TO TOP OF DECORATIVE FLOOR FINISH OR COVERING UNLESS OTHERWISE INDICATED. WHERE THRESHOLD IS SHOWN OR SCHEDULED, PROVIDE 1/4 2.3 GLAZING SYSTEMS INCH FROM BOTTOM OF DOOR TO TOP OF THRESHOLD UNLESS OTHERWISE INDICATED.
- a. COMPLY WITH NFPA 80 FOR FIRE-RATED DOORS

END OF SECTION 081416

### SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

- 1.1 SUMMARY
- A. SECTION INCLUDES 1. EXTERIOR MANUAL-SWING ENTRANCE DOORS AND DOOR FRAME UNITS. . RELATED SECTIONS
- 1. DIVISION 8 SECTION "GLAZING" FOR WINDOWS INSTALLED WITH ALUMINUM-FRAMED SYSTEMS.
- 1.2 PERFORMANCE REQUIREMENTS (MODIFY PER LOCAL REQUIREMENTS)
- 1.3 SUBMITTALS
- PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- SHOP DRAWINGS: FOR ALUMINUM-FRAMED SYSTEMS. INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
  - 1. INCLUDE DETAILS OF PROVISIONS FOR SYSTEM EXPANSION AND CONTRACTION AND FOR DRAINAGE OF MOISTURE IN THE SYSTEM TO THE EXTERIOR.
- C. OTHER ACTION SUBMITTALS:
- 1. ENTRANCE DOOR HARDWARE SCHEDULE: PREPARED BY OR UNDER THE PART 3 -SUPERVISION OF SUPPLIER, DETAILING FABRICATION AND ASSEMBLY OF ENTRANCE DOOR HARDWARE, AS WELL AS PROCEDURES AND DIAGRAMS.
- 1.4 QUALITY ASSURANCE
- A. INSTALLER QUALIFICATIONS: MANUFACTURER'S AUTHORIZED REPRESENTATIVE WHO IS TRAINED AND APPROVED FOR INSTALLATION OF UNITS REQUIRED FOR THIS PROJECT.
- 1.5 WARRANTY
- . SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF ALUMINUM-FRAMED SYSTEMS THAT DO NOT COMPLY WITH REQUIREMENTS OR THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.
- WARRANTY PERIOD: TWO YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
- SPECIAL FINISH WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS ON WHICH FINISHES DO NOT COMPLY WITH REQUIREMENTS OR THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. WARRANTY DOES NOT INCLUDE NORMAL WEATHERING.

- WARRANTY PERIOD: COMPLETION.
- PRODUCTS PART 2 -
- 2.1 MATERIALS
- A. PRODUCTS: EXTERIOR: ALUMINUM STOREFRONT SYSTEM
  - a. FRAMING MEMBER LOW PROFILE: 1 3/4" X 4 1/2" NOMINAL DIMENSION; THERMALLY BROKEN; CENTER GLAZED, SCREW SPLINE, SHEAR BLOCK, OR STICK FABRICATION
  - b. FINISH/COLOR: CLEAR ANODIZED
- B. ALUMINUM: ALLOY AND TEMPER RECOMMENDED BY MANUFACTURER FOR TYPE OF USE AND FINISH INDICATED.
- 1. MATERIAL STANDARD: ASTM B 221; 6063-T6 ALLOY AND TEMPER
- 2. MEMBER WALL THICKNESS: EACH FRAMING MEMBER SHALL PROVIDE STRUCTURAL STRENGTH TO MEET SPECIFIED PERFORMANCE REQUIREMENTS.
- 3. TOLERANCES: REFERENCE TO TOLERANCES FOR WALL THICKNESS AND OTHER CROSS-SECTIONAL DIMENSIONS OF STOREFRONT MEMBERS ARE NOMINAL AND IN COMPLIANCE WITH AA ALUMINUM STANDARDS AND DATA.
- C. STEEL REINFORCEMENT: MANUFACTURER'S STANDARD ZINC-RICH, CORROSION-RESISTANT PRIMER, COMPLYING WITH SSPC-PS GUIDE NO. 12.00; APPLIED IMMEDIATELY AFTER SURFACE PREPARATION AND PRETREATMENT. SELECT SURFACE PREPARATION METHODS ACCORDING TO RECOMMENDATIONS IN SSPC-SP COM AND PREPARE SURFACES ACCORDING TO APPLICABLE SSPC STANDARD.
  - 1. STRUCTURAL SHAPES, PLATES, AND BARS: ASTM A 36/A 36M.
- COLD-ROLLED SHEET AND STRIP: ASTM A 1008/A 1008M 3. HOT-ROLLED SHEET AND STRIP: ASTM A 1011/A 1011M
- D. PERIMETER ANCHORS: ALUMINUM. WHEN STEEL ANCHORS ARE USED PROVIDE INSULATION BETWEEN STEEL MATERIAL AND ALUMINUM MATERIAL TO PREVENT GALVANIC ACTION.
- 2.2 FRAMING SYSTEMS
- A. FRAMING MEMBERS: MANUFACTURER'S STANDARD EXTRUDED-ALUMINUM FRAMING MEMBERS OF THICKNESS REQUIRED AND REINFORCED AS REQUIRED TO SUPPORT IMPOSED LOADS.
- CONSTRUCTION: THERMALLY BROKEN
- B. BRACKETS AND REINFORCEMENTS: MANUFACTURER'S STANDARD HIGH-STRENGTH ALUMINUM WITH NONSTAINING. NONFERROUS SHIMS FOR ALIGNING SYSTEM COMPONENTS.
- C. FASTENERS AND ACCESSORIES: MANUFACTURER'S STANDARD CORROSION-RESISTANT. NONSTAINING. NONBLEEDING FASTENERS AND ACCESSORIES COMPATIBLE WITH ADJACENT MATERIALS
  - 1. USE SELF-LOCKING DEVICES WHERE FASTENERS ARE SUBJECT TO LOOSENING OR TURNING OUT FROM THERMAL AND STRUCTURAL D. ALL CORES SHALL BE OF THE SAME MANUFACTURER AND SPECIFICATION: MOVEMENTS, WIND LOADS, OR VIBRATION
- 2. REINFORCE MEMBERS AS REQUIRED TO RECEIVE FASTENER THREADS. D. CONCRETE AND MASONRY INSERTS: HOT-DIP GALVANIZED CAST-IRON. MALLEABLE-IRON, OR STEEL INSERTS, COMPLYING WITH ASTM A 123/A 123M
- OR ASTM A 153/A 153M. E. CONCEALED FLASHING: MANUFACTURER'S STANDARD CORROSION-RESISTANT, NONSTAINING, NONBLEEDING FLASHING COMPATIBLE WITH ADJACENT MATERIALS.
- F. FRAMING SYSTEM GASKETS AND SEALANTS: MANUFACTURER'S STANDARD, RECOMMENDED BY MANUFACTURER FOR JOINT TYPE.
- A. GLAZING: AS SPECIFIED IN DIVISION 8 SECTION "GLAZING."
- B. GLAZING GASKETS: MANUFACTURER'S STANDARD COMPRESSION TYPES: REPLACEABLE, MOLDED OR EXTRUDED, OF PROFILE AND HARDNESS REQUIRED TO MAINTAIN WATERTIGHT SEAL.
- C. SPACERS AND SETTING BLOCKS: MANUFACTURER'S STANDARD ELASTOMERIC TYPE.
- 2.4 ENTRANCE DOOR SYSTEMS
- A. ENTRANCE DOORS: MANUFACTURER'S STANDARD GLAZED ENTRANCE DOORS FOR MANUAL-SWING OPERATION.
  - 1. DOOR CONSTRUCTION: 1-3/4-INCH OVERALL THICKNESS, WITH MINIMUM 0.125-INCH- THICK. EXTRUDED-ALUMINUM TUBULAR RAIL AND STILE MEMBERS. MECHANICALLY FASTEN CORNERS WITH REINFORCING BRACKETS THAT ARE DEEPLY PENETRATED AND FILLET WELDED OR THAT INCORPORATE CONCEALED TIE RODS.
  - 2. DOOR DESIGN: AS INDICATED.
  - 3. GLAZING STOPS AND GASKETS: BEVELED, SNAP-ON, EXTRUDED-ALUMINUM STOPS AND PREFORMED GASKETS.
- a. PROVIDE NONREMOVABLE GLAZING STOPS ON OUTSIDE OF DOOR. B. ENTRANCE DOOR HARDWARE: AS SPECIFIED ON THE DRAWINGS AND IN
- DIVISION 8 SECTION "DOOR HARDWARE." 2.5 ALUMINUM FINISHES
- A. CLEAR ANODIC FINISH: AAMA 611, AA-M12C22A31, CLASS II, 0.010 MM OR
- EXECUTION INSTALLATION
- A. GENERAL
- 1. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
- DO NOT INSTALL DAMAGED COMPONENTS. 3. FIT JOINTS TO PRODUCE HAIRLINE JOINTS FREE OF BURRS AND
- DISTORTION. 4. RIGIDLY SECURE NONMOVEMENT JOINTS.
- 5. INSTALL ANCHORS WITH SEPARATORS AND ISOLATORS TO PREVENT METAL CORROSION AND ELECTROLYTIC DETERIORATION.
- 6. SEAL JOINTS WATERTIGHT UNLESS OTHERWISE INDICATED.
- B. METAL PROTECTION:
  - 1. WHERE ALUMINUM WILL CONTACT DISSIMILAR METALS, PROTECT AGAINST GALVANIC ACTION BY PAINTING CONTACT SURFACES WITH PRIMER OR APPLYING SEALANT OR TAPE, OR BY INSTALLING NONCONDUCTIVE SPACERS AS RECOMMENDED BY MANUFACTURER FOR THIS PURPOSE.
  - 2. WHERE ALUMINUM WILL CONTACT CONCRETE OR MASONRY, PROTECT AGAINST CORROSION BY PAINTING CONTACT SURFACES WITH BITUMINOUS PAINT.

- 10 YEARS FROM DATE OF SUBSTANTIAL C. INSTALL COMPONENTS TO DRAIN WATER PASSING JOINTS, CONDENSATION OCCURRING WITHIN FRAMING MEMBERS. AND MOISTURE MIGRATING WITHIN THE SYSTEM TO EXTERIOR.
  - D. SET CONTINUOUS SILL MEMBERS AND FLASHING IN FULL SEALANT BED AS SPECIFIED IN DIVISION 7 SECTION "JOINT SEALANTS" TO PRODUCE
  - WEATHERTIGHT INSTALLATION. E. INSTALL COMPONENTS PLUMB AND TRUE IN ALIGNMENT WITH ESTABLISHED
  - LINES AND GRADES, AND WITHOUT WARP OR RACK.

F. INSTALL GLAZING AS SPECIFIED IN DIVISION 8 SECTION "GLAZING."

- G. ENTRANCE DOORS: INSTALL DOORS TO PRODUCE SMOOTH OPERATION AND TIGHT FIT AT CONTACT POINTS.
  - 1. EXTERIOR DOORS: INSTALL TO PRODUCE WEATHERTIGHT ENCLOSURE AND TIGHT FIT AT WEATHER STRIPPING
  - 2. FIELD-INSTALLED ENTRANCE DOOR HARDWARE: INSTALL SURFACE-MOUNTED ENTRANCE DOOR HARDWARE ACCORDING TO ENTRANCE DOOR HARDWARE MANUFACTURERS' WRITTEN INSTRUCTIONS USING CONCEALED FASTENERS TO GREATEST EXTENT POSSIBLE.
- 3.2 PROTECTION AND CLEANING
- A. PROTECTION: PROTECT INSTALLED PRODUCT'S FINISH SURFACES FROM DAMAGE DURING CONSTRUCTION. PROTECT ALUMINUM STOREFRONT SYSTEM FROM DAMAGE FROM GRINDING AND POLISHING COMPOUNDS PLASTER, LIME, ACID, CEMENT, OR OTHER HARMFUL CONTAMINANTS.
- B. CLEANING: REPAIR OR REPLACE DAMAGED INSTALLED PRODUCTS. CLEAN INSTALLED PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO OWNER'S ACCEPTANCE. REMOVE CONSTRUCTION DEBRIS FROM PROJECT SITE AND LEGALLY DISPOSE OF DEBRIS.

END OF SECTION 084113

### **SECTION 087100 - DOOR HARDWARE**

- PART 1 GENERAL
- 1.1 DESCRIPTION A. GENERAL: PRIOR TO COMMENCING THE WORK OF THIS SECTION. THE HARDWARE CONTRACTOR SHALL STUDY ALL OTHER SECTIONS OF THESE
- SPECIFICATIONS AND THE DRAWINGS FOR WORK RELATED TO THIS SECTION. B. WORK INCLUDED: GENERALLY, THE WORK OF THIS SECTION INCLUDES, BUT IS NOT NECESSARILY LIMITED TO FURNISHING AND INSTALLATION OF ALL FINISHING HARDWARE FOR APPLICATION TO WOOD, HOLLOW METAL, STEEL, AND MISCELLANEOUS DOORS AND THE FURNISHING AND INSTALLATION OF ALL OTHER MISCELLANEOUS HARDWARE AS SPECIFIED HEREIN AND IS SCHEDULED AND/OR INDICATED ON THE DRAWINGS.
- C. RELATED WORK DESCRIBED ELSEWHERE:
  - 1. HOLLOW METAL FRAMES: SECTION 081213
- 2. FLUSH WOOD DOORS: SECTION 081416
- THEREFORE, NO SUBSTITUTIONS WILL BE ALLOWED.
- E. ALL LOCATIONS SHALL BE VERIFIED AND COORDINATED BY THE HARDWARE SUPPLIER BEFORE FABRICATION.
- F. UNLESS OTHERWISE DIRECTED, HARDWARE SHALL BE MOUNTED PER SPECIFICATIONS, OR THE HARDWARE MANUFACTURE'S STANDARDS ACCESSIBLE DOOR HARDWARE SHALL BE INSTALLED IN CONFORMANCE WITH ADA REGULATIONS. IT IS THE INTENT TO HAVE ALL HARDWARE USABLE BY THE CHILDREN TO BE INSTALLED LOW ENOUGH SO SMALL CHILDREN CAN OPERATE DOOR IN NORMAL AND EMERGENCY SITUATIONS.
- 1.2 QUALITY ASSURANCE
- A. THE FOLLOWING STANDARDS ARE HEREBY MADE A PART OF THIS SPECIFICATION.
  - 1. BUILDERS HARDWARE MANUFACTURER'S ASSOCIATION "PRODUCTS
  - STANDARDS" 2. ARCHITECTURAL HARDWARE SPECIFICATIONS HANDBOOK
  - 3. ANSI STANDARD A115.1, A115.2, A117.1, A156.13
  - 4. WHERE PROVISIONS OF PERTINENT CODES AND STANDARDS CONFLICT WITH THIS SPECIFICATION, THE MORE STRINGENT PROVISIONS SHALL
- 1.3 SHOP DRAWINGS
- A. MATERIALS LIST: THE HARDWARE CONTRACTOR SHALL SUBMIT FOR APPROVAL A SAMPLE LIST IN TRIPLICATE. LISTING EACH OF THE DIFFERENT ARTICLES OF BUILDER'S HARDWARE REQUIRED. THE SAMPLE LIST SHALL BE SUBMITTED IN THE FOLLOWING FORM WITH MANUFACTURER'S NAME AND CATALOG NUMBER OF THE ARTICLE SUPPLIED.
- 1. QUANTITY NUMBER SPEC. REF., TYPE, MANUFACTURER'S NAME, OR CATALOG NUMBER, ARTICLE AND CATALOG NUMBER OF ARTICLE SUPPLIED.
- 1.4 GUARANTEES: PROVIDE UPON COMPLETION ALL WRITTEN WARRANTIES.
- PART 2 PRODUCTS
- 2.1 ACCOUNT VENDOR
- A. NOT USED GC TO SUPPLY THROUGH THEIR PREFERRED VENDOR
- 2.2 FASTENERS
- A. GENERAL:
  - FURNISH ALL FINISH HARDWARE WITH ALL NECESSARY SCREWS, BOLTS AND OTHER FASTENERS OF SUITABLE SIZE AND TYPE TO ANCHOR THE HARDWARE IN POSITION FOR LONG LIFE UNDER HARD USE. 2. FURNISH FASTENINGS WHERE NECESSARY WITH EXPANSION SHIELDS,
  - TOGGLE BOLTS, SEX BOLTS, AND OTHER ANCHORS APPROVED BY THE ARCHITECT, ACCORDING TO THE MATERIAL TO WHICH THE HARDWARE IS TO BE APPLIED AND THE RECOMMENDATIONS OF THE HARDWARE MANUFACTURER.
- B. DESIGN:
  - 1. ALL FASTENINGS SHALL HARMONIZE WITH THE HARDWARE AS TO MATERIAL AND FINISH
- 2.3 HARDWARE ITEMS

WHICH EACH PIECE BELONGS.

- A. SEE HARDWARE SCHEDULE FOR ALL ITEMS. B. EACH HARDWARE ITEM SHALL BE PACKAGED SEPARATELY WITH ALL SCREWS. WRENCHES, TEMPLATES, AND INSTRUCTIONS. MARK WITH DOOR NUMBER TO
- C. ALL CYLINDER LOCKS SHALL BE REMOVABLE CORE. ALL EXTERIOR DOORS SHALL BE KEYED ALIKE, AND ALL INTERIOR DOORS KEYED ALIKE (TWO DIFFERENT KEYS). PROVIDE CONSTRUCTION CORES FOR ALL EXTERIOR
- D. PROVIDE 4 "DO NOT DUPLICATE" MASTER KEYS AND 6 COPIES OF ALL OTHER

- KEYS TO THE OWNER UPON COMPLETION OF THE PROJECT, DOOR LOCKS SHALL BE KEYED PER THE DIRECTION OF KNOWLEDGE UNIVERSE AND THE
- E. CLOSERS SHALL HAVE BACK CHECK DEVICE AND INSTALLED PARALLEL MOUNT ON THE PUSH SIDE OF ALL DOORS.
- F. HARDWARE SHALL COMPLY WITH THE REQUIREMENTS OF STATE AND LOCAL CODES.
- PART 3 EXECUTION
- 3.1 INSTALLATION
- A. GENERAL: INSTALL ALL MATERIALS PROVIDED UNDER THIS SECTION OF THESE SPECIFICATIONS IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE APPROVAL OF THE ARCHITECT
- B. ALL DOORS SHALL OPERATE WITHOUT BINDING OF ANY TYPE AND SHALL RETURN TO A SMOOTH EVEN FIT WITH THE SURFACE OF THE DOOR EQUAL DISTANT FROM THE SIDES AND FACES OF THE FRAMES. CLOSERS SHALL GENTLY RETURN ALL DOORS TO THE CLOSED POSITION WITH LATCHES FULLY ENGAGED. LABELED HARDWARE SHALL HAVE THE LABELS AND OTHER OPERATING PORTIONS MASKED OFF BEFORE PAINTING COMMENCES. REMOVE AFTER PAINTING IS COMPLETE.
- C. ADJUST, CLEAN AND OIL AND HARDWARE BEFORE FINAL INSPECTION.
- 3.2 TESTS
- A. GENERAL: UPON COMPLETION OF THIS PORTION OF THE WORK, AND PRIOR TO ITS ACCEPTANCE BY THE OWNER. MAKE ALL REQUIRED TESTS AND SECURE ALL REQUIRED APPROVALS FROM AGENCIES HAVING JURISDICTION.
- 3.3 CLEANING:
- A. GENERAL: IN ADDITION TO CONFORMING TO THESE SPECIFICATIONS, DURING THE PROGRESS OF THIS PORTION OF THE WORK ALL WORK AREAS SHALL BE KEPT NEAT, CLEAN AND ORDERLY.

END OF SECTION 087100

**SECTION 088000 - GLAZING** 

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES:

1.2 RELATED SECTIONS

- 1. GLASS FOR WINDOWS, DOORS, INTERIOR BORROWED LITES, STOREFRONT FRAMING
  - GLAZING SEALANTS AND ACCESSORIES.
- A. DIVISION 08 SECTION "HOLLOW METAL FRAMES."
- B. DIVISION 08 SECTION "FLUSH WOOD DOORS."
- 1.3 PERFORMANCE REQUIREMENTS A. GENERAL: PROVIDE GLAZING SYSTEMS THAT WILL WITHSTAND INDICATED LOADS AND NORMAL THERMAL MOVEMENT WITHOUT FAILURE, INCLUDING LOSS OR GLASS BREAKAGE RESULTING FROM DEFECTIVE MANUFACTURE.
- WATERTIGHT AND AIRTIGHT; OR DETERIORATION OF GLAZING MATERIALS.
- 1.4 DELIVERY, STORAGE, AND HANDLING A. PROTECT GLAZING MATERIALS DURING SHIPPING, HANDLING, AND STORAGE TO PREVENT BREAKAGE, SCRATCHING, DAMAGE TO SEALS, OR OTHER VISIBLE DAMAGE. DELIVER, UNLOAD, STORE, AND ERECT GLAZING MATERIALS WITHOUT EXPOSING PANELS TO DAMAGE FROM CONSTRUCTION 2.2 INTERIOR GYPSUM BOARD
  - 1. COMPLY WITH MANUFACTURER'S VENTING AND SEALING RECOMMENDATIONS FOR SHIPPING AND HANDLING OF INSULATING
- GLASS UNITS EXPOSED TO SUBSTANTIAL ALTITUDE CHANGE 1.5 WARRANTY WARRANTY FOR INSULATING GLASS: MANUFACTURER'S STANDARD FORM SIGNED BY INSULATING-GLASS PRODUCT MANUFACTURER/FABRICATOR. AGREEING TO REPLACE INSULATING-GLASS UNITS THAT EXHIBIT FAILURE OF

HERMETIC SEAL UNDER NORMAL USE EVIDENCED BY THE OBSTRUCTION OF

- VISION BY DUST, MOISTURE, OR FILM ON INTERIOR SURFACES OF GLASS, WITHIN 10 YEARS OF DATE OF SUBSTANTIAL COMPLETION B. INSTALLER'S WARRANTY: FORM ACCEPTABLE TO OWNER, SIGNED BY GLASS PRODUCT INSTALLER, AGREEING TO REPLACE GLASS PRODUCTS THAT DETERIORATE, OR THAT EXHIBIT DAMAGE OR DETERIORATION OF GLASS OR C. GYPSUM BOARD, TYPE X: ASTM C 1396/C 1396M GLAZING PRODUCTS DUE TO FAULTY INSTALLATION, WITHIN 2 YEARS OF
- DATE OF SUBSTANTIAL COMPLETION.
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS
- A. PRIMARY GLASS MANUFACTURERS 1. PPG INDUSTRIES, INC, PITTSBURGH, PA, (888) 774-4332, EMAIL INFO@PPG.COM, HTTP://CORPORATEPORTAL.PPG.COM.
- APPROVED EQUAL

CLASS INDICATED.

- 2.2 GLASS PRODUCTS A. ANNEALED FLOAT GLASS, GENERAL: ASTM C 1036, TYPE I, QUALITY-Q3,
- B. HEAT-TREATED FLOAT GLASS, FULLY TEMPERED: ASTM C 1048; TYPE I (TRANSPARENT FLAT GLASS); QUALITY-Q3; KIND FT, OF CLASS AND CONDITION INDICATED: WHERE SAFETY GLASS IS INDICATED. C. INSULATING-GLASS UNITS: FACTORY-ASSEMBLED UNITS CONSISTING OF

DUAL-SEALED LITES OF GLASS SEPARATED BY A DEHYDRATED INTERSPACE,

WITH MANUFACTURER'S STANDARD SPACER MATERIAL AND CONSTRUCTION, PER ASTM E 774 AND E 2190.

GASKET MANUFACTURER.

- 2.3 GLAZING ACCESSORIES A. CLEANERS, PRIMERS, AND SEALERS: TYPES RECOMMENDED BY SEALANT OR
- B. GLAZING TAPE: CLOSED CELL POLYVINYL CHLORIDE FOAM, WIDTHS REQUIRED FOR SPECIFIED INSTALLATION, AND COMPLYING WITH AAMA 800. C. GLAZING GASKETS:
- BLACK COLOR. 2. SOFT COMPRESSION GASKETS: ASTM C 509, TYPE II, BLACK, MOLDED OR EXTRUDED, NEOPRENE, EPDM, SILICONE OR THERMOPLASTIC POLYOLEFIN RUBBER, OF PROFILE AND HARDNESS REQUIRED TO

1. DENSE COMPRESSION GASKETS: ASTM C 864, NEOPRENE OR EPDM, OR

ASTM C 1115, SILICONE OR THERMOPLASTIC POLYOLEFIN RUBBER,

D. SETTING BLOCKS: ASTM C 864, NEOPRENE

MAINTAIN WATERTIGHT SEAL

- E. SPACER SHIMS: ASTM C 864, NEOPRENE.
- F. EDGE BLOCKS: ELASTOMERIC MATERIAL OF HARDNESS NEEDED TO LIMIT

- GLASS LATERAL MOVEMENT (SIDE WALKING) 2.4 FABRICATION OF GLAZING UNITS, GENERAL
  - A. FABRICATE GLAZING UNITS IN DIMENSIONS REQUIRED, WITH EDGE AND FACE CLEARANCES, EDGE AND SURFACE CONDITIONS, AND BITE IN ACCORDANCE WITH GLAZING PRODUCT MANUFACTURER/FABRICATOR'S INSTRUCTIONS
- AND REFERENCED GLAZING PUBLICATIONS. 2.5 MONOLITHIC (SINGLE-GLAZED) FLOAT-GLASS UNITS
- A. UNCOATED CLEAR FLOAT GLASS UNITS:

1. CLASS 1 (CLEAR) FLOAT GLASS, 1/4" MINIMUM THICKNESS.

- a. KIND FT (FULLY TEMPERED)
- B. UNCOATED CLEAR FLOAT GLASS UNITS:
- 1. CLASS 1 (FROSTED) FLOAT GLASS, 1/4" MINIMUM THICKNESS.
- a. KIND FT (FULLY TEMPERED).
- PART 3 EXECUTION

3.1 PREPARATION

- A. CLEAN GLAZING CHANNELS WITH RECOMMENDED SOLVENT AND WIPE DRY APPLY PRIMERS TO JOINT SURFACES TO ENSURE ADHESION OF SEALANTS UNLESS PRECONSTRUCTION SEALANT-SUBSTRATE TESTING INDICATES NO PRIMER IS REQUIRED.
- 3.2 GLAZING INSTALLATION
- A. GENERAL: INSTALL GLASS AND GLAZING MATERIALS IN ACCORDANCE WIT INSTRUCTIONS OF MANUFACTURERS AND REQUIREMENTS OF GANA GLAZING
- B. GASKET GLAZING: FABRICATE GASKETS TO FIT OPENINGS EXACTLY. ALLOW
- FOR STRETCHING OF GASKETS DURING INSTALLATION.
- 3.3 CLEANING AND PROTECTION A. PROTECT INSTALLED GLASS FROM DAMAGE. ATTACH STREAMERS OR WARNING TAPE TO FRAMING MEMBERS, AWAY FROM CONTACT WITH GLASS. REMOVE NONPERMANENT LABELS.
- B. PROTECT GLASS FROM CONTACT WITH CONTAMINATING SUBSTANCES DURING CONSTRUCTION. IMMEDIATELY CLEAN GLASS EXPOSED TO CONTAMINATION USING METHODS RECOMMENDED BY GLASS MANUFACTURER
- C. WITHIN 5 WORKING DAYS PRIOR TO INSPECTION FOR SUBSTANTIA COMPLETION. CLEAN ALL EXPOSED GLASS SURFACES USING METHODS RECOMMENDED BY MANUFACTURER. REMOVE GLAZING COMPOUNDS FROM
- FRAMING SURFACES.
- D. REMOVE AND REPLACE BROKEN OR DAMAGED GLASS. END OF SECTION 088000
- **SECTION 092900 GYPSUM BOARD**
- 1.1 SUMMARY

PART 1 - GENERAL

A. SECTION INCLUDES: INTERIOR GYPSUM BOARD FABRICATION, OR INSTALLATION; FAILURE OF GLAZING SYSTEMS TO REMAIN

PART 2 - PRODUCTS

**FOLLOWING:** 

- 2.1 GYPSUM BOARD, GENERAL A. SIZE: PROVIDE MAXIMUM LENGTHS AND WIDTHS AVAILABLE THAT WILL MINIMIZE JOINTS IN EACH AREA AND THAT CORRESPOND WITH SUPPORT
- SYSTEM INDICATED.
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE
- AMERICAN GYPSUM.
- CERTAINTEED CORPORATION. 3. GEORGIA-PACIFIC BUILDING PRODUCTS.
- 4. NATIONAL GYPSUM COMPANY
- UNITED STATES GYPSUM COMPANY
- B. GYPSUM WALLBOARD: ASTM C 1396/C 1396M. THICKNESS: 5/8 INCH.
- 2. LONG EDGES: TAPERED.
- 1. THICKNESS: 5/8 INCH. LONG EDGES: TAPERED.
- D. GYPSUM CEILING BOARD: ASTM C 1396/C 1396M. 1. THICKNESS: 5/8 INCH.
- LONG EDGES: TAPERED 2.3 TILE BACKING PANELS A. GLASS-MAT GYPSUM INTERIOR BOARD: ASTM C 1658/1658M, WITH FIBERGLASS
- MAT LAMINATED TO BOTH SIDES AND WITH MANUFACTURER'S STANDARD **EDGES**
- PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIRMENTS, PROVIDE GEORGIA-PACIFIC GYPSUM; "DENSARMOR PLUS."
- 2. CORE: 5/8 INCH, TYPE X. LONG EDGES: TAPERED.

B. JOINT TAPE:

TRIM ACCESSORIES

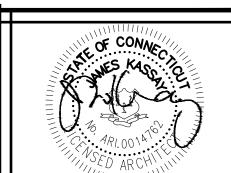
2.5 JOINT TREATMENT MATERIALS

A. INTERIOR TRIM: ASTM C 1047. 1. MATERIAL: GALVANIZED OR ALUMINUM-COATED STEEL SHEET, ROLLED

ZINC, PLASTIC, OR PAPER-FACED GALVANIZED-STEEL SHEET

- A. GENERAL: COMPLY WITH ASTM C 475/C 475M.
  - INTERIOR GYPSUM BOARD: PAPER. EXTERIOR GYPSUM SOFFIT BOARD: PAPER. GLASS-MAT GYPSUM SHEATHING BOARD: 10-BY-10 GLASS MESH.

TILE BACKING PANELS: AS RECOMMENDED BY PANEL MANUFACTURER



06/01/22 21399 JOB NO.

SHEET NO.

REVISIONS

 2
 8

 3
 6

 6
 6

 6
 6

 8

**SPECIFICATIONS** 

- JOINT COMPOUND FOR INTERIOR GYPSUM BOARD: FOR EACH COAT, USE FORMULATION THAT IS COMPATIBLE WITH OTHER COMPOUNDS APPLIED ON PREVIOUS OR FOR SUCCESSIVE COATS.
- 1. PREFILLING: AT OPEN JOINTS, ROUNDED OR BEVELED PANEL EDGES, AND DAMAGED SURFACE AREAS, USE SETTING-TYPE TAPING
- 2. EMBEDDING AND FIRST COAT: FOR EMBEDDING TAPE AND FIRST COAT ON JOINTS, FASTENERS, AND TRIM FLANGES, USE DRYING-TYPE, ALL-PURPOSE COMPOUND.
- a. USE SETTING-TYPE COMPOUND FOR INSTALLING PAPER-FACED METAL TRIM ACCESSORIES.
- 3. FILL COAT: FOR SECOND COAT, USE DRYING-TYPE, ALL-PURPOSE COMPOUND.
- 4. FINISH COAT: FOR THIRD COAT, USE DRYING-TYPE, ALL-PURPOSE COMPOUND.
- . JOINT COMPOUND FOR TILE BACKING PANELS:
- AS RECOMMENDED BY BACKER UNIT MANUFACTURER
- 2.6 AUXILIARY MATERIALS
- . GENERAL: PROVIDE AUXILIARY MATERIALS THAT COMPLY WITH REFERENCED INSTALLATION STANDARDS AND MANUFACTURER'S WRITTEN INSTRUCTIONS
- STEEL DRILL SCREWS: ASTM C 1002 UNLESS OTHERWISE INDICATED. 1. USE SCREWS COMPLYING WITH ASTM C 954 FOR FASTENING PANELS TO
- STEEL MEMBERS FROM 0.033 TO 0.112 INCH THICK. 2. FOR FASTENING CEMENTITIOUS BACKER UNITS, USE SCREWS OF TYPE PART 3 -AND SIZE RECOMMENDED BY PANEL MANUFACTURER

#### PART 3 - EXECUTION

- 3.1 APPLYING AND FINISHING PANELS
- A. EXAMINE PANELS BEFORE INSTALLATION. REJECT PANELS THAT ARE WET, MOISTURE DAMAGED, AND MOLD DAMAGED.
- . COMPLY WITH ASTM C 840.
- PREFILL OPEN JOINTS, ROUNDED OR BEVELED EDGES, AND DAMAGED SURFACE AREAS.
- APPLY JOINT TAPE OVER GYPSUM BOARD JOINTS, EXCEPT FOR TRIM PRODUCTS SPECIFICALLY INDICATED AS NOT INTENDED TO RECEIVE TAPE. GYPSUM BOARD FINISH LEVELS: FINISH PANELS TO LEVELS INDICATED BELOW
- AND ACCORDING TO ASTM C 840: 1. LEVEL 1: CEILING PLENUM AREAS, CONCEALED AREAS, AND WHERE

  - 2. LEVEL 2: PANELS THAT ARE SUBSTRATE FOR TILE.
  - LEVEL 3: NOT USED.
  - 4. LEVEL 4: ALL ROOMS, U.N.O. LEVEL 5: LOBBY
- CEMENTITIOUS BACKER UNITS: FINISH ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 3.3 PROTECTION
- A. PROTECT INSTALLED PRODUCTS FROM DAMAGE FROM WEATHER, CONDENSATION, DIRECT SUNLIGHT, CONSTRUCTION, AND OTHER CAUSES DURING REMAINDER OF THE CONSTRUCTION PERIOD.
- REMOVE AND REPLACE PANELS THAT ARE WET, MOISTURE DAMAGED, AND MOLD DAMAGED.
- END OF SECTION 092900

#### **SECTION 093013 - CERAMIC TILING** PART 1 - GENERAL

- 1.1 SUMMARY
- A. SECTION INCLUDES:
- PORCELAIN TILE. 2. GLAZED WALL TILE
- TILE BACKING PANELS.
- 1.2 MAINTENANCE MATERIAL SUBMITTALS
- A. FURNISH EXTRA MATERIALS THAT MATCH AND ARE FROM SAME PRODUCTION RUNS AS PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS
- 1. TILE AND TRIM UNITS: FURNISH QUANTITY OF FULL-SIZE UNITS EQUAL TO 3 PERCENT OF AMOUNT INSTALLED FOR EACH TYPE, COMPOSITION, COLOR, PATTERN, AND SIZE INDICATED.

### PART 2 - PRODUCTS

- 2.1 PRODUCTS, GENERAL
- $\lambda$ . ANSI CERAMIC TILE STANDARD: PROVIDE STANDARD-GRADE TILE THAT COMPLIES WITH ANSI A137.1 FOR TYPES, COMPOSITIONS, AND OTHER CHARACTERISTICS INDICATED.
- 2.2 TILE PRODUCTS
- CERAMIC TILE TYPE AS NOTED ON DRAWINGS.
  - 1. TRIM UNITS: COORDINATED WITH SIZES AND COURSING OF ADJOINING FLAT TILE WHERE APPLICABLE AND MATCHING CHARACTERISTICS OF 1.2 MAINTENANCE MATERIAL SUBMITTALS ADJOINING FLAT TILE. PROVIDE SHAPES AS FOLLOWS, SELECTED FROM MANUFACTURER'S STANDARD SHAPES:
  - a. TAPERED TRANSITION TILE: SHAPE DESIGNED TO EFFECT TRANSITION BETWEEN THICKNESS OF TILE FLOOR AND ADJOINING FLOOR FINISHES OF DIFFERENT THICKNESS, TAPERED TO PROVIDE REDUCTION IN THICKNESS FROM 1/2 TO 1/4 INCH ACROSS NOMINAL 4-INCH DIMENSION.
  - b. BASE: COVED, MODULE SIZE 6 BY 6 INCHES.
  - c. WAINSCOT CAP: BULLNOSE CAP, MODULE SIZE 6 BY 6 INCHES
  - d. EXTERNAL CORNERS: BULLNOSE, SAME SIZE AS ADJOINING FLAT
  - e. INTERNAL CORNERS: FIELD-BUTTED SQUARE CORNERS. FOR COVED BASE AND CAP USE ANGLE PIECES DESIGNED TO FIT WITH STRETCHER SHAPES.
- 2.3 TILE BACKING PANELS
- A. GLASS-MAT GYPSUM INTERIOR BOARD: ASTM C 1658/1658M, WITH FIBERGLASS MAT LAMINATED TO BOTH SIDES AND WITH MANUFACTURER'S STANDARD EDGES.
- 1. PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE GEORGIA-PACIFIC GYPSUM; "DENSARMOR PLUS."
- 2. CORE: 5/8 INCH, TYPE X.

- 3. LONG EDGES: TAPERED
- B. LATEX-PORTLAND CEMENT: FLEXIBLE MORTAR CONSISTING OF
- CEMENT-BASED MIX AND LATEX ADDITIVE. 1. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE
  - a. MAPEI CORPORATION; MAPELASTIC (PRP 315).
  - b. APPROVED EQUAL.

ONE OF THE FOLLOWING:

- SETTING MATERIALS
- A. LATEX-PORTLAND CEMENT MORTAR (THIN SET): ANSI A118.4.
  - 1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING
  - a. MAPEI CORPORATION
- b. APPROVED EQUAL. 2. PREPACKAGED, DRY-MORTAR MIX TO WHICH ONLY WATER MUST BE
- 3. FOR WALL APPLICATIONS, PROVIDE NONSAGGING MORTAR.
- 2.5 GROUT MATERIALS
- A. SAND-PORTLAND CEMENT GROUT: ANSI A108.10.

AFFECTING PERFORMANCE OF THE WORK.

- B. STANDARD CEMENT GROUT: ANSI A118.6.
  - 1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  - a. MAPEI CORPORATION
- b. APPROVED EQUAL. EXECUTION
- 3.1 EXAMINATION
- A. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS WHERE TILE WILL BE INSTALLED, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS
- B. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- 3.2 PREPARATION
- A. FILL CRACKS, HOLES, AND DEPRESSIONS IN CONCRETE SUBSTRATES FOR TILE FLOORS INSTALLED WITH THINSET MORTAR WITH TROWELABLE LEVELING AND PATCHING COMPOUND SPECIFICALLY RECOMMENDED BY TILE-SETTING MATERIAL MANUFACTURER
- 3.3 CERAMIC TILE INSTALLATION
- A. COMPLY WITH TCNA'S "HANDBOOK FOR CERAMIC, GLASS, AND STONE TILE INSTALLATION" FOR TCNA INSTALLATION METHODS SPECIFIED IN TILE INSTALLATION SCHEDULES. COMPLY WITH PARTS OF THE ANSI A108 SERIES "SPECIFICATIONS FOR INSTALLATION OF CERAMIC TILE" THAT ARE REFERENCED IN TCNA INSTALLATION METHODS, SPECIFIED IN TILE INSTALLATION SCHEDULES, AND APPLY TO TYPES OF SETTING AND GROUTING MATERIALS USED
- B. EXTEND TILE WORK INTO RECESSES AND UNDER OR BEHIND EQUIPMENT AND FIXTURES TO FORM COMPLETE COVERING WITHOUT INTERRUPTIONS UNLESS OTHERWISE INDICATED. TERMINATE WORK NEATLY AT OBSTRUCTIONS. EDGES, AND CORNERS WITHOUT DISRUPTING PATTERN OR JOINT ALIGNMENTS.
- C. JOINTING PATTERN: LAY TILE IN GRID PATTERN UNLESS OTHERWISI INDICATED. LAY OUT TILE WORK AND CENTER TILE FIELDS IN BOTH DIRECTIONS IN EACH SPACE OR ON EACH WALL AREA. LAY OUT TILE WORK TO MINIMIZE THE USE OF PIECES THAT ARE LESS THAN HALF OF A TILE. PROVIDE UNIFORM JOINT WIDTHS UNLESS OTHERWISE INDICATED.
- D. JOINT WIDTHS: UNLESS OTHERWISE INDICATED, INSTALL TILE WITH THE **FOLLOWING JOINT WIDTHS:** 
  - 1. GLAZED WALL TILE: 1/16 INCH.
  - 2. PORCELAIN TILE: 1/4 INCH.
- E. EXPANSION JOINTS: PROVIDE EXPANSION JOINTS AND OTHER SEALANT-FILLED JOINTS, INCLUDING CONTROL, CONTRACTION, AND ISOLATION JOINTS, WHERE INDICATED, FORM JOINTS DURING INSTALLATION OF SETTING MATERIALS, MORTAR BEDS, AND TILE, DO NOT SAW-CUT JOINTS AFTER INSTALLING TILES.
- 1. WHERE JOINTS OCCUR IN CONCRETE SUBSTRATES, LOCATE JOINTS IN TILE SURFACES DIRECTLY ABOVE THEM.
- F. INSTALL TILE BACKING PANELS AND TREAT JOINTS ACCORDING TO ANSI A108.11 AND MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TYPE OF APPLICATION INDICATED. USE MODIFIED DRY-SET MORTAR FOR BONDING MATERIAL UNLESS OTHERWISE DIRECTED IN MANUFACTURER'S WRITTEN INSTRUCTIONS.

### END OF SECTION 093013

### **SECTION 095113 - ACOUSTICAL PANEL CEILINGS**

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES ACOUSTICAL PANELS AND EXPOSED SUSPENSION SYSTEMS FOR INTERIOR CEILINGS.
- A. FURNISH EXTRA MATERIALS, FROM THE SAME PRODUCT RUN, THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING
- CONTENTS. 1. ACOUSTICAL CEILING UNITS: FULL-SIZE PANELS EQUAL TO 2 PERCENT OF QUANTITY INSTALLED.
- PRODUCTS PART 2 -
- 2. HOLD-DOWN CLIPS: EQUAL TO 2 PERCENT OF QUANTITY INSTALLED.

### 2.1 PERFORMANCE REQUIREMENTS

- A. SEISMIC PERFORMANCE: SUSPENDED CEILINGS SHALL WITHSTAND THE
- EFFECTS OF EARTHQUAKE MOTIONS DETERMINED ACCORDING TO ASCE/SEI 7. B. SURFACE-BURNING CHARACTERISTICS: COMPLY WITH ASTM E 84; TESTING BY A QUALIFIED TESTING AGENCY. IDENTIFY PRODUCTS WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AGENCY.
- 1. FLAME-SPREAD INDEX: CLASS A ACCORDING TO ASTM E 1264.
- 2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING (ACT-1) A. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE
- B. CLASSIFICATION: PROVIDE PANELS COMPLYING WITH ASTM E 1264 FOR TYPE

- AND FORM AS FOLLOWS:
- 1. TYPE AND FORM: TYPE IV, FORM 1 AND 2, PATTERN E,G
- C. COLOR: WHITE
- D. THICKNESS: 3/4 INCH WITH 9/16 INCH FLB EDGE.
- E. MODULAR SIZE: 24 BY 48 INCHES.
- 2.5 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING (ACT-1)
- A. AVAILABLE PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- B. DOUBLE-WEB, STEEL SUSPENSION SYSTEM: MAIN AND CROSS RUNNERS ROLL
- ELECTROLYTICALLY ZINC COATED. OR HOT-DIP GALVANIZED ACCORDING TO ASTM A 653/A 653M, NOT LESS THAN G30 COATING DESIGNATION, WITH PREFINISHED 9/16-INCH- WIDE METAL CAPS ON FLANGES.
- 2.6 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING (ACT-1)
- A. AVAILABLE PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE. BUT ARE NOT LIMITED TO, THE FOLLOWING:

  - 2. ARMSTRONG PRELUDE PLUS XL FIRE GUARD
- B. DOUBLE-WEB, STEEL SUSPENSION SYSTEM: MAIN AND CROSS RUNNERS ROLL FORMED FROM COLD-ROLLED STEEL SHEET, PREPAINTED, ELECTROLYTICALLY ZINC COATED, OR HOT-DIP GALVANIZED ACCORDING TO
- PREFINISHED 15/16-INCH- WIDE METAL CAPS ON FLANGES.
- A. ATTACHMENT DEVICES: SIZE FOR FIVE TIMES THE DESIGN LOAD INDICATED IN ASTM C 635/C 635M, TABLE 1, "DIRECT HUNG," UNLESS OTHERWISE INDICATED.
- COMPLY WITH SEISMIC DESIGN REQUIREMENTS
- C. IMPACT CLIPS: MANUFACTURER'S STANDARD IMPACT-CLIP SYSTEM DESIGNED TO ABSORB IMPACT FORCES AGAINST ACOUSTICAL PANELS
- D. SEISMIC CLIPS: MANUFACTURER'S STANDARD SEISMIC CLIPS DESIGNED TO SECURE ACOUSTICAL PANELS IN PLACE DURING A SEISMIC EVENT.
- PART 3 EXECUTION
- A. MEASURE EACH CEILING AREA AND ESTABLISH LAYOUT OF ACOUSTICAL PANELS TO BALANCE BORDER WIDTHS AT OPPOSITE EDGES OF EACH CEILING. AVOID USING LESS-THAN-HALF-WIDTH PANELS AT BORDERS UNLESS
- A. INSTALL ACOUSTICAL PANEL CEILINGS ACCORDING TO ASTM C 636/C 636M, SEISMIC DESIGN REQUIREMENTS, AND MANUFACTURER'S
- WRITTEN INSTRUCTIONS. B. INSTALL EDGE MOLDINGS AND TRIM OF TYPE INDICATED AT PERIMETER OF ACOUSTICAL CEILING AREA AND WHERE NECESSARY TO CONCEAL EDGES OF
  - 1. DO NOT USE EXPOSED FASTENERS, INCLUDING POP RIVETS, ON MOLDINGS AND TRIM.
  - 2. ARRANGE DIRECTIONALLY PATTERNED ACOUSTICAL PANELS
  - 3. INSTALL HOLD-DOWN AND SEISMIC CLIPS IN AREAS INDICATED; SPACE ACCORDING TO PANEL MANUFACTURER'S WRITTEN INSTRUCTIONS UNLESS OTHERWISE INDICATED.
- END OF SECTION 095113

### **SECTION 096513 - RESILIENT BASE AND ACCESSORIES**

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES:
- PART 2 PRODUCTS
- 2.1 VINYL BASE (WB 1-2) A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE
- FOLLOWING:
- ARMSTRONG WORLD INDUSTRIES, INC. 3. BURKE MERCER FLOORING PRODUCTS; A DIVISION OF BURKE
- INDUSTRIES INC. 4. JOHNSONITE; A TARKETT COMPANY
- ROPPE CORPORATION, USA. B. PRODUCT STANDARD: ASTM F 1861, TYPE TV (VINYL, THERMOPLASTIC).
  - GROUP: II (LAYERED).

  - a. STYLE A, STRAIGHT: PROVIDE IN AREAS WITH CARPET
- b. STYLE B, COVE: PROVIDE IN AREAS WITH RESILIENT FLOORING. C. MINIMUM THICKNESS: 0.125 INCH.
- D. HEIGHT: 4 INCHES OR 6 INCHES AS INDICATED ON DRAWINGS.
- E. LENGTHS: CUT LENGTHS 48 INCHES LONG OR COILS IN MANUFACTURER'S STANDARD LENGTH.
- F. OUTSIDE CORNERS: PREFORMED. G. INSIDE CORNERS: PREFORMED.
- H. COLORS AND PATTERNS: AS INDICATED.
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE
- FOLLOWING: FORBO
- 3. BURKE MERCER FLOORING PRODUCTS; A DIVISION OF BURKE INDUSTRIES INC.

- 4. JOHNSONITE; A TARKETT COMPANY
- 5. ROPPE CORPORATION, USA. B. DESCRIPTION: VINYL CAP FOR COVE CARPET, CAP FOR COVE RESILIENT FLOORING, CARPET EDGE FOR GLUE-DOWN APPLICATIONS, NOSING FOR CARPET, NOSING FOR RESILIENT FLOORING, REDUCER STRIP FOR RESILIENT
- FLOORING, JOINER FOR TILE AND CARPET TRANSITION STRIPS. C. COLORS, PATTERNS, PROFILE AND DIMENSIONS: AS INDICATED.
- 2.3 INSTALLATION MATERIALS
- A. TROWELABLE LEVELING AND PATCHING COMPOUNDS: LATEX-MODIFIED, PORTLAND CEMENT BASED OR BLENDED HYDRAULIC-CEMENT-BASED FORMULATION PROVIDED OR APPROVED BY RESILIENT-PRODUCT MANUFACTURER FOR APPLICATIONS INDICATED.
- PART 3 EXECUTION
- 3.1 PREPARATION
- A. PREPARE SUBSTRATES ACCORDING TO MANUFACTURER'S WRITTEN
- INSTRUCTIONS TO ENSURE ADHESION OF RESILIENT PRODUCTS. B. FILL CRACKS, HOLES, AND DEPRESSIONS IN SUBSTRATES WITH TROWELABLE LEVELING AND PATCHING COMPOUND; REMOVE BUMPS AND RIDGES TO
- PRODUCE A UNIFORM AND SMOOTH SUBSTRATE. C. IMMEDIATELY BEFORE INSTALLATION, SWEEP AND VACUUM CLEAN SUBSTRATES TO BE COVERED BY RESILIENT PRODUCTS.
- 3.2 RESILIENT BASE INSTALLATION
- A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING RESILIENT BASE.
- B. APPLY RESILIENT BASE TO WALLS, COLUMNS, PILASTERS, CASEWORK AND CABINETS IN TOE SPACES, AND OTHER PERMANENT FIXTURES IN ROOMS AND
- AREAS WHERE BASE IS REQUIRED. C. INSTALL RESILIENT BASE IN LENGTHS AS LONG AS PRACTICAL WITHOUT GAPS
- AT SEAMS AND WITH TOPS OF ADJACENT PIECES ALIGNED. D. PREFORMED CORNERS: INSTALL PREFORMED CORNERS BEFORE INSTALLING STRAIGHT PIECES.
- 3.3 RESILIENT ACCESSORY INSTALLATION
- A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING RESILIENT ACCESSORIES.
- AND PROTECTING RESILIENT PRODUCTS B. COVER RESILIENT PRODUCTS SUBJECT TO WEAR AND FOOT TRAFFIC UNTIL

### **SECTION 096519 - RESILIENT TILE FLOORING**

- GENERAL
- A. SECTION INCLUDES:
- **B. RELATED SECTIONS:** 1. DIVISION 9 SECTION "RESILIENT WALL BASE AND ACCESSORIES" FOR
- 1.2 CLOSEOUT SUBMITTALS A. MAINTENANCE DATA: FOR EACH TYPE OF FLOOR TILE TO INCLUDE IN
- MAINTENANCE MANUALS. 1.3 MAINTENANCE MATERIAL SUBMITTALS A. FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT

INSTALLED WITH RESILIENT FLOOR COVERINGS.

- WITH LABELS DESCRIBING CONTENTS. 1. FLOOR TILE: FURNISH ONE BOX FOR EVERY 50 BOXES OR FRACTION THEREOF, OF EACH TYPE, COLOR, AND PATTERN OF FLOOR TILE
- 2.1 PERFORMANCE REQUIREMENTS A. FIRE-TEST-RESPONSE CHARACTERISTICS: FOR RESILIENT TILE FLOORING, AS
- OR NFPA 253 BY A QUALIFIED TESTING AGENCY.
- 2.2 SOLID VINYL FLOOR TILE (LVT-1) A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE
- THE FOLLOWING:
- FORBO IN PATTERN INDICATED ON FINISH SCHEDULE.
- C. THICKNESS: 0.1 INCH.
- D. SIZE: AS INDICATED ON DRAWINGS. E. COLORS AND PATTERNS: AS INDICATED ON DRAWINGS 2.3 INSTALLATION MATERIALS
- APPLICATIONS INDICATED. B. ADHESIVES: WATER-RESISTANT TYPE RECOMMENDED BY FLOOR TILE AND
- CONDITIONS INDICATED. C. FLOOR POLISH: PROVIDE PROTECTIVE, LIQUID FLOOR-POLISH PRODUCTS
- RECOMMENDED BY FLOOR TILE MANUFACTURER

OR MORE THAN 10 PH.

- PART 3 EXECUTION
- 3.1 PREPARATION A. PREPARE SUBSTRATES ACCORDING TO FLOOR TILE MANUFACTURER'S
- 1. VERIFY THAT SUBSTRATES ARE DRY AND FREE OF CURING COMPOUNDS, SEALERS, AND HARDENERS. 2. REMOVE SUBSTRATE COATINGS AND OTHER SUBSTANCES THAT ARE
- MANUFACTURER. DO NOT USE SOLVENTS. RECOMMENDED BY MANUFACTURER IN WRITING, BUT NOT LESS THAN 5

- 4. MOISTURE TESTING: PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES PASS TESTING ACCORDING TO FLOOR TILE MANUFACTURER'S WRITTEN RECOMMENDATIONS, BUT NOT LESS STRINGENT THAN THE FOLLOWING:
  - a. PERFORM ANHYDROUS CALCIUM CHLORIDE TEST ACCORDING TO ASTM F 1869. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES HAVE MAXIMUM MOISTURE-VAPOR-EMISSION RATE OF
  - 3 LB OF WATER/1000 SQ. FT. IN 24 HOURS b. PERFORM RELATIVE HUMIDITY TEST USING IN SITU PROBES ACCORDING TO ASTM F 2170. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES HAVE A MAXIMUM 75 PERCENT RELATIVE
- HUMIDITY LEVEL. PROVIDE REPORT TO OWNER & ARCHITECT. C. FILL CRACKS, HOLES, AND DEPRESSIONS IN SUBSTRATES WITH TROWELABLE LEVELING AND PATCHING COMPOUND; REMOVE BUMPS AND RIDGES TO
- PRODUCE A UNIFORM AND SMOOTH SUBSTRATE. D. DO NOT INSTALL FLOOR TILES UNTIL THEY ARE THE SAME TEMPERATURE AS
- THE SPACE WHERE THEY ARE TO BE INSTALLED. E. IMMEDIATELY BEFORE INSTALLATION, SWEEP AND VACUUM CLEAN
- SUBSTRATES TO BE COVERED BY RESILIENT FLOOR TILE. 3.2 FLOOR TILE INSTALLATION
- A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING
- B. LAY OUT FLOOR TILES FROM CENTER MARKS ESTABLISHED WITH PRINCIPAL WALLS. DISCOUNTING MINOR OFFSETS. SO TILES AT OPPOSITE EDGES OF ROOM ARE OF EQUAL WIDTH. ADJUST AS NECESSARY TO AVOID USING CUT WIDTHS THAT EQUAL LESS THAN ONE-HALF TILE AT PERIMETER.
- LAY TILES SQUARE WITH ROOM AXIS. C. MATCH FLOOR TILES FOR COLOR AND PATTERN BY SELECTING TILES FROM CARTONS IN THE SAME SEQUENCE AS MANUFACTURED AND PACKAGED, IF SO NUMBERED. DISCARD BROKEN, CRACKED, CHIPPED, OR DEFORMED TILES.
- VERTICAL SURFACES AND PERMANENT FIXTURES INCLUDING BUILT-IN FURNITURE, CABINETS, PIPES, OUTLETS, AND DOOR FRAMES

1. LAY LVF TILES WITH GRAIN RUNNING IN ONE DIRECTION.

D. SCRIBE, CUT, AND FIT FLOOR TILES TO BUTT NEATLY AND TIGHTLY TO

- E. EXTEND FLOOR TILES INTO TOE SPACES, DOOR REVEALS, CLOSETS, AND SIMILAR OPENINGS. EXTEND FLOOR TILES TO CENTER OF DOOR OPENINGS. F. MAINTAIN REFERENCE MARKERS, HOLES, AND OPENINGS THAT ARE IN PLACE OR MARKED FOR FUTURE CUTTING BY REPEATING ON FLOOR TILES AS MARKED ON SUBSTRATES. USE CHALK OR OTHER NONPERMANENT MARKING
- G. ADHERE FLOOR TILES TO FLOORING SUBSTRATES USING A FULL SPREAD OF ADHESIVE APPLIED TO SUBSTRATE TO PRODUCE A COMPLETED INSTALLATION WITHOUT OPEN CRACKS, VOIDS, RAISING AND PUCKERING AT JOINTS, TELEGRAPHING OF ADHESIVE SPREADER MARKS, AND OTHER SURFACE
- IMPERFECTIONS. 3.3 CLEANING AND PROTECTION A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR CLEANING
- B. FLOOR POLISH: REMOVE SOIL, ADHESIVE, AND BLEMISHES FROM FLOOR TILE SURFACES BEFORE APPLYING LIQUID FLOOR POLISH. RESILIENT BASE, REDUCER STRIPS, AND OTHER ACCESSORIES APPLY TWO COAT(S).

C. COVER FLOOR TILE UNTIL SUBSTANTIAL COMPLETION.

END OF SECTION 096519

AND PROTECTING FLOOR TILE.

- **SECTION 099123 INTERIOR PAINTING**
- PART 1 GENERAL 1.1 SUMMARY
- A. SECTION INCLUDES SURFACE PREPARATION AND THE APPLICATION OF PAINT SYSTEMS ON THE FOLLOWING INTERIOR SUBSTRATES:

CONCRETE.

- STEEL AND IRON. 3. WOOD.
  - GYPSUM BOARD. 1.2 MAINTENANCE MATERIAL SUBMITTALS A. FURNISH EXTRA MATERIALS. FROM THE SAME PRODUCT RUN. THAT MATCH

PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE

COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.

### 1. PAINT: 5 PERCENT, BUT NOT LESS THAN 1 GAL. OF EACH MATERIAL AND

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- COLOR APPLIED.
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING: SHERWIN-WILLIAMS COMPANY (THE). APPROVED EQUAL

B. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE

PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE

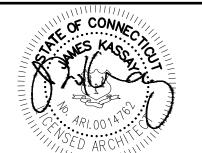
A. MPI STANDARDS: PRODUCTS SHALL COMPLY WITH MPI STANDARDS INDICATED

NOT LIMITED TO PRODUCTS LISTED IN THE INTERIOR PAINTING SCHEDULE FOR THE PAINT CATEGORY INDICATED.

2.2 PAINT, GENERAL

- AND SHALL BE LISTED IN ITS "MPI APPROVED PRODUCTS LISTS." B. MATERIAL COMPATIBILITY: 1. MATERIALS FOR USE WITHIN EACH PAINT SYSTEM SHALL BE COMPATIBLE WITH ONE ANOTHER AND SUBSTRATES INDICATED, UNDER CONDITIONS
  - BASED ON TESTING AND FIELD EXPERIENCE. 2. FOR EACH COAT IN A PAINT SYSTEM, PRODUCTS SHALL B RECOMMENDED IN WRITING BY TOPCOAT MANUFACTURERS FOR USE IN PAINT SYSTEM AND ON SUBSTRATE INDICATED COLORS: AS INDICATED IN A COLOR SCHEDULE.

OF SERVICE AND APPLICATION AS DEMONSTRATED BY MANUFACTURER,



REVISIONS

06/01/22 21399

**SPECIFICATIONS** 

JOB NO. SHEET NO.

- 2. SMOKE-DEVELOPED INDEX: 450 OR LESS.
- OF THE FOLLOWING: 1. USG, MARS MILLENIA #76901

- - 1. USG, CENTRICITEE DXT 9/16 INCH.
  - 2. ARMSTRONG SUPRAFINE XL 9/16 INCH. FORMED FROM COLD-ROLLED STEEL SHEET, PREPAINTED,

  - 1. USG, DONN DXLA
  - ASTM A 653/A 653M, NOT LESS THAN G30 COATING DESIGNATION, WITH
  - 2.7 ACCESSORIES
  - B. HOLD-DOWN CLIPS: MANUFACTURER'S STANDARD HOLD-DOWN
  - 3.1 PREPARATION
  - OTHERWISE INDICATED. 3.2 INSTALLATION
  - ACOUSTICAL PANELS.
  - FOLLOWS: a. AS INDICATED ON REFLECTED CEILING PLANS.

  - 1. RESILIENT BASE. 2. RESILIENT MOLDING ACCESSORIES.
  - 1. FORBO

  - STYLE AND LOCATION

  - 2.2 VINYL MOLDING ACCESSORY
    - ARMSTRONG WORLD INDUSTRIES, INC.

- 3.4 CLEANING AND PROTECTION A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR CLEANING
- SUBSTANTIAL COMPLETION. END OF SECTION 096513
- 1.1 SUMMARY
  - SOLID VINYL FLOOR TILE.
- ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED
- PART 2 PRODUCTS
- DETERMINED BY TESTING IDENTICAL PRODUCTS ACCORDING TO ASTM E 648
- B. TILE STANDARD: ASTM F 1700.
- A. TROWELABLE LEVELING AND PATCHING COMPOUNDS: LATEX-MODIFIED, PORTLAND CEMENT BASED OR BLENDED HYDRAULIC-CEMENT-BASED FORMULATION PROVIDED OR APPROVED BY FLOOR TILE MANUFACTURER FOR
  - ADHESIVE MANUFACTURERS TO SUIT FLOOR TILE AND SUBSTRATE
- WRITTEN INSTRUCTIONS TO ENSURE ADHESION OF RESILIENT PRODUCTS. B. CONCRETE SUBSTRATES: PREPARE ACCORDING TO ASTM F 710.
  - 3. ALKALINITY AND ADHESION TESTING: PERFORM TESTS RECOMMENDED BY FLOOR TILE MANUFACTURER. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATE ALKALINITY FALLS WITHIN RANGE ON PH SCALE

INCOMPATIBLE WITH ADHESIVES AND THAT CONTAIN SOAP, WAX, OIL, OR

SILICONE, USING MECHANICAL METHODS RECOMMENDED BY FLOOR TILE

- 3.1 EXAMINATION A. EXAMINE SUBSTRATES AND CONDITIONS, WITH APPLICATOR PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR MAXIMUM MOISTURE CONTENT AND
- OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK. VERIFY SUITABILITY OF SUBSTRATES, INCLUDING SURFACE CONDITIONS AND COMPATIBILITY WITH EXISTING FINISHES AND PRIMERS.
- PROCEED WITH COATING APPLICATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- 3.2 PREPARATION
- COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS IN "MPI ARCHITECTURAL PAINTING SPECIFICATION MANUAL" APPLICABLE TO SUBSTRATES AND PAINT SYSTEMS INDICATED.
- REMOVE HARDWARE, COVERS, PLATES, AND SIMILAR ITEMS ALREADY IN PLACE THAT ARE REMOVABLE AND ARE NOT TO BE PAINTED. IF REMOVAL IS IMPRACTICAL OR IMPOSSIBLE BECAUSE OF SIZE OR WEIGHT OF ITEM. PROVIDE SURFACE-APPLIED PROTECTION BEFORE SURFACE PREPARATION AND PAINTING.
- 1. AFTER COMPLETING PAINTING OPERATIONS, USE WORKERS SKILLED IN THE TRADES INVOLVED TO REINSTALL ITEMS THAT WERE REMOVED. REMOVE SURFACE-APPLIED PROTECTION IF ANY.
- 3.3 APPLICATION
- A. APPLY PAINTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS IN "MPI ARCHITECTURAL PAINTING SPECIFICATION
- APPLY PAINTS TO PRODUCE SURFACE FILMS WITHOUT CLOUDINESS, SPOTTING, HOLIDAYS, LAPS, BRUSH MARKS, ROLLER TRACKING, RUNS, SAGS, ROPINESS, OR OTHER SURFACE IMPERFECTIONS. CUT IN SHARP LINES AND COLOR BREAKS.
- 3.4 INTERIOR PAINTING SCHEDULE
- A. CONCRETE SUBSTRATES, NONTRAFFIC SURFACES:
- 1. INSTITUTIONAL LOW-ODOR/VOC LATEX SYSTEM MPI INT 3.1M:
- a. PRIME COAT: PRIMER SEALER, INTERIOR, INSTITUTIONAL LOW ODOR/VOC, MPI #149.
- SW LOXON BLOCK SURFACER.
- b. INTERMEDIATE COAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC, MATCHING TOPCOAT.
- c. TOPCOAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC (MPI GLOSS LEVEL 3), MPI #145. 1) SW HARMONY.
- B. STEEL SUBSTRATES:
- 1. WATER-BASED LIGHT INDUSTRIAL COATING SYSTEM MPI INT 5.1B:
  - a. PRIME COAT: PRIMER, RUST-INHIBITIVE, WATER BASED MPI #107 1) PRO INDUSTRIAL PRO-CRYL
  - b. INTERMEDIATE COAT: LIGHT INDUSTRIAL COATING, INTERIOR, WATER BASED, MATCHING TOPCOAT.
  - c. TOPCOAT: LIGHT INDUSTRIAL COATING, INTERIOR, WATER BASED, SEMI-GLOSS (MPI GLOSS LEVEL 5), MPI #153.
  - 1) SW PRO INDUSTRIAL PRE-CATALYZED EPOXY
- . WOOD SUBSTRATES: WOOD TRIM, ARCHITECTURAL WOODWORK AND DOORS
  - 1. INSTITUTIONAL LOW-ODOR/VOC LATEX SYSTEM MPI INT 6.3V: a. PRIME COAT: PRIMER, LATEX, FOR INTERIOR WOOD, MPI #39.
  - 1) PREP RITE MULTI-PURPOSE PRIMER.
  - b. INTERMEDIATE COAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC, MATCHING TOPCOAT.
  - c. TOPCOAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC, SEMI-GLOSS (MPI GLOSS LEVEL 5), MPI #147.
- SW HARMONY. D. GYPSUM BOARD SUBSTRATES:
- 1. INSTITUTIONAL LOW-ODOR/VOC LATEX SYSTEM MPI INT 9.2M:
  - a. PRIME COAT: PRIMER SEALER, INTERIOR, INSTITUTIONAL LOW ODOR/VOC. MPI #149.
  - 1) SW PROGREEN 200 PRIMER
  - b. INTERMEDIATE COAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC, MATCHING TOPCOAT.
  - c. TOPCOAT: LATEX, INTERIOR, INSTITUTIONAL LOW ODOR/VOC (MPI GLOSS LEVEL 3), MPI #145.
- 1) SW HARMONY. END OF SECTION 099123

### SECTION 102800 - TOILET, BATH AND LAUNDRY ACCESSORIES

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES: PRIVATE-USE BATHROOM ACCESSORIES.
- CUSTODIAL ACCESSORIES.
- 1.2 WARRANTY
- . SPECIAL MIRROR WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPLACE MIRRORS THAT DEVELOP VISIBLE SILVER SPOILAGE DEFECTS AND THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.
- WARRANTY PERIOD: 15 YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
- PART 2 PRODUCTS
- 2.1 PRIVATE-USE BATHROOM ACCESSORIES
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
  - BOBRICK WASHROOM EQUIPMENT, INC.
  - 2. VON DREHLE
- MIRRORS: MIRROR SHALL HAVE STAINLESS STEEL CHANNEL FRAME OF NOT LESS THAN 20-GAUGE, WITH SQUARE CORNERS CAREFULLY MITERED TO HAIRLINE JOINTS AND MECHANICALLY INTERLOCKED. PROVIDE NO. 430
- BRIGHT POLISHED FINISH. 1. BOBRICK B165. SIZE AND LOCATION AS SHOWN ON INTERIOR ELEVATIONS.
- GRAB BARS: BOBRICK B-6806 X24", 36" AND 42". VERIFY COMPLIANCE WITH STATE AND LOCAL CODES.
- TOILET PAPER HOLDERS: VON DREHLE SUMMIT R3670WHCL. INSTALL SO

- THAT ONE IS ACCESSIBLE FROM EACH TOILET. MOUNTING HEIGHTS AS SHOWN ON THE ARCHITECTURAL PLANS.
- E. PAPER TOWEL DISPENSERS: VON DREHLE T600-W. INSTALL AS SHOWN ON PLANS AND AT A MINIMUM AT EACH CHILDREN'S VANITY. CHANGING TABLE. ONE IN KITCHEN, AND ONE AT EACH LAVATORY INSIDE A TOILET ROOM.
- SOAP DISPENSERS: ECO-LAB SOAP DISPENSER. CONTRACTOR FURNISHED AND INSTALLED. PROVIDE AND INSTALL ONE DISPENSER AT EACH CHANGE TABLE, VANITIES, LAVATORIES INSIDE TOILET ROOMS, AND AT THE KITCHEN HAND SINK. ORDER THREE EXTRA DISPENSERS FOR FUTURE USE.
- 2.2 FABRICATION
- A. KEYS: PROVIDE UNIVERSAL KEYS FOR INTERNAL ACCESS TO ACCESSORIES FOR SERVICING AND RESUPPLYING. PROVIDE MINIMUM OF SIX KEYS TO OWNER'S REPRESENTATIVE.
- PART 3 EXECUTION
- 3.1 INSTALLATION
- A. INSTALL ACCESSORIES ACCORDING TO MANUFACTURERS' WRITTEN INSTRUCTIONS, USING FASTENERS APPROPRIATE TO SUBSTRATE INDICATE AND RECOMMENDED BY UNIT MANUFACTURER. INSTALL UNITS LEVEL, PLUMB, AND FIRMLY ANCHORED IN LOCATIONS AND AT HEIGHTS INDICATED
- B. GRAB BARS: INSTALL TO WITHSTAND A DOWNWARD LOAD OF AT LEAST 250 LBF, WHEN TESTED ACCORDING TO ASTM F 446.
- END OF SECTION 102800
- **SECTION 104310 INTERIOR SIGNAGE**
- PART 1 GENERAL
- 1.1 SUMMARY A. THIS SECTION INCLUDES THE FOLLOWING:
  - PLAQUES.
- 1.2 QUALITY ASSURANCE A. REGULATORY REQUIREMENTS: COMPLY WITH APPLICABLE PROVISIONS IN
- ADA-ABA ACCESSIBILITY GUIDELINES.
- PART 2 PRODUCTS 2.1 MATERIALS
- A. ACRYLIC SHEET: ASTM D 4802, CATEGORY A-1 (CELL-CAST SHEET), TYPE UVA (UV ABSORBING).
- B. POLYCARBONATE SHEET: OF THICKNESS INDICATED, MANUFACTURED BY EXTRUSION PROCESS, COATED ON BOTH SURFACES WITH ABRASION-RESISTANT COATING:
- 2.2 PLAQUES
- A. PREFERRED VENDOR: PURCHASE FROM THE FOLLOWING:
- MEYER SIGN
- B. INTERIOR SIGNAGE:
  - AT EACH ROOM IN BUILDING. VERBAGE AS DIRECTED BY OWNER.

  - 3. SIGN FACE: a. 1/32" RAISED LETTERS. BRAILLE AND BORDER ARE INTEGRAL VIA
  - ROUTING, ETCHING OR PHOTO POLYMER PROCESS (NOT APPLIED) b. PERMANENTLY BONDED TO 1/4" SUBSTRATE EDGES HAVE 3/6: STEP **BEVEL**
  - 4. COLORS:
  - a. SPECIFIED BY OWNER
- TYPICAL SIGNS:
- a. DIMENSIONS: 10" DIAMETER 2.3 FABRICATION
- A. GENERAL: PROVIDE MANUFACTURER'S STANDARD SIGNS OF
- CONFIGURATIONS INDICATED.
- 1. CONCEAL FASTENERS IF POSSIBLE: OTHERWISE, LOCATE FASTENERS WHERE THEY WILL BE INCONSPICUOUS.
- 2.4 ACRYLIC SHEET FINISHES
- A. COLORED COATINGS FOR ACRYLIC SHEET: FOR COPY AND BACKGROUND AND FRAME COLORS, PROVIDE COLORED COATINGS, INCLUDING INKS, DYES. AND PAINTS, THAT ARE RECOMMENDED BY ACRYLIC MANUFACTURERS FOR OPTIMUM ADHERENCE TO ACRYLIC SURFACE AND THAT ARE UV AND WATER RESISTANT FOR FIVE YEARS FOR APPLICATION INTENDED.
- PART 3 EXECUTION 3.1 INSTALLATION
- A. LOCATE SIGNS AND ACCESSORIES WHERE INDICATED, USING MOUNTING METHODS OF TYPES DESCRIBED AND COMPLYING WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - 1. INSTALL SIGNS LEVEL, PLUMB, AND AT HEIGHTS INDICATED, WITH SIGN SURFACES FREE OF DISTORTION AND OTHER DEFECTS IN APPEARANCE.
  - 2. INTERIOR WALL SIGNS: INSTALL SIGNS ON WALLS ADJACENT TO LATCH SIDE OF DOOR WHERE APPLICABLE. WHERE NOT INDICATED OR POSSIBLE, SUCH AS DOUBLE DOORS, INSTALL SIGNS ON NEAREST ADJACENT WALLS. LOCATE TO ALLOW APPROACH WITHIN 3 INCHES (75 MM) OF SIGN WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR B. RELATED SECTIONS: STANDING WITHIN SWING OF DOOR.
- B. WALL-MOUNTED SIGNS: COMPLY WITH SIGN MANUFACTURER'S WRITTEN INSTRUCTIONS EXCEPT WHERE MORE STRINGENT REQUIREMENTS APPLY
  - 1. TWO-FACE TAPE: MOUNT SIGNS TO SMOOTH, NONPOROUS SURFACES. DO NOT USE THIS METHOD FOR VINYL-COVERED OR ROUGH SURFACES.
  - 2. MECHANICAL FASTENERS: USE NONREMOVABLE MECHANICAL FASTENERS PLACED THROUGH PREDRILLED HOLES. ATTACH SIGNS WITH FASTENERS AND ANCHORS SUITABLE FOR SECURE ATTACHMENT TO SUBSTRATE AS RECOMMENDED IN WRITING BY SIGN MANUFACTURER.
- END OF SECTION 104310

### **SECTION 104413 - FIRE EXTINGUISHER CABINETS**

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES FIRE PROTECTION CABINETS FOR FIRE EXTINGUISHERS. B. RELATED SECTIONS:
- DIVISION 10 SECTION "FIRE EXTINGUISHERS." 1.2 SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- 1.3 QUALITY ASSURANCE
- A. COORDINATE SIZE OF FIRE PROTECTION CABINETS TO ENSURE THAT TYPE AND CAPACITY OF FIRE EXTINGUISHERS INDICATED ARE ACCOMMODATED.

- B. COORDINATE SIZES AND LOCATIONS OF FIRE PROTECTION CABINETS WITH WALL DEPTHS.
- PART 2 PRODUCTS
- 2.1 MATERIALS
- A. COLD-ROLLED STEEL SHEET: ASTM A 1008/A 1008M, COMMERCIAL STEEL (CS), TYPE B.
- B. ALUMINUM: ALLOY AND TEMPER RECOMMENDED BY ALUMINUM PRODUCER AND MANUFACTURER FOR TYPE OF USE AND FINISH INDICATED, AND AS **FOLLOWS**
- 1. SHEET: ASTM B 209.
- 2. EXTRUDED SHAPES: ASTM B 221.
- C. TRANSPARENT ACRYLIC SHEET: ASTM D 4802, CATEGORY A-1 (CELL-CAST SHEET), 3 MM THICK, WITH FINISH 1 (SMOOTH OR POLISHED).
- A. CABINET TYPE: SUITABLE FOR FIRE EXTINGUISHER.
- B. CABINET CONSTRUCTION: NONRATED.
- D. SEMIRECESSED CABINET: CABINET BOX PARTIALLY RECESSED IN WALLS OF SUFFICIENT DEPTH TO SUIT STYLE OF TRIM INDICATED; WITH ONE-PIECE COMBINATION TRIM AND PERIMETER DOOR FRAME OVERLAPPING AT OUTER EDGE (BACKBEND). PROVIDE WHERE WALLS ARE OF INSUFFICIENT DEPTH FOR RECESSED CABINETS BUT ARE OF SUFFICIENT DEPTH TO
- 1. ROLLED-EDGE TRIM: 2-1/2-INCH BACKBEND DEPTH
- E. CABINET TRIM MATERIAL: ALUMINUM SHEET OR EXTRUDED-ALUMINUM
- F. DOOR MATERIAL: ALUMINUM SHEET OR EXTRUDED-ALUMINUM SHAPES.
- 1. ACRYLIC SHEET COLOR: CLEAR TRANSPARENT ACRYLIC SHEET.
- I. DOOR HARDWARE: MANUFACTURER'S STANDARD DOOR-OPERATING
- J. ACCESSORIES:
  - 1. MOUNTING BRACKET: MANUFACTURER'S STANDARD STEEL, DESIGNED TO SECURE FIRE EXTINGUISHER TO FIRE PROTECTION CABINET, OF SIZES REQUIRED FOR TYPES AND CAPACITIES OF FIRE EXTINGUISHERS
  - 2. DOOR LOCK: CAM LOCK THAT ALLOWS DOOR TO BE OPENED DURING EMERGENCY BY PULLING SHARPLY ON DOOR HANDLE.
- K. FINISHES:
  - 1. MANUFACTURER'S STANDARD BAKED-ENAMEL PAINT FOR THE
  - a. EXTERIOR OF CABINET, EXCEPT FOR THOSE SURFACES INDICATED TO RECEIVE ANOTHER FINISH.
  - b. INTERIOR OF CABINET
  - 2. ALUMINUM: CLEAR ANODIZED
- A. FIRE PROTECTION CABINETS: PROVIDE MANUFACTURER'S STANDARD BOX (TUB), WITH TRIM, FRAME, DOOR, AND HARDWARE TO SUIT CABINET TYPE, TRIM STYLE, AND DOOR STYLE INDICATED. MITER AND WELD JOINTS AND **GRIND SMOOTH**
- PART 3 EXECUTION
- A. EXAMINE WALLS AND PARTITIONS FOR SUITABLE FRAMING DEPTH AND BLOCKING WHERE SEMIRECESSED CABINETS WILL BE INSTALLED AND PREPARE RECESSES AS REQUIRED BY TYPE AND SIZE OF CABINET AND TRIM
- B. INSTALL FIRE PROTECTION CABINETS IN LOCATIONS AND AT MOUNTING HEIGHTS INDICATED OR, IF NOT INDICATED, AT HEIGHTS ACCEPTABLE TO
- C. FIRE PROTECTION CABINETS: FASTEN CABINETS TO STRUCTURE, SQUARE AND PLUMB.
- D. ADJUST FIRE PROTECTION CABINET DOORS TO OPERATE EASILY WITHOUT BINDING. VERIFY THAT INTEGRAL LOCKING DEVICES OPERATE PROPERLY.
- DETERIORATED BEYOND SUCCESSFUL REPAIR BY FINISH TOUCHUP OR SIMILAR MINOR REPAIR PROCEDURES.

- A. SECTION INCLUDES PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS.
- DIVISION 10 SECTION "FIRE EXTINGUISHER CABINETS."
- WITH NFPA 10, "PORTABLE FIRE EXTINGUISHERS." B. FIRE EXTINGUISHERS: LISTED AND LABELED FOR TYPE, RATING, AND
- CLASSIFICATION BY AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION. C. COORDINATE TYPE AND CAPACITY OF FIRE EXTINGUISHERS WITH FIRE
- PROTECTION CABINETS TO ENSURE FIT AND FUNCTION.
- 2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS
- A. FIRE EXTINGUISHERS: TYPE, SIZE, AND CAPACITY FOR EACH INDICATED. 1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS,
  - a. BADGER FIRE PROTECTION; A KIDDE COMPANY.
  - c. J. L. INDUSTRIES, INC.; A DIVISION OF ACTIVAR CONSTRUCTION END OF SECTION 114000 PRODUCTS GROUP
  - APPROVED EQUAL 2. INSTRUCTION LABELS: INCLUDE PICTORIAL MARKING SYSTEM COMPLYING WITH NFPA 10, APPENDIX B AND BAR CODING FOR

- DOCUMENTING FIRE EXTINGUISHER LOCATION, INSPECTIONS, MAINTENANCE, AND RECHARGING.
- B. MULTIPURPOSE DRY-CHEMICAL TYPE: UL-RATED 5-LB NOMINAL CAPACITY. WITH MONOAMMONIUM PHOSPHATE-BASED DRY CHEMICAL IN MANUFACTURER'S STANDARD ENAMELED CONTAINER
- PART 3 EXECUTION
- 3.1 INSTALLATION
- A. EXAMINE FIRE EXTINGUISHERS FOR PROPER CHARGING AND TAGGING 1. REMOVE AND REPLACE DAMAGED, DEFECTIVE, OR UNDERCHARGED FIRE
- B. INSTALL FIRE EXTINGUISHERS IN LOCATIONS INDICATED AND IN COMPLIANCE WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- **END OF SECTION 104416**

### **SECTION 114000 - COMMERCIAL EQUIPMENT**

- PART 1 GENERAL
- 1.1 SUMMARY
- A. SECTION INCLUDES EQUIPMENT FOR FOODSERVICE FACILITIES.
- B. SEE DIVISION 23 SECTIONS FOR SUPPLY AND EXHAUST FANS; EXHAUST DUCTWORK; SERVICE ROUGHING-INS; DRAIN TRAPS; ATMOSPHERIC VENTS; VALVES, PIPES, AND FITTINGS; FIRE-EXTINGUISHING SYSTEMS; AND OTHER MATERIALS REQUIRED TO COMPLETE FOODSERVICE EQUIPMENT INSTALLATION.
- C. SEE DIVISION 28 SECTIONS FOR CONNECTIONS TO FIRE-ALARM SYSTEMS, WIRING, DISCONNECT SWITCHES, AND OTHER ELECTRICAL MATERIALS REQUIRED TO COMPLETE FOODSERVICE EQUIPMENT INSTALLATION.
- 1.2 QUALITY ASSURANCE A. NSF STANDARDS: PROVIDE EQUIPMENT THAT BEARS NSF CERTIFICATION MARK OR UL CLASSIFICATION MARK CERTIFYING COMPLIANCE WITH APPLICABLE NSF STANDARDS.
- B. UL CERTIFICATION: PROVIDE ELECTRIC AND FUEL-BURNING EQUIPMENT AND COMPONENTS THAT ARE EVALUATED BY UL FOR FIRE, ELECTRIC SHOCK, AND CASUALTY HAZARDS ACCORDING TO APPLICABLE SAFETY STANDARDS, AND THAT ARE UL CERTIFIED FOR COMPLIANCE AND LABELED FOR INTENDED USE.
- 1.3 WARRANTY A. REFRIGERATION COMPRESSOR WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPRESSORS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN
- SPECIFIED WARRANTY PERIOD. 1. FAILURE INCLUDES, BUT IS NOT LIMITED TO, INABILITY TO MAINTAIN SET
- TEMPERATURE. 2. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIAL **END OF SECTION 11451**
- COMPLETION PART 2 - PRODUCTS
- 2.1 FABRICATED EQUIPMENT A. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL EQUIPMENT LISTED ON THE DRAWINGS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. SECURELY ANCHOR UNITS TO COUNTERS OR CABINETRY WITH CONCEALED FASTENERS. VERIFY CLEARANCES ARE ADEQUATE FOR PROPER FUNCTIONING, AND THAT ROUGH OPENINGS ARE COMPLETELY
- CONCEALED. B. PLACE FREESTANDING EQUIPMENT AFTER ALL FINISHES ARE IN PLACE.

VERIFY CLEARANCES ARE ADEQUATE FOR PROPER OPERATION.

- C. VERIFY ALL POWER AND UTILITY CONNECTIONS AND COORDINATE ALL TRADES PRIOR TO ROUGH-IN D. VERIFY ALL ACCESSORY ITEMS HAVE BEEN PROVIDED.
- E. REMOVE ALL PACKING MATERIAL AND LEAVE UNITS CLEAN, READY TO OPERATE.
- 2.2 FINISHES
- A. PROVIDE EQUIPMENT IN FINISH NOTED ON DRAWINGS.

PART 3 - EXECUTION

- 3.1 INSTALLATION A. INSTALL FOODSERVICE EQUIPMENT LEVEL AND PLUMB, ACCORDING TO
  - MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - CONNECT EQUIPMENT TO UTILITIES. 2. PROVIDE CUTOUTS IN EQUIPMENT, NEATLY FORMED, WHERE REQUIRED TO RUN SERVICE LINES THROUGH EQUIPMENT TO MAKE FINAL CONNECTIONS.
- B. COMPLETE EQUIPMENT ASSEMBLY WHERE FIELD ASSEMBLY IS REQUIRED. 1. PROVIDE CLOSED BUTT AND CONTACT JOINTS THAT DO NOT REQUIRE A
- 2. GRIND FIELD WELDS ON STAINLESS-STEEL EQUIPMENT UNTIL SMOOTH AND POLISH TO MATCH ADJACENT FINISH C. INSTALL EQUIPMENT WITH ACCESS AND MAINTENANCE CLEARANCES THAT
- COMPLY WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. D. INSTALL CABINETS AND SIMILAR EQUIPMENT ON BASES IN A BED OF SEALANT
- E. INSTALL CLOSURE-TRIM STRIPS AND SIMILAR ITEMS REQUIRING FASTENERS IN A BED OF SEALANT. F. INSTALL JOINT SEALANT IN JOINTS BETWEEN EQUIPMENT AND ABUTTING SURFACES WITH CONTINUOUS JOINT BACKING UNLESS OTHERWISE INDICATED. PRODUCE AIRTIGHT, WATERTIGHT, VERMIN-PROOF, SANITARY
- JOINTS.
- 3.2 CLEANING AND PROTECTING A. AFTER COMPLETING INSTALLATION OF EQUIPMENT, REPAIR DAMAGED

B. CLEAN AND ADJUST EQUIPMENT AS REQUIRED TO PRODUCE READY-FOR-USE

CONDITION. C. PROTECT EQUIPMENT FROM DAMAGE DURING REMAINDER OF THE

A. TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND

MAINTAIN FOODSERVICE EQUIPMENT.

3.3 DEMONSTRATION

CONSTRUCTION PERIOD.

- **SECTION 114510 APPLIANCES** PART 1 - GENERAL
- 1.1 SUMMARY

- COOKING, REFRIGERATION AND CLEANING APPLIANCES
- 1.2 CLOSEOUT SUBMITTALS
- A. OPERATION AND MAINTENANCE DATA.
- 1.3 QUALITY ASSURANCE
- A. INSTALLER QUALIFICATIONS: AN EMPLOYER OF WORKERS TRAINED AND APPROVED BY MANUFACTURER FOR INSTALLATION AND MAINTENANCE OF UNITS REQUIRED FOR THIS PROJECT.
- 1.4 WARRANTY
- A. SPECIAL WARRANTIES: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE RESIDENTIAL APPLIANCES OR COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.
  - 1. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIA
- PRODUCTS
- 2.1 MANUFACTURERS
- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE PRODUCT LISTED FOR EACH APPLIANCE AS LISTED IN THE DRAWINGS.
- PART 3 EXECUTION
- 3.1 INSTALLATION, GENERAL
- A. BUILT-IN EQUIPMENT: SECURELY ANCHOR UNITS TO SUPPORTING CABINETS OR COUNTERTOPS WITH CONCEALED FASTENERS. VERIFY THAT CLEARANCES ARE ADEQUATE FOR PROPER FUNCTIONING AND THAT ROUGH
- OPENINGS ARE COMPLETELY CONCEALED B. FREESTANDING EQUIPMENT: PLACE UNITS IN FINAL LOCATIONS AFTER FINISHES HAVE BEEN COMPLETED IN EACH AREA. VERIFY THAT CLEARANCES
- ARE ADEQUATE TO PROPERLY OPERATE EQUIPMENT. C. UTILITIES: COMPLY WITH PLUMBING AND ELECTRICAL REQUIREMENTS
- 3.2 FIELD QUALITY CONTROL
- A. TESTS AND INSPECTIONS: 1. PERFORM VISUAL, MECHANICAL, AND ELECTRICAL INSPECTION AND TESTING FOR EACH APPLIANCE ACCORDING TO MANUFACTURERS' WRITTEN RECOMMENDATIONS. CERTIFY COMPLIANCE WITH EACH
  - MANUFACTURER'S APPLIANCE-PERFORMANCE PARAMETERS 2. LEAK TEST: AFTER INSTALLATION, TEST FOR LEAKS. REPAIR LEAKS AND
  - RETEST UNTIL NO LEAKS EXIST. 3. OPERATIONAL TEST: AFTER INSTALLATION, START UNITS TO CONFIRM PROPER OPERATION.
- 4. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND COMPONENTS.
- SECTION 123216 MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES:

PLASTIC-LAMINATE CASEWORK AND COUNTERTOPS

- 1.2 SUBMITTALS A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- B. SHOP DRAWINGS: INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
- 1.3 QUALITY ASSURANCE A. PRODUCT DESIGNATIONS: DRAWINGS INDICATE SIZES, CONFIGURATIONS, AND FINISH MATERIAL OF MANUFACTURED WOOD CASEWORK BY REFERENCING DESIGNATED MANUFACTURER'S CATALOG NUMBERS. OTHER MANUFACTURERS' CASEWORK OF SIMILAR SIZES AND DOOR AND DRAWER CONFIGURATIONS, OF SAME FINISH MATERIAL, AND COMPLYING WITH THE

SPECIFICATIONS MAY BE CONSIDERED. REFER TO DIVISION 1 SECTION

- "PRODUCT REQUIREMENTS." 1.4 WARRANTY
- A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF MANUFACTURED WOOD CASEWORK THAT FAIL IN MATERIALS OR

a. DELAMINATION OF COMPONENTS OR OTHER FAILURES OF GLUE

WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. 1. FAILURES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

c. FAILURE OF OPERATING HARDWARE.

- b. WARPING OF COMPONENTS.
- d. DETERIORATION OF FINISHES. 2. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIA
- COMPLETION.

COMPANY.

- PART 2 PRODUCTS 2.1 CASEWORK
- A. ALL CASEWORK SHALL BE PURCHASED FROM STEVENS INDUSTRIES, INC.

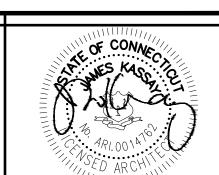
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704 WEST MAIN

B. SEE DRAWINGS FOR THE SCHEDULE OF CASEWORK. C. ALL CASEWORK WILL BE DELIVERED "READY TO ASSEMBLE" OR ASSEMBLED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PURCHASE. RECEIVE.

ASSEMBLE, AND INSTALL ALL CASEWORK SUPPLIED BY THE CABINET

JASON WOOMER, 217-857-7119, JASONW@STEVENSIND.COM



X

**SPECIFICATIONS** 06/01/22

SHEET NO.

21399 JOB NO.

- 2.2 FIRE PROTECTION CABINET
- C. CABINET MATERIAL: STEEL SHEET. SURROUNDING WALL SURFACE WITH EXPOSED TRIM FACE AND WALL RETURN
- ACCOMMODATE SEMIRECESSED CABINET INSTALLATION.
- SHAPES. SAME MATERIAL AND FINISH AS DOOR.
- G. DOOR STYLE: FULLY GLAZED PANEL WITH FRAME.
- H. DOOR GLAZING: ACRYLIC SHEET
- HARDWARE OF PROPER TYPE FOR CABINET TYPE, TRIM STYLE, AND DOOR MATERIAL AND STYLE INDICATED.
  - INDICATED, WITH PLATED OR BAKED-ENAMEL FINISH
  - **FOLLOWING:**
- 2.3 FABRICATION
- 3.1 INSTALLATION
- AUTHORITIES HAVING JURISDICTION.
- E. REPLACE FIRE PROTECTION CABINETS THAT HAVE BEEN DAMAGED OR HAVE
- END OF SECTION 104413
- **SECTION 104416 FIRE EXTINGUISHERS**
- 1.2 QUALITY ASSURANCE A. NFPA COMPLIANCE: FABRICATE AND LABEL FIRE EXTINGUISHERS TO COMPLY
- PART 2 PRODUCTS
  - PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: BUCKEYE FIRE EQUIPMENT COMPANY.
  - d. LARSEN'S MANUFACTURING COMPANY.
    - A. SECTION INCLUDES:

- 3.1 CASEWORK INSTALLATION
- A. INSTALL LEVEL, PLUMB, AND TRUE; SHIM AS REQUIRED, USING CONCEALED SHIMS. WHERE MANUFACTURED WOOD CASEWORK ABUTS OTHER FINISHED WORK, APPLY FILLER STRIPS AND SCRIBE FOR ACCURATE FIT. WITH FASTENERS CONCEALED WHERE PRACTICAL.
- BASE CABINETS: SET CABINETS STRAIGHT, LEVEL, AND PLUMB. ADJUST SUBTOPS WITHIN 1/16 INCH OF A SINGLE PLANE. FASTEN CABINETS TO MASONRY OR FRAMING, WOOD BLOCKING, OR REINFORCEMENTS IN WALLS AND PARTITIONS WITH FASTENERS SPACED 24 INCHES O.C. BOLT ADJACENT CABINETS TOGETHER WITH JOINTS FLUSH, TIGHT, AND UNIFORM. ALIGN SIMILAR ADJOINING DOORS AND DRAWERS TO A TOLERANCE OF 1/16 INCH
- WALL CABINETS: HANG CABINETS STRAIGHT, LEVEL, AND PLUMB. ADJUST FRONTS AND BOTTOMS WITHIN 1/16 INCH OF A SINGLE PLANE. FASTEN TO HANGING STRIPS, MASONRY, OR FRAMING, BLOCKING, OR REINFORCEMENTS IN WALLS OR PARTITIONS. ALIGN SIMILAR ADJOINING DOORS TO A TOLERANCE OF 1/16 INCH.
- ADJUST CASEWORK AND HARDWARE SO DOORS AND DRAWERS OPERATE SMOOTHLY WITHOUT WARP OR BIND. LUBRICATE OPERATING HARDWARE AS RECOMMENDED BY MANUFACTURER.
- 3.2 INSTALLATION OF TOPS
- A. FIELD JOINTING: WHERE POSSIBLE MAKE IN THE SAME MANNER AS SHOP JOINTING, USING DOWELS, SPLINES, ADHESIVES, AND FASTENERS RECOMMENDED BY MANUFACTURER. PREPARE EDGES TO BE JOINED IN SHOP SO PROJECT-SITE PROCESSING OF TOP AND EDGE SURFACES IS NOT
- REQUIRED. LOCATE FIELD JOINTS WHERE SHOWN ON SHOP DRAWINGS. 1. SECURE FIELD JOINTS IN PLASTIC-LAMINATE COUNTERTOPS WITH CONCEALED CLAMPING DEVICES LOCATED WITHIN 6 INCHES OF FRONT AND BACK EDGES AND AT INTERVALS NOT EXCEEDING 24 INCHES. TIGHTEN ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS TO EXERT A CONSTANT, HEAVY-CLAMPING PRESSURE AT JOINTS.
- SECURE TOPS TO CABINETS WITH Z- OR L-TYPE FASTENERS OR EQUIVALENT. USING TWO OR MORE FASTENERS AT EACH FRONT, END, AND BACK.
- SECURE BACKSPLASHES TO WALLS WITH ADHESIVE.
- SEAL JUNCTURES OF TOPS, SPLASHES, AND WALLS WITH MILDEW-RESISTANT SILICONE SEALANT OR ANOTHER PERMANENTLY ELASTIC SEALING COMPOUND RECOMMENDED BY COUNTERTOP MATERIAL MANUFACTURER.
- 3.3 CLEANING AND PROTECTING
- A. CLEAN FINISHED SURFACES, TOUCH UP AS REQUIRED, AND REMOVE OR REFINISH DAMAGED OR SOILED AREAS TO MATCH ORIGINAL FACTORY FINISH, AS APPROVED BY ARCHITECT
- PROTECTION: PROVIDE 6-MIL PLASTIC OR OTHER SUITABLE WATER-RESISTANT COVERING OVER COUNTERTOP SURFACES. TAPE TO UNDERSIDE OF COUNTERTOP AT A MINIMUM OF 48 INCHES O.C. REMOVE PROTECTION AT SUBSTANTIAL COMPLETION.

END OF SECTION 123216

#### SECTION 321816.12 - SYNTHETIC TURF SAFETY SURFACE SYSTEM PART1 - GENERAL

1.1RELATED DOCUMENTS

- DRAWINGS AND GENERAL PROVISIONS TO THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATIONS APPLY TO THIS SECTION.
- 1.2DESCRIPTION OF WORK

1.3 WARRANTY

- PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND TOOLS NECESSARY FOR THE COMPLETE INSTALLATION OF SYNTHETIC TURF SAFETY SURFACE. SURFACE SHALL MEET THE REQUIREMENTS OF ASTM F 1292 THAT STATES THAT THE SURFACE MUST YIELD BOTH A PEAK DECELERATION OF THE NO MORE THAN 200 G'S AND A HEAD INJURY CRITERIA (HIC) VALUE OF NO MORE THAN 1,000 FOR A HEADFIRST FALL FROM THE ACCESSIBLE HEIGHT OF THE PLAY EQUIPMENT. SURFACE SHALL ALSO MEET THE REQUIREMENTS OF ASTM F 1951 FOR PLAYGROUND ACCESSIBILITY. THE SYSTEM SHALL CONSIST OF, BUT NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
  - SYNTHETIC TURF CONSISTING OF FIBERS THAT ARE A MINIMUM OF 1.125" LONG. TURF FIBER CONSTRUCTION CONSISTING OF POLYETHYLENE MONOFILAMENT AND TEXTURIZED MONOFILAMENT FIBERS TUFTED TO SILVERBACK ™ POLYURETHANE.
  - 2. PAD UNDERLAYMENT SYSTEM CONSISTING OF POROUS CLOSED CELL COMPOSITE MATERIALS. THICKNESS AND DENSITY OF PANELS SHALL BE SUFFICIENT SO THAT THE SYSTEM MEETS THE REQUIREMENTS OF ASTM F 1292. 3. SYNTHETIC TURF INFILL, SPECIFICALLY DESIGNED FOR SYNTHETIC TURF. IT
  - SHALL BE ROUNDED UNIFORM QUARTZ SAND PIGMENTED AND SEALED WITH AN 1.1 SUMMARY ACRYLIC POLYMER DESIGNED TO PROVIDE THE LOOK, FEEL AND A. THIS SECTION INCLUDES THE FOLLOWING: PERFORMANCE OF OPTIMALLY MAINTAINED NATURAL GRASS.
- WORK PROVIDED IN THIS SECTION INCLUDES GRADING NECESSARY TO SHAPE AND DRAIN THE AREA AND BASE PREPARATION AND INSTALLATION OF THE SYNTHETIC TURF IN AREAS SHOWN ON DRAWINGS.
- . STANDARD WARRANTY: MANUFACTURER AGREES TO REPAIR OR REPLACE SYNTHETIC GRASS SURFACING AGAINST FAILURE DUE TO EXPOSURE TO SUNLIGHT (PE)
  - 1. IF ANY AREA OR PORTION OF THE TURF SUBSTANTIALLY CHANGES, AS DISTINGUISHED FROM A CHANGE IN TEXTURE, OR IF PILE HEIGHTS DECREASE MANUFACTURER WILL HAVE SUCH AREAS OR PORTIONS REPLACED WITH NEW TURF OF EQUIVALENT QUALITY, EXCLUDING INSTALLATION COSTS. MANUFACTURER ALSO WARRANTS THAT AT THE TIME OF THE INITIAL TURF INSTALLATION, THE SYNTHETIC TURF WILL BE FREE OF MANUFACTURING DEFECTS. SLIGHT COLOR CHANGES WILL OCCUR OVER THE LIFETIME OF THIS TURF/CARPET AND IS NOT CONSIDERED AN ISSUE OR BASIS FOR CLAIM. ALL LABOR COST INVOLVED WITH THE REMOVAL OF THE AFFECTED TURF / CARPET AND REINSTALLATION OF THE REPLACEMENT CARPET WILL BE THE 1.4 WARRANTY RESPONSIBILITY OF THE PURCHASER
  - 2. WARRANTY PERIOD: 8 YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
- 5 YEAR INSTALLATION WARRANTY: MANUFACTURER WARRANTIES THE INSTALLATION FOR PERIOD OF 5 YEARS FROM THE DATE OF INSTALLATION. WARRANTY APPLIES SPECIFICALLY TO THE INSTALLATION OF THE SYNTHETIC TURF.
  - GENERAL PROVISIONS OF THIS LIMITED WARRANTY ONLY TO THE WEAR OF THE TURF WITH REGARD TO ULTRAVIOLET DEGRADATION, AND DO NOT APPLY TO DAMAGE INCURRED DURING INSTALLATION, IMPROPER UNDERLAY, PILE CRUSHING, WILLFUL OR NEGLIGENT ABUSES, OR DAMAGE BY MACHINERY OR EQUIPMENT, NOR DOES IT APPLY WHEN THE TURF IS NOT PROFESSIONALLY INSTALLED BY AN APPROVED INSTALLER. THIS LIMITED WARRANTY DOES NOT APPLY TO INSTALLATIONS ON STAIRWAYS OR OTHER UNEVEN SURFACES, NOR DOES IT APPLY TO TURF, WHICH HAS NOT BEEN PROPERLY MAINTAINED.

PART 2 - PRODUCTS

- 2.1 SYNTHETIC TURF SAFETY SURFACE
- A. AGGREGATE BASE- 50% CRUSHED CLEAN STONE (SIZE= 3/4") / 50% CRUSHED CLEAN STONE (SIZE=1/4"). (REFER TO SECTION 3.2-B)
- B. SYNTHETIC TURF: 1.25" KID PLAY SYNTHETIC TURF FOR PLAY AREAS FROM SPORT SURFACE SPECIALTIES, LLC 6091 SENECA ST, ELMA NY 14059. PHONE: 716-652-2039
  - 1. FACE WEIGHT: 60 OZ. / SQ YD
  - 2. YARN TYPE: POLYETHYLENE
  - SPINE/TEXTURIZED POLYPROPYLENE THATCH

  - 4. PILE HEIGHT: 1.25" 5. COLOR: FIELD /FOREST / OLIVE
  - CONSTRUCTION: BROADLOOM TUFTED
  - 7. TUFTING GAUGE: 3/8"
  - TOTAL PRODUCT WEIGHT: 87 OZ.
- 9. FINISHED ROLL WIDTH: 180" UNTRIMMED 10. WARRANTY: 8 YEAR U. V. DEGRADATION
- C. PAD UNDERLAYMENT STANDARD RECYCLED, NON-CONTAMINATED, POSTINDUSTRIAL CROSS LINK, AND CLOSED CELL POLYETHYLENE- POLYOLEFIN FOAM PAD FROM SPORT SURFACE SPECIALTIES.
- 1. FOAM TYPE: POLYETHYLENE-POLYOLEFIN
- 2. BULK DENSITY: 5.0-8.0 LB/CU FT
- 3. EFFECTIVE SIZE: 24 SQ FT (NET COVERAGE)
- 4. TENSILE STRENGTH 34-36 PSI
- D. SYNTHETIC TURF INFILL MATERIAL
  - 1. COEFFICIENT OF UNIFORMITY OF < 1.3.
  - 2. 98% OF THE PARTICLES RETAINED ON US STANDARD SIEVES 12 THROUGH 20 3. COATED PARTICLES SHALL BE SMOOTH TO RESIST MOUNDING AND COMPACTION AND HAVE AN ANGLE OF REPOSE OF 30° OR LESS.
- 4. THE FINISHED PRODUCT SHALL BE 100% COATED, SHALL REPEL WATER, BE NON- FLAMMABLE AND HAVE <.001% DUST CONTENT.
- 5. WHEN PLACED IN SYNTHETIC TURF, THE SYSTEM SHALL HAVE AN ABRASION INDEX OF 26+2.
- 6. COLOR: GREEN OR TAN
- 7. PRODUCT TO BE ENVIROFILL® MANUFACTURED BY US GREENTECH, L.L.C. OR APPROVED EQUAL
- E. SPLICING MATERIAL: SPUN BONDED COATED POLYPROPYLENE (12" SEAMING TAPE) F. ADHESIVE: TURFCLAW SYNTHETIC TURF ADHESIVE

PART 3 - EXECUTION

#### 3.1 GROUND PREPARATION

- A. GENERAL: THE GROUND AREAS TO RECEIVE SYNTHETIC TURF SAFETY SURFACE IS INDICATED ON DRAWINGS
- B. LEVELING AND SITE PREPARATION: ALL ORGANIC MATERIAL AND ORGANIC DEBRIS TO BE REMOVED. SOIL TO BE GRADED LEVEL AND STABILIZED (COMPACTED) COMPACTION SHALL BE DONE WITH MECHANICAL COMPACTORS, INCLUDING VIBRATORY COMPACTORS, AND /OR POWERED TAMPERS AND ROLLERS 3.2 BASE AND SYNTHTTIC TURF CONSTRUCTION
- A. GENERAL: THE AREA TO BE SMOOTH AND GRADED TO ALLOW PROPER DRAINAGE. REFER TO GRADING PLAN. THE OVERALL GRADE OF THE PLAYGROUND IS NOT TO EXCEED 3%.
- B. COMPACTED AGGREGATE BASE: PLACE 4INCHES OF AGGREGATE BASE AS LEVELING LAYER COMPACTED TO 90% OF MAX DENSITY PER AASHTO T99. COMPACTION SHALL BE DONE WITH MECHANICAL COMPACTORS INCLUDING VIBRATORY COMPACTORS AND/OR POWERED TAMPERS AND ROLLERS. AGGREGATE SHOULD BE A COMBINATION: 50% CRUSHED CLEAN STONE (SIZE=3/4") 50% CRUSHED CLEAN STONE (SIZE=1/4").
- C. SYNTHETIC TURF: PLACE TURF AND CUT TO FIT CONFIGURATION AS SHOWN ON DRAWINGS. SPLICE SEAMS. ALL SEAMS MUST BE ATTACHED WITH SPLICING FILM/ FABRIC AND ADHESIVE AS APPROVED BY THE MANUFACTURER FOR THIS TYPE OF INSTALLATION OF THEIR PRODUCT.
- D. INFILL: APPLY LAYERS OF SYNTHETIC TURF INFILL WITH A DROP SPREADER AND BROOM THE TURF FIBERS WITH STIFF BRISTLED BROOM TO STAND UP AND ALLOW INFILL TO SETTLE INTO THE BOTTOM. BROOM IN ENVIROFILL® INFILL AT APPROXIMATELY 2 POUNDS PER SQUARE FOOT.
- E. ANCHOR/ EDGING: EDGES OF TURF WILL BE GROUND WITH MECHANICAL FASTENERS. STAKES OR EDGING.

SECTION 321816.15 - PLAY FIELD EQUIPMENT AND STRUCTURES

GENERAL

END OF SECTION 321816.12

- MANUFACTURED PLAYGROUND EQUIPMENT. B. GENERAL REQUIREMENTS:
  - 1. THE CONTRACTOR IS RESPONSIBLE FOR THE PLAYGROUND EQUIPMENT SITE AREA AS SPECIFIED ON THE SITE PLAN, INCLUDING FINAL GRADING SUITABLE FOR INSTALLATION OF PLAYGROUND EQUIPMENT.
  - EQUIPMENT WILL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE TO RECEIVE, VERIFY, STORE AND INSTALL PLAYGROUND EQUIPMENT WHEN DELIVERED.
- 1.2 SUBMITTALS
- 50% OR MORE WITHIN EIGHT YEARS AFTER ITS INITIAL INSTALLATION, A. SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS FOR PLAYGROUND EQUIPMENT AND STRUCTURES.
  - 1.3 QUALITY ASSURANCE
  - A. SAFETY STANDARDS: PROVIDE PLAYGROUND EQUIPMENT COMPLYING WITH OR EXCEEDING REQUIREMENTS IN THE FOLLOWING:
  - 1. ASTM F 1487.
  - 2. CPSC NO. 325

  - A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF PLAYGROUND EQUIPMENT THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN
  - FAILURES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: a. DETERIORATION OF METALS, METAL FINISHES, AND OTHER MATERIALS
  - BEYOND NORMAL WEATHERING. 2. WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
  - PRODUCTS
  - 2.1 MANUFACTURER:
  - A. PLAYPOWER INC., 878 E HIGHWAY 60, MONETT, MO 65708, PHONE: 417-354-2678
  - 2.2 COMMON MATERIALS AND PROCESSES:

SPECIFIED WARRANTY PERIOD.

- A. CONDITIONED WOOD ALL WOOD COMPONENTS ARE MANUFACTURED FROM KILN DRIED FSC CERTIFIED SOFTWOODS AND ARE CONDITIONED WITH COPPER AZOLE AFTER ALL FABRICATION HAS BEEN COMPLETED.
- B. 6" DIAMETER STEEL TUBING ALL 6" DIAMETER STEEL TUBING IS PRODUCED FROM 12 GAUGE GALVANIZED SHEET STOCK USING RECLAIMED SCRAP METAL, LIGHTLY SANDBLASTED. PRIMED AND ELECTRO-STATICALLY POWDER COATED AFTER ALL FABRICATION HAS BEEN COMPLETED. THIS MATERIAL CONSISTS OF 78% RECYCLED CONTENT ON AVERAGE
- 3. YARN CROSS SECTION: POLYETHYLENE MONOFILAMENT CLASSIC C. RECYCLED PLASTIC ALL RECYCLED PLASTIC COMPONENTS ARE MADE FROM 98% POST CONSUMER RECYCLED HIGH DENSITY POLYETHYLENE WITH THE REMAINING 2% CONSISTING OF PIGMENTS AND UV INHIBITORS. ALL LOAD BEARING COMPONENTS ARE GLASS REINFORCED.
  - D. ROTATIONALLY MOLDED PLASTIC ALL ROTATIONALLY MOLDED PLASTIC COMPONENTS ARE DOUBLE WALLED WITH UV STABILIZED POLYETHYLENE TO AN AVERAGE 3/16 INCH WALL THICKNESS, UNLESS OTHERWISE SPECIFIED.
  - E. INJECTION MOLDED PLASTIC ALL INJECTION MOLDED PLASTIC COMPONENTS ARE COMPOSED OF NYLON OR HIGH IMPACT POLYPROPYLENE WITH UV INHIBITOR.
  - F. STANDARD STEEL TUBING ALL 1INCH AND 1-1/4 INCH STEEL TUBING IS PROTECTED WITH AN IN-LINE PROCESS THAT INCLUDES FLO-COAT® ZINC GALVANIZING, CHROMATE CONVERSION, AND A CLEAR POLYMER COATING. THIS MATERIAL CONSISTS OF 50% RECYCLED CONTENT ON AVERAGE
  - G. FASTENERS ALL FASTENERS ARE EITHER ZINC PLATED OR STAINLESS STEEL BASED ON APPLICATION. ALL THREADED FASTENERS INSTALLED ON SITE INCLUDE LOCKNUTS WITH DEFORMED THREADS, NYLON RINGS, OR A THREAD-LOCKING PRODUCT PLACED ON THE THREADS OF BOLT.
  - H. POWDER-COATING PARTS THAT ARE POWDER-COATED USE A TGIC POLYESTER POWDER RESIN THAT IS ELECTRO-STATICALLY APPLIED AND HEAT CURED LEAVING A FINISH THAT IS NON-POROUS, NON-TOXIC, AND UV STABILIZED. ZINC-PLATING OR ZINC RICH PRIMER IS USED AS BASE COAT PRIOR TO APPLYING THE POWDER-COAT TOP LAYER. TYPICAL THICKNESS OF POWDER-COATING IS 3 - 4 MILS.
  - HOT-DIP GALVANIZING AFTER FABRICATION, ALL NON-PAINTED STEEL COMPONENTS ARE GALVANIZED WITH A HEAVY INDUSTRIAL GRADE ZINC-PLATING.
  - J. ALUMINUM CASTING ALUMINUM CASTINGS USE EITHER A 713 T6, 356 T6, OR ZN12 ALLOY THAT IS TUMBLED TO REMOVE ANY SHARP CASTING FLASHING AND LEAVE A SMOOTH EXTERIOR FINISH.
  - PART 3 EXECUTION
  - 3.1 INSTALLATION, GENERAL
  - A. GENERAL: COMPLY WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED. ANCHOR PLAYGROUND EQUIPMENT SECURELY, POSITIONED AT LOCATIONS AND ELEVATIONS INDICATED.
    - 1. MAXIMUM EQUIPMENT HEIGHT: COORDINATE INSTALLED HEIGHTS OF EQUIPMENT AND COMPONENTS WITH FINISHED ELEVATIONS OF PROTECTIVE SURFACING. SET EQUIPMENT SO FALL HEIGHTS AND UP TO 4' ELEVATION REQUIREMENTS FOR AGE GROUP USE AND ACCESSIBILITY 4'1" TO 6' ARE WITHIN REQUIRED LIMITS. VERIFY THAT PLAYGROUND EQUIPMENT ELEVATIONS COMPLY WITH REQUIREMENTS FOR EACH TYPE AND COMPONENT OF EQUIPMENT.
    - 2. PLAYGROUND EQUIPMENT IS INSTALLED AFTER GRADE HAS BEEN ESTABLISHED IN THE FALL ZONE AREAS; ANY REQUIRED DRAINAGE OF THE FALL ZONE AREAS IS INSTALLED AND CONNECTED TO THE APPROVED STORM SYSTEM. THE PERIMETER SIDEWALKS MAY BE POURED PRIOR TO PLAYGROUND INSTALLATION. IMMEDIATELY PRECEDING THE COMPLETION OF THE PLAY STRUCTURE INSTALLATION, THE SOD AND REMAINING LANDSCAPE FEATURES ARE TO BE COMPLETED. THE PLAYGROUND SOD SHALL BE INSTALLED AND COMPLETE A MINIMUM OF 45 DAYS PRIOR TO OCCUPANCY. REFER TO THE PLANS AND MANUFACTURER SPECS' FOR ADDITIONAL INFORMATION. DO NOT INSTALL THE SOD (WHERE SOD IS USED) PRIOR TO INSTALLATION OF THE PLAYGROUND STRUCTURES.

END OF SECTION 321816.15

### **SECTION 323119 - DECORATIVE METAL FENCES AND GATES**

- PART 1 GENERAL 1.01 SUMMARY
- A. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND APPURTENANCES NECESSARY FOR INSTALLATION OF THE WELDED ORNAMENTAL STEEL FENCE SYSTEM DEFINED IN THE DRAWINGS AND SPECIFICATIONS.

PART 2 - MATERIALS

### 2.01 MANUFACTURER

A. THE FENCE SYSTEM SHALL CONFORM TO MONTAGE PLUS ATF™ WELDED ORNAMENTAL STEEL MAJESTIC™ DESIGN. EXTENDED PICKET BOTTOM RAIL TREATMENT. 3" PICKET INTERSPACE 3-RAIL STYLE MANUFACTURED BY AMERISTAR FENCE PRODUCTS, INC., IN TULSA, OKLAHOMA. OR APPROVED EQUAL.

### 2.02 MATERIAL

- A. STEEL MATERIAL FOR FENCE PANELS AND POSTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A653/A653M, WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI (344 MPA) AND A MINIMUM ZINC (HOT-DIP GALVANIZED) COATING WEIGHT OF 0.90 OZ/FT<sub>2</sub> (276 G/M<sub>2</sub>), COATING DESIGNATION G-60.
- B. MATERIAL FOR FENCE PICKETS SHALL BE 3/4" SQUARE X 18 GA. TUBING. THE RAILS SHALL BE STEEL CHANNEL, MONTAGE PLUS ATF PROfile, 1.5" X 1.4375" X 14 GA. PICKET HOLES IN THE RAIL SHALL BE AT 3.500" O.C. FOR 3" AIR SPACE. 1. FENCE POSTS AND GATE POSTS SHALL MEET THE MINIMUM SIZE
- REQUIREMENTS OF TABLE 1, LOCATED AT THE END OF THIS SECTION. C. DUMPSTER ENCLOSURE GATE INFILL: BUNZL EXTRUSION - OP PANEL
  - 1. MATERIAL: RIGID PVC
- 2. COLOR: BLACK 2.03 FABRICATION
- A. PICKETS, RAILS AND POSTS SHALL BE PRE-CUT TO SPECIFIED LENGTHS. RAILS SHALL BE PRE-PUNCHED TO ACCEPT PICKETS.
- B. PICKETS SHALL BE INSERTED INTO THE PRE-PUNCHED HOLES IN THE RAILS AND SHALL BE ALIGNED TO STANDARD SPACING USING A SPECIALLY CALIBRATED ALIGNMENT fIXTURE. THE ALIGNED PICKETS AND RAILS SHALL BE JOINED AT EACH PICKET-TO-RAIL INTERSECTION BY AMERISTAR'S PROPRIETARY FUSION WELDING PROCESS, THUS COMPLETING THE RIGID PANEL ASSEMBLY.

- C. THE MANUFACTURED PANELS AND POSTS SHALL BE SUBJECTED TO THE AMERICOAT™ INLINE ELECTRODEPOSITION COATING PROCESS CONSISTING OF A MULTI-STAGE PRETREATMENT/WASH (WITH ZINC PHOSPHATE) FOLLOWED BY A DUPLEX CATHODIC ELECTROCOAT APPLICATION OF AN EPOXY PRIMER FOLLOWED BY AN ACRYLIC TOPCOAT. THE MINIMUM CUMULATIVE COATING THICKNESS OF EPOXY AND ACRYLIC SHALL BE 2 MILS (0.058 MM).
- THE COLOR SHALL BE BLACK.
- D. GATES SHALL BE FABRICATED USING WELDED ORNAMENTAL PANEL MATERIAL AND GATE ENDS HAVING A 1-3/4" SQUARE CROSS-SECTIONAL SIZE. ALL RAIL AND UPRIGHT INTERSECTIONS SHALL BE JOINED BY WELDING. ALL PICKET AND RAIL INTERSECTIONS SHALL ALSO BE JOINED BY WELDING.
- HARDWARE:
- i. #SH100 SPRING HINGE
- ii. #DL100 LOCKING GRAVITY LATCH (TO BE USED AT GATES WITH NO PANIC HARDWARE) iii. EXIT ALARM LOCK:
- 1. VON DUPRIN MODEL #2670
- 2. FINISH-US28
- 3. ACCESSORIES:
- a. 210DTX050140
- b. 230DTX050140 c. 3216 RIM CYLINDER
- iv. GATE HINGE (OVER 4'-0"W)
- PART 3 EXECUTION
- 3.01 INSTALLATION A. FENCE POSTS SHALL BE SET ACCORDING TO THE MANUFACTURER'S

1. MHH180 COMMERCIAL/INDUSTRIAL 180 HINGE

- RECOMMENDATIONS. FENCE PANELS SHALL BE ATTACHED TO POSTS WITH BOULEVARD BRACKETS SUPPLIED BY THE MANUFACTURER. GATE POSTS SHALL BE SPACED ACCORDING TO THE GATE OPENINGS SPECIFIED IN THE CONSTRUCTION PLANS. THE "EARTHWORK" AND "CONCRETE" SECTIONS OF
- THIS SPECIFICATION SHALL GOVERN POST BASE MATERIAL REQUIREMENTS. 3.02 CLEANING

GATE LEAF

A. THE CONTRACTOR SHALL CLEAN THE JOBSITE OF EXCESS MATERIALS; POST-HOLE EXCAVATIONS SHALL BE SCATTERED UNIFORMLY AWAY FROM POSTS.

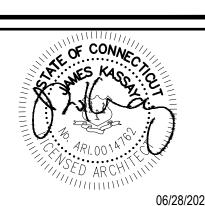
**GATE HEIGHT** 

3.02 POST SCHEDULE

	TABLE 1 - MINIMUM SIZES FOR MONTAGE PLUS POSTS
ENCE POSTS	PANEL HEIGHT
2-1/2" X 16 GA.	UP TO & INCLUDING 6' HEIGHT

UP TO & INCLUDING 4' OVER 4' UP TO & INCLUDING 6' 3" X 12 GA. 2-1/2" X 14 GA. 3" X 12GA. 3" X 12 GA. 3" X 12 GA. 4" X 11 GA.

END OF SECTION 323119



REVISIONS

**SPECIFICATIONS** 

 2
 8

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06/01/22

21399 JOB NO.

### **GENERAL NOTES & SPECIFICATIONS**

### Design Criteria

Applicable Building Code: 2018 Connecticut State Building Code (IBC 2015 with State of Connecticut State Amendments)

#### Design live loads

Design wind loads

A. Floor loa	ads	
a.	Daycares	=100 psf
D. Daaflaa		

#### B. Roof loads

a.	Minimum roof snow or live load	
	dictated by Building Official	= N/A
b.	Minimum roof live load by code	= 20 psf
C.	Ground snow load	= 30 psf
	<ul> <li>Snow exposure factor (Ce)</li> </ul>	= 1.0
	<ul> <li>Snow importance factor (Is)</li> </ul>	= 1.0
	Thermal Factor (Ct)	= 1.0
d.	Flat roof snow load (Pf)	= 21 psf
e.	Rain on snow	= 0 psf
f.	Total design snow load	= 30 psf + drift

g. Roof design is governed by the minimum roof live load or total design snow load +

### drifting whichever is more stringent.

A. Basic win	d speed (3 second gust) (Ultimate)	= 125 mph
a.	Exposure	= B
b.	Risk Category	= II
C.	Internal pressure coefficient (GCpi)	$= \pm 0.18$

#### B. Components and Cladding Wind Loads (PSF) (Ultimate)

WALLS - WINDWARD COMPONENTS AND CLADDING										
	Effective Area (sq.ft.)									
<u>Height</u>	Interior Zone				Exterior Zone					
	10	20	50	100	10	20	50	100		
0-20	28.1	26.9	25.1	23.9	28.1	26.9	25.1	23.9		

WALLS - LEEWARD COMPONENTS AND CLADDING										
	Effective Area (sq.ft.)									
<u>Height</u>	Interior Zone				Exterior Zone					
	10	20	50	100	10	20	50	100		
0-20	30.5	29.3	27.5	26.3	37.6	35.3	31.7	29.3		

#### ROOF UPLIFT - COMPONENTS AND CLADDING

Effective Area (sq. ft.)	Gross				Net (roof trusses)				
	10	20	50	100	10	20	50	100	
Interior Zone	25.7	25.1	23.9	23.3	18.7	18.1	16.9	16.3	
Perimeter (7.0' wide)	44.7	41.2	37.6	32.8	37.7	34.2	30.6	25.8	
Corner (7.0'x7.0')	66.2	62.6	56.6	51.9	59.2	55.6	49.6	44.9	

C. Components and cladding: use the most stringent wind load obtained from code, underwriter criteria (Factory Mutual, etc.), and the project specifications. Cladding manufacturer shall consider increased pressure coefficients at building perimeter, corners, eaves, and rakes. Loads noted in general notes are obtained from code.

### 3. Seismic

 $S_S = 0.177$ 

Analysis procedures

Design base shear (v)

S <sub>1</sub>	= 0.064	
$S_{DS}$	= 0.189	
S <sub>D1</sub>	= 0.102	
Risk Seisn Seisn Resp Seisn	nic importance factor (le) Category nic site class nic design category onse Modification factor (R) nic Response Coefficient (Cs) seismic force resistance system	1.0 II D B 6.5 0.029 Light framed walls with

### 4. Frost depth = 42"

### General

The term General Contractor (G.C.) as used in these documents refers to the Contractor / Construction Manager in responsible charge of the project in terms of coordination, scheduling, subcontractor coordination, etc. This term refers to, but is not limited to, General Contractor, Construction Manager, Design Build Contractor, Prime Contractor, etc. The term is referencing the entity that coordinates the work of other trades.

wood structural shear panels

Equivalent lateral force method

8.95 kips (ultimate)

- 2. All referenced standards, such as codes, specifications, and other publications noted herein, are intended to refer to the edition of said standard as referenced by the applicable building code or the latest edition published as of the date on the contract documents.
- 3. The structure is designed to be self-supporting and stable after the building is fully completed. It is solely the contractor's responsibility to determine erection procedure and sequence and insure the safety of the construction personnel, public, building and its component parts. This includes the addition of whatever temporary or permanent shoring, bracing, etc. that may be necessary to brace new construction, so that the structure is braced for wind, seismic, gravity, construction loads, etc. and so that no horizontal or vertical settlement or any damage occurs. Temporary supports shall be maintained in place until permanent supports and/or shoring and bracing are installed. Design of these supports shall be by an engineer registered in the state where the project is located in the employ of the contractor.
- 4. It is the contractors' responsibility to enforce all applicable safety codes and regulations during all phases of construction.
- 5. The contractor shall perform all construction for the project in a manner and sequence that are based on accepted industry standards that recognize the interaction of the components that comprise the structure, without causing distress, unanticipated movements or irregular load paths as a result of the construction means and methods employed.
- 6. Construction loads shall not exceed design live loads. The contractor shall be responsible for all design required to support construction equipment used in constructing this project. Shoring and re-shoring is the responsibility of the contractor.
- Principal openings through the structure are shown on these drawings. The general contractor shall examine the structural and mechanical, electrical, plumbing and other trades drawings for the required openings and shall verify size and location of all openings with the appropriate trade contractor. Providing all openings required for mechanical, electrical, plumbing, or other trades shall be a part of the general contract, whether or not shown in the structural drawings. Any deviation from the openings shown on the structural drawings shall be brought to the engineer's attention for review.

#### General (cont.)

- 8. All contractors are required to examine the drawings and specifications carefully, visit the site and fully inform themselves as to all existing conditions and limitations, prior to agreeing to perform the work. Failure to visit the site and familiarize themselves with the existing conditions and limitations will in no way relieve the contractor from furnishing any materials or performing any work in accordance with drawings and specifications without additional cost to the owner.
- 9. Details labeled "Typical Details" on drawings apply to situations occurring on the project that are the same or similar to those specifically detailed. Such details apply whether or not details are referenced at each location. Notify engineer for clarifications regarding applicability of "Typical Details".
- 10. Work these drawings with architectural, mechanical, electrical, and plumbing drawings, along with all other drawings and specifications included in the contract documents.
- 11. Do not scale drawings.
- 12. Any discrepancies between structural and architectural drawings shall be brought to the attention of the architect and structural engineer.
- 13. Should any of the general notes conflict with any details or instructions on plans, or in the specifications, the strictest provision shall govern.
- 14. Shop drawings and submittals:
  - A. These drawings shall be checked and coordinated with other materials and contracts by the general contractor and shop drawings and submittals shall bear the contractor's review stamp with the checker's initials before being submitted to the architect for approval.
  - B. When the fabricator has been authorized to use the architect's and engineer's drawings as erection drawings, the fabricator must remove all title blocks, professional seals and any other references to the architect and engineer from that erection drawing. The fabricator's name and title shall be placed on the erection drawings.
  - C. Where dimensions and elevations of existing construction could affect the new construction, it is the contractor's responsibility to make field measurements in time for their incorporation in the shop drawings

#### **Building Pad Preparation**

achieved.

- 1. All building pad preparation shall follow the recommendations of the geotechnical report (uno).
- 2. Foundation design is based upon the removal of all top soil, existing fill and all/any other deleterious materials and replacement with compacted controlled fill, as required, per the geotechnical report.
- 3. All trees, brush, roots, topsoil, rubble, organically contaminated or otherwise objectionable materials
- encountered are to be removed from structural areas of the site per the geotechnical report.
  Subgrade sectors which will exist in cut and those which are to support fill structures are to be proof rolled. Areas exhibiting instability are to be undercut and back filled on a lift-by-lift basis with each lift
- carefully compacted.
  If unstable subgrade sectors cannot be stabilized by excavation and recompaction, then crushed stone or similar coarse aggregate materials shall be rolled into the subgrade until a firm subgrade reaction is
- 6. The geotechnical engineer shall determine on site or off site imported material that can be used for
- 7. The proposed engineered fill materials are to be placed in lifts not exceeding eight (8) inches in loose measured thickness. Each lift is to be compacted as follows:
- A. Slab on grade: Minimum of 95% maximum density by ASTM D1557.
- B. Footings bearing on fill: Minimum of 95% maximum density by ASTM D1557.

engineered fill. All fill material shall be approved by the geotechnical engineer.

8. The earthwork program shall be conducted under the supervision of a soils testing laboratory. The in-place densities achieved are to be verified by tests.

### Foundation

- 1. The contractor shall familiarize themselves with the survey and the geotechnical investigation report before starting construction. All foundation work shall be in accordance with the recommendations of the geotechnical report by Welti Geotechnical, P.C., dated 3/31/22 except where noted otherwise on drawings or specifications.
- 2. A soils testing laboratory shall be retained by the owner to provide construction review to insure conformance with the construction documents during the excavation, back fill, and foundation phases of the project
- The soils testing laboratory shall:
- Discuss with the engineer the design intent of the construction documents and the testing procedures used to ensure conformance with the construction documents before construction.
- Inform the engineer of any variance in these procedures.
- 4. It shall be the responsibility of the soils testing laboratory to:
  - Determine topsoil and excavation stripping depth;
    Inspect all subsoil exposed during stripping, site grading, and excavation operations;
  - Approve fill materials, perform density tests of fills to insure placement per specification requirements:
- Inspect foundation bearing surfaces.
- 5. Foundation design is based on 4000 psf bearing pressure on natural soils or controlled compacted fill per the geotechnical report.
- 6. Top of footing elevations, footing steps and thickness of footings are shown on the drawings and are based upon the information from the geotechnical report and the civil drawings available at the time of design. The top and bottom of footing may vary depending on the conditions encountered at the site. Frost depth shall be maintained and coordinated with final grading and location of footing steps. If proper foundation bearing is found to be deeper than that shown on the drawings then foundations shall be thickened maintaining the top of footing elevation to assure proper foundation bearing. The contractor shall submit unit prices for such work and shall qualify the extent of work in the base bid. If top of footing elevations need to vary for final site conditions then the general contractor shall coordinate the effort of other trades.
- Step footings, where required, at a ratio of one (1) vertical to two (2) horizontal with a maximum vertical step of 2'-0" unless noted otherwise.
- 8. Inundation and long term exposure of bearing surfaces, which will result in deterioration of bearing formations, shall be prevented. Footings shall be placed immediately following footing excavations and bearing surface inspection.
- 9. All fill materials shall be free of organic contaminations and other deleterious matter.
- 10. For back fill against footings, place in 8" thick layers, with each lift compacted at near optimum moisture content, until a minimum in place density of 95% of the maximum density as determined by ASTM D1557 is achieved.
- 11. All soil surrounding and under footings shall be protected from frost action and freezing during the course of construction.
- 12. Notify structural engineer of any unusual soil conditions that are in variance with the geotechnical report.

#### Concrete

- 1. All concrete construction shall conform to ACI 301, "Specifications for Structural Concrete", ACI 305.1, and ACI 306.1 unless noted otherwise.
- 2. All detailing, fabrication and placing of reinforcing bars, unless otherwise noted, shall conform to ACI 318, "Building Code Requirements for Structural Concrete", ACI 117, and the ACI Detailing Manual.
- 310, Building Code Requirements for Structural Contrete, ACT 117, and the ACT Betaining Manua
- 3. Concrete production: General as per ACI 301, Section 4, Article 4.3, except as noted.
- 4. Ready-mixed Concrete: Use for all work, except that when small quantities (not over 1/2 cubic yard) are needed for isolated or relatively unimportant items.

Concrete Types Schedule									
Type of Concrete	Minimum cementious content (lb/cu. yd)	Maximum water/ cement ratio (by weight)	Specified 28-day compressive strength (psi)	Specified slump range for placement with W.R. (inches)	Specified air content range (% by volume)	Maximum size aggregate (inches)			
Spread footings	470	0.60	3000	5	0-3 Entrapped	1 1/2			
Interior concrete	564	0.48	4000	3-5	0-3 Entrapped	1			
Concrete permanently exposed to the weather or vulnerable to de-icers or freeze thaw cycles	564	0.45	4500	5-6	6 ±1.5%	1			

#### Notes:

- A. All cement shall be Type I or Type III Portland Cement per ASTM C150. Types IA and IP are not acceptable. Use one brand of cement throughout project.
- B. Minimum cementitious content shall consist of 100% cement or a combination of cement and fly ash per Note C, or a combination of cement and slag cement per Note D. Fly Ash shall not be
- used in combination with slag cement as a substitute for cement.

  C. Fly Ash is permitted and shall conform to ASTM C618 Type C or F, but shall not exceed 20% of cementitious content by weight indicated above on a substitution basis and shall be included in the water-to-cement ratio. If fly ash is used, the mix design submittals shall have tests using the
- same amount of fly ash. The contractor's schedule shall account for the use of fly ash.

  D. Slag cement is permitted and shall conform to ASTM C989, but shall not exceed 15% of cementitious content by weight indicated above on a substitution basis and shall be included in the water-to-cement ratio. If slag cement is used, the mix design submittals shall have tests using the same amount of slag cement. The contractor's schedule shall account for the use of slag
- E. All admixtures other than superplasticizers shall be added at the batch plant. Superplasticizers, designed for addition to the mix at the plant, may be added at the batch plant with verifications from the structural engineer and verifications that the water-to-cement ratio has not been exceeded. Superplasticizers added at the site shall be sent in pre-measured containers from the batch plant.
- F. All concrete used for cast-in-place concrete slabs shall contain the specified water reducing or water reducing/retarding admixture. All concrete slabs, placed at air temperature below 50°F shall contain the specified non-corrosive, non-chloride accelerator. All concrete placed at air temperature above 80° shall contain specified water-reducing/retarder admixture. All concrete required to be air-entrained shall contain an approved air-entraining admixture. All pumped concrete shall contain the specified high-range water-reducing admixture. Concrete with a water-cement ratio above 0.40 to 0.60 shall contain the specified water reducer.
- G. All concrete requiring a high slump for placement (e.g. pumping, drilled piers, etc.) shall contain mid-range and high-range superplasticizer. Increased slump may not be achieved by exceeding the specified maximum water cement ratio. Maximum slump is 8 inches with use of water reducing admixture (ASTM C494).
- H. Calcium chloride shall not be permitted nor shall any admixture containing calcium chloride be
- 6. Normal weight aggregate: ASTM C33, from a single source.
- 7. Air-entraining admixture: ASTM C260.
- Water-reducing admixture: ASTM C494, Type A, containing not more than 0.1% chloride ions.
- High-range water-reducing admixture (superplasticizer): ASTM C494, Type F or G, containing not more than 0.1% chloride ions.
- 10. Water-reducing, non-chloride accelerating admixture: ASTM C494, Type E, containing not more than 0.1% chloride ions.
- 11. Water-reducing, retarding admixture: ASTM C494, Type D, containing not more than 0.1% chloride ions.
- 12. Curing Compound: Liquid membrane-forming type (sodium silicate type not approved) meeting all requirements of ASTM C309, Type 1-D clear or translucent, having a fugitive dye to facilitate visual check of coverage. Use of Type 2 white pigmented type is recommended during hot weather.
- 13. Moisture-retaining sheet materials: Any of the types listed in and meeting requirements of ASTM C171: waterproof paper, 4 mil. (.004") polyethylene film, white burlap/polyethylene sheet.
- 14. Sealing materials: For laps in sheet cover, provide pressure sensitive tape, non-staining mastic, or other effective adhesive recommended by covering manufacturer.
- 15. Premolded joint filler: For use in expansion or isolation joints, size 1/2" thick x full depth of slab; either
- ASTM D1751 or D1752, and compatible with type of joint sealant used.
- 16. Vapor Retarder: Polyethylene sheet not less than 10 mils thick, which complies with ASTM E 1745, Class C.
- 17. Bond Breaker Felt: 15# felt.
- 18. All pipe sleeve openings through concrete slabs shall be formed with standard steel pipe.
- 19. No electrical conduit shall be placed above the welded wire reinforcement or top reinforcing of slabs. Conduit embedded in slabs on composite metal deck are subject to additional restrictions and shall be coordinated with the structural engineer. Where slab thickness on metal deck contributes to fire rating, embedded conduit is prohibited.
- 20. All aluminum in contact with concrete or dissimilar metals shall be coated with two coats coal tar epoxy, approved by the architect, unless otherwise noted.
- 21. Measure, batch, mix and deliver concrete according to ASTM C94/C94M (ASTM C1116/C1116M for concrete with synthetic or steel fiber) and furnish batch ticket information. Addition of water to the mix at the project site will not be permitted. All water must be added at the batch plant. Slump may be adjusted only through the use of additional water reducing admixture or high range water reducing admixture.
- 22. All concrete shall be placed without horizontal construction joints, except where specifically noted. Horizontal reinforcement shall be continuous through vertical construction joints.
- 23. Construction joint locations other than shown on the drawings are permitted subject to prior approval of the engineer. Expansion joint and control joint locations are mandatory as shown. Contractor shall submit drawings showing intended placing sequences and location of construction joints to the engineer for approval. At poured in place walls, construction joints shall be located so as to provide a 60'-0" maximum horizontal length of concrete placement in any direction.
- All exposed edges of concrete members shall be chamfered 3/4" unless shown otherwise on architectural drawings.
- 25. See architectural drawings for concrete finishes, masonry anchors, and for miscellaneous embedded plates, bolts, anchors, angles, etc.
- 26. The placement of sleeves, outlet boxes, box-outs, anchors, etc., for the mechanical, electrical and plumbing trades is the responsibility of the trade involved; however, any box-outs not covered by typical details in the structural drawings shall be submitted for approval.

#### Concrete (cont.)

- 27. The general contractor shall coordinate locations and dimensions of all openings and sleeves required for mechanical, electrical, and plumbing penetrations before concrete is placed. Shop drawings of all slab openings and sleeves shall be submitted for review by structural engineer. Openings shall not be cut or drilled in slabs without prior approval by structural engineer.
- 28. Reinforcing bars shall conform to ASTM A615, Grade 60. No tack welding of reinforcing in the field will be permitted
- 29. Welded wire reinforcement (W.W.R.) shall conform to ASTM A1064 and be furnished in flat sheets and installed on chairs or precast blocks for slab on grade.
- 30. Reinforcing bar sizes #3 through #5 may be bent cold the first time, provided reinforcing bar temperature is above 32°. For other bar sizes, preheat reinforcing bars before bending. See procedures as outlined in ACL 301
- 31. Wire bar supports shall be furnished for all reinforcing within slabs, inclusive of welded wire reinforcement. Bottom bars in slabs on grade may be supported by other suitable supports. Reinforcing shall be properly positioned prior to concrete placement and may not be repositioned once concrete operations have begun. Wire bar and other types of supports shall be in accordance with the Concrete Reinforcing Steel Institute Manual of Standard Practice.
- 32. Reinforcement shall be continuous through all construction joints unless otherwise noted on drawings.
- 33. All hooks shown on drawings shall be standard hooks unless otherwise noted.
- 34. Where continuous bars are called for, they shall run continuously around corners and be lapped at necessary splices, or hooked at discontinuous ends. Lap lengths shall be as given in the splice and development table. Lap beam top bars at mid-span and beam bottom bars at supports, unless otherwise noted
- 35. Provide additional reinforcing at the sides and corners of all openings in concrete in accordance with the typical details. Extend bars a minimum of 2'-0" beyond openings, hook where extension is not possible. Minimum additional requirements are as follows:
  - (2) #5 top and bottom in slabs (2) #5 each face in walls
  - (2) #5 x 4'-0" long diagonally each corner of opening
- 36. In reinforced concrete footings provide corner dowels of same size and spacing as horizontal reinforcing. Dowels shall have a class "b" lap with horizontal reinforcing in each direction
- 37. Filling-in: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- 38. Grout foundations as indicated, using specified non-metallic non-shrink grout.
- 39. Form work for structural elements shall not be removed until concrete has reached 75% of its design strength.
- 40. Cold weather placing: Comply with ACI 306.1.
- 41. Hot weather placing: Comply with ACI 305.1.
- Minimum Lap Splice and Anchorage Dimension Table3000 psi normal weight concrete, Fy=grade 60, non-coated bars

	Top Bars		Other Bars				
Bar size #3 #4 #5	Lap 28" 37" 47"	Anchorage 22" 29" 36"	Bar Size #3 #4 #5	Lap 22" 29" 36"	Anchorage 17" 22" 28"		
#6	56"	43"	#6	43"	33"		

### 2. 4000 psi normal weight concrete, Fy=grade 60, non-coated bars

than 12 inches of fresh concrete is cast below the splice.

dimension of the larger bar. Use whichever dimension is larger.

oo psi nom	iai weigni con	icrete, Fy-grade 60	, non-coated bars						
Top Bars				Other Bars					
ar Size	Lap	Anchorage	Bar Size	Lap	Anchorage				
<del>!</del> 3	24"	19"	#3	19"	15"				
<del>!</del> 4	33"	25"	#4	25"	19"				
<sup>1</sup> 5	41"	31"	#5	31"	24"				
<del>!</del> 6	49"	37"	#6	37"	29"				

- 3. 'Top Bars' as noted in the tables indicates the condition where horizontal bars are so placed that more
- 4. When lapping two different size bars, use the lap dimension of the smaller bar or the anchorage

### Minimum Concrete Cover for Reinforcing

1. Unless noted otherwise, concrete reinforcing shall be placed with proper cover to provide protection in accordance with ACI 318, and within deviation tolerances listed in ACI 117.

<u>Location</u>	Minimum Cover
Footings cast against and permanently exposed to earth	3"
Slabs on grade (W.W.R)	1/3 slab thickness from top of slab
Piers (vert. reinf.)	2"
Diere ties	1 1/2"

- Maximum deviation from the above cover requirements shall be as follows:
- A. For member depth 4" or less: ±1/4".
  For member depth 12" or less but greater than 4": ±3/8".
  For member depth greater than 12": +1/2", -1/4".
- B. For slab on grade: +3/4", with lower bound per above item 'A'.C. Reduction in cover dimension shall not exceed 1/3 the specified cover.
- Reduction in cover dimension shall not exceed 1/3 the specified cover
   Reduction in cover dimension for formed soffits shall not exceed 1/4".

### Floor Finish

Interior floor slabs: Machine trowel unless noted otherwise.

2. Exterior slab areas: Light flexible bristle broom unless noted otherwise.

- 3. Provide ACI 'Class A' tolerance, 1/8" variation in 10 feet, measured with a straight edge laid in any
- 4. Control joints in slabs on grade: Control joints in slabs on grade shall be provided at the locations indicated on the drawings. Joints shall be made by saw cutting 0-2 hours after the final finish at each joint location using the early-entry dry-cut process per ACI 302.1R. Joint depth shall be per drawing detail. The saw shall use a diamond-impregnated blade and employ the use of a skid plate to prevent

spalling and raveling of the slab. Approved supplier: Soff-cut International or equal.





**InSite** 

**TROUGHT Avenue** Lakewood, Ohio 4410 Phone (216) 521-5134 Fax (216) 521-482

1, CT A R C 17710 Detroit Phone (216)

VERNITECTS INC

ERD.

UMENTS CONTAIN INFORMATION PROPRIETARY TO

GENERAL NOTES & SPECIFICATIONS

DATE

06/01/22

JOB NO. 21399 S-0.1

### GENERAL NOTES & SPECIFICATIONS (cont.)

#### Concrete (cont.)

#### Curing

- Curing compound shall be provided as prescribed on architectural drawings based on floor use. Coordinate for compatibility of finish material.
- 2. Moisture-retaining sheet material meeting ASTM C171 may be used.

the Architect and a minimum of 1 print for the General Contractor

. Maintain initial curing for 12 hours after finishing, 24 hours for air temperature of 75 degrees F and above.

#### Submittals

- Product data: Submit data for proprietary materials and items including admixtures, patching compounds, waterstops, joint systems, curing compounds, finish materials, and others as requested by architect/engineer.
- 2. Certification: Upon engineer's request, provide admixture manufacturer's written certification that chloride ion content complies with specified requirements.
- Shop drawings/Reinforcement: See ACI 301, Section 3.1. Detailing shall conform to the ACI Detailing Manual
- 4. Shop drawing submittals shall consist of 3 prints of each drawing for the Structural Engineer, 1 print for
- 5. Mix design: Submit mix designs for each concrete mix for the project per ACI 301. Mix designs shall include all back up material with compressive strength breaks based on field experience or breaks from a laboratory trial mix per ACI 301.

#### Quality Assurance

- 1. Mold and cure four 6"x12" cylinders or five 4"x8" cylinders in accordance with ASTM C31 for each composite sample. Test one cylinder at 7 days, two 6"x12" cylinders or three 4"x8" cylinders at 28 days, and retain one cylinder for 56-day test if required. Two 6"x12" cylinders or three 4"x8" cylinders constitute a strength test. Acceptance of structure will be based on three consecutive 28-day strength tests.
- 2. In accordance with ASTM C172/C172M, obtain at least one composite sample set of cylinders for each 150 cubic yards or fraction thereof, but not less than one set for each 5000 square feet of surface area for slabs or walls, of each concrete mixture placed in any one day.

#### Air Conter

- A. Determine air content of concrete for each strength test by either the pressure method (ASTM C231) or the volumetric method (ASTM C173). The "Chase" air indicator shall not be used.
- B. A minimum of one air content test shall be made in the morning and one in the afternoon. Air content tests shall be made on all concrete whether the concrete is designated as air-entrained or not
- C. Additional air content tests, for concrete specified as air-entrained, shall be made when any of the following conditions occur:
- A change in appearance or consistency of concrete.
- Possible reduction of air content due to time delays of truck and/or hot weather.
  When air temperature is over 80°F, check each truckload.
- 4. Slump test: Perform slump test on each truckload of concrete.
- 5. Inform engineer immediately of any slump and/or air content tests that do not meet these specifications. If strength, durability or aesthetics of the structure would be impaired, that concrete shall not be used.
- 6. Concrete test reports shall contain the following information: Concrete supplier, quantity of concrete represented, location of samples taken, design strength requirement at 28 days, list of all materials and admixtures used with quantity and brand or source, actual slump, actual air content, air temperature, concrete temperature, weather, cylinder weight as received, date molded, number of days on job site, date tested, test results for 7 and 28 days, and any other information necessary to evaluate test results.
- 7. Send one copy of reports on all required laboratory testing directly to the structural engineer, two copies to the architect, one copy to the contractor and one copy to the concrete supplier. A copy of all test reports shall be in the engineers office within a maximum of five (5) working days from date of test or inspection.
- 8. Acceptance of structure: If 28-day test results do not meet requirements, the engineer shall have the right to order a change in mix proportions for remaining portions of structure. The engineer may require core tests to be made at contractors expense. Any such testing shall be done by an independent testing agency acceptable to the engineer.

### Post-Installed Anchors and Reinforcing Dowels

- Design of anchors, adhesives, and embedments specified on the drawings is based on Hilti products. Any substitutions shall meet or exceed the allowable shear and allowable tension values published in the Hilti North American Product Technical Guide.
- 2. The contractor shall submit ICC ES Evaluation reports and manufacturer installation instructions for all post-installed anchors being used on the project.
- 3. The contractor shall ensure the installers of post-installed anchors shall have at least three (3) years of experience installing anchors in similar installations. If installers do not have the required experience with similar installations they must conduct a thorough training with the manufacturer's representative. Training shall consist of but not be limited to, proper hole drilling procedures, hole preparation and cleaning techniques, adhesive injection techniques and dispenser training / maintenance, rebar dowel preparation and installation and proof loading/torquing.
- 4. The contractor shall provide manufacturer product information for any requests for substitution for review to the EOR for compliance with the contract documents.
- 5. The contractor shall submit the specific product information, for each application, for any product requesting substitution. For each application being substituted, provide anchor type, embedment depth, adhesive type, edge distances, etc.; along with the allowable shear and tension capacity for the requested applications. Do not provide generic product data; only specific values for each substitution will be reviewed. If this information is not fully provided, the submittal will be immediately rejected.
- 6. Post-installed anchors and dowels shall be used only where specifically indicated on the drawings or for specific conditions approved by the engineer. Items indicated to be cast-in-place shall not be substituted with post-installed methods or products unless prior approval is given by the engineer. When requesting a substitution of a post-installed anchor in lieu of cast-in-place anchor, calculations, for a post installed alternate, shall be provided by an engineer registered in the appropriate jurisdiction of the project.
- 7. Fastener and anchor material shall be as follows:
  - Bolts and Studs: ASTM A307; ASTM A449 (where indicated as 'High Strength')
  - Carbon and Alloy Steel Nuts: ASTM A563Carbon Steel Washers: ASTM F436
  - Carbon Steel Threaded Rod: ASTM F1554, GR.36
    Wedge Anchors: ASTM A510 or ASTM A108
  - Zinc Plating: ASTM B633Hot-Dip Galvanizing: ASTM A153
- Reinforcing Dowels: ASTM A615

#### Post-Installed Anchors and Reinforcing Dowels (cont.)

8. The following anchors shall only be used where indicated on the drawings, unless specifically noted otherwise in sections or details in the drawings:

CONCRETE ANCHORS (CRACKED AND UNCRACKED CONCRETE)		
ANCHOR TYPE	ADHESIVE TYPE	ROD TYPE
Adhesive Hilti HIT-HY200 SafeSet System		Hilti HIT-Z Rod
Mechanical -		Hilti KWIK HUS-EZ
Mechanical	-	Hilti KWIK Bolt-TZ Mechanical Safe-Set with AT tool

## CONCRETE REINFORCING (CRACKED AND UNCRACKED CONCRETE)

ANCHOR TYPE ADHESIVE TYPE		REINFORCING
Medium Duty Adhesive	Hilti HIT-HY100 SafeSet System	As indicated on drawings.
Heavy Duty Adhesive	Hilti HIT-HY200 SafeSet System	As indicated on drawings.

#### MASONRY REINFORCING

(MASONRY SHALL BE SOLID GROUTED A DISTANCE OF 8" FROM ANCHOR IN ALL DIRECTIONS)

ANCHOR TYPE	ADHESIVE TYPE	REINFORCING TYPE
Adhesive	Hilti HIT-HY270 SafeSet System	#4 Rebar (4 1/2" embed.)
Adhesive	Hilti HIT-HY270 SafeSet System	#5 Rebar (5 5/8" embed.)

Note: For applications into existing masonry / brick that may be ungrouted provide screen tube insert.

#### <u>Mason</u>

- All masonry shall conform to "Building Code Requirements for Masonry Structures" (ACI 530/ASCE 5/TMS 402) and "Specification for Masonry Structures" (ACI 530.1/ASCE 6/TMS 602).
- 2. All brick and concrete masonry construction shall comply with the recommendations of the Brick Industry Association (BIA) and the National Concrete Masonry Association (NCMA) and minimum requirements established in the applicable building code.
- 3. Grouting and Reinforcing: All masonry and grouting and reinforcing work shall be performed by masonry craftworkers who have successfully completed the International Masonry Institute (1-800-IMI-0988) training course for Grouting and Reinforced Masonry Construction, or equal.
- 4. Structural masonry design compressive strength of wall assembly (f'm) = 2,000 psi based on Unit Strength
- 5. Concrete masonry units (CMU) shall be normal weight units conforming to ASTM C90.
- 6. Mortar for all structural masonry shall be Type S, conforming to ASTM C270 Proportion Specification, and shall be either Portland cement (ASTM C150, Type I or III) and hydrated lime (ASTM C207, Type S) or Mortar cement (ASTM C1329). Masonry cement mortar is not acceptable for structural masonry.
- 7. Grout to fill cores shall be ASTM C476, coarse grout (3/8" maximum aggregate) with a minimum compressive strength of 2500 psi in 28 days.
- 8. Reinforcing bars shall conform to ASTM A615, grade 60.

Method, unless otherwise noted.

- 9. All concrete masonry units shall have galvanized horizontal joint reinforcement as follows:
- A. 9 ga. side and cross rods (ladder type) spaced 16" o.c. vertically.
- 11. Lap joint reinforcing as shown in the table below:

### Wire Joint Reinforci

- 12. All cores with reinforcement shall be filled solid with grout. All grout shall be consolidated in place by vibration to insure complete filling of cells.
- 13. Place reinforcing bars before grouting. Properly secure reinforcing bars to maintain the positions indicated on the drawings. Bars to be located in center of cells unless otherwise noted.

Splice Length

- 14. Mortar protrusions, extending into cells or cavities to be reinforced and filled, shall be removed.
- Place grout with pour height not exceeding 5 feet. Consolidate each pour by mechanical vibration. Reconsolidate after initial water loss and settlement has occurred.
- 16. Lay masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footing and in all courses of columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete grout.
- 17. All corners to be tied by masonry bond.
- 18. Grout cores solid a minimum of one course below any change in wall thickness.
- 19. All masonry walls shall have vertical control joints at a maximum spacing of 25'. Coordinate with locations indicated on architectural drawings. Control joints shall extend through the entire wall thickness, except at continuous bond beams where the masonry shall be scored only.
- 20. The collar joint in multi-wythe walls below grade shall be fully grouted as the wall is constructed.
- 21. CMU walls 12" or less in width shall be single-wythe. CMU walls greater than 12" wide may be constructed as multi-wythe, provided the collar joint is continuously grouted solid, continuous header course is provided at 40" o.c. maximum vertically and header overlaps the collar joint by 3" minimum. Use single wythe for walls greater than 12" and exposed to view.
- 22. All openings in masonry walls for mechanical, electrical, plumbing, etc. penetrations are to be coordinated and located prior to beginning wall construction. Detailed fully-dimensioned drawings of wall openings, including lintels and adjacent reinforcement shall be submitted for review prior to construction of the walls. No openings are permitted to be cut in bearing walls, shear walls or exterior walls without prior approval by the engineer.

### Submittals

- 1. Product data / Material certificates: Submit data and certificates for masonry units, cementitious materials, mortar admixtures, pre-blended dry mortar mixes, reinforcing bars, joint reinforcement, anchors, ties, and metal accessories
- 2. Shop drawings / Reinforcement: Show elevations of reinforced walls. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI Detailing Manual.
- 3. Shop drawings shall indicate the date of the structural drawings that were used to prepare the shop drawings.
- 4. Shop drawing submittals shall consist of 3 prints of each drawing for the Structural Engineer, 1 print for the Architect, and a minimum of 1 print for the General Contractor.
- 5. Mix designs: Submit mix designs for each type of mortar and grout. Include description of type and proportions of ingredients. Include test reports, according to ASTM C1019, for grout mixes.

### Masonry (cont.)

### Quality Assurance

An independent testing laboratory shall be retained to periodically inspect and perform material testing of masonry materials and construction to comply with the building code and minimum testing and submittals as required by the Special Inspections section of the General Notes & Specifications.

#### Wood Framing

- 1. Detail, fabricate and erect structural wood in accordance with the National Design Specification for Wood Construction as referenced in the applicable building code, the project specifications, and these drawings.
- 2. All stress-grade lumber to be spruce, pine, fir no. 1/no. 2. Stress-grade lumber for joists, beams, bearing wall studs and columns shall develop working stresses of not less than:
  - Δ 875 nsi in hending Fh
  - A. 875 psi in bending, Fb
    B. 1,150 psi in compression parallel with grain, Fc
  - C. 135 psi in horizontal shear, Fv D. E=1,400,000 psi
- 3. Laminated veneer lumber (LVL) for joists, beams and columns shall develop working stresses of not less than:
  - A. 2,900 psi in bending, Fb, up to 12" depth. For other depths, multiply Fb by  $\left[\frac{12}{d}\right]^{0.136}$ .
  - B. 2,635 psi in compression parallel to grain, Fc C. 285 psi in horizontal shear, Fv
- D. E=2,000,000 psi

hangers with the following minimum capacities per joist:

4. Maximum moisture content for all structural members shall not exceed 19%.
5. Stress grade floor joists framing into the side of stress grade lumber beams, or steel beams require joist

A. 2"x6"	900# cap
B. 2"x8"	900# cap
C. 2"x10"	1200# cap
D 2"x12"	1300# cap

- 6. At bearing ends of wood beams, provide wood post with one stud for each nominal two inches of beam
- 7. Members shall be connected and fastened in accordance with the schedules within the governing codes and specifications identified (uno).
- 8. No structural member shall be cut or notched unless specifically shown, noted, or approved by the
- 9. All sill plates shall be preservative treated wood.
- 10. All wood exposed to earth, weather, moisture, etc. that would be subject to decay shall be preservative
- 11. All connectors and fasteners in contact with chemically treated lumber such as fire treated, preservative treated, etc. shall be galvanized or stainless steel as follows:
  - A. All fasteners and anchors shall be hot dipped galvanized per ASTM A153 (u.n.o.).
- B. All connectors shall be galvanized per ASTM A653 grade G185 or hot dipped galvanized per ASTM A123 (u.n.o.).
  C. For treated lumber containing ammonia, such as ACZA, retention levels for ACQ above 0.40 or exposure to ocean salts, large bodies of water, fires, fertilizers, etc. connectors, fasteners and
- 12. Framing hangers, caps, hold downs, bases, anchors, connections, etc., shall be as manufactured by "Simpson Strong-Tie Company".

anchors shall be stainless steel type 304 or 316.

- 13. At wall locations where multiple studs are required to support vertical loads, a continuous load path shall be provided to support those loads through the structure inclusive of the floor system to the foundations. This may be accomplished through the use of rim joists, squash blocks or other appropriate means based on location and detailing considerations.
- 14. All temporary and permanent bridging and blocking shall be provided in accordance with the building code requirements, and as shown on the contract drawings.
- 15. Provide 1/8" gap between floor/roof sheathing panel edges to allow for expansion of sheathing during construction.
- 16. Construction manager or general contractor shall consider the placement of temporary expansion joints at 80' on center in the sheathing until the building is closed in from moisture infiltration. See APA Technical Note U425C for expansion joint details, Figures 1, 2 and 3. Expansion joints are not to interrupt a shear
- 17. Construction manager or general contractor shall coordinate with subcontractors to account for vertical shrinkage of the wood structure. This shall include but not be limited to plumbing, mechanical, facade construction etc. An estimated shrinkage of 3/8" may occur for each level of construction. Shrinkage at each level is cumulative for determining the overall building shrinkage (i.e. number of levels x 3/8" = overall building shrinkage). This calculation is based upon 19% maximum moisture content in the wood framing during construction. Contractor shall protect wood framing from absorbing and retaining additional moisture during construction. Flexible connections and/or oversized holes may be required for plumbing and mechanical penetrations to account for shrinkage movement.

### Submittals

- Product Data: For each type of process and factory-fabricated product. Indicate component materials and
- dimensions and include construction and application details.

  A. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of
- preservative used and net amount of preservative retained.

  B. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated
- materials based on testing by a qualified independent testing agency.

  C. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
- D. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.

Indicate species and grade selected for each use and design values approved by the ALSC Board of

#### Wood Roof Trusses

- All truss design shall conform to the applicable building code.
- See Plan Notes for design load requirements.
- 3. Submit truss design drawings and calculations stamped by an engineer registered in the appropriate jurisdiction of the project to the structural engineer for review prior to truss fabrication.
- 4. Truss quantities, spacing and profiles shown are a schematic representation only. Actual layout and design shall be by truss supplier.
- Temporary and permanent bridging of wood roof trusses shall be provided in accordance with TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses" and SBCA BCSI "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses". Temporary bridging shall be furnished as required to maintain truss stability, spacing, and to prevent buckling during erection. The following minimum permanent bridging shall be provided:
  - A. Bottom chord bridging: Continuous horizontal 2x4 @ 8'-0" o.c. for roof trusses. Provide horizontal diagonal bridging at 45 degree angle between bridging lines at ends of building and at 20'-0" intervals throughout.
- B. Web members bridging: Continuous horizontal bridging at 12'-0" o.c. for roof trusses. Provide vertical diagonal bridging at 45 degree angle at ends of building and at 20'-0" intervals throughout.
- 6. All temporary and permanent bridging and blocking shall be provided in accordance with the building code requirements, and as shown on the contract drawings.
- All connectors and fasteners in contact with chemically treated lumber such as fire treated, preservative treated, etc. shall be galvanized or stainless steel as follows:
- A. All fasteners and anchors shall be hot dipped galvanized per ASTM A153 (u.n.o.).
   B. All connectors shall be galvanized per ASTM A653 grade G185 or hot dipped galvanized per ASTM
- C. For treated lumber containing ammonia, such as ACZA, retention levels for ACQ above 0.40 or exposure to ocean salts, large bodies of water, fires, fertilizers, etc. connectors, fasteners and anchors shall be stainless steel type 304 or 316.

#### Submittals

- 1. Shop drawings: Submit shop drawings showing species, sizes and stress grades of lumber to be used; pitch, span, camber, configuration and spacing for each type of truss required; type, size, material, finish, design value, and location of metal connector plates; and bearing and anchorage details. Submit calculations for truss design. Shop drawings and calculations shall be signed and stamped by a structural engineer licensed to practice in state where the project is located.
- To the extent engineering design considerations are indicated as fabricator's responsibility, submit design analysis and test reports indicating loading, section modulus, assumed allowable stress, stress diagrams and calculations, and similar information needed for analysis and to ensure that trusses comply with requirements.

ABBREVIATION	<u>IS</u>	GALV	GALVANIZED
	ANCHOR BOLT ANCHOR ROD ADDITIONAL ABOVE FINISH FLOOR ARCHITECTURAL BOTTOM OF BUILDING	HD'D	HEADED
A.B	ANCHOR BOLT	HORIZ	HORIZONTAL
A.R	ANCHOR ROD	I.F	_INSIDE FACE
ADD'L	ADDITIONAL	INT.	_INTERIOR
A.F.F.	ABOVE FINISH FLOOR	J/B OR J/BRG.	JOIST BEARING
ARCH.	ARCHITECTURAL	k	KIP
B/	BOTTOM OF	LG	 LONG
BLDG.	BUILDING	L.L.	LIVE LOAD
ВМ.	 BEAM	(LLH)	LONG LEG HORIZONTAL
BOT.	—_ BOTTOM	(LLV)	LONG LEG VERTICAL
BRG.	BEARING	(LSH)	LONG SIDE HORIZONTAL
BT.I	BOLTED TIE JOIST	(LSV)	LONG SIDE VERTICAL
CANTI	CANTILEVER	i W	LONG SIDE VERTICAL _LONG WAY _MECHANICAL
CEME	COLD FORMED METAL FRAMING	MECH	MECHANICAL
CIP	CAST IN DIACE	MED	MANUFACTURER
C.I.F	CONTROL IOINT	(NI)	WANDI ACTONEN
CJ	CONTROL JOINT	(N)	NEW
CL	CENTERLINE	(IV.I.C.)	NOT IN CONTRACT
CLR	CLEAR	N.S.	NOT TO SOALE
CMU	CONCRETE MASONRY UNIT	N15	NOT TO SCALE
COL	COLUMN	O.C	_ON CENTER
CONC	CONCRETE	O.F	OUTSIDE FACE
CONSTR	CONSTRUCTION	0/0	OUT TO OUT OPPOSITE
CONT	CONTINUOUS	OPP	_OPPOSITE
C.Y	CUBIC YARD	PC	PRECAST CONCRETE
DBA	DEFORMED BAR ANCHOR	PJ	PANEL JOINT
DET	BOTTOM OF BUILDING BEAM BOTTOM BEARING BOLTED TIE JOIST CANTILEVER COLD FORMED METAL FRAMING CAST-IN-PLACE CONTROL JOINT CENTERLINE CLEAR CONCRETE MASONRY UNIT COLUMN CONCRETE CONSTRUCTION CONTINUOUS CUBIC YARD DEFORMED BAR ANCHOR DETAIL DIAGONAL	PL	PLATE
DIAG	DIAGONAL	PSF	POUNDS/SQUARE FOOT POUNDS/SQUARE INCH
Ø / DIA	DIAMETER	PSI	POUNDS/SQUARE INCH
D.L.	DEAD LOAD	RAD	RADIUS
DWG.	DRAWING	R.D.	ROOF DRAIN REINFORCING REQUIRED
E.F.	EACH FACE	REINF.	REINFORCING
EJ	EXPANSION JOINT	REQ'D	REQUIRED
EL.	ELEVATION	SECT.	SECTION
EMBED.	EMBEDMENT	SIM	SIMILAR TO
E.S	EACH SIDE	S.O.G.	SLAB ON GRADE
FQ.	FOUAL OR FOUIVALENT	SP	SPACES
EQUIP.	FQUIPMENT	SQ.	SQUARE
F W	DIAGONALDIAMETERDEAD LOADDRAWINGEACH FACEEXPANSION JOINTELEVATIONEMBEDMENTEACH SIDEEQUAL OR EQUIVALENTEACH WAYEXPANSION	STIFF	STIFFENER _STEEL _STRUCTURAL _SHORT WAY
EXP	EXPANSION	STI	STEEL
		STRUCT	STRUCTURAL
(E) EXT	EXTERIOR	S W	SHORT WAY
F.D	FLOOR DRAIN	S.W	SHORT WAY SYMMETRICAL
FIN.		T/	TOP OF
		T/ TYP.	
FLG.	FLOOR		
FLR.	I LOON I LOON	UNO	UNLESS NOTED OTHERWISE
F.S	FAR SIDE OR FOOTING STEP	VERT	VERTICAL
FT.	FEET	V.I.F.	VERIFY IN FIELD
FIG	FOOTING	W.P	WORK POINT
GA.		W.W.R	WELDED WIRE REINFORCEMENT
GB	GRADE BEAM	W/	WITH
G.C	GENERAL CONTRACTOR		





**nSite** 

ARCHITECTS

17710 Detroit Avenue Lakewood, Ohio 44107
Phone (216) 521-5134 Fax (216) 521-4824

/ERNON, CT

ROPRIETARY TO ADA ARCHITECTS

ζD.

KINDER 295 TALCOTTVILLE RD.

# DATE TYPE
1 06/28/22 ISSUE FOR PERMIT
3 SAME TYPE
3 SAME TYPE
5 SAME TYPE
6 SAME TYPE
7 SAME TYPE
8 SAME TYPE
8

DATE 06/01/22

JOB NO. 21399

SHEET NO.

S-0.2

### GENERAL NOTES & SPECIFICATIONS (cont.)

#### Special Inspection

Special inspection is to be provided in addition to the inspections conducted by the department of building safety and shall not be construed to relieve the owner or his authorized agent from requesting the periodic and called inspections required by the applicable building code. Owner shall engage and pay for a qualified testing agency to perform special inspections.

#### Required Special Inspections

- In addition to the regular inspections, the following items will also require special inspection in accordance with the applicable building code.
- A. Soils compliance prior to foundation inspection (compacting fill, special grading)
- B. Structural concrete over 2,500 psi
- C. Structural masonry
- D. Fabricated structural wood elements
- 2. Special inspector shall meet the qualifications as stated in the applicable building code and shall perform the duties and responsibilities as outlined in the applicable building code. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of the applicable building code.
- 3. Special inspection shall meet the requirements of the applicable building code. Special inspector(s) shall be hired by the owner to perform the required special inspections. The names of persons or firms who are to perform the special inspections shall be forwarded to the building official for approval. The special inspector(s) shall complete and submit all forms required by the building department having jurisdiction.
- Access for special inspection: The construction or work for which special inspection is required shall remain accessible and exposed for special inspection purposes until completion of the required special inspections.

#### 5. The special inspector(s) shall:

- A. Observe the work assigned for conformance to the approved drawing and specifications.
- B. Furnish inspection reports to the engineer of record and building department. Discrepancies shall be brought to the immediate attention of the contractor for correction, then, if not corrected, to the engineer and the building department.
- C. Submit to the engineer of record and the building department a signed final report stating that the work was in conformance with the approved drawings and specifications and the applicable workmanship provisions of the applicable building code.

#### 6. Special Inspection Notes:

- A. Continuous special inspection is always required during the performance of the work unless specifically noted below.
- B. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, continuous special inspection is required during the performance
- of the work except as allowed in the applicable building code and unless specifically noted below.

  C. It is the responsibility of the contractor to provide the special inspector(s) with advance notice, no less than one working day, of the initiation of any work required to have special inspections. All work performed without required special inspection will be subject to removal.

#### 7. Types of work requiring special inspections are:

- A. Open web steel joists and joist girders as required per Table 3.
- B. Concrete construction as required by applicable building code and Table 4. Exceptions are as follows:
  1. Concrete patios, driveways and sidewalks, on grade.
- C. Masonry construction as required in the applicable building code and Table 5, Level B, special
- inspection, except as allowed in the applicable building code.
  D. Wood Construction as required by the applicable building code and as follows:
  1. Metal plate connected wood trusses spanning 60'-0" and greater shall be inspected to
- approved submittal package.

  E. Special inspection for existing site soil conditions, during site preparation and fill placement, to ensure load-bearing requirements in compliance with applicable building code and Table 7 except as allowed in applicable building code.

verify temporary and permanent restraints / bracing are installed in accordance with the

### TABLE 4 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

APPLICABLE TO PROJECT	VERIFICATION AND INSPECTION	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED	REFERENCED STANDARD (a)	APPLICABLE CODE REFERENCE
Х	INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS,     AND VERIFY PLACEMENT.		х	ACI 318 CH. 20, 25.2, 25.3, 26.5.1-26.5.3	1908.4
	2. REINFORCING BAR WELDING:				
	a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706;	***	Х		
	b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"		Х	AWS D1.4 ACI 318: 26.5.4	
	c. INSPECT ALL OTHER WELDS	X			
Х	3. INSPECT ANCHORS CAST IN CONCRETE.		Х	ACI 318: 17.8.2	
Х	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE     MEMBERS: (b)				
	a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS:	X		ACI 318: 17.8.2.4	
Х	b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4a.		Х	ACI 318:17.8.2	_ <del>-</del>
Х	5. VERIFY USE OF REQUIRED DESIGN MIX.		Х	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
Х	6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	х		ASTM C 172 ASTM C 31 ACI 318: 26.4.5, 26.12	1908.10
Х	7. INSPECT CONCRETE PLACEMENT AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	Х		ACI 318: 26.4.5	1908.6, 1908.7, 1908.8
Х	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE     AND TECHNIQUES.		Х	ACI 318: 26.4.7-26.4.9	1908.9
	9. INSPECTION OF PRESTRESSED CONCRETE:				
	a. APPLICATION OF PRESTRESSING FORCES.	Χ		ACI 318: 26.9.2.1	
	b. GROUTING OF BONDED PRESTRESSING TENDONS.	X		ACI 318: 26.9.2.3	
	10. ERECTION OF PRECAST CONCRETE MEMBERS.		Х	ACI 318: 26.8	
Х	11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.		Х	ACI 318: 26.10.2	
Х	12. INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF CONCRETE MEMBER BEING FORMED.		Х	ACI 318: 26.10.1(b)	

(a) Where applicable, also see Section 1705.12, Special Inspection for Seismic Resistance.

(b) Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318 or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be

approved by the building official prior to the commencement of the work.

## TABLE 5 LEVEL B REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

APPLICABLE TO PROJECT						
X	VERIFICATION OF SLUMP FLOW AND VSI AS DELIVERED TO THE SITE IN ACCORDANCE WITH ARTICLE 1.5 B.1.b.3 FOR SELF-CONSOLIDATING GROUT.					
Х	EXCEPT FOR MASONRY THAT IS EXEMPT, PRE-CONSTRUCTION VERIFICATION	OF fm AND fAAC IN ACCORDA	NCE WITH ARTICLE 1.4B			
	MINIMUM INSPECTION					
	VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED			
Х	VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS		Х			
	2. AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
Χ	a. PROPORTION OF SITE-PREPARED MORTAR.		X			
Χ	b. CONSTRUCTION OF MORTAR JOINTS		X			
	c. GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGES		X			
X	d. LOCATION OF REINFORCEMENT, CONNECTORS, AND PRESTRESSING TENDONS AND ANCHORAGES:		X			
	e. PRESTRESSING TECHNIQUE.		X			
	3. PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
Х	a. GROUT SPACE.		Х			
Х	b. GRADE, TYPE, AND SIZE OF REINFORCEMENT AND ANCHOR BOLTS, AND PRESTRESSING TENDONS, AND ANCHORAGES.		х			
Х	c. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND PRESTRESSING TENDONS AND ANCHORAGES.		х			
Х	d. PROPORTIONS OF SITE-PREPARED GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS		х			
Х	e. CONSTRUCTION OF MORTAR JOINTS.		Х			
	4. VERIFY DURING CONSTRUCTION:		1			
Х	a. SIZE AND LOCATION OF STRUCTURAL ELEMENTS		Х			
Х	b. TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION		х			
	c. WELDING OF REINFORCEMENT.	Χ				
Х	d. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F) OR HOT WEATHER (TEMPERATURE ABOVE 90°F).		х			
	e. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE.	Χ				
Х	f. PLACEMENT OF GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS IS IN COMPLIANCE.	Х				
Х	5. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS.		х			

### TABLE 7 REQUIRED VERIFICATION AND INSPECTION OF SOILS

APPLICABLE TO PROJECT	VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
X	VERIFY MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		х
Х	2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		Х
Х	3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		Х
Х	4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	Х	
Х	5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUB-GRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		х



**InSite** 

ARCHITECTS

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A Manual Lakewood Ohio 44107

VERNON, CT

VE

D. ENTS CONTAIN INFORMATION PROPRIET,

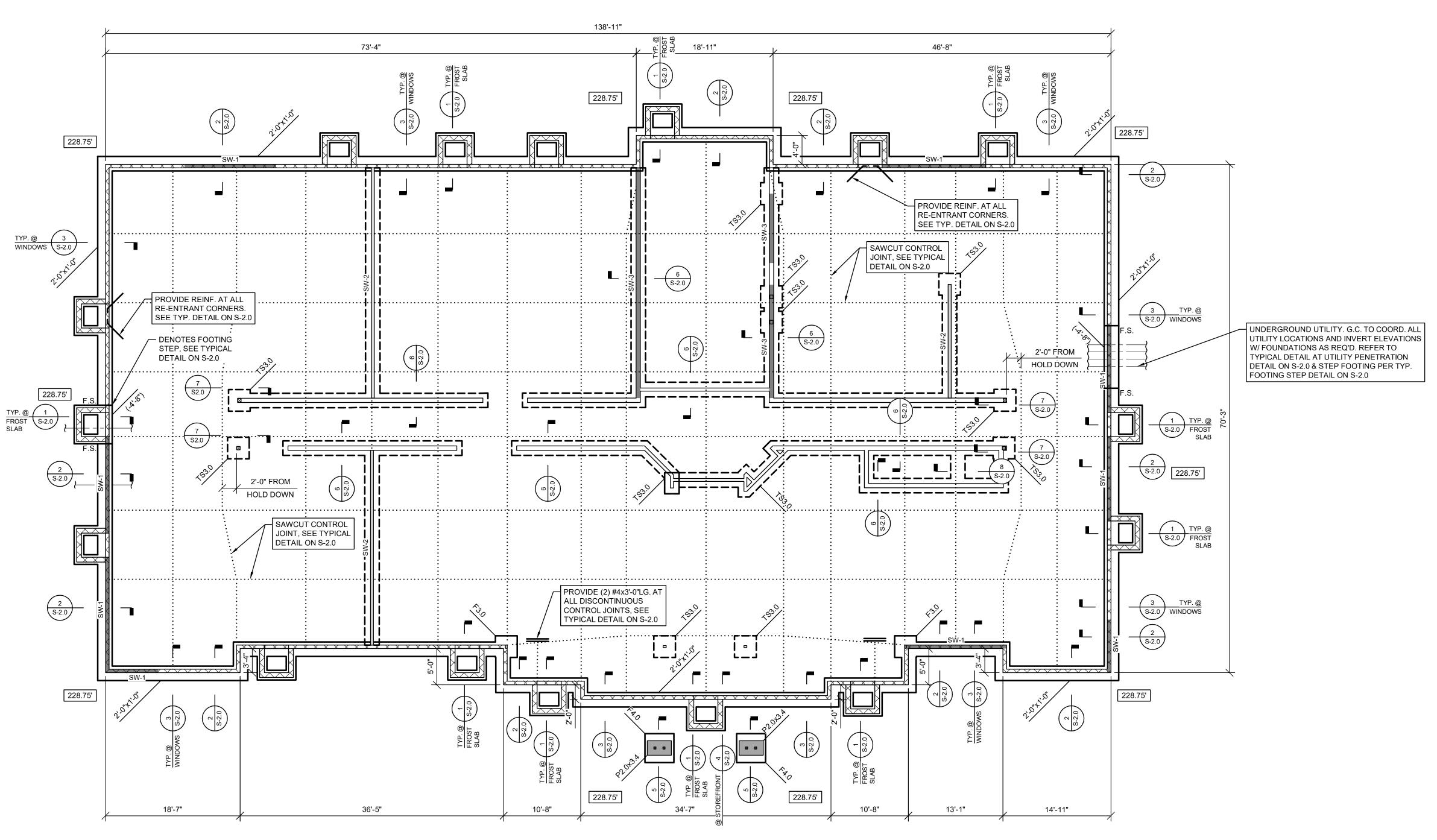
295 TALCOTTVILLE RD.

DATE 06/01/22 JOB NO. 21399

SHEET NO.

Thorson • Baker + Associates
CONSULTING ENGINEERS

3030 West Streetsboro Road
Richfield, Ohio 44286 (330) 659-6675 Fax





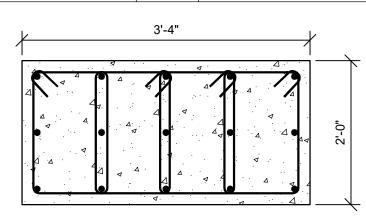
- FLOOR CONSTRUCTION: 4" CONCRETE SLAB ON GRADE WITH ONE LAYER OF 6x6-W2.1xW2.1 W.W.F. PROVIDE 10 MIL VAPOR BARRIER AND 4" LAYER OF GRANULAR FILL BELOW SLAB (UNO).
- TOP OF SLAB ON GRADE ELEVATION = "SLAB ON GRADE" SEE ELEVATION LEGEND. PROJECT DATUM ELEVATION = 228.75' USGS.
- ELEVATIONS NOTED THUS (-X'-X") ARE TO TOP OF FOOTING REFERENCED FROM SLAB ON GRADE ELEVATION (UNO).
- FX.X DENOTES SPREAD FOOTING. SEE SCHEDULE ON THIS SHEET.
- TOWN DENOTES THROWENED SLAD SEE SOURDING ON THIS SUFER
- TSX.X DENOTES THICKENED SLAB. SEE SCHEDULE ON THIS SHEET.
- PX.X DENOTES CONCRETE PIER. SEE CONCRETE PIER SCHEDULE ON THIS SHEET.

   SWLX DENOTES SHEAR WALL SEE SHEET S-4.0 FOR ELEVATIONS SCHEDULES AND DETAIL
- SW-X DENOTES SHEAR WALL. SEE SHEET S-4.0 FOR ELEVATIONS, SCHEDULES AND DETAILS.
- TOP OF EXTERIOR FOOTING ELEVATION = (-2'-8") (UNO).
- CONTINUOUS FOOTINGS ARE MARKED THUS: WIDTH x DEPTH (TOP OF FTG. EL.)
- PROVIDE (2) #4x3'-0" LONG AT ALL REENTRANT CORNERS.
- SEE ARCHITECTURAL DRAWINGS FOR EXTENT AND FINISH OF SLAB ON GRADE AND ANY FLOOR DEPRESSIONS, UNDERFLOOR CONDUITS, DRAINS, ETC.
- SEE SHEET S-0.1, S-0.2, & S-0.3 FOR GENERAL NOTES & SPECIFICATIONS.
- SEE SHEET S-2.0 FOR TYPICAL DETAILS.
- DENOTES PRESUMED FINISH GRADE AT LOCATION SHOWN. VERIFY VALUE WITH FINAL SITE PLAN AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

SPREAD FOOTING SCHEDULE 4000 PSF				
SPREAD FOOTING SIZES			DEINEODOINO	
MARK	LENGTH	WIDTH	THICKNESS	REINFORCING
F3.0	3'-0"	3'-0"	1'-0"	(4) - #4 E.W. BOT.
F4.0	4'-0"	4'-0"	1'-0"	(4) - #5 E.W. BOT.

THICKENED SLAB SCHEDULE 4000 PSF				
THICKENED SLAB SIZES			DEINICODOINO	
MARK LENGTH		WIDTH	THICKNESS	REINFORCING
TS3.0	3'-0"	3'-0"	1'-0"	(4) - #4 E.W. BOT.

CONCRETE PIER SCHEDULE			
MARK PIER SIZE (LENGTH x WIDTH) TYPE			REINFORCING
P2.0x3.4	2'-0"x3'-4"	I	(15) - #6 VERT., W/ #3 TIES @ 4" O.C. @ ANCHOR RODS (MIN. (3) TIES); & #3 TIES @ 12" O.C. REMAINING.

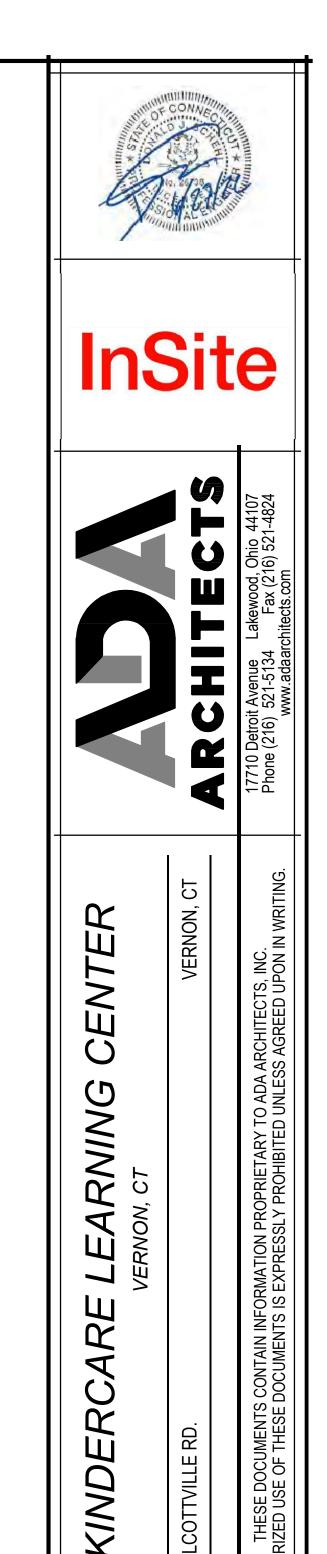


CONCRETE PIER TYPES

ELEVATION LEGEND			
LEVEL DESIGNATION	ELEVATION (UNO)	PROJECT DATUM	
SLAB ON GRADE	0'-0"	•	
TRUSS BEARING	9'-1 1/8"		
CANOPY TRUSS BEARING	10'-6"		
GYM ROOF TRUSS BEARING	12'-0"		

- ELEVATIONS ON PLAN MAY VARY FROM ELEVATIONS SHOWN IN THE ELEVATION LEGEND. SEE PLAN FOR SPECIFIC ELEVATION VARIATIONS.
- • DENOTES THE LEVEL THAT IS THE PROJECT DATUM.





REVISIONS

**FOUNDATION** 

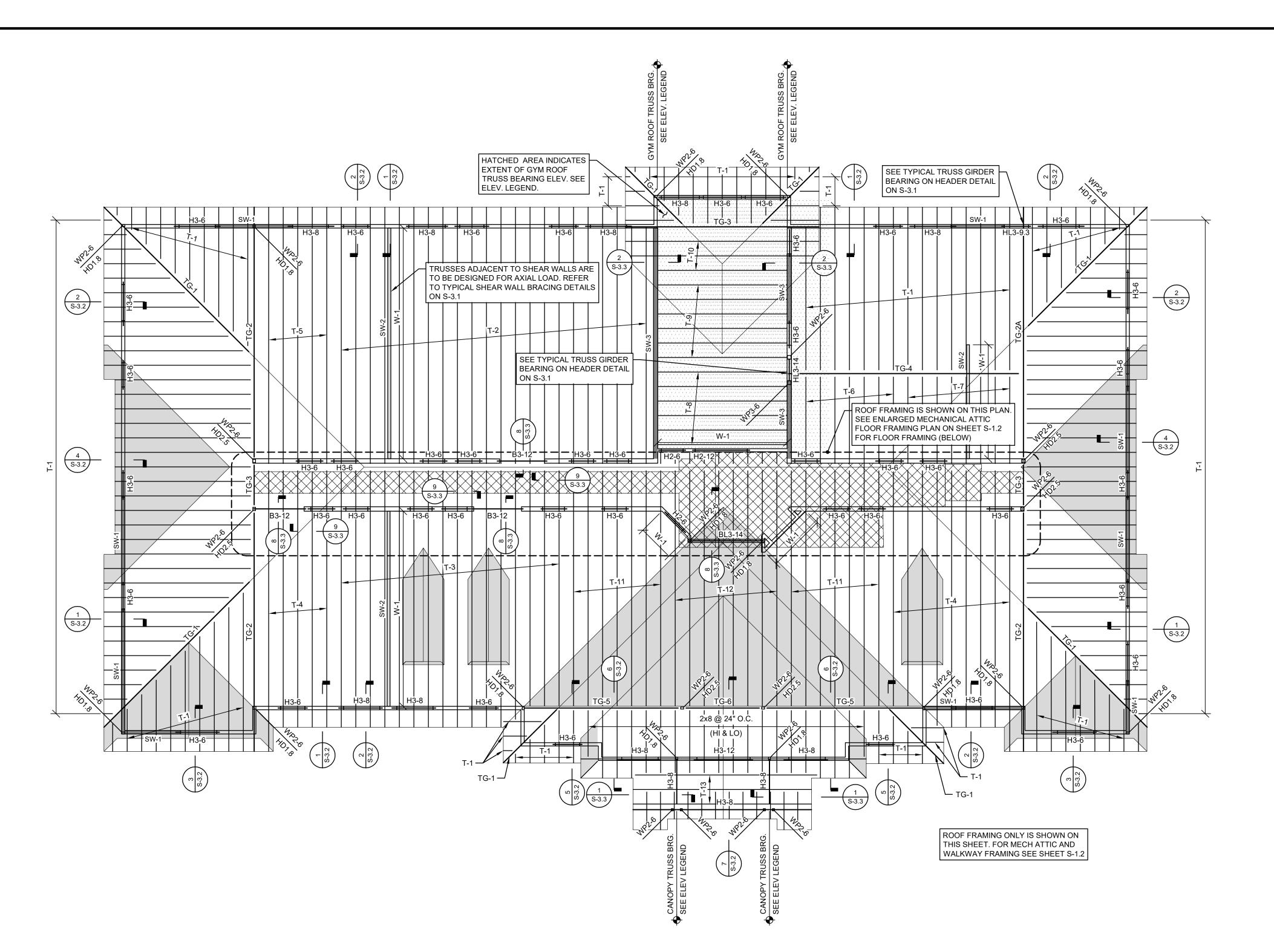
PLAN

JOB NO.

SHEET NO.

06/01/22

21399





- ROOF CONSTRUCTION: 19/32" APA RATED SHEATHING, SPAN RATING 40/20, EXPOSURE 1, NAILED TO FRAMING. SEE TYPICAL ROOF SHEATHING LAYOUT AND ATTACHMENT DETAIL ON S-3.0.
- DENOTES ACCESSIBLE MECH. ATTIC. COORD. EXTENTS W/ ARCH. & MECH DWGS. ATTIC WALKWAY IS DESIGNED FOR 20PSF LIVE LOAD AND 10 PSF DEAD LOAD.
- T-X DENOTES PREFABRICATED WOOD ROOF TRUSSES DESIGNED BY SUPPLIER AND SPACED AT A MAXIMUM OF 2'-0" O.C.
- 2x ROOF & FLOOR JOISTS SHALL BE SPACED AT A MAXIMUM OF 2'-0" O.C.
- TRUSS BEARING (T/B) = "TRUSS BEARING" (UNO) SEE ELEVATION LEGEND. ELEVATION IS REFERENCED FROM PROJECT DATUM SLAB ON GRADE ELEVATION.
- DENOTES OVERBUILD AREAS OR DORMERS TO BE CONSTRUCTED ON TOP OF ROOF STRUCTURE USING STICK FRAMING OR PIGGYBACKED TRUSSES.
- PROVIDE METAL ANCHORS ON ALL TRUSSES AND ROOF FRAMING TO RESIST WIND UPLIFT. SEE SCHEDULE ON SHEET S-3.0 FOR ALLOWABLE ANCHOR LOADS. TRUSS SUPPLIER TO INDICATE ANCHORS ON TRUSS ERECTION PLAN.
- SEE ARCHITECTURAL ROOF PLANS FOR MISCELLANEOUS DORMER LOCATIONS.
- SEE ARCHITECTURAL DRAWINGS FOR ROOF ELEVATIONS AND ROOF SLOPES.
- SEE SHEET S-0.1, S-0.2, & S-0.3 FOR GENERAL NOTES & SPECIFICATIONS.
- SEE SHEET S-3.0 FOR TYPICAL DETAILS.
- SEE SHEET S-4.0 FOR TRUSS PROFILES.
- SEE SHEET S-3.0 FOR TYPICAL WALL ELEVATION.
- SEE SHEET S-3.0 FOR TYPICAL ROOF SHEATHING LAYOUT AND ATTACHMENT DETAIL.
- WPX-X DENOTES WOOD POST. SEE SHEET S-3.0 FOR WOOD POST SCHEDULE.
- BX-X DENOTES WOOD BEAM. SEE SHEET S-3.0 FOR BEAM SCHEDULE. TOP OF BEAM, IS AT TRUSS BEARING ELEVATION (UNO).
- HX-X DENOTES WOOD HEADER TO BE LOCATED AT HEAD OF OPENING. SEE SHEET S-3.0 FOR WOOD HEADER SCHEDULE.
- W-1 DENOTES 2x4 STUD WALL, SEE SCHEDULE ON SHEET S-3.0.
- SW-X DENOTES SHEAR WALL. SEE SHEET S-4.0 FOR ELEVATIONS, SCHEDULES AND DETAILS.
- COORDINATE SIZE AND LOCATION OF ALL ROOF OPENINGS WITH ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.
- EXACT ROOF TRUSS/JOIST LAYOUT AND DIMENSIONS ARE THE RESPONSIBILITY OF TRUSS FABRICATOR AND FRAMING SUBCONTRACTOR. TRUSS/JOIST LAYOUT SHALL BE COORDINATED WITH THE MECHANICAL, ELECTRICAL AND PLUMBING SUBCONTRACTORS PRIOR TO SUBMISSION OF TRUSS SHOP DRAWINGS, FABRICATION AND INSTALLATION TO ENSURE THE PROPOSED LAYOUT PROVIDES NECESSARY CLEARANCES FOR THE MECHANICAL, PLUMBING AND ELECTRICAL TRADE ELEMENTS, FIXTURES, DUCTING AND PIPING.
- CONTRACTOR TO COORDINATE ADDITIONAL LOADING FOR BUILDING EQUIPMENT SYSTEMS TO ROOF TRUSSES/JOISTS WITH ROOF TRUSS MANUFACTURER.
- EXACT FRAMING LAYOUT SHALL BE COORDINATED WITH ALL OTHER TRADE SUBCONTRACTORS PRIOR TO INSTALLATION FOR ITEMS INCLUDING BUT NOT LIMITED TO: ELECTRIC PANEL, ELECTRIC FIXTURES (INCLUDING CAN LIGHTS), FIRE EXTINGUISHER CABINETS, MEDICINE CABINETS, CONTROL JOINTS, DOOR FRAMING AND HVAC DUCTS/SOFFITS.
- IF THE LAYOUT IS CHANGED SUCH THAT THE LOADING ON HEADERS/BEAMS IS INCREASED, THE FRAMING SUBCONTRACTOR SHALL SUBMIT A REVISED SCHEDULE OF THOSE HEADERS/BEAMS STAMPED BY AN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED.

PRE-ENGINEER	ED WO	OD ROOF TRU	SS DESIGN LOADS:	
SUPERIMPOSED DEAD LOAD	PSF	LIVE LOAD	PSF	
TOP CHORD	6	TOP CHORD	SEE DESIGN LIVE LOADS IN GENERAL NOTES & SPECIFICATIONS	
BOTTOM CHORD	12			
TOTAL SUPERIMPOSED DEAD LOAD	18	BOTTOM CHORD	MECHANICAL ATTIC LIVE LOAD = 20 PSF + MECH. EQUIPMENT (SEE PLAN FOR WEIGHTS)	
TRUSS SELF-WT. DEAD LOAD	**			

- \*\* TRUSS DEAD LOAD TO BE DETERMINED BY TRUSS MANUFACTURER.
- TRUSSES SHALL BE DESIGNED FOR ALL APPLICABLE LOAD CASES DEFINED IN THE APPLICABLE BUILDING CODE INCLUDING BUT NOT LIMITED TO DEAD, LIVE, SNOW, WIND, SIESMIC, ETC. IN ADDITION, TRUSSES SHALL BE DESIGNED FOR ALL DEAD LOADS FOR EQUIPMENT AND CONDUIT INDICATED ON ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS.
- IN ADDITION TO OTHER APPLICABLE LOAD CASES TRUSS SHALL BE DESIGNED FOR TOTAL DEAD LOAD IN CONJUNCTION WITH A 20 PSF LL ON THE BOTTOM CHORD ONLY (NO TOP CHORD LIVE
- DEFLECTION CRITERIA: LIVE LOAD TOTAL LOAD L/240

ELEVATION LEGEND			
LEVEL DESIGNATION	ELEVATION (UNO)	PROJECT DATUM	
SLAB ON GRADE	0'-0"	•	
TRUSS BEARING	9'-1 1/8"		
CANOPY TRUSS BEARING	10'-6"		
GYM ROOF TRUSS BEARING	12'-0"		

- ELEVATIONS ON PLAN MAY VARY FROM ELEVATIONS SHOWN IN THE ELEVATION LEGEND. SEE PLAN FOR SPECIFIC ELEVATION VARIATIONS.

- • DENOTES THE LEVEL THAT IS THE PROJECT DATUM.





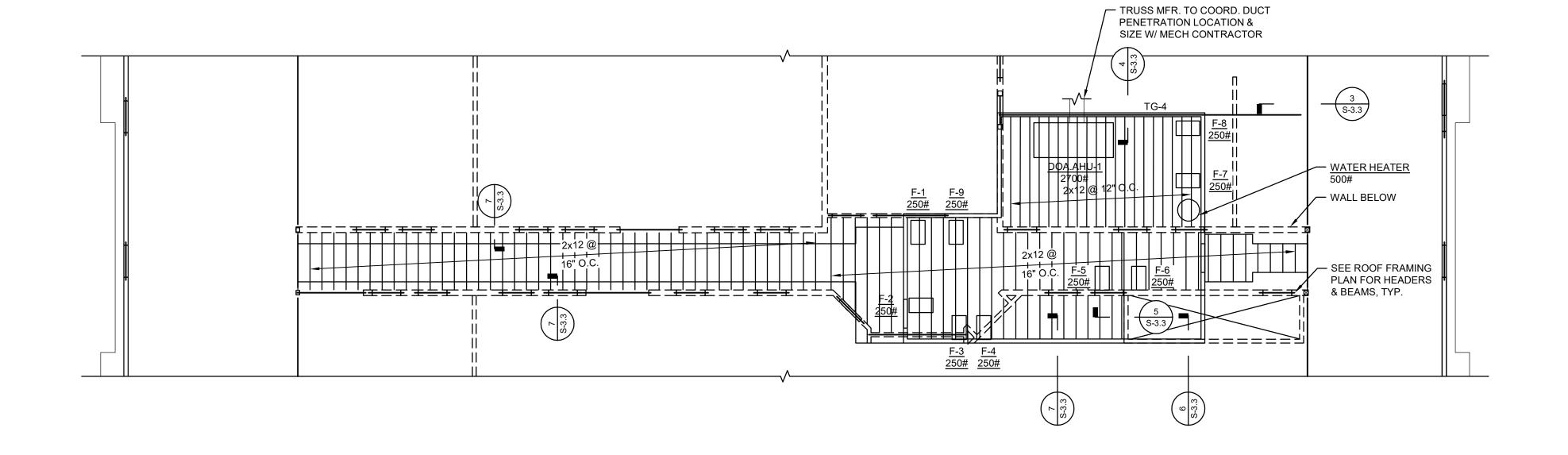
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REVISIONS

**ROOF FRAMING** PLAN

06/01/22 DATE 21399 JOB NO.





- MECHANICAL ATTIC FLOOR CONSTRUCTION: 3/4" APA RATED FIRE RETARDANT FLOOR SHEATHING GLUED AND FASTENED TO FLOOR FRAMING. SEE TYPICAL FLOOR SHEATHING ATTACHMENT DETAIL
- SEE SHEET S-1.1 FOR ADDITIONAL PLAN NOTES.

ELEVATION LEGEND			
LEVEL DESIGNATION	ELEVATION (UNO)	PROJECT DATUM	
SLAB ON GRADE	0'-0"	•	
TRUSS BEARING	9'-1 1/8"		
CANOPY TRUSS BEARING	10'-6"		
GYM ROOF TRUSS BEARING	12'-0"		

- ELEVATIONS ON PLAN MAY VARY FROM ELEVATIONS SHOWN IN THE ELEVATION LEGEND. SEE PLAN FOR SPECIFIC ELEVATION VARIATIONS.
- • DENOTES THE LEVEL THAT IS THE PROJECT DATUM.

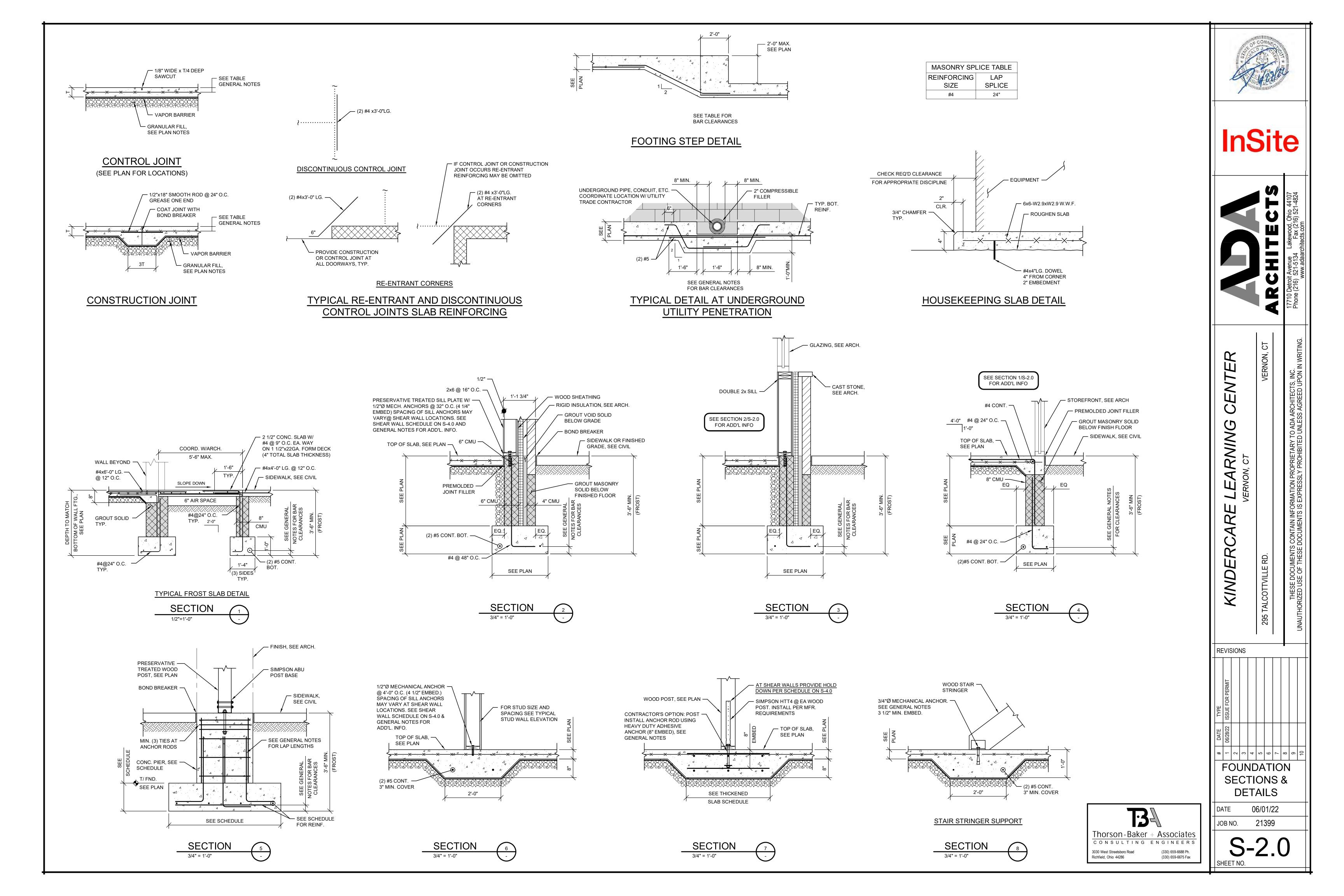
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REVISIONS

MECHANICAL ATTIC FLOOR FRAMING PLAN

DATE 06/01/22 21399 JOB NO.



WOOD BEAM SCHEDULE					
<u>MARK</u>	SIZE	MOMENT CAPACITY (FT. LBS)	SHEAR CAPACITY (LBS)	MOMENT OF INERTIA (in <sup>4</sup> )	MINIMUM # OF BRG. STUDS UNDER EACH END OF BEAM
B3-12	(3) 2x12				(2) 2x
B3-14	(3) 1.75"x14" LVL	40600	13970	1201	(2) 2x

\*NOTES

SEE GENERAL NOTES FOR ALLOWABLE STRESS & SHEAR VALUES FOR LAMINATED VENEER LUMBER.

• # OF JACK STUDS UNDER EACH END OF BEAM IS TYPICAL U.N.O. ON PLAN.

MARK	<u>SIZE</u>	MOMENT CAPACITY (FT. LBS)	SHEAR CAPACITY (LBS)	MOMENT OF INERTIA (in <sup>4</sup> )	# OF JACK STUDS UNDER EACH END OF HEADER	# OF KING STUDS EACH END OF HEADER
H2-6	(1) 2x				(1) 2x	(2) 2x
H2-12	(2) 2x			-	(1) 2x	(2) 2x
H3-6	(3) 2x6				(1) 2x	(2) 2x
H3-8	(3) 2x8			-	(1) 2x	(2) 2x
H3-12	(3) 2x12				(2) 2x	(2) 2x
HL3-9.3	(3) 1.75"x9.3" LVL	19,700	9,480	375	(2) 2x	(2) 2x

- SEE GENERAL NOTES FOR ALLOWABLE STRESS & SHEAR VALUES FOR STANDARD SAWN LUMBER.
- # OF JACK STUDS UNDER EACH END OF BEAM IS TYPICAL U.N.O. ON PLAN. VALUES SHOWN IN THE TABLE ABOVE ARE FOR A DURATION FACTOR OF 1.0

WOOD FASTE	ENING SCHEDULE (MI	NIMUM)	
CONNECTION TYPE	FASTENER SIZE & QUANTITY	COMMENTS	TYPICAL DETAIL
2x FLOOR JOIST AT BEARING CONDITION	(3) 8d	TOENAIL	Α
SOLE PLATE TO JOIST OR BLOCKING	16d @ EA. JOIST OR TRUSS	FACE NAIL	A,B OR C
SINGLE OR DOUBLE TOP PLATE TO STUD (END NAIL)	(2) 16d	END NAIL	D
STUD TO SOLE PLATE	(4) 8d OR (2) 16d	8d TOENAIL OR 16d END NAIL	Е
DOUBLE STUDS	16d @ 24"O.C.	FACE NAIL	F
TOP PLATES, LAPS AND INTERSECTIONS	SEE TYP. LAP SPLICE OF 2x TOP PLATES	FACE NAIL. COORD. W/ DETAIL	G
HEADER, TWO PIECES	16d @ 16"O.C.	EACH EDGE	Н
HEADER TO KING STUD	(4) 8d	TOENAIL	I
2x CEILING AND ATTIC FLOOR JOISTS LAPS OVER PARTITION	(3) 16d	FACE NAIL	J
CEILING AND ATTIC FLOOR JOISTS TO PARALLEL RAFTERS	(3) 16d	FACE NAIL	К
SOLID 2x RAFTER TO PLATE	(3) 8d	TOENAIL	L
ROOF TRUSS TO PLATE	(2) 12d	TOENAIL THROUGH BOTTOM CHORD & UPLIFT FASTENERS	М
BUILT-UP CORNER STUDS	16d @ 24"O.C.		N
BUILT-UP BEAMS - SOLID SAWN LUMBER	16d @ 12"O.C.	EACH EDGE	0
PLYWOOD OR OSB FLOOR SHEATHING		SEE TYPICAL FLOOR SHEATHING LAYOUT & ATTACHMENT DETAIL	WD105
PLYWOOD OR OSB ROOF SHEATHING		SEE TYPICAL ROOF SHEATHING LAYOUT & ATTACHMENT DETAIL	WD106-X O WD107-X
RIM BOARD TO TOP PLATE	8d @ 6"O.C.	TOENAIL	A,B OR C
RIM BOARD TO TOP & BOTTOM CHORD OF I-JOISTS, FLAT TRUSS, OR 2x	(1) 10d BOX NAIL	FACE NAIL	A, B OR C

- ALL NAILS TO BE COMMON NAILS MINIMUM, UNO.
- IN ADDITION TO THE ABOVE CHART, THE MINIMUM NAILING AS SPECIFIED BY THE BUILDING CODE SHALL BE REQUIRED. USE WHICHEVER NAILING REQUIREMENT IS MORE STRICT.
- SEE SECTIONS FOR ANY ADDITIONAL FASTENING OR INFORMATION.

WOOD TRUSS METAL UPLIFT TIE DOWN ANCHOR SCHEDULE			
MARK	SIMPSON STRONG TIE ANCHOR OR EQUIVALANT	UPLIFT CAPACITY	COMMENTS
	SIMPSON H5	265#	
	SIMPSON H2.5A	535#	
	SIMPSON H10A	760#	
	SIMPSON H14	1050#	
HD1.2	SIMPSON H16	1265#	PROVIDE PA51 TIE DOWN AT BASE OF WALL STUD
HD1.8	SIMPSON LGT2	1785#	PROVIDE LTTI31 TIE DOWN AT BASE OF WALL STUD
HD2.5	SIMPSON MGT WITH HDU5	3300#	PROVIDE HDU5 TIE DOWN AT BASE OF WALL STUD
HD3.7	SIMPSON HGT-3 WITH (2) HTT5	3740#	PROVIDE (2) HTT5 TIE DOWN AT BASE OF WALL STUI

- NOTE: VALUES SHOWN ARE FOR SPF/HF.

PROVIDE METAL TRUSS ANCHOR AT EA. TRUSS, TYP. — (2) 2x PLATE 3'-6" MAX. SPAN

SEE TYPICAL LAP SPLICE

OF 2x TOP PLATE DETAIL

SEE WALL STUD

SCHEDULE

MAXIMUM

12" MAX.

@ 16" O.C. TYP.

UNO. ON PLAN

EA. SIDE OF BUTT JOINT

- HEADER AT OPENINGS SEE PLAN AND SCHEDULE

-PROVIDE HORIZONTAL STUD

BRIDGING @ 4'-0" O.C. VERT.

PROVIDE MECH. ANCHOR

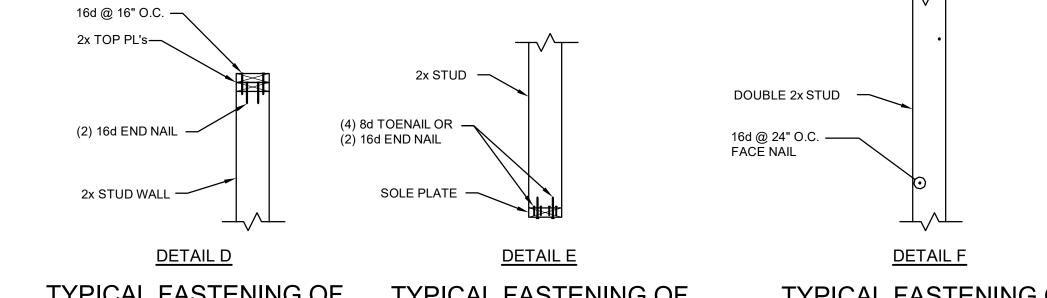
- RUSS MANUFACTURER TO INDICATE ANCHOR TO BE USED ON ERECTION PLAN UNLESS NOTED OTHERWISE ON PLAN.

		WALL STUD SCH	HEDULE	
FLOOR	EXTERIOR STUDS		INTERIOR STUD	INTERIOR STUD
TYPICAL		CORNER	BEARING WALLS	NON-BEARING WALLS
1st FLOOR	2x6 @ 16"O.C.	2x6 @ 16"O.C.	TYP. (UN0) 2x6 @ 16"O.C. W-1: 2x4 @ 16" O.C.	SEE ARCHITECTURAL

- ALL SPECIES SPRUCE - PINE - FIR No. 1/No. 2 UNO. - SEE SHEAR WALL ELEVATIONS AND SCHEDULES FOR ADDITIONAL INFORMATION AT SHEAR WALLS.

WOOD POST SCHEDULE	
MARK	STUD SIZE & QUANTITY
WP2-6 (2) 2x6's	

• SEE GENERAL NOTES FOR DESIGN VALUES OF STUDS.



TYPICAL FASTENING OF TOP PLATE TO STUD

TYPICAL FASTENING OF STUD TO SOLE PLATE

16d @ 16" O.C.

DETAIL H

DETAIL N

TYPICAL FASTENING OF

**BUILT-UP CORNER STUDS** 

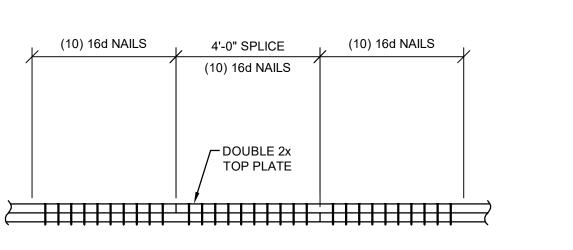
EA. EDGE

TYPICAL FASTENING OF **DOUBLE STUD CONNECTION** 

2x STUD -

(4) 8d TOENAIL -

· KING STUD



DETAIL O

TYPICAL FASTENING OF BUILT-UP

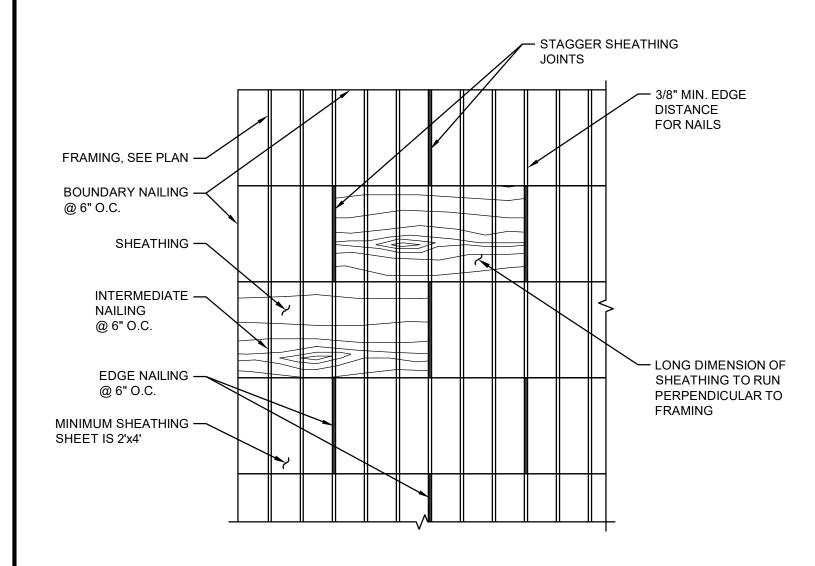
BEAMS SOLID SAWN LUMBER

DETAIL G

TYPICAL FASTENING OF LAP SPLICE TYPICAL FASTENING OF FOR 2x TOP PLATES HEADER (2) PIECES

DETAIL I TYPICAL FASTENING OF **HEADER TO KING STUD** 

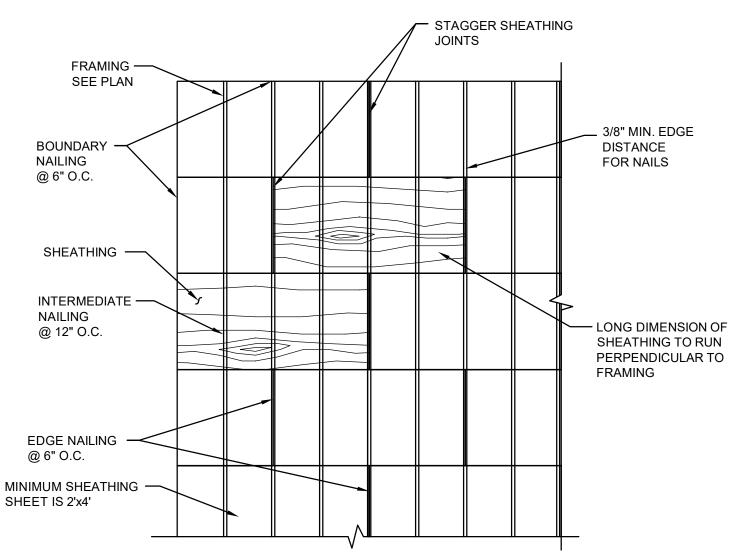
### CEILING OR FLOOR JOIST PRE-ENGINEERED WOOD TRUSSES \_ 2x TOP PL's METAL UPLIFT TIE DOWN — \_ 2x TOP PL'S ANCHOR AT EACH TRUSS 2x PARTITION WALL (2) 10d TOENAIL AT EA. TRUSS -- 2x BLOCKING @ 24" O.C. 2x STUD WALL 16d @ 24" O.C.— DETAIL M DETAIL J TYPICAL FASTENING OF TYPICAL FASTENING OF 2x **ROOF TRUSS TO PLATE CEILING AND FLOOR JOISTS** LAPS OVER PARTITIONS - (2) 2x BLOCKING @ 24" O.C. **BUILT UP BEAM** 16d @ 12" O.C. EACH EDGE EACH FACE 2x STUD - 16d @ 24" O.C.



TYPICAL FLOOR SHEATHING LAYOUT & ATTACHMENT TO WOOD FRAMING DETAIL

NOTES:

- SHEATHING SHALL BE GLUED AND NAILED TO FLOOR FRAMING WITH 3" 10d COMMON NAILS WITH 1 1/2" MIN. EMBEDMENT.



WALL STUDS.

SEE FASTENING SCHEDULE.

ROOF TRUSS -

@ 24" O.C.

ADD ONE STUD FOR EA.

JAMB STUD TO SUPPORT

HEADER - TYPICAL EACH

SEE SCHEDULE FOR # OF JACK STUDS

2x TREATED WOOD

1/2"Ø MECH. ANCHOR BOLTS

TYPICAL WALL ELEVATION

AT WALL LOCATIONS WHERE MULTIPLE STUDS ARE REQUIRED TO

SEE WALL STUD SCHEDULE FOR SIZE, SPACING AND SPECIES OF

SUPPORT VERTICAL LOADS, A CONTINUOUS LOAD PATH SHALL BE PROVIDED TO SUPPORT THOSE LOADS THROUGH THE STRUCTURE TO THE FOUNDATIONS. THIS MAY BE ACCOMPLISHED THROUGH THE USE OF RIM JOISTS, SQUASH BLOCKS OR OTHER APPROPRIATE MEANS BASE ON LOCATION AND DETAILING CONSIDERATIONS.

SILL PLATE, TYP.

SIDE OF OPENING

@ 2'-8" O.C. MAX.

STUD INTERUPTED AT

OPENINGS

TYPICAL ROOF SHEATHING LAYOUT & ATTACHMENT TO WOOD FRAMING DETAIL

NOTES:

- SHEATHING SHALL BE NAILED TO ROOF FRAMING WITH 3" 10d
- COMMON NAILS WITH 1 1/2" EMBEDMENT.



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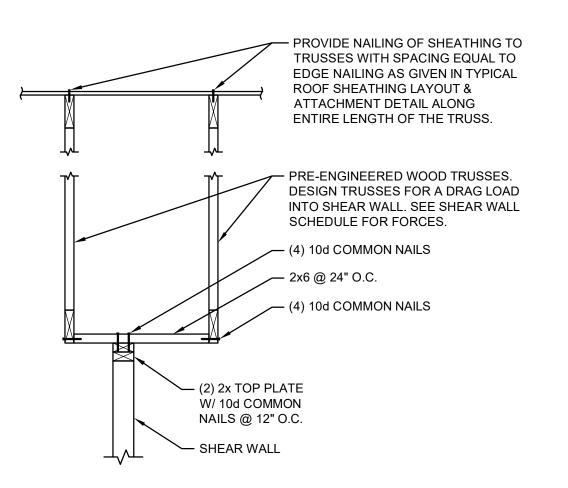
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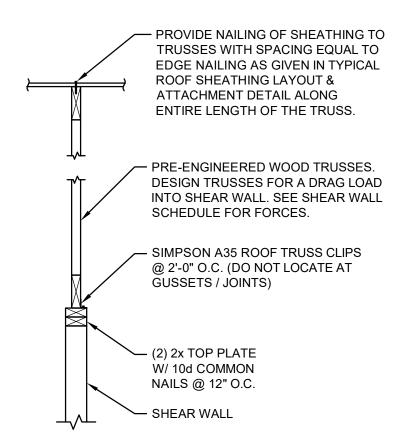
REVISIONS

TYPICAL WOOD **FRAMING** 

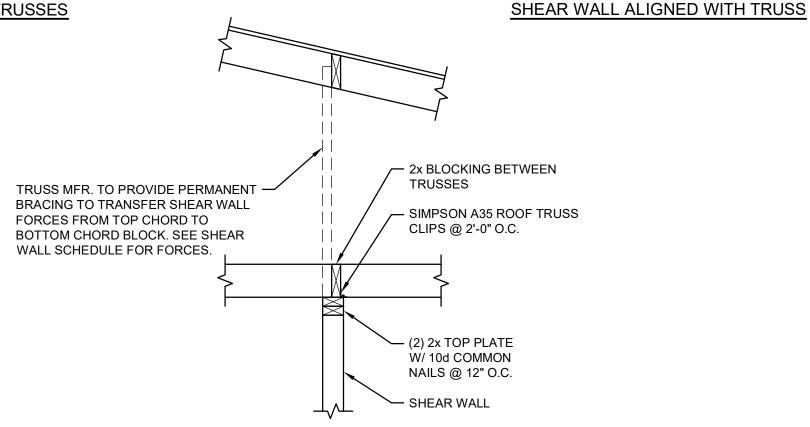
**DETAILS** 

06/01/22 DATE 21399 JOB NO.





SHEAR WALL BETWEEN TRUSSES

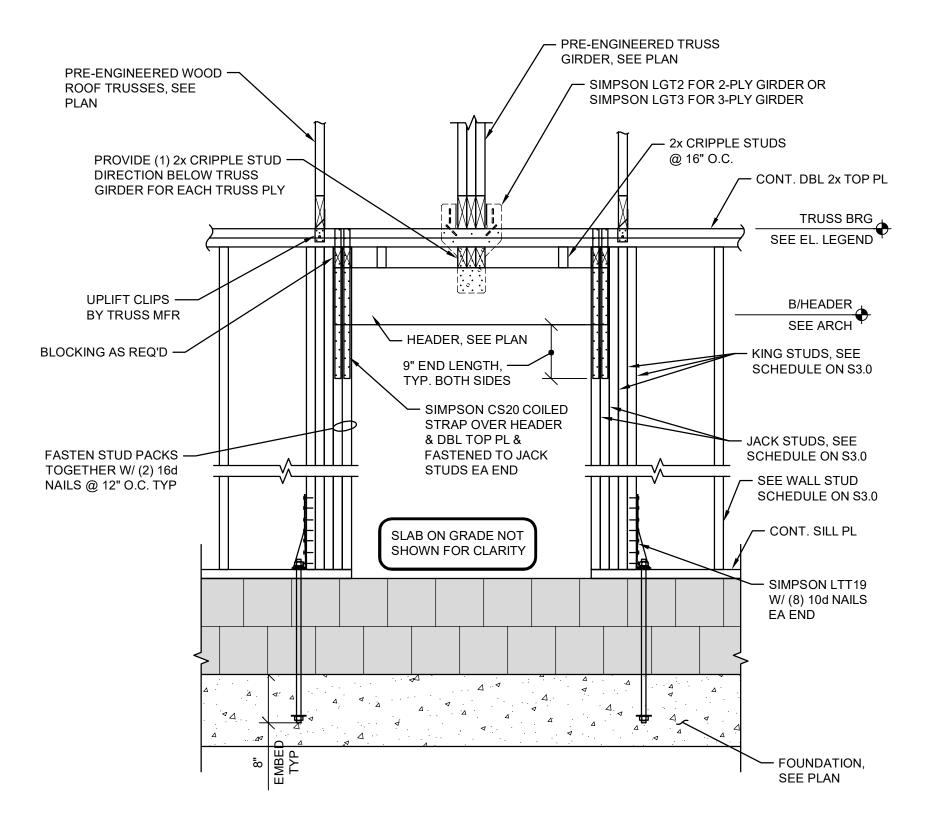


SHEAR WALL PERPENDICULAR TO TRUSSES

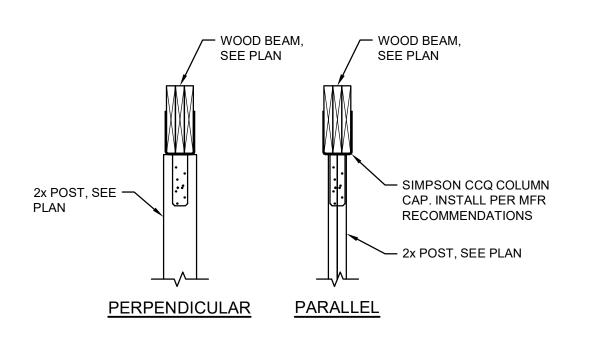
# TYPICAL SHEAR WALL BRACING DETAILS

### NOTES:

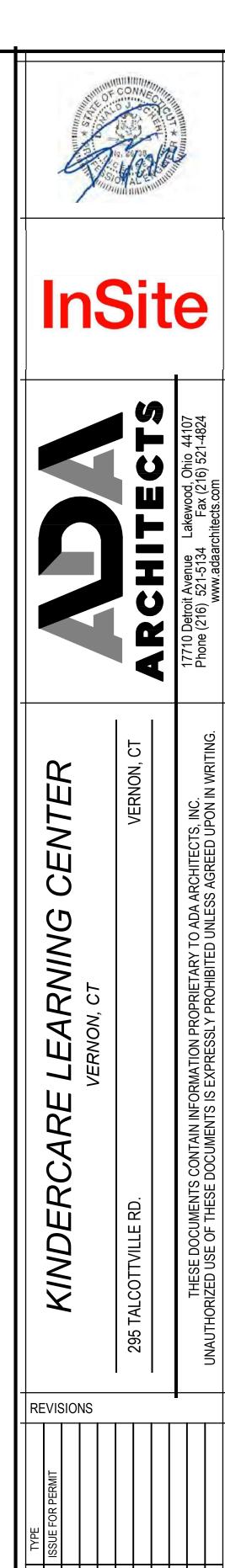
 TRUSS MFR. TO DESIGN WOOD ROOF TRUSSES FOR BOTH SEISMIC AND WIND AXIAL LOADS PROVIDED ON SHEAR WALL SCHEDULE ON S-4.0



TYPICAL TRUSS GIRDER BEARING ON WOOD HEADER



TYPICAL WOOD BEAM BEARING
ON WOOD 2x POST DETAIL



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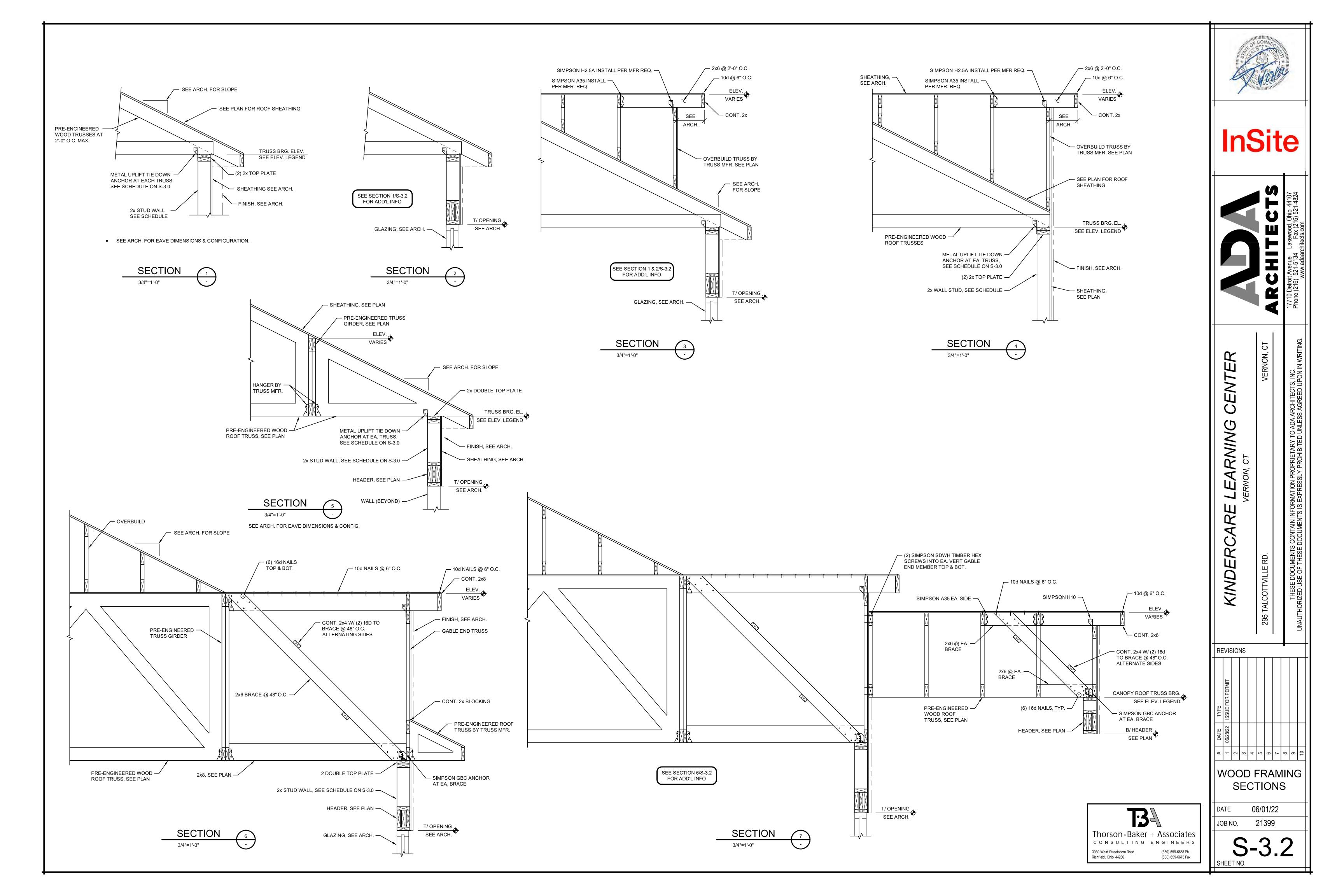
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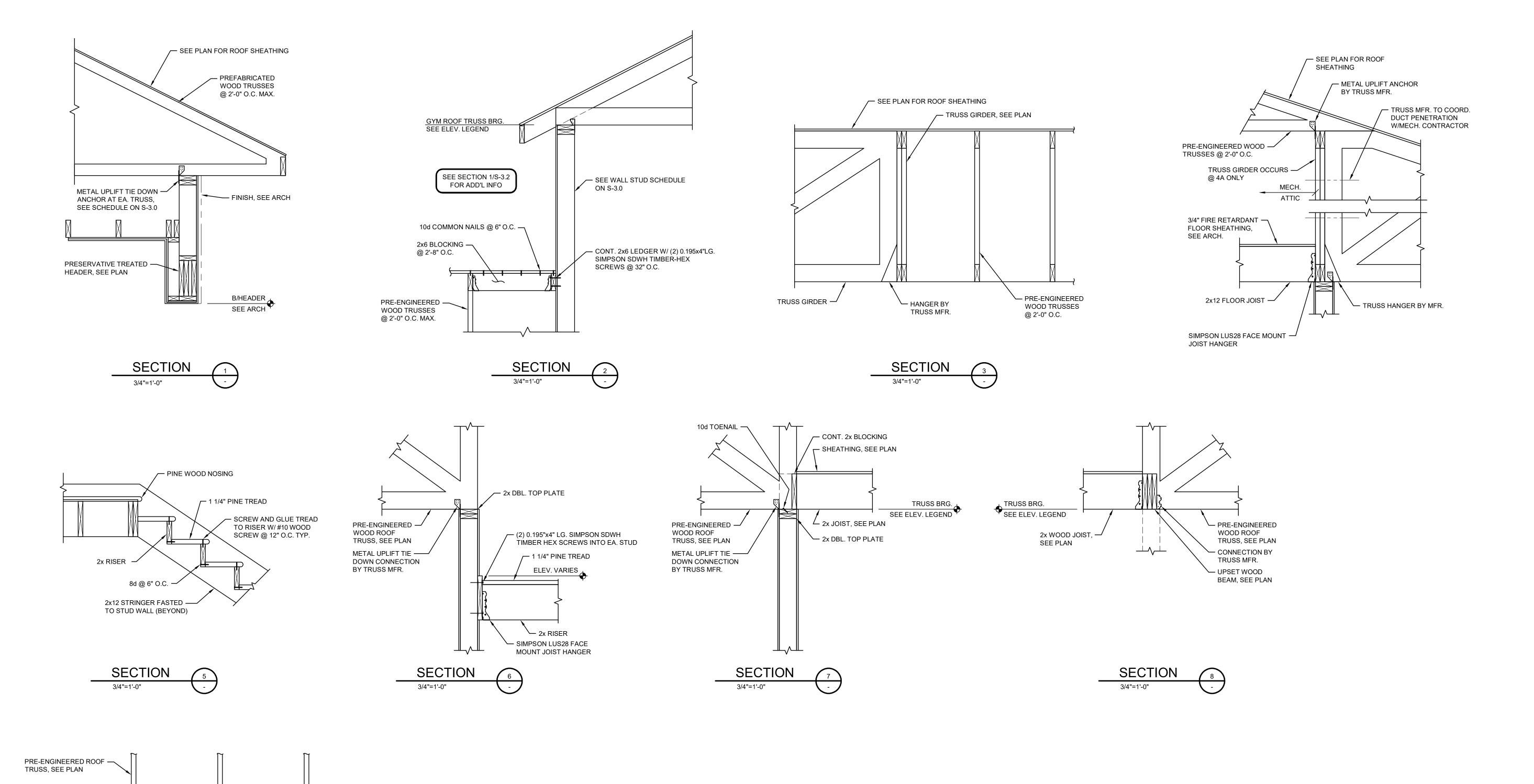
TYPICAL WOOD
FRAMING
DETAILS

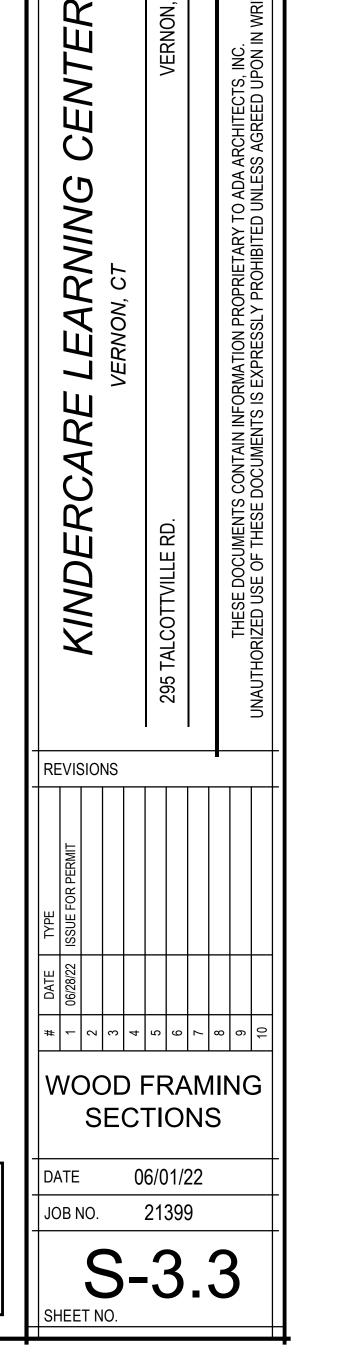
DATE 06/01/22

JOB NO. 21399

Sociates
N E E R S
0659-6688 Ph.







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3030 West Streetsboro Road Richfield, Ohio 44286



- WOOD BEAM, SEE PLAN

SIMPSON LUS FACE MOUNT HANGER

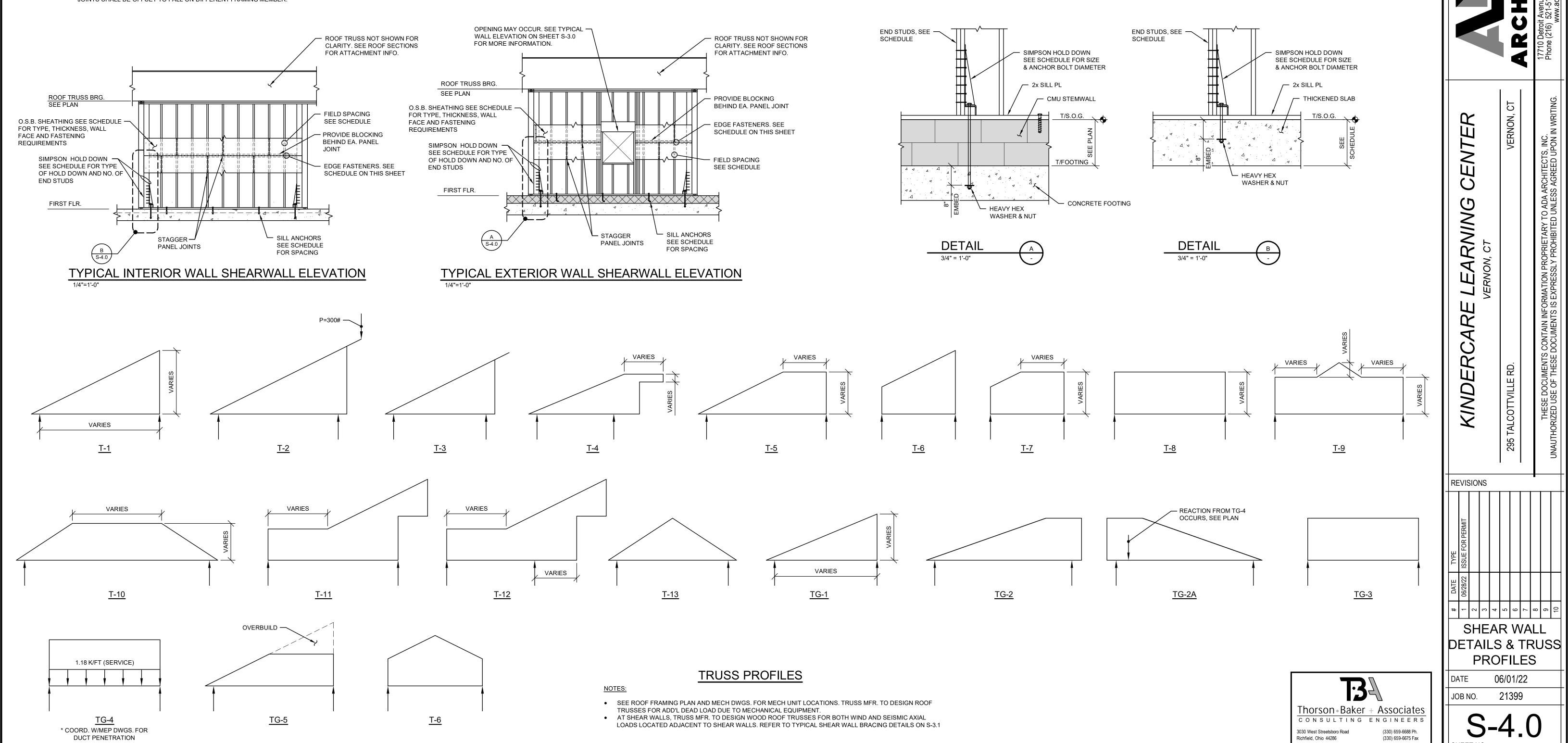
➤ WOOD POST, SEE PLAN

2x DBL. TOP -PLATE

> SIMPSON CCQ — COLUMN CAP

				SH	EAR WALL SCHEDULE					
MARK	STRAP/HOLD DOWN AND ANCHORS	SHEATHING TYPE	SHEATHING FACE	SHEATHING THICKNESS	SHEATHING FASTENER TYPE	SHEATHING FASTENER EDGE/FIELD SPACING (INCHES)	ALLOWABLE SHEAR LOAD (lb/ft)	No. OF END STUDS	SILL PLATE ANCHORS	COMMENTS
SW-1	SIMPSON HTT4 W/ (18) 16d COMMON OR GALV. BOX NAILS	O.S.B.	EXT. FACE OR ONE SIDE	15/32"	10d COMMON OR GALV. BOX NAILS	6/12	285 (WIND) 400 (SEISMIC)	(2) 2x	1/2"Ø MECH. ANCHOR @ 2'-8" O.C. (4 1/4" EMBED) SEE GENERAL NOTES	
SW-2	SIMPSON HTT4 W/ (18) 16d COMMON OR GALV. BOX NAILS	GYP BOARD	BOTH FACES	5/8"	6d COOLER (0.092"x1 7/8"LG., 19/64" HEAD) OR WALLBOARD NAIL (0.0915"x1 7/8"LG. 19/64" HEAD) OR 0.120" NAIL x 1 3/4"LG. MIN. 3/8" HEAD	7/7	230 (WIND & SEISMIC)	(2) 2x	1/2"Ø MECH. ANCHOR @ 2'-8" O.C. (4 1/4" EMBED) SEE GENERAL NOTES	
SW-3	SIMPSON HTT4 W/ (18) 16d COMMON OR GALV. BOX NAILS	GYP BOARD	BOTH FACES	5/8"	6d COOLER (0.092"x1 7/8"LG., 19/64" HEAD) OR WALLBOARD NAIL (0.0915"x1 7/8"LG. 19/64" HEAD) OR 0.120" NAIL x 1 3/4"LG. MIN. 3/8" HEAD	4/4	290 (WIND & SEISMIC)	(2) 2x	1/2"Ø MECH. ANCHOR @ 2'-8" O.C. (4 1/4" EMBED) SEE GENERAL NOTES	

- A. FRAMING AT ADJOINING PANELS SHALL BE 3" NOMINAL OR WIDER AT THE FOLLOWING CONDITIONS:
- EDGE SPACING OF 3" OR LESS AND FASTENER TYPE OF 10d (3"x0.148") HAVING PENETRATION INTO FRAMING OF MORE THAN 1 1/2".
- EDGE SPACING OF 2" PANEL EDGES SHALL BE STAGGERED.
- B. WHERE PANEL EDGES ARE APPLIED ON BOTH FACES OF WALL AND EDGE NAIL SPACING IS LESS THAN 6" O.C. ON EITHER SIDE, PANEL JOINTS SHALL BE OFFSET TO FALL ON DIFFERENT FRAMING MEMBER.



**PROFILES** 

06/01/22

21399

SHEET NO.



	Cooling: 1 each - Split System, Capacity = 156 kBtu/h, Air-Cooled Condenser, Air Economizer
	Obbling. I capit Cystem, Capacity - 100 kBta/ff, 7th Cooled Condensor, 7th Economizer
	Proposed Efficiency = 11.60 EER, Required Efficiency: 11.00 EER + 12.4 IEER
	Fan System: DOA.AHU Compliance (Motor nameplate HP method): Passes
	Fans:
	FAN 5 Supply, Constant Volume, 3330 CFM, 4.0 motor nameplate hp, 0.0 fan efficiency grade
	, , , , , , , , , , , , , , , , , , , ,
1	ECH-1 (Single Zone):
	Heating: 1 each - Unit Heater, Electric, Capacity = 10 kBtu/h
	No minimum efficiency requirement applies
	Fan System: ECH Compliance (Motor nameplate HP method) : Passes
	Fans:
	FAN 6 Supply, Constant Volume, 150 CFM, 0.1 motor nameplate hp, 0.0 fan efficiency grade
2	ECH-2/3 (Single Zone):
_	Heating: 1 each - Unit Heater, Electric, Capacity = 5 kBtu/h
	No minimum efficiency requirement applies
	· · · · · · · · · · · · · · · · · · ·
	Fan System: ECH Compliance (Motor nameplate HP method) : Passes
	Fans:
	FAN 6 Supply, Constant Volume, 150 CFM, 0.1 motor nameplate hp, 0.0 fan efficiency grade
1	EUH-1 (Single Zone):
	Heating: 1 each - Unit Heater, Electric, Capacity = 10 kBtu/h
	No minimum efficiency requirement applies
	Fan System: EUH Compliance (Motor nameplate HP method) : Passes
	Face
	Fans:
	FAN 7 Supply, Constant Volume, 350 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade
1	WH-1:
	Gas Storage Water Heater, Capacity: 60 gallons, Input Rating: 120 kBtu/h w/ Circulation Pump
	Proposed Efficiency: 95.00 % Et, Required Efficiency: 80.00 % Et
	r reposed Emeloney, cores /s Est redamed Emeloney, cores /s Es
Mechai	nical Compliance Statement
	nical Compliance Statement
Complia	nce Statement: The proposed mechanical design represented in this document is consistent with the building pla
Complia: specifica	nce Statement: The proposed mechanical design represented in this document is consistent with the building plations, and other calculations submitted with this permit application. The proposed mechanical systems have bee
<i>Complia</i> specifica designed	nce Statement: The proposed mechanical design represented in this document is consistent with the building pla tions, and other calculations submitted with this permit application. The proposed mechanical systems have bee I to meet the 2015 IECC requirements in COM <i>check</i> Version 4.1.5.3 and to comply with any applicable mandatory
Complia specifica designed requiren	nce Statement: The proposed mechanical design represented in this document is consistent with the building plations, and other calculations submitted with this permit application. The proposed mechanical systems have been to meet the 2015 IECC requirements in COMcheck Version 4.1.5.3 and to comply with any applicable mandatory ments listed in the Inspection Checklist.
Complia specifica designed requiren	nce Statement: The proposed mechanical design represented in this document is consistent with the building pla tions, and other calculations submitted with this permit application. The proposed mechanical systems have bee I to meet the 2015 IECC requirements in COM <i>check</i> Version 4.1.5.3 and to comply with any applicable mandatory

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CT\Mechanical\Design\Vernon COMcheck.cck

**Quantity System Type & Description** 

1 DOA (Single Zone):

A/E	ARCHITECT/ENGINEER	LAT	LEAVING AIR TEMPERATURE
•	ABOVE	LB	POUND
AFF	ABOVE FINISHED FLOOR	MBH	THOUSAND BTUH
AHJ	AUTHORITY HAVING JURISDICTION	MD	MANUAL DAMPER
ALUM.	ALUMINUM	MECH.	MECHANICAL
ARCH.	ARCHITECTURAL	MCA	MINIMUM CIRCUIT AMPACITY
BDD	BACKDRAFT DAMPER	MOCP	MAXIMUM OVERCURRENT PROTECTION
BHP		MOD	MOTOR-OPERATED DAMPER
BOD	BOTTOM OF DUCT	(N)	NEW
BTUH	BRITISH THERMAL UNIT PER HOUR		NOISE CRITERIA
CAV	CONSTANT AIR VOLUME	NFPA	
CC	COOLING COIL	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NTS	NOT TO SCALE
CO		OA	OUTSIDE AIR
CO2	CARBON DIOXIDE	OBD	OPPOSED BLADE DAMPER
COD	CENTER OF DUCT	OC	ON CENTER
COP	COEFFICIENT OF PERFORMANCE	OD	OUTSIDE DIMENSION
(D)	DEMO	PD	
DB	DRY BULB	POC	
dB	DECIBEL	PSIG	
DDC	DIRECT DIGITAL CONTROL	(R)	RELOCATE/RELOCATED
DN	DOWN	RA	RETURN AIR
(E)	EXISTING	REF.	REFERENCE
EA		RH	RELATIVE HUMIDITY
EAT			REVOLUTIONS PER MINUTE
EER	ENERGY EFFICIENCY RATIO		REFRIGERANT SUCTION & LIQUID LINES
EFF.	EFFICIENCY	SA	SUPPLY AIR
ESP		SF	
F	FAHRENHEIT	SENS.	
FD	FIRE DAMPER		SHEET METAL & AIR CONDITIONING
FLA	FULL LOAD AMPS	SMACINA	CONTRACTORS NATIONAL ASSOCIATION
FPM	FEET PER MINUTE	SP	STATIC PRESSURE
		SPD	STATIC PRESSURE DROP
FSD	FIRE/SMOKE DAMPER	SS	STAINLESS STEEL
FT.	FOOT (FEET)	SQ.	SQUARE
G	NATURAL GAS	TA	TRANSFER AIR
GA.	GAUGE	TYP.	TYPICAL
GPM	GALLONS PER MINUTE	UH	UNIT HEATER
GRD	GRILLES, REGISTERS AND DIFFUSERS	UL	UNDERWRITERS LABORATORIES
HGRH	HOT GAS REHEAT	UNO	UNLESS NOTED OTHERWISE
HP	HORSEPOWER, HEAT PUMP	V/PH	VOLTS/PHASE
HVAC	HEATING, VENTILATION AND AIR	•	•
ID	CONDITIONING	VAV	VARIABLE AIR VOLUME
ID	INSIDE DIAMETER	VFD W	VARIABLE FREQUENCY DRIVE
IN.	INCH		WATT WET DIJLD
IN. WG	INCHES WATER GAUGE	WB	WET BULB
KW	KILOWATT	WC	WATER COLUMN

LEGEND	
₹ 00x00 ₹	RECTANGULAR DUCT - FIRST DIMENSION IS SIDE SHOWN
<b>9</b> 00 <b>"</b> ø	ROUND DUCT (OR FLAT OVAL - 00x00Φ)
<i>[</i>	LINED DUCTWORK - DIMENSIONS ARE INSIDE CLEAR
<b>∱M</b> OR <b>X1</b>	SUPPLY AIR RECTANGULAR DUCT RISE OR DROP
<b>∮ I</b> OR <b></b>	RETURN AIR RECTANGULAR DUCT RISE OR DROP
<b>∮ ⊘</b> OR <b>⋌ ∮</b>	EXHAUST AIR RECTANGULAR DUCT RISE OR DROP
<b>₹</b> OR ○}	ROUND DUCT RISE OR DROP
	MANUAL VOLUME DAMPER
	FIRE DAMPER (VERTICAL ORIENTATION)
<b>*</b>	FIRE DAMPER (HORIZONTAL ORIENTATION)
f M	MOTOR OPERATED DAMPER
<i>f</i> ] <i>f</i>	BACKDRAFT DAMPER
[Rec.]	MITERED ELBOW WITH TURNING VANES
	TRANSITION, RECT. TO RECT. OR ROUND TO ROUND
	TRANSITION, RECTANGULAR TO ROUND OR OVAL
<u>DN</u> <u>UP</u>	GRADE ARROW - INDICATES RISE OR DROP IN DUCT
	45° BRANCH TAKE-OFF FROM RECTANGULAR DUCT
	45° BRANCH TAKE-OFF FROM ROUND DUCT
<b>∑</b> √√+	SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION (4-WAY UNO)
- <u>E</u> WH	2-WAY SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
<u>E</u>	RETURN GRILLE WITH HARD DUCT CONNECTION
<b>€</b>	EXHAUST GRILLE WITH HARD DUCT CONNECTION
⊕ <sub>RTU−1</sub>	THERMOSTAT (ASSOCIATED UNIT TAG, WHERE SHOWN)
(\$)	TEMPERATURE SENSOR
$\oplus$	HUMIDITY SENSOR
P	PRESSURE SENSOR
©	CARBON DIOXIDE (CO2) SENSOR
S	SWITCH
<u></u>	SMOKE DETECTOR

# GENERAL NOTES

- 1. THE CONTRACTOR SHALL PROVIDE A COMPLETE HVAC SYSTEM FOR THE PROJECT. ITEMS OR WORK NOT SHOWN OR SPECIFIED ON THE MECHANICAL DRAWINGS, BUT REQUIRED FOR THE COMPLETE HVAC SYSTEM, SHALL BE PROVIDED AND SHALL CONFORM WITH ACCEPTED TRADE PRACTICES, LOCAL CODES AND GOVERNING AUTHORITIES.
- 2. THE MECHANICAL DRAWINGS ARE SCHEMATIC IN NATURE AND ARE TO CONVEY DESIGN INTENT ONLY. COORDINATE AND FIELD—LOCATE DUCTWORK AND EQUIPMENT LOCATIONS PRIOR TO FABRICATION OR INSTALLATION, TO MEET JOB REQUIREMENTS. REQUIRED OFFSETS, FITTINGS AND GENERAL INSTALLATION REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER OR DESIGN TEAM SHALL NOT BE RESPONSIBLE FOR SHOP—FABRICATED DUCTWORK SIZED DIRECTLY FROM THE MECHANICAL DRAWINGS.
- 3. ALL WORK AND MATERIALS SHALL CONFORM TO THE CODES LISTED IN THE DESIGN CRITERIA AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
- 4. ALL DIMENSIONS LISTED ARE IN INCHES, UNLESS NOTED OTHERWISE.
- 5. PROVIDE CLEAR MAINTENANCE ACCESS AREA AROUND ALL EQUIPMENT AS REQUIRED BY CODES AND AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- 6. PROVIDE ACCESS PANELS IN WALLS, CEILINGS AND DUCTWORK, AS REQUIRED, FOR ACCESS TO VALVES, DAMPERS AND EQUIPMENT.
- PROVIDE AND INSTALL ENGRAVED PLASTIC SIGNS AT ALL MECHANICAL EQUIPMENT INDICATING EQUIPMENT TAG.
- 8. TRAPPED CONDENSATE DRAINS FROM ALL MECHANICAL EQUIPMENT SHALL BE PROVIDED FOR
- PROPER DRAINAGE TO SUIT EQUIPMENT FURNISHED. SEE PLUMBING PLANS FOR CONTINUATION.
- ALL ROOF PENETRATIONS SHALL BE COORDINATED WITH ROOFING CONTRACTOR, WHERE APPLICABLE. PENETRATIONS SHALL BE WEATHER—TIGHT AND BE IN ACCORDANCE WITH ROOFING SYSTEM REQUIREMENTS TO MAINTAIN ALL WARRANTIES.
- 10. COORDINATE EXACT LOCATION OF GRILLES, REGISTERS AND DIFFUSERS WITH ARCHITECTURAL REFLECTED CEILING PLANS AND EQUIPMENT OF ALL TRADES.
- I1. DUCT CONSTRUCTION AND SUPPORTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
- 12. LIMITED CLEARANCES EXIST ABOVE CEILING. COORDINATE LOCATION AND ELEVATION OF DUCTWORK WITH SPRINKLERS, LIGHT FIXTURES, AND ALL OTHER TRADES. ATTIC DUCTWORK SHOULD BE COORDINATED WITH FINAL TRUSS DESIGN.
- 13. INDICATED DUCT SIZES ARE INSIDE CLEAR DIMENSIONS, INCLUDING LINER WHERE USED.
- 14. ALL EXPOSED DUCTWORK SHALL BE SHEET METAL ONLY NO FLEXIBLE DUCTWORK IS ALLOWED.
- 15. WHERE SPACE IS AVAILABLE, AT CONTRACTOR'S OPTION, EQUIVALENT ROUND DUCT MAY BE SUBSTITUTED FOR RECTANGULAR DUCT AND VICE VERSA. THIS DOES NOT APPLY TO EXPOSED DUCTWORK, WHICH MUST BE SPIRAL ROUND OR RECTANGULAR AS SHOWN ON THE MECHANICAL DRAWINGS. EQUIVALENT DUCT SIZING SHALL BE BY THE "EQUAL FRICTION" METHOD.
- 16. ROUND RUNOUTS TO DIFFUSERS AND GRILLES SHALL BE PROVIDED WITH A 45° TIME-AND-A-HALF, RADIUS, OR SPIN-IN FITTING ONLY. NO STRAIGHT TAPS OR AIR SCOOPS ARE ALLOWED. PROVIDE MANUAL VOLUME DAMPER FOR EACH RUNOUT. VOLUME DAMPERS ABOVE NON-ACCESSIBLE CEILINGS SHALL BE REMOTE-OPERATED WITH ACTUATOR IN AN ACCESSIBLE LOCATION.
- 7. ROUND RUNOUTS TO DIFFUSERS SHALL BE THE SAME SIZE AS DIFFUSER NECK SIZE, UNLESS NOTED OTHERWISE.
- 18. MAXIMUM FLEXIBLE DUCT LENGTH TO BE 5'-0" ON POSITIVE PRESSURE SYSTEMS AND 2'-0" ON NEGATIVE PRESSURE SYSTEMS. USE GALVANIZED STEEL DUCT FOR INDIVIDUAL RUNOUTS OVER MAXIMUM ALLOWABLE FLEXIBLE DUCT LENGTH.
- 19. PROVIDE FLEXIBLE CONNECTIONS AT EACH DUCT CONNECTION TO FANS, PACKAGED HVAC EQUIPMENT, AIR HANDLING UNITS, FURNACES AND SIMILAR EQUIPMENT.
- 20. ALL DUCTWORK SHALL BE EXTERNALLY INSULATED PER SPECIFICATIONS.
- 21. MOUNT ALL THERMOSTATS AND WALL-MOUNTED SENSORS AT 48" AFF, UNLESS NOTED OTHERWISE. PROVIDE LABEL WITH ASSOCIATED EQUIPMENT TAG.
- 22. ALL WIRING FOR LESS THAN 110V SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR, UNLESS NOTED OTHERWISE. ALL WORK SHALL BE PER NATIONAL ELECTRIC CODE AND APPLICABLE LOCAL CODES AND ORDINANCES.
- 23. LOCATE ALL OUTSIDE AIR INTAKES A MINIMUM OF 10'-0" CLEAR FROM ALL PLUMBING VENTS, GAS FLUES, AND EXHAUST AIR DISCHARGE LOCATIONS.
- 24. PROVIDE SEISMIC RESTRAINTS FOR MECHANICAL EQUIPMENT, PIPING AND DUCTWORK PER SMACNA AND LOCAL REGULATIONS.
- 25. CONTRACTOR SHALL RECORD ON AS-BUILT DRAWINGS ALL SIZES, MATERIALS, AND LOCATIONS OF ALL EQUIPMENT AND DUCTWORK THAT DEVIATES FROM THE MECHANICAL DRAWINGS.
- 26. CONTRACTOR SHALL REPLACE ALL HVAC EQUIPMENT FILTERS AT CERTIFICATE OF OCCUPANCY.

# MECHANICAL SHEET INDEX

- M-0.0 MECHANICAL COVER SHEET
  M-0.1 MECHANICAL SCHEDULES
- M-0.2 MECHANICAL DETAILS
  M-1.0 MECHANICAL PLAN
- M-1.1 MECHANICAL ATTIC PLAN
- M-3.0 MECHANICAL SPECIFICATIONS

**InSite** 

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REVISIONS

REVISIONS

MECHANICAL COVER SHEET

DATE 06/01/22

M-0.0

(208) 914-5087 (208) 989-2572 www.apexeng.co
Apex Project No. 082129

						(	GAS	FUR	RNACE	& E\	/APORA	TOR CO	OIL S	CHED	JLE						
	CORRESPONDING				FAN (1)		OA		COOL	ING COIL (2)			HE	ATING			E	LECTRICAL			
TAG	EQUIPMENT	AREA SERVED	ORIENTATION	CFM	ESP	MOTOR HP	CFM	NOMINAL TONS	EAT	NET TOTAL CAPACITY	NET SENSIBLE CAPACITY	TYPE	MAX. INPUT	MAX. OUTPUT	STAGES (MIN.)	AFUE	V/PH	MCA	МОСР	MANUFACTURER & MODEL	REMARKS
<u>F–1</u>	<u>CU-1</u>	TODDLER 1 & 2	UPFLOW	800	0.90"	1/2	475	2	75°F DB 63°F WB	22.6 MBH	16.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-2</u>	<u>CU-2</u>	TODDLER 3 & INFANT 3	UPFLOW	1,000	0.90"	1/2	545	2.5	75°F DB 63°F WB	27.2 MBH	21.2 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU30BS3	(3)
<u>F-3</u>	<u>CU-3</u>	INFANT 1 & 2	UPFLOW	800	0.90"	1/2	460	2	75°F DB 63°F WB	22.6 MBH	16.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-4</u>	CU-4	VESTIBULE, OFFICE, LOBBY, STAFF, WARMING PANTRY, LAUNDRY	UPFLOW	1,200	0.90"	1/2	160	3	75°F DB 63°F WB	33.0 MBH	25.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU36BS3	(3)
<u>F–5</u>	<u>CU-5</u>	PRESCH00L	UPFLOW	800	0.90"	1/2	410	2	75°F DB 63°F WB	22.6 MBH	16.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-6</u>	CU-6	PRE-K 1	UPFLOW	600	0.90"	1/2	250	1.5	75°F DB 63°F WB	16.8 MBH	12.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-7</u>	<u>CU-7</u>	DISCOVERY PRESCHOOL 3	UPFLOW	600	0.90"	1/2	255	1.5	75°F DB 63°F WB	16.8 MBH	12.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-8</u>	<u>CU-8</u>	DISCOVERY PRESCHOOL 1 & 2	UPFLOW	800	0.90"	1/2	510	2	75°F DB 63°F WB	22.6 MBH	16.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)
<u>F-9</u>	<u>CU-9</u>	PRE-K 2	UPFLOW	600	0.90"	1/2	320	1.5	75°F DB 63°F WB	16.8 MBH	12.6 MBH	NAT. GAS, CONDENSING	40.0 MBH	38.8 MBH	2	95%	120/1	9.3	15	FURNACE: TRANE S9X2B040U3PSB COIL: TRANE 4PXCBU24BS3	(3)

(1)	FURNACE	SHALL	BE	WIRED	TO	OPERATE	ΑT	THE	SAME	FAN	SPEED	FOR	ALL	MODES	OF
• •	<b>OPERATIO</b>	N (HEA	TING	, COOL	ING	AND FAN	-01	NLY).							

(2) COOLING CAPACITY BASED ON COMBINATION WITH ASSOCIATED CONDENSING UNIT AT 95°F AMBIENT. ENTERING AIR TEMPERATURE BASED ON SUMMER INDOOR & ERV SUPPLY AIR TEMPERATURES.

(3) PROVIDE WITH:

- VERTICAL CONCENTRIC VENT KIT

FILTER BOX FOR 1" FILTERCONDENSATE OVERFLOW SAFETY FLOAT SWITCH

REMOTE SENSORS QUANTITY PER SYSTEM.

- CONDENSATE OVERFLOW SAFETY FLOAT SWITCH
- SEVEN-DAY PROGRAMMABLE THERMOSTAT (HONEYWELL TH8321R OR LATEST MODEL, NO EXCEPTIONS) AND REMOTE SENSOR(S) (HONEYWELL TR21 OR TR21a). SEE PLANS FOR

	С	OND	ENSIN	TIV	SCHE	DULE		
TAG	TYPE	NOMINAL	ELE	CTRICAL		EFFICIENCY (SEER)	MANUFACTURER & MODEL	REMARKS
IAG	HPL	TONS	V/PH	MCA	MFS	(1)	MANUFACTURER & MODEL	KEMAKKS
<u>CU-1</u>	COOLING-ONLY, AIR-COOLED	2	208-230/1	14.0	20	15.0	TRANE 4TTR4024	(2)(3)
<u>CU-2</u>	COOLING-ONLY, AIR-COOLED	2.5	208-230/1	17.0	25	15.0	TRANE 4TTR4030	(2)(3)
<u>CU-3</u>	COOLING-ONLY, AIR-COOLED	2	208-230/1	14.0	20	15.0	TRANE 4TTR4024	(2)(3)
<u>CU-4</u>	COOLING-ONLY, AIR-COOLED	3	208-230/1	18.0	30	15.0	TRANE 4TTR4036	(2)(3)
<u>CU-5</u>	COOLING-ONLY, AIR-COOLED	2	208-230/1	14.0	20	15.0	TRANE 4TTR4024	(2)(3)
<u>CU-6</u>	COOLING-ONLY, AIR-COOLED	1.5	208-230/1	12.0	20	15.0	TRANE 4TTR4018	(2)(3)
<u>CU-7</u>	COOLING-ONLY, AIR-COOLED	1.5	208-230/1	12.0	20	15.0	TRANE 4TTR4018	(2)(3)
<u>CU-8</u>	COOLING-ONLY, AIR-COOLED	2	208-230/1	14.0	20	15.0	TRANE 4TTR4024	(2)(3)
<u>CU-9</u>	COOLING-ONLY, AIR-COOLED	1.5	208-230/1	12.0	20	15.0	TRANE 4TTR4018	(2)(3)

- (1) SEER VALUES LISTED ARE BASED ON AHRI RATINGS FOR EQUIPMENT COMBINATION.
- (2) PROVIDE WITH ANTI-SHORT CYCLE TIMER, EVAPORATOR DEFROST CONTROL AND HARD START KIT. LINE SET PIPING SIZED & INSTALLED PER MANUFACTURER'S REQUIREMENTS (VERIFY LENGTHS REQUIRED). MINIMUM 5-YEAR WARRANTY ON COMPRESSOR AND MINIMUM 1-YEAR WARRANTY ON ALL OTHER PARTS & LABOR.
- (3) PROVIDE WITH CONDENSER PAD, DIVERSITECH E-LITE OR EQUAL.

# HVAC SEQUENCES OF OPERATION

<u>DEDICATED OUTDOOR AIR SYSTEM (DOAS)</u> : <u>DOA.AHU-1</u> & <u>DOA.CU-1</u>

- 1. OPERATION: DEDICATED OUTDOOR AIR SYSTEM (DOAS) SHALL BE STAND—ALONE. SYSTEM SHALL OPERATE AUTOMATICALLY PER BUILDING SCHEDULED OCCUPIED HOURS.
- 2. CONTROL: UNIT CONTROLLER WITH REMOTE FUNCTIONALITY
- A) BUILDING OCCUPIED HOURS SHALL BE SCHEDULED AT THE UNIT CONTROLLER. CONSULT BUILDING OWNER OR REPRESENTATIVE FOR SCHEDULED OCCUPIED HOURS.
- B) SETPOINTS, MONITORING, AND ALARMS SHALL BE INITIALLY PROGRAMMED AT THE UNIT CONTROLLER.C) SYSTEM SHALL HAVE REMOTE ACCESS CAPABILITY TO MONITOR, ADJUST
- SETPOINTS, AND VIEW AND CLEAR ALARMS.

  3. OCCUPIED HOURS SEQUENCING:
- A) SUPPLY AND EXHAUSTS FANS SHALL RUN CONTINUOUSLY.
- B) COOLING AND DEHUMIDIFICATION MODES AND ENERGY RECOVERY WHEEL SHALL BE ENERGIZED AS REQUIRED WITH A DISCHARGE AIR TEMPEARTURE (DAT) SETPOINT OF 70°F (ADJUSTABLE).
- FAN-ONLY MODE: WHEN COIL ENTERING AIR TEMPERATURE (DOWNSTREAM OF ENERGY RECOVERY WHEEL) IS NO MORE THAN 5°F GREATER THAN DAT SETPOINT, UNIT SHALL OPERATE IN FAN-ONLY MODE WITH NO COOLING ACTIVATED.

  COOLING MODE: WHEN COIL ENTERING AIR TEMPERATURE (EAT) IS MORE THAN 5°F GREATER THAN DISCHARGE AIR TEMPERATURE SETPOINT, UNIT COMPRESSORS
- SHALL MODULATE TO MAINTAIN DAT SETPOINT.

  DEHUMIDIFICATION MODE: WHEN OUTDOOR AIR EXCEEDS 55°F DP (ADJUSTABLE),
  DEHUMIDIFICATION MODE SHALL BE ACTIVATED. COMPRESSORS SHALL BE
  ENERGIZED FOR MAXIMUM COOLING POTENTIAL AND HOT GAS REHEAT MODULATED
  TO MAINTAIN DAT SETPOINT. DEHUMIDIFICATION MODE SHALL BE ACTIVATED DURING
  AND OVERRIDE BOTH FAN—ONLY AND COOLING MODES.
- 4. UNOCCUPIED SETBACK SEQUENCING:A) UNIT SHALL BE OFF.
- 5. SAFETIES:
- A) UNIT DIRTY FILTER SENSORS SHALL ACTIVATE A NOTIFICATION LIGHT AT THE CONTROL PANEL TO ALERT STAFF WHEN FILTERS NEED TO BE REPLACED.
- SPLIT SYSTEMS: FURNACE & EVAPORATOR COIL (F-X) & CONDENSING UNITS (CU-X)
- 1. OPERATION: SPLIT SYSTEMS SHALL BE STAND-ALONE.
- 2. CONTROL: THERMOSTAT
- A) BUILDING OCCUPIED HOURS SHALL BE PROGRAMMED EACH INDIVIDUAL THERMOSTAT. CONSULT BUILDING OWNER OR REPRESENTATIVE FOR SCHEDULED OCCUPIED HOURS.
- B) THERMOSTAT SHALL BE LOCATED IN THE OFFICE PER PLANS.
- C) ROOM TEMPERATURE SHALL BE MEASURED AT WALL—MOUNTED TEMPERATURE SENSORS, SEE PLANS FOR LOCATIONS. AVERAGING SENSORS SHALL BE PROVIDED WHERE MULTIPLE SENSORS ARE SHOWN FOR A SINGLE SPLIT SYSTEM.
- D) FURNACE SHALL BE WIRED TO OPERATE AT THE SAME FAN SPEED FOR ALL MODES OF OPERATION (HEATING, COOLING AND FAN-ONLY).
- 3. OCCUPIED HOURS SEQUENCING:
- A) HEATING AND COOLING MODES SHALL BE ACTIVATED AS REQUIRED TO MAINTAIN SPACE SETPOINTS.
- B) AIR HANDLER SUPPLY FAN SHALL BE LOCKED TO "ON" MODE TO RUN CONTINOUSLY DURING OCCUPIED HOURS.
- 4. UNOCCUPIED SETBACK SEQUENCING:
- A) HEATING OR COOLING MODES SHALL BE ACTIVATED AS REQUIRED TO MAINTAIN SPACE SETBACK TEMPERATURE SETPOINTS.
- B) AIR HANDLER SUPPLY FAN SHALL BE IN "AUTO" MODE FOR ALL UNITS.
- 5. SAFETIES:
- A) OVERFLOW DRAIN PAN FLOAT SWITCH SHALL SHUT DOWN ASSOCIATED AIR HANDI FR

# ELECTRIC HEATERS : ECH-X & EUH-X

1. OPERATION: ELECTRIC HEATER SHALL BE STAND—ALONE, CONTROLLED BY INTEGRAL THERMOSTAT.

						DE	DIC	ATED C	UTD	OOR	AIR	SYST	EM -	- AIR	НА	NDLE	R SCI	HEDU	LE							
		S	SUPPLY FA	AN	E)	(HAUST F	AN			ENE	RGY RECO	VERY					COOLING				ELECT	RICAL			UNIT	
TAG	TYPE	CFM	ESP	HP	CFM	ESP	HP	TYPE	PERFOR	RMANCE -	WINTER	PERFO	RMANCE -	SUMMER	TYPE	EAT	NET SENSIBLE	NET TOTAL	COIL LAT	V/PH	FLA	MCA	MOCP	MANUFACTURER & MODEL	WEIGHT (LBS)	REMARKS
		CIM	(1)	HIF	CIW	(1)	1115		OA TEMP.	RA TEMP.	SA TEMP.	OA TEMP.	RA TEMP.	SA TEMP.	IIFL	LAI	(MBH)	(MBH)	COIL LAI	<b>V</b> /111	1124	WICA	MOCF		(LD3)	
DOA.AHU-	VERTICAL 100% OUTSIDE AIR INDOOR AIR HANDLER WITH ENERGY RECOVERY, DX COOLING, AND MODULATING HOT GAS REHEAT	3,330	1.05"	4	2,915	1.05"	4	TOTAL ENERGY WHEEL	8.0°F	70.0°F	38.0°F	90.9°F DB 73.1°F WB	75°F DB 50% RH	81.2°F DB 67.2°F WB	DX	81.2°F DB 67.2°F WB	109.3	155.6	50.0°F DB 49.6°F WB	208/3	17	20	25	AAON V3-CRB-8-0-162C-000	1,875	(2)

(1) EXTERNAL STATIC PRESSURE (ESP) IN INCHES W.C., INCLUDES 0.3" FILTER ALLOWANCE

# (2) PROVIDE WITH:

- FACTORY-INSTALLED NON-FUSED DISCONNECT
- 4 MERV 11 FILTERS
   MODULATING HOT GAS REHEAT CAPABLE OF REHEAT TO 70°F DB
- RETURN AIR HUMIDITY SENSOR AND ALL INTERNAL SENSORS AS REQUIRED PER THE SEQUENCES OF OPERATION
- TOTAL ENERGY RECOVERY WHEEL WITH MINIMUM 70% EFFECTIVENESS
   SYSTEM CONTROLLER (ORION VCC-X)

	Е	LECTRIC	HEA	TER	SCHI	EDULE		
TAG	LOCATION	TYPE	CFM	ELECT	RICAL	MANUFACTURER & MODEL	REMARKS	
IAG	LUCATION	ITPL	CFM	WATTS	V/PH	MANUFACTURER & MODEL	REMARKS	
<u>ECH-1</u>	VESTIBULE	CEILING HEATER	150	3,000	208/1	QMARK EFF4004	(2)	
ECH-2	CORRIDOR	CEILING HEATER	150	1,500	120/1	QMARK EFF1500	(2)	
ECH-3	CORRIDOR	CEILING HEATER	150	1,500	120/1	QMARK EFF1500	(2)	
<u>EUH-1</u>	ATTIC	UNIT HEATER	350	3,000	208/1	QMARK MUH03-81	(3)	

(1) PROVIDE WITH DOUBLE-POLE THERMOSTAT AND T-BAR FRAME KIT.

1. VERIFY GRD FRAME STYLES WITH ARCHITECTURAL

REFLECTED CEILING PLAN PRIOR TO ORDERING.

(2) PROVIDE WITH WALL-MOUNTING BRACKET, DISCONNECT SWITCH, AND SINGLE-POLE INTERNAL THERMOSTAT.

		GRILL	E, REG	ISTER	AND DIF	FUSER	SCHEDULE	
TAG	TYPE	MANUFACTURER & MODEL	AIR PATTERN	MATERIAL	FRAME STYLE	FINISH	SIZE	OPTIONS AND NOTES
S-1	SQUARE PLAQUE CEILING DIFFUSER	PRICE SPD	4-WAY	STEEL	9/16" TEGULAR T-BAR	WHITE	24x24 WITH ROUND NECK, SIZED PER PLANS	INSULATED BACKPAN
S-2	SQUARE PLAQUE CEILING DIFFUSER	PRICE SPD	2-WAY	STEEL	9/16" TEGULAR T-BAR	WHITE	24x24 WITH ROUND NECK, SIZED PER PLANS	INSULATED BACKPAN
S-3	SQUARE PLAQUE CEILING DIFFUSER	PRICE SPD	4-WAY	STEEL	SURFACE MOUNT	WHITE	12x12 WITH ROUND NECK, SIZED PER PLANS	INSULATED BACKPAN
R-1	EGGCRATE RETURN AIR GRILLE	PRICE 80	N/A	ALUMINUM	9/16" TEGULAR T-BAR	WHITE	24x24 MODULE (22x22 DUCT)	NOT PANEL MOUNT
R-2	EGGCRATE EXHAUST GRILLE	PRICE 80	N/A	ALUMINUM	SURFACE MOUNT	WHITE	14x14 DUCT	
R-3	EGGCRATE RETURN AIR GRILLE	PRICE 80	N/A	ALUMINUM	9/16" TEGULAR T-BAR	WHITE	24x12 MODULE (22x10 DUCT)	NOT PANEL MOUNT
E-1	EGGCRATE EXHAUST GRILLE	PRICE 80	N/A	ALUMINUM/ STEEL	9/16" TEGULAR T-BAR	WHITE	8x8 ALUMINUM GRILLE ON 24x24 STEEL PANEL	
E-2	EGGCRATE EXHAUST GRILLE	PRICE 80	N/A	ALUMINUM	SURFACE MOUNT	WHITE	8x8 DUCT	
E-3	EGGCRATE EXHAUST GRILLE	PRICE 80	N/A	ALUMINUM	SURFACE MOUNT	WHITE	12x12 DUCT	
T-1	SIDEWALL TRANSFER AIR GRILLE	PRICE 510Z	N/A	STEEL	SURFACE MOUNT	WHITE	SIZE PER PLANS	3/4" BLADE SPACING AT 0° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION

	DOA	S -	COND	ENS	ING	UNI	IT SC	HEDULE	
TAG	TYPE	NOMINAL		ELECTRIC	CAL		EFFICIENCY	MANUFACTURER & MODEL	REMARKS
IAG	IIFE	TONS	V/PH	FLA	MCA	МОСР	(1)	MANUFACTURER & MODEL	KEMAKKS
DOA.CU-1	COOLING-ONLY, AIR-COOLED	15	208/3	56	62	80	11.6 EER	AAON CFA-015-B-A-8-DA00K	(2)

- (1) EFFICIENCY VALUES LISTED ARE BASED ON OPERATING CONDITIONS.
- (2) PROVIDE WITH MINIMUM OF 2 STAGES OF COOLING. LINESETS SHALL BE SIZED & INSTALLED PER MANUFACTURER'S REQUIREMENTS (VERIFY LENGTHS REQUIRED). MINIMUM 5-YEAR WARRANTY ON COMPRESSOR AND MINIMUM 1-YEAR WARRANTY ON ALL OTHER PARTS & LABOR.

	GRA	۷ YIIV	/ENT	ILATO	OR S	CHED	ULE	
TAG	SERVES	TYPE	AIRFLOW	THROA	T SIZE	MAX. PRESURE	MANUFACTURER &	REMARKS
IAG	SLINVES	IIFL	(CFM)	WIDTH	LENGTH	DROP	MODEL	NEWANNS
<u>IH-1</u>	DOA.AHU—1 OUTSIDE AIR INTAKE	FABRA HOOD	3,355	30"	30"	0.05"	GREENHECK FGI	(1)(2)
<u>RH-1</u>	<u>Doa.ahu-1</u> Exhaust relief	FABRA HOOD	2,855	24"	24"	0.09"	GREENHECK FGR	(1)(2)

- (1) PROVIDE WITH INSECT SCREEN AND GRAVITY BACKDRAFT DAMPER.
- (2) PROVIDE WITH PITCHED, INSULATED ROOF CURB, GREENHECK GPFP OR EQUAL. CONFIRM ROOF PITCH WITH ARCHITECTURAL DRAWINGS.

# DESIGN CRITERIA

CODES:

2015 INTERNATIONAL MECHANICAL CODE (IMC) WITH CONNECTICUT AMENDMENTS
2015 INTERNATIONAL ENERGY CODE (IECC) WITH CONNECTICUT AMENDMENTS
CLIMATE ZONE 5A

# DESIGN TEMPERATURES:

SUMMER: 90.9°F DB / 73.1°F WB (OUTDOORS—COOLING)

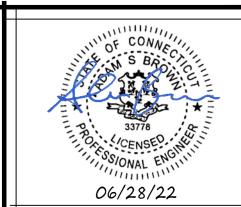
80.2°F DB / 73.7°F DP (OUTDOORS—DEHUMIDIFICATION)

75°F DB / 50% RH (INDOORS)

WINTER: 8°F DB (OUTDOORS)

70°F DB (INDOORS) <u>ELEVATION:</u> 400 FEET ABOVE SEA LEVEL





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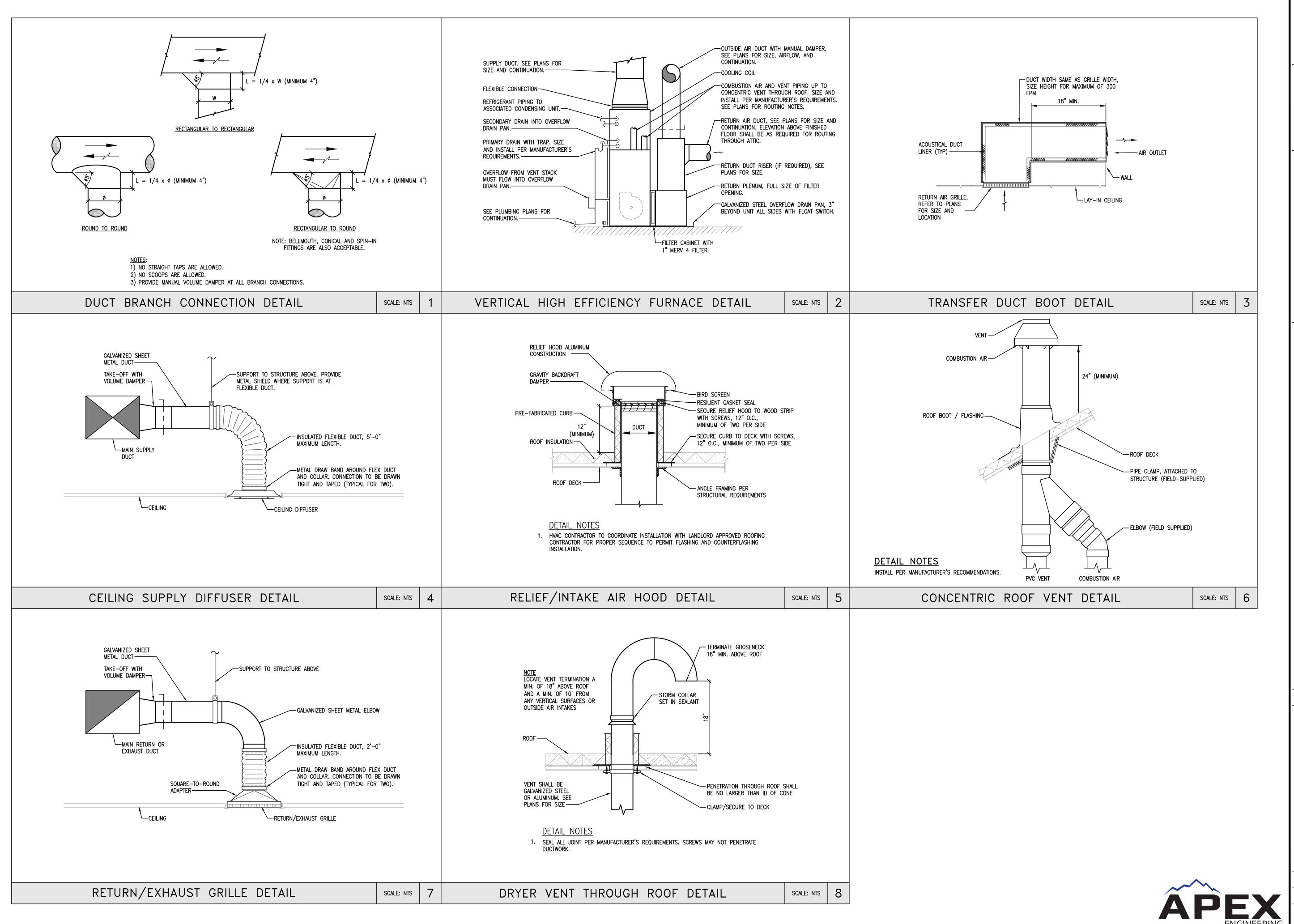
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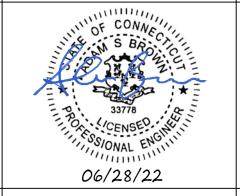
MECHANICAL SCHEDULES

DATE 06/01/22

JOB NO. 21399

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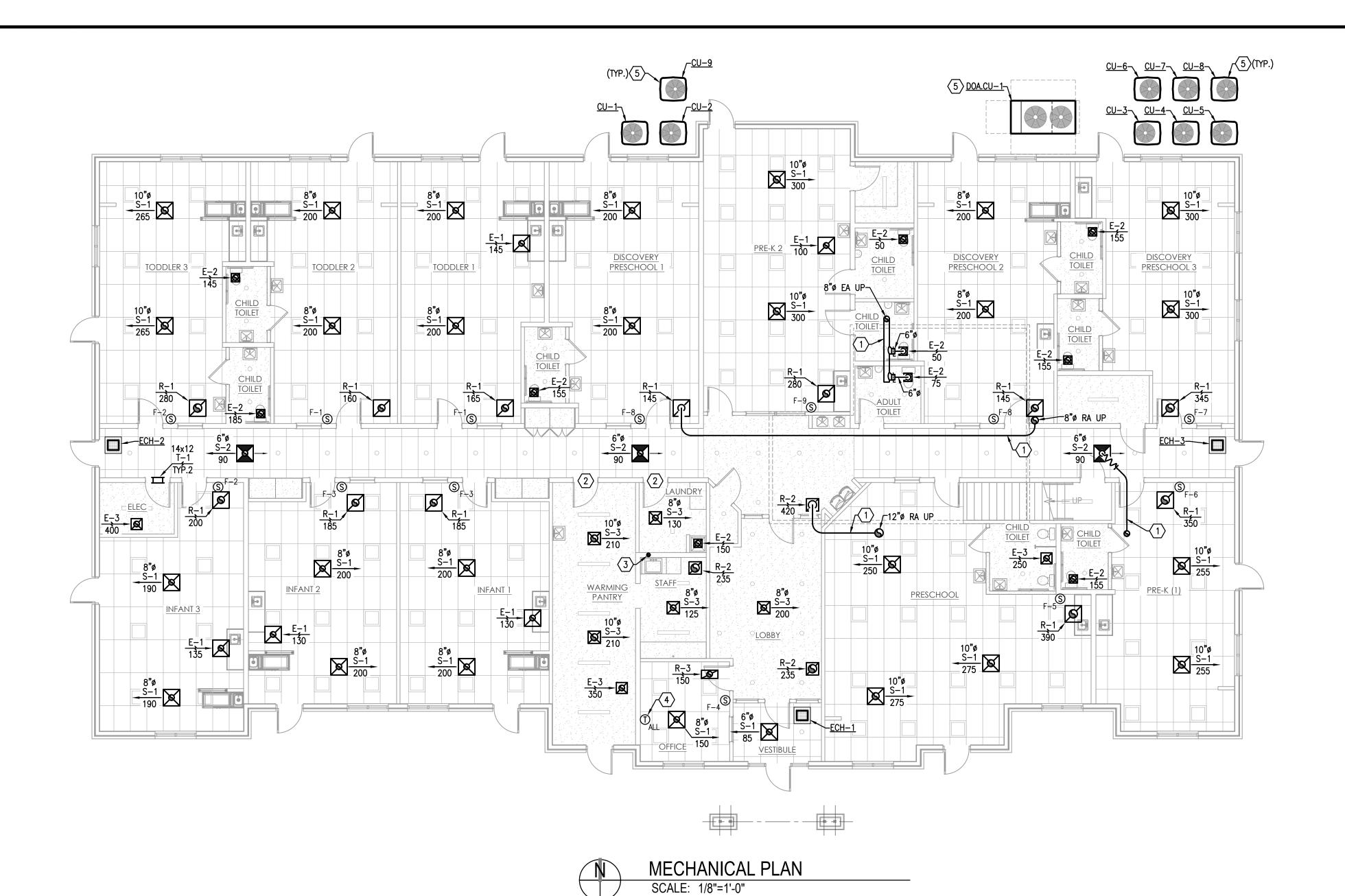
REVISIONS

**MECHANICAL DETAILS** 

06/01/22

(208) 914-5087

Apex Project No. 082129

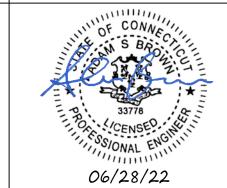


GENERAL NOTES

- A. SEE MECHANICAL COVER SHEET, M-0.0, FOR GENERAL NOTES.
- . UNDERCUT ALL TOILET ROOM DOORS BY 1".
- C. COORDINATE EXACT LOCATION OF ALL WALL-MOUNTED SENSORS AND THERMOSTATS WITH FURNITURE LAYOUT AND ARCHITECTURAL PLANS.

# KEY NOTES #

- 1. ROUTE DUCTWORK FROM ATTIC ABOVE AND HORIZONTALLY WITHIN CEILING SPACE.
- UNDERCUT DOOR BY 1" (TYPICAL FOR ALL TOILET ROOM DOORS).
- 3. PROVIDE 4"Ø DRYER VENT WITH 1 ELBOW AND UP THROUGH ATTIC TO ROOF. TERMINATE WITH MINIMUM-5" CLEARANCE ROOF VENT, DRYERJACK MODEL 486 OR EQUAL. DRYER VENT EQUIVALENT LENGTH SHALL BE LESS THAN 35-FEET.
- 4. PROVIDE CUSTOM CONTROL BOX/PANEL AT 48" AFF. PANEL SHALL HOLD ALL 9 FURNACE THERMOSTATS. COORDINATE EXACT LOCATION FOR CONTROL BOX WITH OWNER'S REPRESENTATIVE AND FURNITURE LAYOUT.
- 5. MOUNT CONDENSING UNIT ON CONCRETE PAD WITH VIBRATION ISOLATION PADS. ROUTE REFRIGERANT LINESET UP EXTERIOR WALL TO ATTIC AND ROUTE TO ASSOCIATED EVAPORATOR COIL IN MECHANICAL ATTIC.



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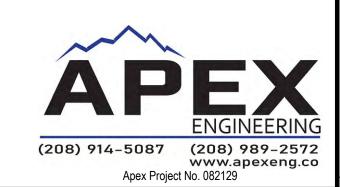
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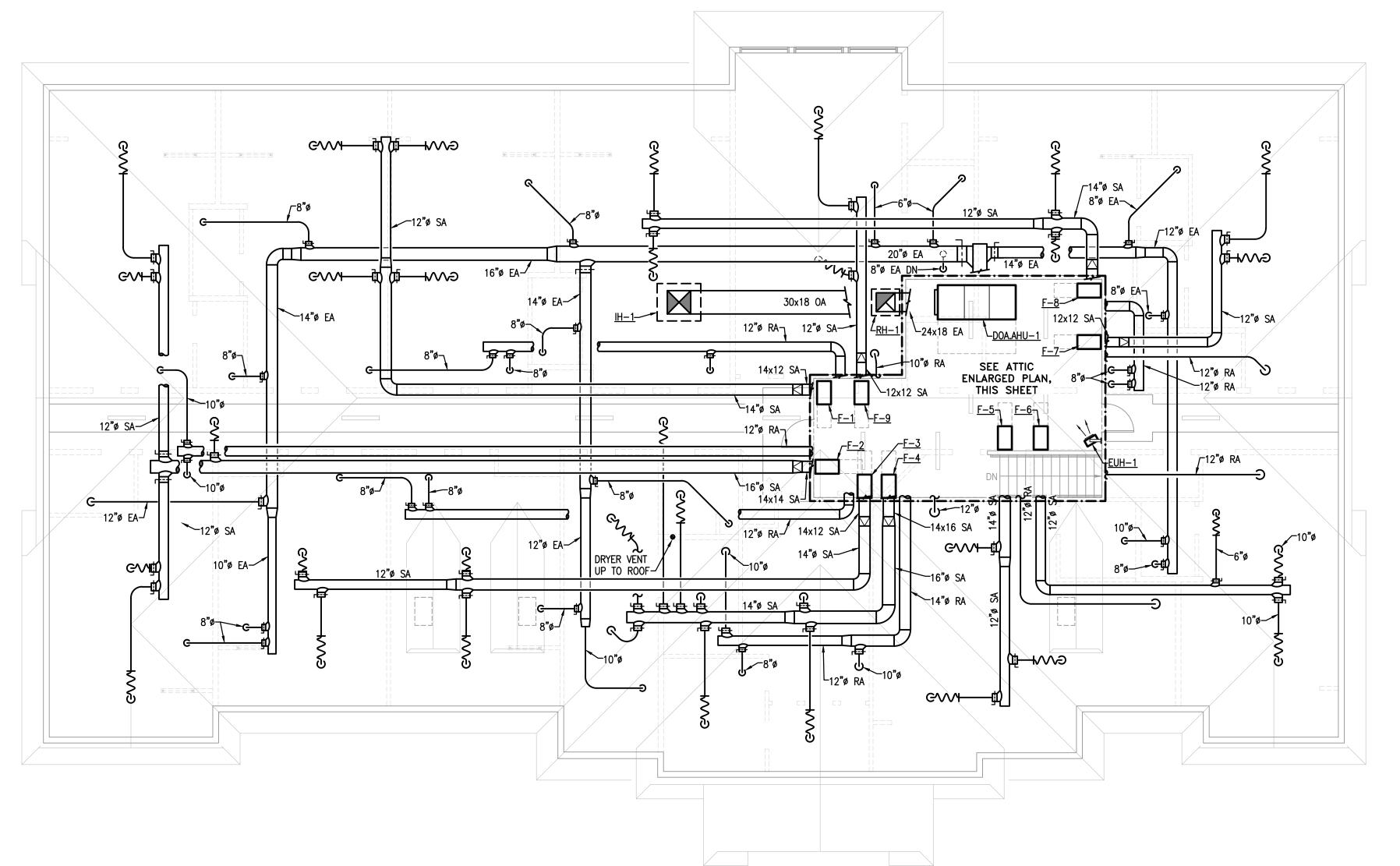
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MECHANICAL PLAN

DATE 06/01/22

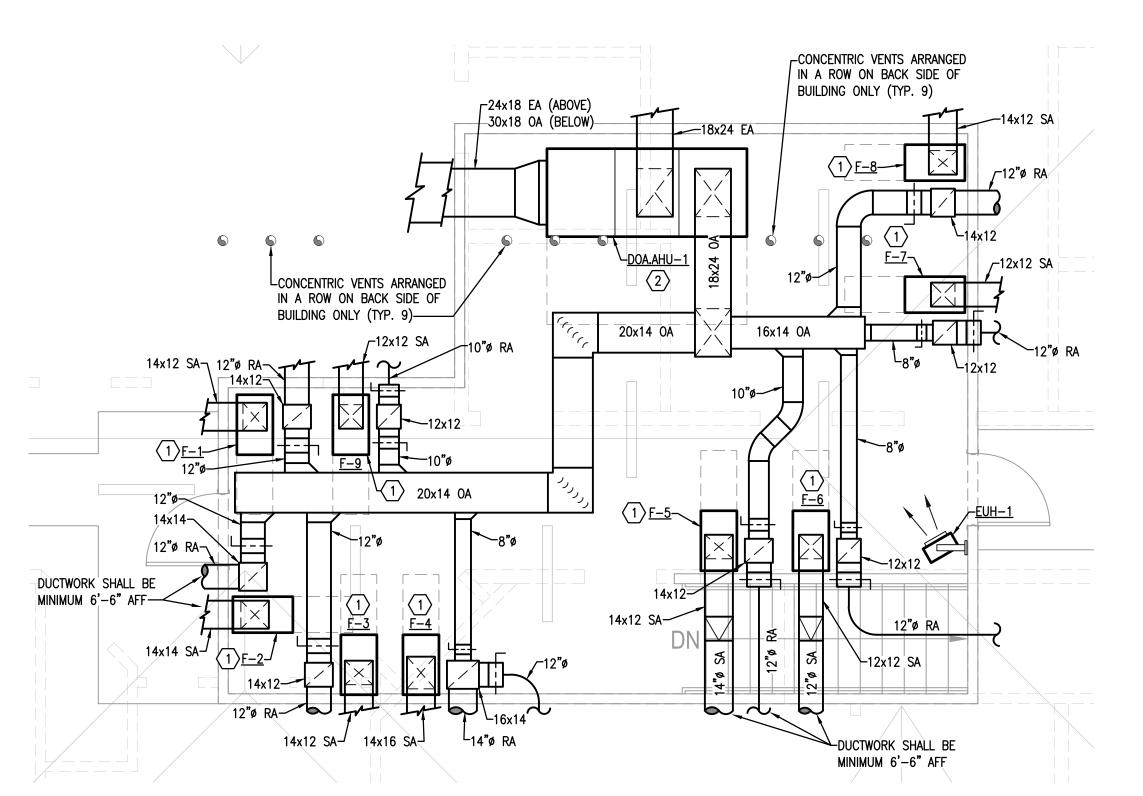
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MECHANICAL ATTIC PLAN

SCALE: 1/8"=1'-0"



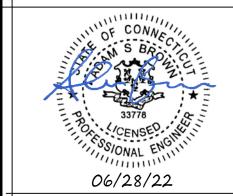
MECHANICAL ATTIC - ENLARGED PLAN
SCALE: 1/8"=1'-0"

GENERAL NOTES

A. SEE MECHANICAL COVER SHEET, M-0.0, FOR GENERAL NOTES.

# KEY NOTES #

- PROVIDE AND INSTALL VERTICAL FURNACE PER DETAIL ON SHEET M-0.2. SIZE AND ROUTE COMBUSTION AIR AND FLUE PIPING THROUGH ATTIC AND TERMINATE THROUGH BACK SIDE OF ROOF WITH VERTICAL CONCENTRIC VENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. ALIGN ROOF PENETRATIONS IN A NEAT ALIGNED ROW. ROUTE AND SIZE REFRIGERANT LINESETS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS, THROUGH ATTIC AND DOWN EXTERIOR WALL TO ASSOCIATED CONDENSING UNIT.
- 2. MOUNT DEDICATED OUTSIDE AIR AIR HANDLING UNIT (DOA.AHU) ON SITE-BUILT PLATFORM USING DIMENSIONAL LUMBER WITH MINIMUM 1/2"-THICK PLYWOOD OR OSB SHEATHING ON TOP. PLATFORM SHALL BE MINIMUM 4"-TALL OR AS REQUIRED TO INSTALL CONDENSATE P-TRAP. SET DOA.AHU ON 6"x6" RUBBER/CORK VIBRATION ISOLATION PADS, SPACED NO MORE THAN EVERY 20" O.C. OR AS RECOMMENDED BY AHU MANUFACTURER.



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**ARCHI1**17710 Detroit Avenue La Phone (216) 521-5134

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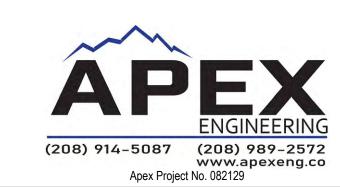
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# MECHANICAL SPECIFICATIONS

## <u>PART 1 – GENERAL</u>

# 1.01 SUMMARY

- A. FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT AND FACILITIES NECESSARY TO FURNISH, FABRICATE, DELIVER, STORE AND INSTALL ALL WORK NOTED ON THE DRAWINGS.
- B. THE CONTRACTOR SHALL PROVIDE A COMPLETE HVAC SYSTEM FOR THE PROJECT. ITEMS OR WORK NOT SHOWN OR SPECIFIED ON THE MECHANICAL DRAWINGS, BUT REQUIRED FOR THE COMPLETE HVAC SYSTEM, SHALL BE PROVIDED AND SHALL CONFORM WITH ACCEPTED TRADE PRACTICES, LOCAL CODES AND GOVERNING AUTHORITIES.
- C. THE MECHANICAL DRAWINGS ARE SCHEMATIC IN NATURE AND ARE TO CONVEY DESIGN INTENT ONLY. COORDINATE AND FIELD—LOCATE DUCTWORK AND EQUIPMENT LOCATIONS PRIOR TO FABRICATION OR INSTALLATION, TO MEET JOB REQUIREMENTS. REQUIRED OFFSETS, FITTINGS AND GENERAL INSTALLATION REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER OR DESIGN TEAM SHALL NOT BE RESPONSIBLE FOR SHOP—FABRICATED DUCTWORK SIZED DIRECTLY FROM THE MECHANICAL DRAWINGS.
- D. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE EXECUTION OF THIS WORK.
- E. SITE INSPECTION: CONTRACTOR SHALL VISIT THE SITE OF WORK PRIOR TO SUBMISSION OF HIS BID AND THOROUGHLY FAMILIARIZE HIMSELF WITH THE WORKING CONDITIONS & EXACT NATURE OF THE WORK, INCLUDING EXAMINATION OF AND REFERENCE TO THE CONSTRUCTION DOCUMENTS FOR ALL OTHER TRADES. SUBMISSION OF A BID ACKNOWLEDGES FULL RESPONSIBILITY FOR FURNISHING A COMPLETE & FUNCTIONAL SYSTEM. NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDING FOR ANY OMISSIONS WHICH RESULTS FROM A FAILURE TO THOROUGHLY PERFORM THE REQUIRED DUE DILIGENCE.
- F. COORDINATION: CONTRACTOR SHALL COORDINATE EACH PIECE OF EQUIPMENT WITH ALL OTHER TRADES AFFECTED BY THAT PIECE OF EQUIPMENT (ROOF OPENINGS, WEIGHTS, POWER REQUIREMENTS, DRAINING, ETC.). NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDING FOR ANY ISSUE WHICH RESULTS FROM A FAILURE TO THOROUGHLY COORDINATE AMONG DISCIPLINES.
- G. ALL WIRING FOR 110V AND ABOVE SHALL BE BY THE ELECTRICAL CONTRACTOR. ALL WIRING FOR LESS THAN 110V SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR, UNLESS NOTED OTHERWISE. ALL WORK SHALL BE PER NATIONAL ELECTRIC CODE AND APPLICABLE LOCAL CODES AND ORDINANCES.
- H. PROVIDE ALL CUTTING, EXCAVATING AND PATCHING NECESSARY TO INSTALL THE HVAC SYSTEMS. PATCHING SHALL MATCH ADJACENT SURFACES.
- I. CONTRACTOR SHALL FURNISH FIRST CHARGES OF REFRIGERANT, OILS, GREASE, ETC. AND SHALL BE RESPONSIBLE FOR ALL SUCH CHARGES FOR THE GUARANTEE PERIOD. PROVIDE A SPARE SET OF FILTERS, BELTS, ETC. AT PROJECT CLOSEOUT.

# 1.02 QUALITY ASSURANCE

- A. ALL WORK AND MATERIALS SHALL CONFORM TO LOCAL BUILDING, MECHANICAL AND ENERGY CODES, ASHRAE, SMACNA AND NFPA STANDARDS, AND ALL OTHER APPLICABLE STATE AND FEDERAL CODES
- B. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL DISPLAY A UL LABEL WHERE APPLICABLE.
- C. INSOFAR AS POSSIBLE, ALL EQUIPMENT AND MATERIALS OF THE SAME TYPE SHALL BE BY THE SAME MANUFACTURER.
- D. PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, LOSS AND THEFT BEFORE AND AFTER INSTALLATION.

# 1.03 SUBMITTALS

# A. SUBSTITUTION

- 1. THESE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO INDICATE A STANDARD OF QUALITY FOR MATERIALS AND EQUIPMENT BY THE LISTING OF MANUFACTURER'S NAMES AND MODEL NUMBERS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVE EQUALITY FOR ANY SUBSTITUTIONS.
- 2. ALL SUBSTITUTION REQUESTS MUST BE APPROVED BY THE ENGINEER ON RECORD.
  3. THE SIZES OF EQUIPMENT SHOWN ON THE MECHANICAL DRAWINGS IS BASED ON THE DIMENSIONS OF THE BASIS OF DESIGN EQUIPMENT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF PROPOSED EQUIPMENT SUBSTITUTIONS WILL FIT IN THE AVAILABLE SPACE.
- 4. THE CONTRACTOR PROPOSING THE SUBSTITUTION IS RESPONSIBLE FOR ANY ADDITIONAL COSTS AND CHANGES AS A RESULT OF PRODUCT SUBSTITUTIONS.

# B. PRODUCT DATA:

- 1. INCLUDE MANUFACTURER'S TECHNICAL DATA FOR EACH MODEL INDICATED, INCLUDING PERFORMANCE CHARACTERISTICS AT CONDITIONS NOTED IN THE CORRESPONDING EQUIPMENT SCHEDULE, DIMENSIONS, REQUIRED CLEARANCES, CHARACTERISTICS AND ACCESSORIES. EQUIPMENT CATALOGS WITHOUT PROPER PERFORMANCE CHARACTERISTICS ARE NOT ACCEPTABLE AND WILL BE REJECTED.
- 2. THE ARCHITECT'S/ENGINEER'S REVIEW OF PRODUCT DATA SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR DEVIATIONS FROM THE CONTRACT DRAWINGS OR SPECIFICATIONS OR THE RESPONSIBILITY TO COORDINATE WITH ALL OTHER TRADES FOR
- CONFLICTS.
  3. PRODUCT DATA SUBMITTALS REQUIRED FOR:
  - A) ALL SCHEDULED HVAC EQUIPMENT AND PRODUCTS
  - B) INSULATION
    C) FIRE AND COMBINATION
  - C) FIRE AND COMBINATION FIRE/SMOKE DAMPERS
    D) FLEXIBLE DUCTWORK
- E) SPIRAL DUCTWORK AND FITTINGS

# 1.04 PROJECT CLOSEOUT

- A. MECHANICAL SYSTEMS TRAINING: THE OWNER'S REPRESENTATIVE SHALL BE INSTRUCTED BY THE CONTRACTOR ON THE OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS, INCLUDING BUT NOT LIMITED TO EACH ITEM OF EQUIPMENT AND THE TEMPERATURE CONTROLS SYSTEM(S). ANY SPECIAL TOOLS AND/OR INSTRUMENTS REQUIRED FOR EQUIPMENT OPERATION OR MAINTENANCE SHALL BE TURNED OVER TO THE OWNER.
- B. OPERATING AND MAINTENANCE DATA:
  - 1. AT PROJECT CLOSEOUT, OPERATING AND MAINTENANCE DATA SHALL BE COMPILED INTO A THREE—RING BINDER LABELED "OPERATING AND MAINTENANCE MANUALS."
  - THEE—RING BINDER LABELED OPERATING AND MAINTENANCE MANUALS.

    THE FOLLOWING SHALL BE INCLUDED IN THE O&M BINDER, AT MINIMUM:

    A) OPERATING AND MAINTENANCE DATA AND WARRANTY DATA FOR ALL SCHEDULED
  - HVAC EQUIPMENT
    B) TEST AND BALANCE REPORT
  - C) FILTER CHART, WHICH INCLUDES FILTER SIZE & QUANTITY FOR ALL SCHEDULED HVAC EQUIPMENT REQUIRING FILTERS

D) GUARANTEE LETTER

OR WARRANTIES.

C. GUARANTEE LETTER: ALL WORKMANSHIP, MATERIAL, EQUIPMENT, SYSTEMS, ETC. FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED BY THIS CONTRACTOR IN WRITING FOR A PERIOD OF ONE YEAR AFTER SUBSTANTIAL COMPLETION OF THE PROJECT. THIS WARRANTY MEANS THAT THIS CONTRACTOR SHALL MAKE GOOD TO THE OWNER, AT NO COST, ANY DEFECTS OR SERVICE REQUIREMENTS THAT BECOME APPARENT DURING THE WARRANTY PERIOD. THIS GUARANTEE IS IN ADDITION TO ANY OTHER WARRANTIES AND IS NOT INTENDED TO LIMIT OTHER SUCH GUARANTEES

D. CONTRACTOR SHALL RECORD ON AS-BUILT DRAWINGS ALL SIZES, MATERIALS, AND LOCATIONS OF ALL EQUIPMENT AND DUCTWORK THAT DEVIATES FROM THE MECHANICAL DRAWINGS. AT PROJECT CLOSEOUT, THE DRAWINGS SHALL BE SIGNED AND DATED BY THE CONTRACTOR AND DELIVERED TO THE A/E TEAM.

# PART 2 - PRODUCTS

# 2.01 FLAME SPREAD PROPERTIES:

A. ALL MATERIALS, ADHESIVES, MASTICS SHALL HAVE A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS.

# 2.02 HVAC EQUIPMENT

- A. ALL EQUIPMENT CAPACITIES, CHARACTERISTICS AND REQUIREMENTS ARE SHOWN ON THE SCHEDULES ON THE DRAWINGS. THE CAPACITIES SHOWN ARE MINIMUM CAPACITIES. VARIATIONS IN THE CHARACTERISTICS AND CAPACITIES WILL ONLY BE PERMITTED WITH WRITTEN APPROVAL FROM THE ENGINEER ON RECORD.
- 2.03 AIR INLETS AND OUTLETS (GRILLES, DIFFUSERS, LOUVERS, GRAVITY VENTILATORS, ETC.)
  - A. SIZE, CAPACITIES, CHARACTERISTICS AND REQUIREMENTS ARE SHOWN ON THE SCHEDULES ON THE DRAWINGS.

# 2.04 DUCTWORK

- A. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL UNLESS NOTED OTHERWISE.
- B. DUCTWORK CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION, THE GOVERNING MECHANICAL CODE, AND NFPA 90A AND 90B. SHEET METAL GAUGE, REINFORCING, JOINT TYPES, AND SEALING SHALL BE AS REQUIRED FOR THE APPLICABLE SIZE AND PRESSURE CLASS. SMACNA STANDARD DUCT PRESSURE CLASSES SHALL GOVERN, UNLESS NOTED OTHERWISE. ALL DUCTS PENETRATING FIRE—RATED ASSEMBLIES SHALL BE MINIMUM 24 GA. CONSTRUCTION.
- C. ALL ROUND DUCTWORK EXPOSED TO VIEW SHALL BE FACTORY—FABRICATED SPIRAL ROUND. DOUBLE—WALL DUCTWORK SHALL BE PROVIDED IN LOCATIONS WHERE LINER OR INSULATION IS REQUIRED.
- D. LOW PRESSURE FLEXIBLE DUCTS SHALL BE RATED AS A CLASS 1 AIR DUCT AND TESTED TO UL STANDARD 181. FLEXIBLE DUCT SHALL HAVE A MINIMUM INSULATION VALUE OF R-6.
- E. EXTERIOR DUCTWORK SHALL MEET THE REQUIREMENTS OF SECTION 6.3 OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION. DUCTS SHOULD BE SEALED WATERTIGHT AT ALL JOINTS WITH EXTERIOR DUCT SEALANT AND HAVE A LENGTH OF HAT CHANNEL FASTENED ABOVE ALL JOINTS LOCATED ON TOP OF DUCTWORK. EXTERIOR DUCTWORK SHALL BE INTERNALLY LINED OF THE THICKNESS AND DENSITY REQUIRED TO MEET THE MINIMUM INSULATION VALUE OF THE ASSOCIATED DUCTWORK.
- F. DUCTWORK HANGERS AND SUPPORT SYSTEMS SHALL BE PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION. FLEXIBLE DUCTS SHALL BE FREE OF SAGS AND KINKS AND SUPPORTED ON MINIMUM OF 36" CENTERS.
- G. ACOUSTICAL DUCT LINER SHALL BE 1-1/2 LB/FT3 DENSITY, 1"-THICK. LINER SHALL BE USED IN SUPPLY AND RETURN DUCTWORKS FOR THE FIRST 10-FEET FROM CONNECTIONS TO ROOFTOP UNITS AND AIR HANDLING UNITS, AND WHERE OTHERWISE NOTED ON THE DRAWINGS. LINER SHALL NOT BE USED IN LIEU OF EXTERNAL INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE, SUCH AS EXTERIOR DUCTWORK. IN SUCH CASES DUCT LINER SHALL BE OF THE THICKNESS AND DENSITY REQUIRED TO MEET THE MINIMUM INSULATION VALUE OF THE ASSOCIATED DUCTWORK.

# H. NO FIBERGLASS DUCTBOARD WILL BE PERMITTED.

# 2.05 DUCTWORK ACCESSORIES

- A. DUCT ACCESS DOORS SHALL BE GASKETED FRAME WITH WING NUT FASTENERS, SIZED 8"x8" ON DUCTWORK UP TO 14" AND 12"x12" ON LARGER DUCTWORK.
- B. FLEXIBLE CONNECTIONS TO EQUIPMENT SHALL BE "VENTGLAS" FABRIC THAT IS FIRE—RESISTANT, WATERPROOF AND MILDEW—RESISTANT.
- C. PROVIDE TURNING VANES IN ALL SQUARE ELBOWS PER SMACNA STANDARDS.

# D. VOLUME DAMPERS:

- DAMPERS SHALL BE EITHER SINGLE-BLADE OR MULTI-BLADE AS INDICATED OR REQUIRED.
   DAMPERS SHALL HAVE AN INDICATING DEVICE WITH LOCK TO HOLD DAMPER IN POSITION.
- 3. DAMPERS LOCATED IN EXTERNALLY—INSULATED DUCTS SHALL INCLUDE A STAND—OFF BRACKET AND FLAG.

  AND PLANTED AROUSE INACCESSIBLE OF LINES SHALL BE FURNISHED WITH EXTENSION.
- DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL BE FURNISHED WITH EXTENSION RODS OPERABLE THROUGH DIFFUSER OR GRILLE FACES OR FROM REMOTE LOCATIONS USING CONCEALED DAMPER REGULATORS.

# E. FIRE DAMPERS:

- 1. FIRE DAMPERS SHALL BE LISTED AND BEAR THE LABEL OF AN APPROVED TESTING
- AGENCY, BE TYPE—A TYPE WITH 165°F FUSIBLE LINK.

  ORIENTATION AND SLEEVE LENGTH SHALL BE AS REQUIRED.
- 3. FIRE DAMPER RATING SHALL BE 1.5—HOUR WHEN INSTALLED IN LESS THAN 3—HOUR RATED ASSEMBLIES AND 3—HOUR WHEN INSTALLED IN ASSEMBLIES RATED FOR 3—HOURS OR GREATER.
- 4. ALL FIRE DAMPERS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S LISTING AND
- INSTALLATION INSTRUCTIONS.

  5. PROVIDE DUCT ACCESS DOOR FOR FIRE DAMPER ACCESS.

# 2.06 PIPING

A. REFRIGERANT PIPING SHALL BE TYPE L HARD-DRAWN COPPER WITH WROUGHT COPPER FITTINGS AND SILVER-FOS JOINTS. PROVIDE SPECIALTIES SUCH AS SOLENOID VALVES, SIGHT GLASSES AND FILTER/DRYERS AS INDICATED AND REQUIRED FOR PROPER SYSTEM OPERATION.

# 2.07 INSULATION

# A. DUCTWORK INSULATION:

- 1. REFER TO THE DUCT INSULATION SCHEDULE BELOW FOR DUCTS REQUIRING INSULATION. INSULATION SHALL MEET LISTED R-VALUES OR AS REQUIRED BY GOVERNING ENERGY CODE, WHICHEVER IS MORE STRINGENT.
- 2. ALL DUCTWORK REQUIRING INSULATION SHALL BE EXTERNALLY—INSULATED UNLESS SPECIFICALLY NOTED OTHERWISE. DUCT LINER SHALL NOT BE UTILIZED TO ACHIEVE SCHEDULED INSULATION R—VALUE, EXCEPT FOR EXTERIOR DUCTWORK AND EXPOSED DUCTS WITHIN CONDITIONED SPACES, WITHOUT PRIOR APPROVAL FROM THE ENGINEER ON RECORD.
- DUCT WRAP INSULATION SHALL BE FIBERGLASS BLANKET TYPE, FORMALDEHYDE-FREE, WITH FSK VAPOR BARRIER FACING, OF THE THICKNESS AND DENSITY REQUIRED TO MEET REQUIRED R-VALUE. INSULATION SHALL BE WRAPPED TIGHTLY ON DUCTWORK WITH ALL ADHESION, OVERLAP AND SEAMS TAPED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- REQUIRED INSULATION R-VALUES ARE FOR THE INSULATION AS INSTALLED.

  WHERE DUCTWORK IS REQUIRED TO BE INSULATED, ALL FITTINGS MUST ALSO BE INSULATED.

# 6. DUCTWORK INSULATION SCHEDULE:

DUCT SYSTEM	<u>DUCT_LOCATION</u>	INSULATION R-VALUE
SUPPLY	INTERIOR OF BUILDING, ALL	R-6
RETURN	INTERIOR OF BUILDING, ALL	R-6
OUTSIDE AIR	INTERIOR OF BUILDING, ALL	R-6
EXHAUST	UPSTREAM OF ENERGY RECOVERY DEVICE	R-6
	OTHER	NONE

# B. PIPE INSULATION:

1. REFRIGERANT SUCTION LINES SHALL BE INSULATED WITH CLOSED—CELL FOAM INSULATION, AP ARMAFLEX OR EQUAL. THICKNESS SHALL BE 1/2" THICK FOR 1-1/2" AND SMALLER PIPE AND 1" THICK FOR PIPE LARGER THAN 1-1/2". ALL INSULATION EXPOSED TO WEATHER SHALL BE COATED WITH A WEATHERPROOF AND UV-RESISTANT FINISH OR PROVIDED WITH PROTECTIVE JACKETING AS RECOMMENDED BY THE MANUFACTURER.

## 2.08 CONTROL SYSTEM

A. SCOPE OF WORK: FURNISH AND INSTALL ALL MATERIALS, LABOR AND SERVICES FOR A COMPLETE AND OPERABLE CONTROL SYSTEM FOR ALL APPLICABLE HVAC SYSTEMS. COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR WIRING AND CONDUIT PROVIDED UNDER THEIR SCOPE.

# B. THERMOSTATS:

- 1. THERMOSTATS SHALL BE 7-DAY PROGRAMMABLE, COMBINATION HEATING/COOLING (AUTOMATIC CHANGEOVER) WITH MULTIPLE STAGES OF HEATING AND/OR COOLING, AS REQUIRED BY THE ASSOCIATED EQUIPMENT.
- 2. THERMOSTATS SHALL HAVE THE NECESSARY HARDWARE AND SHALL BE PROGRAMMED TO COMPLY WITH ALL REQUIREMENTS OF THE APPLICABLE ENERGY CODE.
- 3. THERMOSTATS LOCATED ON EXTERIOR WALLS SHALL BE PROVIDED WITH AN INSULATED SUB-BASE.

# C. DUCT-MOUNTED SMOKE DETECTORS:

- DUCT-MOUNTED SMOKE DETECTORS SHALL BE PROVIDED WHERE SHOWN ON THE PLANS. FACTORY-INSTALLED SMOKE DETECTORS LOCATED IN HVAC EQUIPMENT MUST MEET ALL REQUIREMENTS OF THE GOVERNING MECHANICAL CODE.
   SMOKE DETECTORS SHALL BE IONIZATION TYPE, UL-LISTED AND COMPLY WITH NFPA 90A.
- IF A FIRE ALARM SYSTEM IS AVAILABLE, SMOKE DETECTORS SHALL BE CONNECTED TO THE FIRE ALARM SYSTEM.
   IF A FIRE ALARM SYSTEM IS NOT AVAILABLE, SMOKE DETECTORS SHALL BE PROVIDED WITH A VISUAL AND AUDIO INDICATOR. INDICATOR SHALL BE LOCATED IN THE CEILING
- DIRECTLY BELOW THE SMOKE DETECTOR OR AS OTHERWISE NOTED ON THE PLANS OR REQUIRED BY THE AHJ.
- D. MOTOR-OPERATED DAMPERS SHALL BE OPPOSED-BLADE TYPE, CLASS 1A LEAKAGE WITH FACTORY-MOUNTED ACTUATOR.
- E. MISCELLANEOUS CONTROL ITEMS: CONTRACTOR SHALL FURNISH ALL MISCELLANEOUS RELAYS, SWITCHES, SENSORS, ETC. AS REQUIRED FOR THE CONTROL SYSTEM AND AS SHOWN ON THE DRAWINGS AND/OR AS DESCRIBED IN THE HVAC SEQUENCES OF OPERATION.

# 2.09 VIBRATION ISOLATION

- A. FURNISH AND INSTALL VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, SUPPORTS, ANCHORS, AND/OR FOUNDATIONS AS REQUIRED TO PREVENT TRANSMISSION OF VIBRATION FROM EQUIPMENT, PIPING OR DUCTWORK TO BUILDING STRUCTURE.
- B. ISOLATORS SHALL BE MANUFACTURED BY MASON INDUSTRIES OR APPROVED EQUAL AND SHALL BE SELECTED BY THE ISOLATOR MANUFACTURER FOR EACH ITEM OF EQUIPMENT ON THE BASIS OF CRITERIA AS SPECIFIED IN THE ASHRAE APPLICATIONS HANDBOOK, LATEST EDITION, NOISE AND VIBRATION CONTROL CHAPTER.
- C. PROVIDE SPRING ISOLATORS ON PIPING CONNECTED TO ISOLATED EQUIPMENT THROUGH THE FIRST THREE POINTS OF SUPPORT.

# 2.10 SEISMIC SUPPORTS

- A. FURNISH AND INSTALL SEISMIC SUPPORTS FOR ALL EQUIPMENT, DUCTWORK AND PIPING AS REQUIRED BY THE GOVERNING BUILDING CODE.
- B. SEISMIC SUPPORTS SHALL BE MANUFACTURED BY MASON INDUSTRIES OR APPROVED EQUAL AND SHALL BE SELECTED BY THE MANUFACTURER FOR EACH ITEM OF EQUIPMENT BASED ON SPECIFIC PROJECT CONDITIONS. CONTRACTOR TO COORDINATE SELECTIONS WITH MANUFACTURER AND PROVIDE ENGINEER—SEALED SEISMIC SUPPORT SUBMITTALS AS REQUIRED BY THE AHJ.

# PART 3 - EXECUTION

# 3.01 GENERAL INSTALLATION

- A. MANUFACTURER'S INSTRUCTIONS SHALL BE STRICTLY FOLLOWED IN THE DELIVERY, STORAGE, PROTECTION, INSTALLATION, PIPING AND WIRING OF ALL EQUIPMENT AND MATERIAL.
- B. INSTALL ALL EQUIPMENT, DUCTWORK AND PIPING LEVEL AND PLUMB, UNLESS NOTED OTHERWISE.
- C. ALL PIPING AND DUCTWORK WHICH PASSES THROUGH A CONCRETE SLAB, MASONRY WALL, ROOF OR OTHER PORTION OF THE BUILDING STRUCTURE SHALL PASS THROUGH A SLEEVE FURNISHED AND INSTALLED BY THIS CONTRACTOR. COORDINATE SLEEVE SIZE AND LOCATION WITH OTHER TRADES. AS REQUIRED.
- D. SEE STRUCTURAL DRAWINGS FOR DETAILS ON STRUCTURAL SUPPORTS AND ATTACHMENT TO STRUCTURE. NO SUPPORTS SHALL BE ATTACHED DIRECTLY TO THE ROOF DECK UNLESS NOTED
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY OBJECTIONABLE SOUND AND/OR VIBRATION ASSOCIATED WITH ANY SYSTEM PROVIDED UNDER THIS DIVISION, AT NO EXPENSE TO THE OWNER.
- F. ALL BUILDING PENETRATIONS TO THE OUTDOORS SHALL BE FLASHED AND COUNTER-FLASHED AS REQUIRED TO ELIMINATE LEAKS.
- G. FIRESTOPPING: ALL PENETRATIONS OF FIRE-RATED CEILINGS, WALLS, PARTITIONS OR FLOORS SHALL BE FIRESTOPPED USING APPROVED MATERIALS TO MAINTAIN THE FIRE RATING OF THE CEILING, WALL, PARTITION OR FLOOR. METHODS AND MATERIALS SHALL BE APPROVED BY LOCAL CODE OFFICIALS.

# 3.02 WORKMANSHIP

- THIS CONTRACTOR SHALL USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND REQUIREMENTS TO FULFILL THE SCOPE OF WORK.
- B. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
- C. CONTRACTOR SHALL CONTINUOUSLY MAINTAIN ADEQUATE PROTECTION OF STORED MATERIALS AND INSTALLED EQUIPMENT TO PROTECT FROM DIRT, RUST, MOISTURE AND OTHER DAMAGE. REPAIRS MADE NECESSARY BY DAMAGE SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
- D. PROVIDE CLEAR MAINTENANCE ACCESS AREA AROUND ALL EQUIPMENT AS REQUIRED BY CODES AND AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- E. PROVIDE ACCESS PANELS IN WALLS, CEILINGS AND DUCTWORK, AS REQUIRED, FOR ACCESS TO VALVES, DAMPERS AND EQUIPMENT.

# 3.03 SAFETY

- A. THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY REGARDING THE SAFETY OF HIS PERSONNEL ON THE PROJECT DURING CONSTRUCTION.
- B. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SAFETY GUARDS, AS REQUIRED. ALL BELT—DRIVEN EQUIPMENT AND OTHER ROTATING PARTS SHALL BE ENCLOSED OR ADEQUATELY
- C. NO WATER PIPING SHALL BE ROUTED OVER A THREE-FOOT HORIZONTAL CLEARANCE OF ANY ELECTRICAL PANEL OR EQUIPMENT.

# 3.04 IDENTIFICATION

A. PROVIDE AND INSTALL ENGRAVED PLASTIC SIGNS AT ALL MECHANICAL EQUIPMENT INDICATING EQUIPMENT TAG AND AREA SERVED. SIGN SHALL BE LOCATED AT AN EASILY—VISIBLE LOCATION. FOR EQUIPMENT LOCATED ABOVE A CEILING, PROVIDE AN EQUIPMENT TAG MARKER ON CEILING RELOW.

# 3.05 DUCTWORK AND ACCESSORIES

- A. INSTALL DUCTWORK APPROXIMATELY AS SHOWN ON THE DRAWINGS, PROPERLY SUPPORTED AND RUN AS DIRECTLY AS POSSIBLE AT PERPENDICULAR OR PARALLEL ANGLES TO BUILDING LINES. LOCATE DUCTWORK AS HIGH AS PRACTICAL WHILE COORDINATING WITH OTHER TRADES.
- B. EXPOSED DUCTWORK THAT IS VISIBLY DAMAGED SHALL BE REPAIRED, REPLACED, OR ROTATED SUCH THAT THE DAMAGE IS NOT VISIBLE.
- C. PROVIDE MANUAL VOLUME DAMPERS IN ALL BRANCHES, SPLITS AND TAPS FOR PROPER BALANCING OF AIR DISTRIBUTION SYSTEM, WHETHER INDICATED ON THE DRAWINGS OR NOT.

# 3.06 PIPING

- A. INSTALL PIPING SYSTEMS APPROXIMATELY AS SHOWN ON THE DRAWINGS, PROPERLY SUPPORTED AND RUN AS DIRECTLY AS POSSIBLE AT PERPENDICULAR OR PARALLEL ANGLES TO BUILDING LINES. LOCATE PIPING AS HIGH AS PRACTICAL WHILE COORDINATING WITH OTHER TRADES.
- B. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT UNDUE STRESS TO THE PIPE OR CONNECTED EQUIPMENT.
- C. PIPING SHALL BE LEAK-TESTED PRIOR TO THE APPLICATION OF INSULATION. THE USE OF CHEMICALS OR COMPOUNDS TO STOP LEAKS IS NOT PERMITTED.

# 3.07 AIR SYSTEMS BALANCING

- A. ALL AIR SYSTEMS TO BE BALANCED BY AN INDEPENDENT BALANCE CONTRACTOR CERTIFIED BY THE TESTING, ADJUSTING AND BALANCING BUREAU (TABB) AND/OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
- B. BALANCE AIR SYSTEMS TO WITHIN 10% OF ALL INDICATED AIRFLOWS. UTILIZE MANUAL DAMPERS ONLY TO THE EXTENT THAT OBJECTIONABLE SOUND LEVELS ARE NOT CREATED.
- C. ADJUST MOTOR OPERATED DAMPERS TO THE REQUIRED POSITIONS BASED ON INDICATED

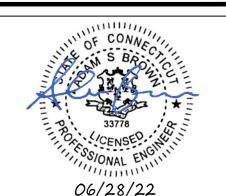
AIRFLOWS AND SEQUENCE OF OPERATION.

- D. ADJUST GRILLES, REGISTERS AND DIFFUSERS FOR PROPER DIRECTION AND THROW WITHOUT EXCESSIVE DRAFTS OR NOISE LEVELS.
- E. PERMANENTLY IDENTIFY THE POSITION OF SPEED CONTROLLERS AND DAMPERS FOR FUTURE REFERENCE.
- F. SUBMIT A CERTIFIED REPORT BEARING THE SEAL AND SIGNATURE OF THE TEST AND BALANCE ENGINEER. REPORT SHALL BE THE STANDARD FORMS OF THE APPROPRIATE CERTIFYING AGENCY.

# 3.08 TESTING

- A. ALL MECHANICAL SYSTEMS SHALL BE TESTED PRIOR TO PROJECT CLOSE—OUT TO ENSURE THAT THE SYSTEMS OPERATE AS REQUIRED AND SPECIFIED. TESTING SHALL BE PERFORMED AFTER AIR SYSTEMS BALANCING IS COMPLETED.
- B. HVAC SYSTEMS TESTING SHALL BE PERFORMED AT MINIMUM 60°F FOR COOLING AND MAXIMUM 50°F FOR HEATING. PROVIDE ADDITIONAL VISITS DURING THE GUARANTEE PERIOD TO PROVIDE TESTING AT THESE CONDITIONS.
- C. RE-TEST OR RE-BALANCE THE SYSTEMS AS REQUIRED DURING THE GUARANTEE PERIOD.
- D. DUCTWORK LEAK TESTING SHALL BE PROVIDED WHERE REQUIRED BY THE GOVERNING ENERGY CODE BASED ON SYSTEM TYPE AND OPERATING PRESSURE.

END OF SPECIFICATIONS



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TALCOTTVILLE RD.

DATE TYPE

06/28/22 ISSUED FOR PERMIT

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MECHANICAL SPECIFICATIONS

DATE 06/01/22 JOB NO. 21399

M-3.0

(208) 914-5087 (208) 989-2572 www.apexeng.co
Apex Project No. 082129

WATER CALCULATIONS							
FIXTURE	NEW	TOTAL	WA	STE	WATER		
FIXTURE	INEW	IOIAL	DFU EA.	DFU TOTAL	WFU EA.	WFU TOTAL	
WATER CLOSET	11	11	4	44	2	22	
URINAL	0	0	2	0	4	0	
LAVATORY	43	43	1	43	1	43	
DRINKING FOUNTAIN	2	2	.5	1	.5	1	
KITCHEN SINK	2	2	2	4	3	6	
MOP SINK	1	1	3	3	3	3	
HOSE BIBB	2	2	ı	-	2.5	5	
		ТОТ	AL FU	95		80	

TOTAL DEMAND 80 F.U. (F.V.) = 39 GPM

AVAILABLE STREET WATER PRESSURE 60 PSI

PRESSURE LOSS THRU 1-1/2" WTR MTR. = 1.2 PSI PRESSURE LOSS THRU 2" RPBP-1 = 14 PSI

PRESSURE FOR LAST FIXTURE = 25 PSI

PRESSURE LOSS DUE HEIGHT = 15 FT. x 0.433 = 6.5 PSI PRESSURE AVAILABLE FOR FRICTION LOSS = 13.30 PSI

 $13.30 \times 100 = 1,330/375$  FT. TDL = 3.55 PSI FRICTION LOSS PER 100 FT.

l		PIPE SIZI	E SCHEDU	LE
	PIPE SIZE	HW FU (MAX. 5'/SEC.)	FLUSH TANK CW FU (MAX. 8'/SEC.)	FLUSH VALVE CW FU (MAX. 8'/SEC.)
l	1/2"	1 1		-
l	3/4"	6	6	-
l	1'	16	16	-
l	1-1/4"	26	26	-
l	1-1/2"	46	54	16
ı	2"	111 185		102

	PLUME	ING FIXTURE SCHEDULE				
SYMBOL	DESCRIPTION	TRIM / ACCESSORIES	WASTE	VENT	НОТ	COLD
COTG-1	CLEANOUT TO GRADE: SIOUX CHIEF; MODEL 834 SERIES.	NO-HUB CONNECTION, ROUND PVC TOP, MEDIUM DUTY.	SEE PLAN FOR SIZE	-	-	-
<u>CP-1</u>	CIRCULATING PUMP: BELL & GOSSETT; ECOCIRC 20-18 PUMP ELECTRICAL: 120V/1PH/60HZ.	DIGITAL TIMER: MODEL 265-3, SET TO BUSINESS HOURS (115V/1PH/60Hz) AQUASTAT: MODEL 563-2 (115V/1PH/60Hz)	-	-	3/4"	-
<u>EWC-1</u>	ELECTRIC WATER COOLER: ELKAY; LZSTL8WSVRLK	HIGH-LOW WATER COOLER WITH BOTTLE FILLER, 115V.	1-1/2"	1-1/2"	-	1/2"
<u>ET-1</u>	EXPANSION TANK: THERM-X-TROL; MODEL ST-12-C. NON-ASME THERMAL EXPANSION TANK.		-	ı	ı	3/4"
<u>FCO</u>	FLOOR CLEANOUT: ZURN; 1400 SERIES	ADJUSTABLE TOP, IF FLOORS ARE TILE OR TERRAZO PROVIDE A NICKEL BRONZE TOP. IF FLOORS ARE CARPET PROVIDE A RECESSED TOP.	SEE PLAN FOR SIZE	1	1	-
<u>FD-1</u>	FLOOR DRAIN: JR SMITH; 2005	ADJUSTABLE 5" SQUARE NICKEL TOP, PROVIDE WITH TP-1.	2"	1-1/2"	-	-
<u>FS-1</u>	FLOOR SINK: ZURN; Z1900 SERIES	8" DEEP, 12"X12" WITH BOTTOM DOME CAST IRON HALF GRATE.	3"	2"	-	_
<u>GT-1</u>	GREASE TRAP: (IN FLOOR) SCHIER; GB-1, COORDINATE REQUIREMENTS WITH LOCAL AUTHORITY.	100 LB CAPACITY AND BUILT IN FLOW CONTROL.	3"	2"	1	-
<u>HB-1</u>	HOSE BIBB: (FROST FREE) JR SMITH; 5509QT	INTEGRAL VACUUM BREAKER AND STAINLESS RECESSED BOX WITH KEYED LOCK.	-	-	-	3/4"
<u>HD-1</u>	HUB DRAIN: 4X2 REDUCER TERMINATED APPROX. 1" A.F.F. FOR INDIRECT WASTE CONNECTIONS. PROVIDE W/ DEEP SEAL TRAP.			1-1/2"	-	-
<u>LAV-1</u>	WALL HUNG LAVATORY: AMERICAN STANDARD; 0954.00EC-020	FAUCET: ZURN; Z81101-XL-25M AQUASPEC. WALL CARRIER: ZURN; Z1231-F/AM-0954.00 1 PIPE COVERING: TRUEBRO; LAV GUARD.		1-1/2"	1/2"	1/2"
<u>MS-1</u>	MOP SINK: ZURN; Z1996-24	FAUCET: ZURN; Z843M1—RC, WITH LINT TRAP, MOP BRACKET, HOSE AND BRACKET, AND BUMPER GUARD. INSTALL WITH DEEP SEAL TRAP.		2"	3/4"	3/4"
<u>MXV-1</u>	THERMOSTATIC MIXING VALVE: CASH ACME; 25686	SET TO 105°F DELIVERY TEMPERATURE.	-	1	1/2"	1/2"
RPBP-1	REDUCED PRESSURE BACKFLOW PREVENTER: WATTS; LF009		-	I	ı	2"
<u>SK-1</u>	SINGLE BOWL SINK: AMERICAN STANDARD; 0355.012.020 SUPPLIED BY HJC.	FAUCET: ZURN AQUASPEC; 81104-XL-25M (0.35 GPM)	1-1/2"	1-1/2"	1/2"	1/2"
<u>SK-2</u>	CHANGING TABLE SINK: MAINLINE; MLD15152 SUPPLIED BY HJC.	FAUCET: TOTO; TEL155-D10E#CP ECO	1-1/2"	1-1/2"	1/2"	1/2"
<u>SK-3</u>	SINK: SINGLE BOWL: MAINLINE; MLD15152 SUPPLIED BY HJC.	FAUCET: ZURN; Z812B4-XL	1-1/2"	1-1/2"	1/2"	1/2"
<u>SK-4</u>	SINK: STAFF SINK DAYTON; PSRAQQD191950L	FAUCET: CHICAGO; 201-AGN2AE3VP BASKET STRAINER: ML151	1-1/2"	1-1/2"	1/2"	1/2"
<u>TP-1</u>	TRAP PRIMER: RECTORSEAL; SURE SEAL	DIAPHRAM TYPE TRAP SEAL.	MATCH DRAIN SIZE	-	-	-
<u>WB-1</u>	WASHER BOX: MAINLINE; ML10501		2"	1-1/2"	1/2"	1/2"
<u>WCO</u>	WALL CLEANOUT: JR SMITH; 4400 SERIES		SEE PLAN FOR SIZE	-	-	_
<u>WC-1</u>	FLOOR MOUNTED WATER CLOSET 10" (JUNIOR): AMERICAN STANDARD; 2315.228, WHITE.	SEAT: MAINLINE; ML1055SSC000, WHITE.	3"	2"	-	1/2"
<u>₩C−2</u>	FLOOR MOUNTED WATER CLOSET: AMERICAN STANDARD; 211CC.104, WHITE.	SEAT: MAINLINE; ML1055SSC000, WHITE.	3"	2"	_	1/2"
<u>WC-3</u>	FLOOR MOUNTED WATER CLOSET 17.5" (ACCESSIBLE): AMERICAN STANDARD; 211AA.104, WHITE.	SEAT: MAINLINE; ML1055SSC000, WHITE.	3"	2"	-	1/2"
<u>WH-1</u>	GAS WATER HEATER: AO SMITH; BTH—120. 60 GALLON, 120,000 BTU.	EXTEND P&T AND DRAIN PAN TO ADJACENT RECEPTOR.	-	-	1-1/2"	1-1/2"

	KITCHEN FIXTURE SCHEDULE (VENDOR SUPPLIED)								
SYMBOL	DESCRIPTION	TRIM / ACCESSORIES	WASTE	VENT	НОТ	COLD			
<u>DW-1</u>	DISHWASHER: COMMERCIAL TYPE.	PROVIDE DRAIN TO $\underline{FS-1}$ . PROVIDE WITH ZURN 35XL BACKFLOW PREVENTER.	INDIRECT	-	1/2"	_			
<u>K-1</u>	HAND SINK: VENDOR SUPPLIED, CONTRACTOR INSTALLED	PROVIDE AND INSTALL MXV-1	2"	1-1/2"	1/2"	1/2"			
<u>K-2</u>	SINK 1-COMPARTMENT: VENDOR SUPPLIED, CONTRACTOR INSTALLED	PROVIDED WITH WALL FAUCET	INDIRECT	-	1/2"	1/2"			
<u>K-3</u>	SINK 3-COMPARTMENT: VENDOR SUPPLIED, CONTRACTOR INSTALLED	PROVIDED WITH WALL FAUCET AND PRE RINSE	INDIRECT	-	1/2"	1/2"			

GAS C	CALCULATIONS
EQUIPMENT	LOAD IN MBH
F-1	40
F-2	40
F-3	40
F-4	40
F-5	40
F-6	40
F–7	40
F–8	40
F-9	40
WH-1	120
TOTAL	480
DISTANCE TO MOST REMOTE FIXTURE	150'
GAS DELIVERY PRESSURE	11"WC

A/E	ARCHITECT/ENGINEER	LB	POUND
AFF	ABOVE FINISHED FLOOR	MBH	
AFG	ABOVE FINISHED GRADE	MECH	MECHANICAL
AHJ	AUTHORITY HAVING JURISDICTION	MCA	MINIMUM CIRCUIT AMPACITY
BFP	BACKFLOW PREVENTER	MIN	
BHP	BRAKE HORSEPOWER	MOCP	
CD	CONDENSATE	MPG	MEDIUM PRESSURE GAS
COTG	CLEANOUT TO GRADE	MS	MOP SINK
CW	COLD WATER	(N)	
CWV	COMBINATION WASTE & VENT	NIC	
(D)	DEMO	NTS	
DFU	DRAINAGE FIXTURE UNIT	OC	
DIA.	DIAMETER	OD	
DN	DOWN	OFRWL	
(E)	EXISTING	PC	PLUMBING CONTRACTOR
EA.	EACH	POC	POINT OF CONNECTION
EFF	EFFICIENCY	PSI	
EOR	ENGINEER OF RECORD	(R)	RELOCATE/RELOCATED
F	FAHRENHEIT	REF	REFERENCE
FCO	FLOOR CLEANOUT	RPBP	
FD	FLOOR DRAIN		PREVENTER
FLA	FULL LOAD AMPS	RPM	
FPM	FEET PER MINUTE	RTU	
FPS	FEET PER SECOND	RWL	
FS	FLOOR SINK	SD	
FT .	FOOT (FEET)/FLUSH TANK	SF	
FU	FIXTURE UNIT	SEN.	SENSIBLE
FV	FLUSH VALVE	SOV	
G	NATURAL GAS	SP	
GA	GAUGE	SS	SANITARY SEWER
GPM	GALLONS PER MINUTE	SQ	SQUARE
GW	GREASE WASTE	T&P	TEMPERATURE AND PRESSURE
HB	HOSE BIBB	TDL	TOTAL DEVELOPED LENGTH
HP	HORSEPOWER	TYP.	TYPICAL
HVAC	HEATING, VENTILATION AND AIR CONDITIONING	UH	UNIT HEATER
HW	HOT WATER	UNO	UNLESS NOTED OTHERWISE
HWR	HOT WATER RETURN	V/PH	VOLTS/PHASE
ID	INSIDE DIAMETER	٧	VENT
IE	INVERT ELEVATION	VTR	VENT THRU ROOF
IN	INCH	W	WATT
IN. WG	INCHES WATER GAUGE	WC	WATER CLOSET OR WATER COLUM
IN. WG	ICE MACHINE	WCO	WALL CLEANOUT
KW	KILOWATT	WFU	WATER FIXTURE UNIT
	NEARALL	*** •	WILL INTOIL OITH

NOTE THAT NOT ALL ABBREVIATIONS LISTED IN THIS LEGEND WILL BE UTILIZED ON THIS PROJECT.

EGEND	
CD	CONDENSATE PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
G	NATURAL GAS PIPING
— — ss— — —	SANITARY SEWER PIPING
— — GW— — —	GREASE WASTE PIPING
— cwv— —	COMBINATION WASTE & VENT
	VENT PIPING
	FLOOR DRAIN
$\boxtimes$	FLOOR SINK
$\otimes$	HUB DRAIN
( <u>o</u> )	ROOF DRAIN
<b>⊚</b> ——►	VENT THRU ROOF
<b>&gt;_≯</b>	HOSE BIBB
I▼I	GAS VALVE
×	SHUT OFF VALVE
MEM	BACK FLOW PREVENTER
K	PRESSURE REDUCING VALVE
A	PRESSURE REGULATOR
7	CHECK VALVE
•	CLEANOUT
$\hookrightarrow$	WALL CLEANOUT
0	PIPE UP
С	PIPE DOWN
C	PIPE TEE
•	POINT OF CONNECTION (POC)

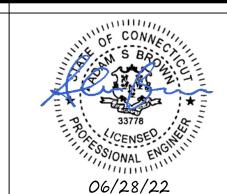
# PLUMBING SHEET INDEX

- P-0.1 PLUMBING COVER SHEET
- P-0.2 PLUMBING DETAILS
- P-1.0 PLUMBING PLAN WASTE & VENT
- P-2.0 PLUMBING PLAN WATER & GAS
- P-3.0 PLUMBING SPECIFICATIONS

- GENERAL NOTES
- CONTRACTOR SHALL PROVIDE A COMPLETE PLUMBING SYSTEM FOR THE PROJECT. ITEMS OR WORK NOT SHOWN OR SPECIFIED ON THE PLUMBING DRAWINGS. BUT REQUIRED FOR THE COMPLETE PLUMBING SYSTEM, SHALL BE PROVIDED AND SHALL CONFORM WITH ACCEPTED TRADE PRACTICES, LOCAL CODES AND GOVERNING AUTHORITIES.
- THE PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE AND ARE TO CONVEY DESIGN INTENT ONLY. COORDINATE AND FIELD-LOCATE PIPING AND EQUIPMENT LOCATIONS PRIOR TO FABRICATION OR INSTALLATION, TO MEET JOB REQUIREMENTS. REQUIRED OFFSETS, FITTINGS AND GENERAL INSTALLATION REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER OR DESIGN TEAM SHALL NOT BE RESPONSIBLE FOR MATERIAL PLACED DIRECTLY FROM THE MECHANICAL
- ALL WORK AND MATERIALS SHALL CONFORM TO ALL APPLICABLE LOCAL AND STATE CODES AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
- ALL DIMENSIONS LISTED ARE IN INCHES, UNLESS NOTED OTHERWISE.
- FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT AND FACILITIES NECESSARY TO FURNISH, FABRICATE, DELIVER, STORE AND INSTALL ALL WORK NOTED ON THE DRAWINGS.
- SUBMISSION OF A BID ACKNOWLEDGES FULL RESPONSIBILITY FOR FURNISHING A COMPLETE & FUNCTIONAL PLUMBING SYSTEM.
- LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF UTILITIES PRIOR TO STARTING WORK OF THIS SECTION. MAKE REQUIRED ADJUSTMENTS TO CONNECT TO UTILITIES. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND. THE CONTRACTOR SHALL, BEFORE CONTINUING, NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.
- ALL DIMENSIONS AND LOCATIONS PER ARCHITECTURAL DRAWINGS.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY AVAILABLE SPACES FOR INSTALLING THE
- ). THE WORK SHALL BE ACCOMPLISHED IN A THOROUGH & WORKMANLIKE MANNER SATISFACTORY TO AND MEETING THE APPROVAL OF THE ENGINEER AND ARCHITECT.
- CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE ALL LABOR & MATERIAL ON ALL WORK AGAINST DEFECTS IN WORKMANSHIP & MATERIALS FOR A PERIOD OF ONE YEAR.
- 2. ALL MATERIALS, APPLIANCES & EQUIPMENT SHALL BE NEW & THE BEST OF THEIR RESPECTIVE
- 3. CATALOG INFORMATION & CUTS OF ALL EQUIPMENT, DEVICES & TRIM SHALL BE SUBMITTED FOR REVIEW. ALL SUBMITTALS TO BE APPROVED BY ARCHITECT, ENGINEER.

KIND. FREE FROM ALL DEFECTS AND OF THE MAKE, BRAND, AND QUANTITY SPECIFIED.

- 4. CLEANOUTS SHALL BE INSTALLED AS PER THE PLUMBING CODE.
- 5. PROVIDE FELT WITH METAL BACKING VIBRATION ISOLATION SLEEVES OR PADS AT ALL PIPE HANGERS OR SUPPORTS AND ALL POINTS WHERE PIPING COMES IN CONTACT WITH ANY PORTION OF THE STRUCTURE. APPLIES TO ALL WATER AND WASTE PIPING. PROVIDE FELT AROUND ALL PVC PIPING AT SUPPORTS FOR THERMAL EXPANSION.
- 6. ALL PIPES SHALL BE SUPPORTED AND BRACED PER NFPA STANDARDS.
- . PLUMBERS TAPE WILL NOT BE ACCEPTED AS A PERMANENT SUPPORT FOR ANY PIPING OR DEVICES.
- . VALVES SHALL BE FULL PORT, BRONZE 1/4 TURN BALL TYPE. 4" TO 6" SHALL BE GATE VALVE BRONZE BODY, RISING STEM. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. PROVIDE AND INSTALL IDENTIFICATION TAGS ON ALL VALVES. VALVES IN EXPOSED COMMON AREAS TO HAVE LOCKING HANDLES. NO IRON BODY VALVES WILL BE ACCEPTED.
- 9. PROVIDE AND INSTALL DIELECTRIC UNIONS BETWEEN ALL COPPER AND GALVANIZED & IRON PIPING & COMPONENTS.
- O. PENETRATIONS IN WALLS, FLOORS, OR CEILINGS, WHICH REQUIRE PROTECTED OPENINGS SHALL BE FIRE-STOPPED. RE-STOPPING SHALL BE AN APPROVED MATERIAL. INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE TO THE INSPECTION AUTHORITY AND BE MAINTAINED AT THE JOB SITE.
- . PROVIDE WATERTIGHT FLASHING WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOF AND
- 2. CUTTING AND PATCHING: ALL CUTTING & PATCHING OF THE EXISTING STRUCTURE SHALL BE PROVIDED. PROVIDE ALL NECESSARY REQUIREMENTS TO THE PROJECT MANAGER. PROTECTION AGAINST DUST AND DEBRIS SHALL BE TO THE SATISFACTION OF THE PROJECT MANAGER.
- 3. UPON COMPLETION OF THE WORK UNDER THIS SECTION THE CONTRACTOR SHALL REMOVE ALL SURPLUS MATERIALS, EQUIPMENT, & DEBRIS INCIDENTAL TO THIS WORK & LEAVE THE PREMISES CLEAN AND ORDERLY. PROVIDE NEW CEILING TILES (TO MATCH EXISTING) IF ANY ARE DAMAGED DURING CONSTRUCTION.
- 4. WASTE PIPE SIZES THAT ARE 3 INCHES OR SMALLER SHALL BE EVALUATED AT 2% SLOPE.
- 6. WATER, SEWER, VENT, AND FIRE PIPES THROUGH CONCRETE WALLS AND FLOORS SHALL HAVE PIPE -SLEEVES WITH NON COMBUSTIBLE SEALING.
- 6. RUN A FULL SIZE DRAIN LINE FROM WATER HEATERS TEMPERATURE AND PRESSURE RELIEF VALVE TO NEAREST FLOOR SINK OR TO AN APPROVED LOCATION.
- 7. PROVIDE ACCESS DOORS TO ALL CONCEALED VALVES, STRAINERS, TRAP PRIMERS, ETC./ PROVIDE STAINLESS STEEL ACCESS PANELS & FRAMES FOR ALL TILED AREAS.
- 28. ALL PIPING IN FINISHED AREAS SHALL BE RUN CONCEALED. EXPOSED PIPING, WHERE NECESSARY, SHALL RUN AS HIGH AS POSSIBLE AND TIGHT TO THE WALLS.
- 9. WATER HEATERS SHALL BE SEISMICALLY BRACED PER CODE REQUIREMENTS.
- 30. INSTALL WATER HAMMER ARRESTORS ON EACH COLD AND HOT WATER FIXTURE BRANCH AS RECOMMENDED BY PLUMBING AND DRAINAGE INSTITUTE. DEVICES SHALL BE FACTORY MADE WITH PERMANENT CUSHION OF GAS OR AIR. PROVIDE ACCESS PANEL.
- 1. PROVIDE AND INSTALL DIAPHRAGM TRAP PRIMERS FOR ALL FLOOR DRAINS.
- 2. NEW POTABLE WATER SYSTEMS SHALL BE DISINFECTED PRIOR TO USE ACCORDING TO THE METHODS SET IN THE LOCAL PLUMBING CODE.



REVISIONS

PLUMBING COVER SHEET

06/01/22 JOB NO.

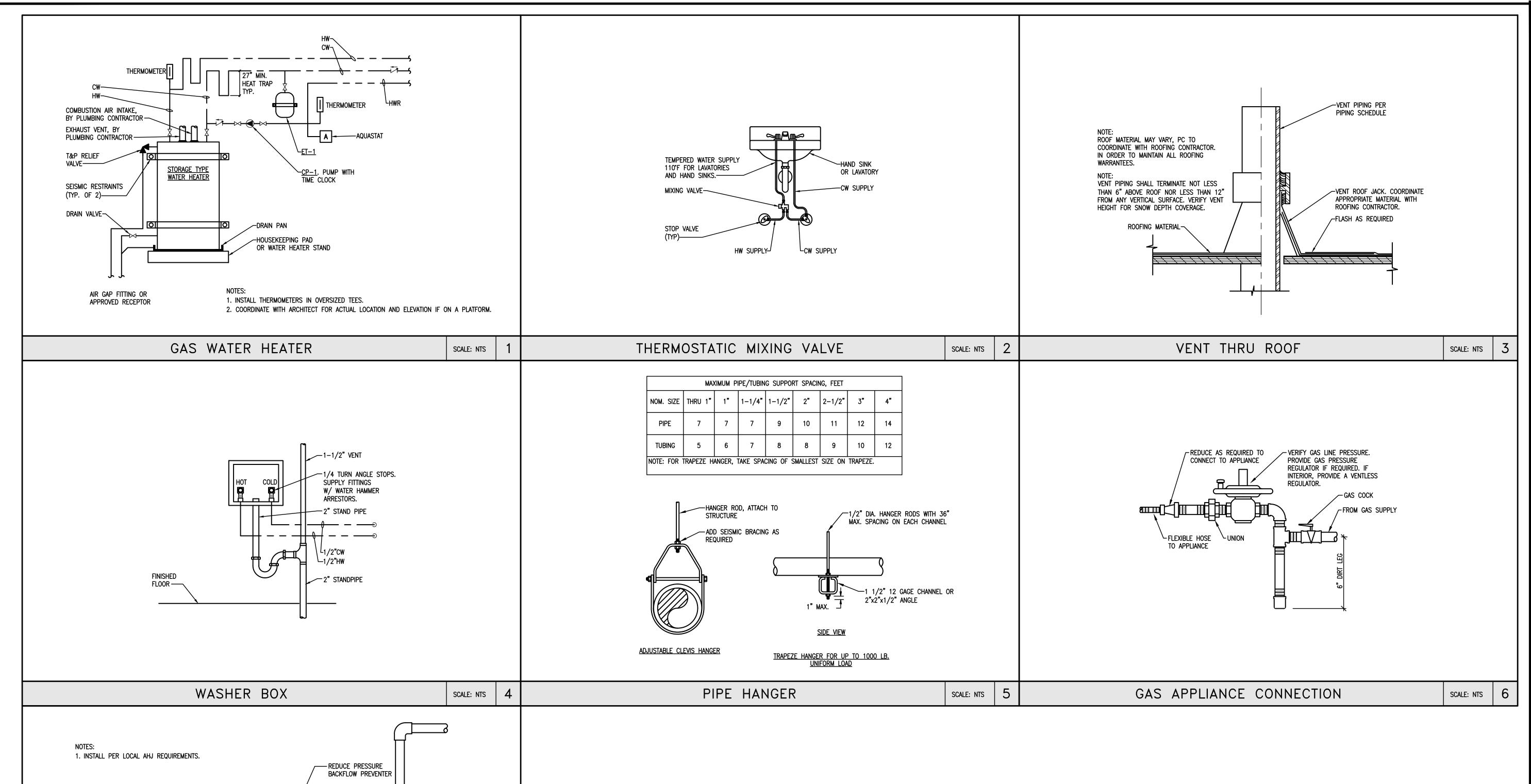
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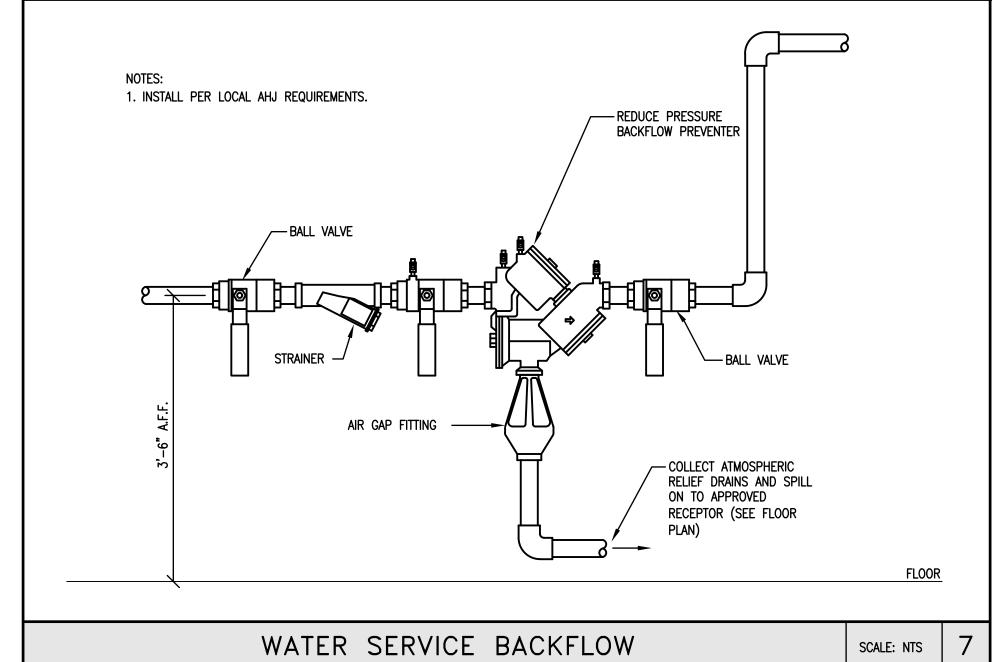


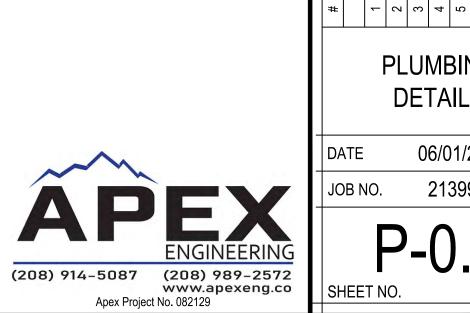
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**PLUMBING DETAILS** 

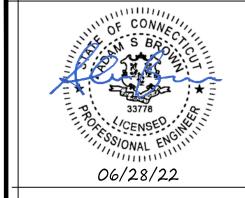
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# GENERAL NOTES

1. SEE SHEET P-0.1 FOR PLUMBING GENERAL NOTES.

# KEY NOTES #

- 1. SEE CIVIL FOR CONTINUATION.
- 2. 3"SD UP. TRANSITION TO SQUARE DOWNSPOUT.
- 3. DRAIN DISHWASHER INTO ADJACENT SANITARY FLOOR
- 4. ROUTE VENT PIPING IN HALF HEIGHT WALL TO FULL HEIGHT WALL
- SEE MEZZANINE PLUMBING PLAN ON SHEET P-2.0 FOR CONTINUATION.



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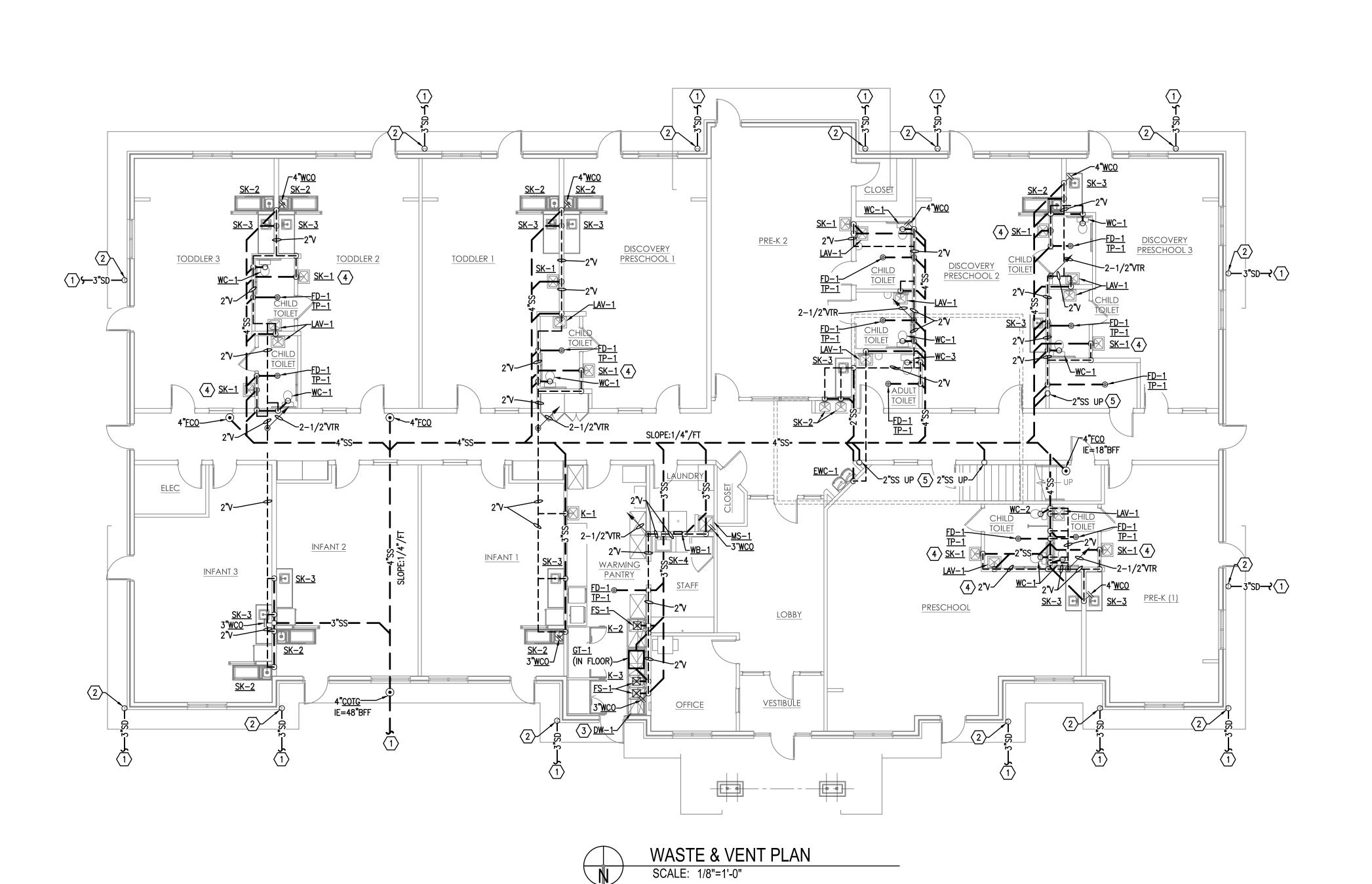
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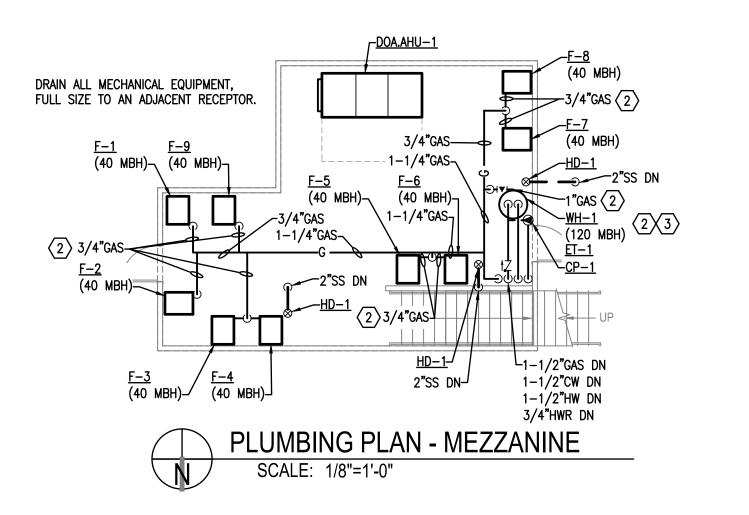
PLUMBING PLAN -WASTE & VENT

DATE 06/01/22

JOB NO. 21399

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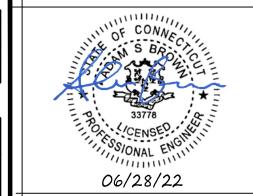


# GENERAL NOTES

. SEE SHEET P-0.1 FOR PLUMBING GENERAL NOTES.

# KEY NOTES #

- 1. SEE CIVIL FOR CONTINUATION.
- GAS CONNECTION TO APPLIANCE WITH GAS COCK, 6" DIRT LEG AND FLEXIBLE CONNECTION.
- 3. DRAIN WATER HEATER DRAIN AND AND P&T INTO ADJACENT RECEPTOR.



**InSite** 

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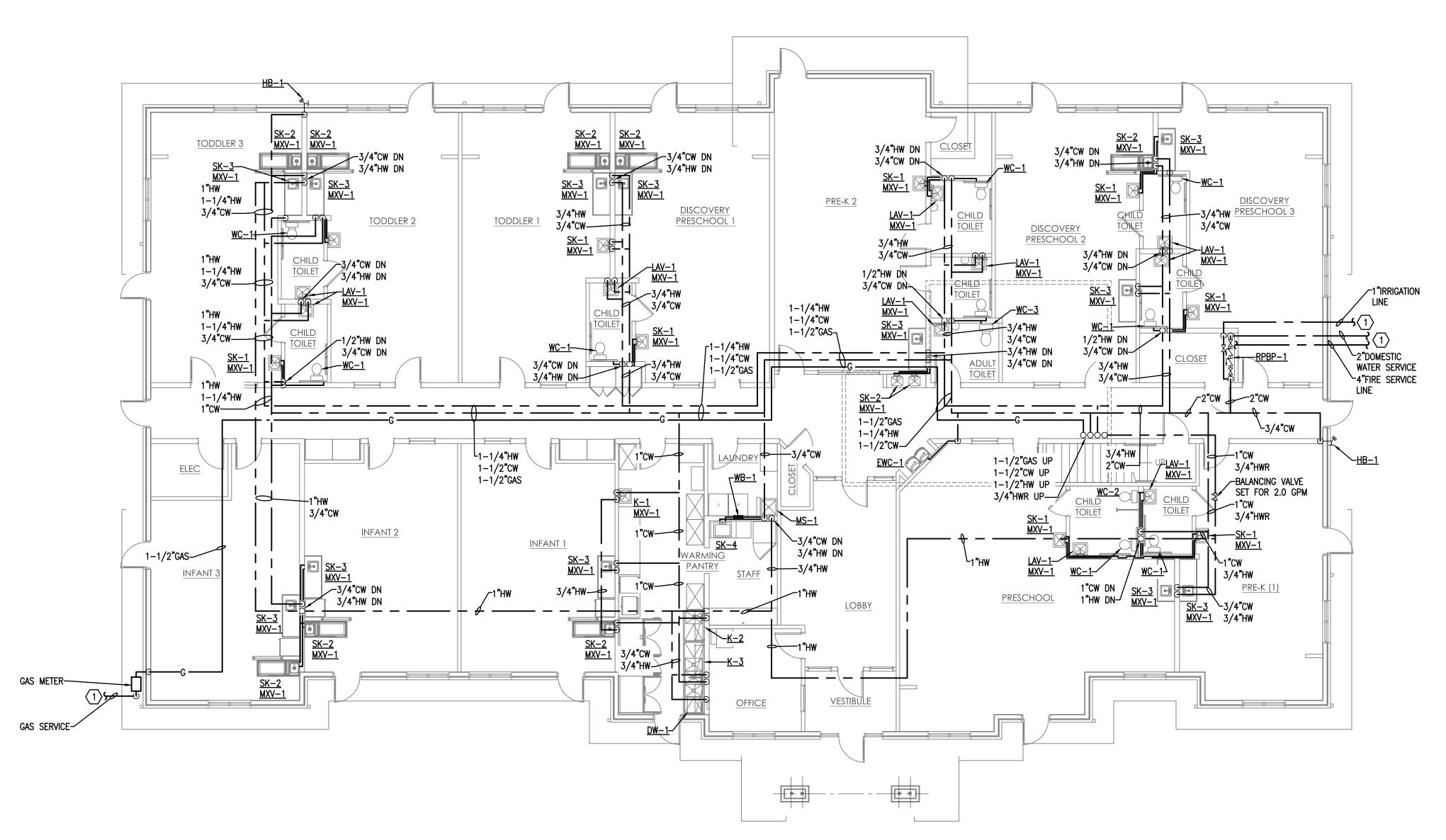
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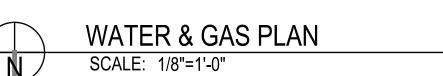
JOB NO. 21399

P-2.0 SHEET NO.

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## 1.01 SUMMARY

- A. FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT AND FACILITIES NECESSARY TO
- B. THE CONTRACTOR SHALL PROVIDE A COMPLETE PLUMBING SYSTEM FOR THE PROJECT. ITEMS OR WORK NOT SHOWN OR SPECIFIED ON THE PLUMBING DRAWINGS, BUT REQUIRED FOR THE COMPLETE PLUMBING SYSTEM, SHALL BE PROVIDED AND SHALL CONFORM WITH ACCEPTED TRADE PRACTICES, LOCAL CODES AND GOVERNING AUTHORITIES.

FURNISH, FABRICATE, DELIVER, STORE AND INSTALL ALL WORK NOTED ON THE DRAWINGS.

- C. THE PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE AND ARE TO CONVEY DESIGN INTENT ONLY. COORDINATE AND FIELD-LOCATE PIPING AND EQUIPMENT LOCATIONS PRIOR TO FABRICATION OR INSTALLATION, TO MEET JOB REQUIREMENTS. REQUIRED OFFSETS, FITTINGS AND GENERAL INSTALLATION REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER OR DESIGN TEAM SHALL NOT BE RESPONSIBLE UNFORESEEN SITE OR AS-BUILT CONDITIONS TAKEN DIRECTLY FROM THE PLUMBING DRAWINGS.
- D. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE EXECUTION OF THIS WORK.
- SITE INSPECTION: CONTRACTOR SHALL VISIT THE SITE OF WORK PRIOR TO SUBMISSION OF HIS BID AND THOROUGHLY FAMILIARIZE HIMSELF WITH THE WORKING CONDITIONS & EXACT NATURE OF THE WORK, INCLUDING EXAMINATION OF AND REFERENCE TO THE CONSTRUCTION DOCUMENTS FOR ALL OTHER TRADES. SUBMISSION OF A BID ACKNOWLEDGES FULL RESPONSIBILITY FOR FURNISHING A COMPLETE & FUNCTIONAL SYSTEM. NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDING FOR ANY OMISSIONS WHICH RESULTS FROM A FAILURE TO THOROUGHLY PERFORM THE REQUIRED DUE DILIGENCE.
- F. COORDINATION: CONTRACTOR SHALL COORDINATE EACH PIECE OF EQUIPMENT WITH ALL OTHER TRADES AFFECTED BY THAT PIECE OF EQUIPMENT (ROOF OPENINGS, WEIGHTS, POWER REQUIREMENTS, DRAINING, ETC.). NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDING FOR ANY ISSUE WHICH RESULTS FROM A FAILURE TO THOROUGHLY COORDINATE AMONG DISCIPLINES.
- G. ALL WIRING FOR 110V AND ABOVE SHALL BE BY THE ELECTRICAL CONTRACTOR. ALL WIRING FOR LESS THAN 110V SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR, UNLESS NOTED OTHERWISE. ALL WORK SHALL BE PER NATIONAL ELECTRIC CODE AND APPLICABLE LOCAL CODES AND ORDINANCES.
- H. PROVIDE ALL CUTTING, EXCAVATING AND PATCHING NECESSARY TO INSTALL THE PLUMBING SYSTEMS. PATCHING SHALL MATCH ADJACENT SURFACES.
- . SUPPORT ALL PIPING FROM THE STRUCTURE. DO NOT HANG PIPE FROM ANY OTHER PIPING, DUCTS OR EQUIPMENT.

# 1.02 QUALITY ASSURANCE

- A. ALL WORK AND MATERIALS SHALL CONFORM TO LOCAL BUILDING, PLUMBING AND ENERGY CODES, ASPE, SMACNA AND NFPA STANDARDS, AND ALL OTHER APPLICABLE STATE AND FEDERAL CODES.
- B. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL DISPLAY A UL LABEL WHERE APPLICABLE.
- C. INSOFAR AS POSSIBLE, ALL EQUIPMENT AND MATERIALS OF THE SAME TYPE SHALL BE BY THE SAME MANUFACTURER.
- D. PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, LOSS AND THEFT BEFORE AND AFTER INSTALLATION.

# 1.03 SUBMITTALS

# A. SUBSTITUTIONS:

- THESE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO INDICATE A STANDARD OF QUALITY FOR MATERIALS AND EQUIPMENT BY THE LISTING OF MANUFACTURER'S NAMES AND MODEL NUMBERS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVE EQUALITY FOR ANY SUBSTITUTIONS.
- 2. ALL SUBSTITUTION REQUESTS MUST BE APPROVED BY THE ENGINEER ON RECORD,
- OWNER, OR ARCHITECT OF RECORD.

  3. THE SIZES OF EQUIPMENT SHOWN ON THE PLUMBING DRAWINGS IS BASED ON THE DIMENSIONS OF THE BASIS OF DESIGN EQUIPMENT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF PROPOSED EQUIPMENT SUBSTITUTIONS WILL FIT
- IN THE AVAILABLE SPACE.

  4. THE CONTRACTOR PROPOSING THE SUBSTITUTION IS RESPONSIBLE FOR ANY ADDITIONAL COSTS AND CHANGES AS A RESULT OF PRODUCT SUBSTITUTIONS.

# B. PRODUCT DATA:

- 1. INCLUDE MANUFACTURER'S TECHNICAL DATA FOR EACH MODEL INDICATED, INCLUDING PERFORMANCE CHARACTERISTICS AT CONDITIONS NOTED IN THE CORRESPONDING EQUIPMENT SCHEDULE, DIMENSIONS, REQUIRED CLEARANCES, CHARACTERISTICS AND ACCESSORIES. EQUIPMENT CATALOGS WITHOUT PROPER PERFORMANCE CHARACTERISTICS ARE NOT ACCEPTABLE AND WILL BE REJECTED.
- 2. THE ARCHITECT'S/ENGINEER'S REVIEW OF PRODUCT DATA SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR DEVIATIONS FROM THE CONTRACT DRAWINGS OR SPECIFICATIONS OR THE RESPONSIBILITY TO COORDINATE WITH ALL OTHER TRADES FOR CONFLICTS.
- 6. PRODUCT DATA SUBMITTALS REQUIRED FOR:
  A) ALL SCHEDULED PLUMBING FIXTURES AND PRODUCTS
- A) ALL SCHEDUL
  B) INSULATION
- B) INSULATION
  C) FIRE CHAULK
- D) VALVES E) PIPING MATERIAL
- F) HANGERS AND SUPPORTS

# 1.04 PROJECT CLOSEOUT

- A. PLUMBING SYSTEMS TRAINING: THE OWNER'S REPRESENTATIVE SHALL BE INSTRUCTED BY THE CONTRACTOR ON THE OPERATION AND MAINTENANCE OF THE PLUMBING SYSTEMS, INCLUDING BUT NOT LIMITED TO EACH ITEM OF EQUIPMENT INSTALLED. ANY SPECIAL TOOLS AND/OR INSTRUMENTS REQUIRED FOR EQUIPMENT OPERATION OR MAINTENANCE SHALL BE TURNED OVER TO THE OWNER.
- B. OPERATING AND MAINTENANCE DATA:
- 1. AT PROJECT CLOSEOUT, OPERATING AND MAINTENANCE DATA SHALL BE COMPILED INTO
- A THREE-RING BINDER LABELED "OPERATING AND MAINTENANCE MANUALS."

  2. THE FOLLOWING SHALL BE INCLUDED IN THE O&M BINDER, AT MINIMUM:
- A) OPERATING AND MAINTENANCE DATA AND WARRANTY DATA FOR ALL SCHEDULED PLUMBING EQUIPMENT.

GUARANTEE LETTER.

- C. GUARANTEE LETTER: ALL WORKMANSHIP, MATERIAL, EQUIPMENT, SYSTEMS, ETC. FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED BY THIS CONTRACTOR IN WRITING FOR A PERIOD OF ONE YEAR AFTER SUBSTANTIAL COMPLETION OF THE PROJECT. THIS WARRANTY MEANS THAT THIS CONTRACTOR SHALL MAKE GOOD TO THE OWNER, AT NO COST, ANY DEFECTS OR SERVICE REQUIREMENTS THAT BECOME APPARENT DURING THE WARRANTY PERIOD. THIS GUARANTEE IS IN ADDITION TO ANY OTHER WARRANTIES AND IS NOT INTENDED TO LIMIT OTHER SUCH GUARANTEES OR WARRANTIES.
- O. CONTRACTOR SHALL RECORD ON AS-BUILT DRAWINGS ALL SIZES, MATERIALS, AND LOCATIONS OF ALL EQUIPMENT AND PIPING THAT DEVIATES FROM THE PLUMBING DRAWINGS. AT PROJECT CLOSEOUT, THE DRAWINGS SHALL BE SIGNED AND DATED BY THE CONTRACTOR AND DELIVERED TO THE A/E TEAM.

### PART 2 - PRODUCTS

# 2.01 FLAME SPREAD PROPERTIES:

A. ALL MATERIALS, ADHESIVES, MASTICS SHALL HAVE A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS.

# 2.02 PLUMBING EQUIPMENT

A. ALL EQUIPMENT CAPACITIES, CHARACTERISTICS AND REQUIREMENTS ARE SHOWN ON THE SCHEDULES ON THE DRAWINGS. THE CAPACITIES SHOWN ARE MINIMUM CAPACITIES. VARIATIONS IN THE CHARACTERISTICS AND CAPACITIES WILL ONLY BE PERMITTED WITH WRITTEN APPROVAL FROM THE ENGINEER ON RECORD.

# 2.03 PLUMBING FIXTURES & TRIM

A. ALL PLUMBING FIXTURES SHALL BE PROVIDED COMPLETE WITH ALL REQUIRED TRIM FOR A COMPLETE AND OPERATIONAL SYSTEM. ALL EXPOSED TRIM SHALL BE CHROME PLATED. ALL PIPING PENETRATIONS THROUGH FINISHED WALLS SHALL BE PROVIDED WITH CHROME ESCUTCHEONS. ALL PLUMBING FIXTURES SHALL BE CAULKED AND SEALED TO SURROUNDING SURFACES. ALL SINK TRAPS SHALL BE PROVIDED WITH A CLEAN OUT PLUG IN THE BOTTOM OF THE TRAP. INTERIOR EXPOSED PIPE, VALVES, AND FIXTURE TRIM, INCLUDING TRIM BEHIND ALL CASEWORK DOORS, SHALL BE CHROME PLATED. ALL FIXTURE STOP VALVES SHALL BE QUARTER—TURN BRASS BALL TYPE.

## 2.04 PIPING & FITTINGS

# A. GENERAL:

- 1. UNDERGROUND SANITARY SEWER AND STORM DRAIN LINES SHALL BE INSTALLED AT 1/4" PER FOOT SLOPE, UNLESS OTHERWISE INDICATED. IF SUCH SLOPE IS NOT POSSIBLE DUE TO EXISTING INVERTS, APPROVAL SHALL BE OBTAINED FROM THE ARCHITECT/ENGINEER AND THE AUTHORITY HAVING JURISDICTION BEFORE ANY PIPING IS
- INSTALLED AT A LESSER SLOPE.
  2. CONNECTIONS BETWEEN PIPING OF DISSIMILAR MATERIALS SHALL BE MADE WITH
- DIELECTRIC WATERWAY FITTINGS OR UNIONS.

  3. PROVIDE STANDARD MANUFACTURED WATER HAMMER ARRESTERS AT ALL FLUSH VALVES. SIZE AND LOCATE PER MANUFACTURERS RECOMMENDATIONS. PROVIDE ACCESS PANELS FOR ACCESS TO ALL WATER HAMMER ARRESTERS.

# B. DOMESTIC HOT AND COLD WATER:

- 1. PIPING INSIDE BUILDING ABOVE SLAB OR ABOVE GRADE IN CRAWL SPACE SHALL BE ASTM B88, TYPE "L", HARD DRAWN COPPER. FITTINGS SHALL BE ANSI/ASME B16.23 CAST BRASS, OR ANSI/ASME B16.29 WROUGHT COPPER. JOINTS SHALL BE ANSI/ASTM B32 SOLDER. GRADE 95-5, LEAD FREE.
- 2. PIPING UNDERGROUND WITHIN 5 FEET OF THE BUILDING LINE OR BELOW FLOOR SLAB, SMALLER THAN 4 INCHES, SHALL BE ASTM B88, TYPE "K", HARD DRAWN OR SOFT ANNEALED COPPER. FITTINGS SHALL BE ANSI/ASME B16.29 WROUGHT COPPER. JOINTS SHALL BE ANSI/ASTM B32 SOLDER, GRADE 95-5, LEAD FREE. NO JOINTS SHALL BE INSTALLED BENEATH CONCRETE FLOOR SLABS. UNDERGROUND COPPER PIPING SHALL BE PROVIDED WITH A POLYETHYLENE JACKET, ANSI/AWWA C105, OR SHALL BE WRAPPED WITH DOUBLE LAYER, HALF-LAPPED, 10 MIL POLYETHYLENE TAPE. TRAP PRIMER PIPING (BELOW FLOOR OR CONCEALED ONLY) 1/2" TYPE K HARD DRAWN COPPER, WRAPPED AS INDICATED ABOVE.
- 3. PIPING UNDERGROUND BEYOND 5 FEET FROM BUILDING LINE SHALL BE SCHEDULE 40 PVC, ASTM D1785 OR D2241. FITTINGS SHALL BE PVC, ANSI/ASTM D2466. JOINTS SHALL BE SOLVENT WELD, ASTM D2855, OR GASKETED, ASTM F477. PIPING SHALL BE RATED FOR NOT LESS THAN 150 PSIG PRESSURE.

# C. SANITARY SEWER AND VENT:

- 1. PIPING AND FITTINGS SHALL BE SCHEDULE 40 PVC-DWV (CELLULAR CORE), PER ASTM F1488 AND ASTM F891, SOLVENT WELDED PER SOLVENT MANUFACTURERS INSTRUCTIONS, OR ABS SCHEDULE 40 PIPING AND FITTINGS PER EITHER ASTM D2661 OR ASTM F628 WITH SOLVENT CEMENT CONFORMING TO ASTM D2235. ALL SEWER RISERS (2 STORY OR MORE) SHALL BE SERVICE WEIGHT CAST IRON, NO-HUB OR SINGLE-HUB, ASTM A74. ALL PIPING PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS, OR CEILINGS, AND ALL PIPING LOCATED ABOVE CEILINGS USED AS RETURN AIR PLENUMS SHALL ALSO BE CAST IRON OR GALVANIZED STEEL, ASTM A53.
- UNDERGROUND PVC-DWV PIPING SHALL BE INSTALLED PER ASTM D-2321.

  2. ALL SANITARY WASTE AND GREASE PIPING FOR COMMERCIAL TYPE KITCHENS SHALL BE CAST IRON CISPI 201, ASTM888 HUBLESS, WITH CAST IRON FITTINGS. JOINTS SHALL BE NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHEILD ASSEMBLIES AND SHALL CONFORM TO CISP 310 AND BE CERTIFIED BY NSF FOR COMPLIANCE. PIPE AND FITTINGS SHALL BE LISTED BY NSF INTERNATIONAL AND MANUFACTURED BY AB&I, CHARLOTTE, TYLER, NEWAGE CASTING, STAR, OR RECEIVE PRIOR APPROVAL. CAST IRON PIPING SHALL EXTEND DOWNSTREAM FROM THE KITCHEN TO THE MAIN BUILDING WASTE LINE, AND / OR, GREASE INTERCEPTOR.
- PIPING AND FITTINGS BEYOND 5 FEET FROM THE BUILDING LINE SHALL BE PVC, ASTM D3033 OR D3034, SDR 35. JOINTS SHALL BE ASTM F477 WITH ELASTOMERIC GASKETS.
- UNDERGROUND PIPING SHALL BE INSTALLED PER ASTM D-2321.
  4. ALL 90 DEGREE WASTE LINE ELBOWS SHALL BE PER THE LATEST ISSUE OF THE
- PLUMBING CODE.

  5. ALL EXPOSED VENT PIPING LOCATED IN OCCUPIED AREAS OR ROOMS, IS TO BE CAST IRON WITH CAST IRON FITTINGS.
- 6. CLEANOUTS SHALL BE PROVIDED AT EACH HORIZONTAL DRAINAGE PIPE AT ITS UPPER TERMINAL, AND EACH RUN OF PIPING WHICH IS MORE THAN 100 FEET, AND SHALL BE PROVIDED FOR EACH 100 FEET DEVELOPED LENGTH, OR FRACTION THEREOF OF SUCH PIPING. AN ADDITIONAL CLEAN OUT SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING ONE HUNDRED THIRTY—FIVE DEGREES, PER APPLICABLE PLUMBING CODE. THIS SHALL BE PROVIDED REGARDLESS OF WHAT IS SHOWN ON THE DRAWINGS.
- ALL FLOOR DRAINS, FLOOR SINKS, AND HUB DRAINS WITH INFREQUENT USE SHALL BE INSTALLED WITH A TRAP PRIMER. REFERENCE THE PLUMBING FIXTURE SCHEDULE, ON THE PLANS, FOR TYPE.
- 8. ALL VENTS THROUGH ROOF (VTR'S) SHALL BE EXTENDED AT LEAST 1 FOOT ABOVE THE ROOF SURFACE, OR TO THE TOP OF THE CLOSEST ADJACENT PARAPET WALL, WHICHEVER IS GREATEST.
- VERIFY WITH LOCAL AND STATE CODE FOR ALLOWABLE PIPING. CODE SHALL SUPERCEDE THIS SECTION WHERE APPLICABLE.

# D. STORM DRAIN PIPING

- 1. EXTERIOR EXPOSED PIPING SHALL BE SERVICE WEIGHT CAST IRON, NO—HUB OR SINGLE—HUB, ASTM A74. UNDERGROUND SCHEDULE 40 PVC—DWV PIPING SHALL BE INSTALLED PER ASTM D—2321.
- INTERIOR PIPING AND FITTINGS SHALL BE SCHEDULE 40 PVC-DWV (CELLULAR CORE), PER ASTM F1488 AND ASTM F891, SOLVENT WELDED PER SOLVENT MANUFACTURERS INSTRUCTIONS. ALL RISERS (2 STORY OR MORE) SHALL BE SERVICE WEIGHT CAST IRON, NO-HUB OR SINGLE-HUB, ASTM A74. ALL PIPING PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS, OR CEILINGS, AND ALL PIPING LOCATED ABOVE CEILINGS USED AS RETURN AIR PLENUMS SHALL ALSO BE CAST IRON OR GALVANIZED STEEL, ASTM A53. UNDERGROUND SCHEDULE 40 PVC-DWV PIPING SHALL BE INSTALLED PER ASTM D-2321.

# E. CONDENSATE DRAIN PIPING

- EXTERIOR TO BUILDING, OR LOCATED IN PLENUM: PIPING SHALL BE TYPE L HARD DRAWN COPPER, ASTM B88 WITH SOLDER JOINTS. COPPER PIPING SHALL NOT BE USED ON 90% CONDENSING TYPE FOLIDMENT.
- ON 90% CONDENSING TYPE EQUIPMENT.
  INTERIOR: PIPING SHALL BY TYPE L HARD DRAWN COPPER, ASTM B88, WITH SOLDER
  JOINTS, GRADE 95TA, OR SHALL BE SCHEDULE 40 PVC. COPPER PIPING SHALL NOT BE
  USED ON 90% CONDENSING TYPE EQUIPMENT. PROVIDE A NEOPRENE OR RUBBER
  GASKET AT ALL COPPER PIPING SUPPORT HANGERS TO INHIBIT CORROSION.

# . NATURAL GAS PIPING

- 1. CONTRACTOR SHALL COORDINATE WITH THE LOCAL GAS COMPANY TO PROVIDE A NEW SERVICE FOR THE BUILDING (AS REQUIRED). THIS SHALL INCLUDE THE INSTALLATION OF A NEW REGULATOR AND METER (AS REQUIRED). THE ENTIRE INSTALLATION SHALL CONFORM TO THE GAS COMPANY REQUIREMENTS. ALL FEES AND/OR COSTS ASSOCIATED WITH THE GAS SERVICE AND METER SHALL BE PAID BY THE CONTRACTOR.
- 2. NATURAL GAS PIPING MATERIAL, JOINTS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF THE LOCALLY ENFORCED INTERNATIONAL FUEL AND GAS CODE, THE UTILITY COMPANY REQUIREMENTS, AND ANY OTHER AUTHORITIES HAVING JURISDICTION.
- 3. ALL ELEVATION CHANGES AND CONNECTIONS TO EQUIPMENT SHALL HAVE A 6" DEEP DRIP LEG.
  - DRIP LEG.
    . PROVIDE A FULL SIZE GAS SHUT-OFF VALVE AND GROUND JOINT UNION AT ALL
- CONNECTIONS TO GAS FIRED EQUIPMENT.
- IN NO CASE MAY A VALVE BE INSTALLED IN A RETURN AIR PLENUM.
   UNDERGROUND NATURAL GAS PIPING SHALL BE ASTM D 2513, POLYETHYLENE (PE), SDR 11 OR 11.5 PLASTIC PIPE WITH FUSION WELDED JOINTS AS APPROVED BY THE GAS COMPANY. PIPING SHALL BE INSTALLED PER GAS COMPANY AND MANUFACTURER'S REQUIREMENTS.
- . ABOVEGROUND NATURAL GAS PIPING SHALL BE:

  2" AND SMALLER: SCHEDULE 40 BLACK STEEL PIPE WITH THREAD JOINTS AND MALLEABLE IRON FITTINGS.
- 2-1/2" AND LARGER: SCHEDULE 40 BLACK STEEL PIPE WITH WROUGHT STEEL BUTTWELD FITTINGS.
- 8. GAS SHUT-OFF VALVES SHALL BE:

  1" AND SMALLER: 125 LB. IRON BODY WITH BRONZE PLUG WASHER. CRANE #

  320 OR HOMESTEAD # 601.
- HOMESTEAD # 602.
  OR APPROVED EQUAL VALVES BY NIBCO, LUNKENHEIMER, STOCKHAM OR POWELL.

1-1/4" AND LARGER: LUBRICATED PLUG COCK. NORDSTRUM # 142 OR

P. ROOFTOP GAS PIPING SUPPORTS SHALL BE DURA-BLOCK MANUFACTURED SUPPORTS OR EQUAL. INSTALL SUPPORT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

# G. SLEEVES

- PROVIDE SLEEVE FOR ALL PIPING PENETRATIONS THROUGH WALLS AND POURED
- 2. CARRY INSULATION THROUGH PIPE SLEEVES.
- 3. INSTALL CAULKING BETWEEN PIPES AND PIPE SLEEVES.

# H. WATER HAMMER ARRESTORS

1. INSTALL SHOCK ABSORBERS ON WATER PIPING IMMEDIATELY ADJACENT TO ALL EQUIPMENT WITH QUICK-CLOSING SHUT-OFF VALVES INCLUDING DISHWASHERS AND CLOTHES WASHERS, AND ON COLD WATER HEADER FEEDING FLUSH VALVE WATER CLOSETS. SHOCK ABSORBERS TO BE SIMILAR OR EQUAL TO JOSAM SERIES 1485.

# I. HANGER AND SUPPORTS:

- 1. PIPE HANGERS SHALL BE PROVIDED TO ADEQUATELY SUPPORT ALL PIPING SYSTEMS. HANGERS SHALL BE VERTICALLY ADJUSTABLE TO PROVIDE FOR PROPER PITCH AND DRAINAGE. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION OF THE PIPING SYSTEM. REFERENCE "GENERAL REGULATIONS" OF THE LATEST EDITION OF THE INTERNATIONAL PLUMBING CODE.
- 2. HANGERS FOR PIPE SIZES 1/2 TO 6 INCHES SHALL BE ADJUSTABLE CLEVIS TYPE, OR UNISTRUT SADDLES WITH ALL—THREAD HANGER ROD.
- 3. HANGERS FOR HOT PIPE, SIZES 6 INCHES AND OVER SHALL BE ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER TYPE.
- 4. VERTICAL PIPES SHALL BE SUPPORTED WITH STEEL RISER CLAMPS. SPACING INTERVAL REQUIREMENTS PER "GENERAL REGULATIONS" OF THE LATEST EDITION OF THE INTERNATIONAL PLUMBING CODE.

  5. ALL INSULATED DIDING SHALL BE PROVIDED WITH MINIMUM 18 CALICE CALVANIZED.
- 5. ALL INSULATED PIPING SHALL BE PROVIDED WITH MINIMUM 18 GAUGE GALVANIZED INSULATION SHIELDS, 12 INCHES LONG, AND OVERSIZED HANGERS. PIPE SIZES 2 INCHES AND OVER SHALL ALSO BE PROVIDED WITH 12 INCH LONG CALCIUM SILICATE INSULATING BLOCKS BETWEEN THE PIPING AND THE GALVANIZED INSULATION SHIELD.

  6. SEE PIPE HANGER DETAIL FOR ROD SIZING AND SPACING:
- PROVIDE HANGERS WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
   PROVIDE HANGERS WITH MINIMUM 1-1/2 INCHES VERTICAL ADJUSTMENT.

# 2.05 INSULATION

# A. GENERAL: 1. ALL INSULATION SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS, AS TESTED BY ASTM E-84, NFPA 255, AND UL 723.

# B. PIPING:

- 1. ALL DOMESTIC, POTABLE & NON-POTABLE, HOT AND COLD WATER LINES AND RAIN DRAINS SHALL BE INSULATED WITH PREFORMED INSULATION.
- a. FIBERGLASS INSULATION WITH A VAPOR BARRIER JACKET. INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.28 BTU-INCH/HOUR-SQ. FT.-\*F. LAPS AND BUTT JOINTS SHALL BE SEALED WITH PRESSURE SENSITIVE JOINT SEALING TAPE OF THE SAME FINISH AS THE INSULATION JACKET TO PROVIDE A CONTINUOUS VAPOR SEAL. FITTINGS AND VALVES SHALL BE INSULATED WITH PVC FITTING COVERS AND FIBERGLASS INSULATION INSERTS, OR WITH HYDRAULIC SETTING INSULATING CEMENT AND FOUR OUNCE CANVAS JACKET WITH VAPOR BARRIER ADHESIVE.
- b. ALTERNATE MATERIAL FOR CROSS-LINKED POLYETHYLENE TUBING (PEX). ONE PIECE PREFORMED FLEXIBLE ELASTOMERIC CLOSED CELL FOAM WITH BUILT-IN VAPOR BARRIER. SEAL LAPS AND BUTT JOINTS WITH MOISTURE RESISTANT ADHESIVE TO PROVIDE A CONTINUOUS VAPOR BARRIER. INSULATION SHALL HAVE A CONDUCTIVITY RATING NOT EXCEEDING 0.27 BTU-INCH/HOUR-SQ. FT.-\*F.

# INSULATION THICKNESS SHALL BE AS FOLLOWS:

- SYSTEM PIPE SIZES 1/2" TO 1-1/2"

  DOMESTIC COLD WATER (POT. & NON-POT.) 1"

  DOMESTIC HOT WATER & RECIRC. (POT. & NON-POT.) 1"
- SYSTEM
  DOMESTIC COLD WATER (POT. & NON-POT.)
  DOMESTIC HOT WATER & RECIRC. (POT. & NON-POT.)

  1"
  1-1/2"
- 2. INSULATION SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S
- INSULATION SHALL BE CONTINUOUS THROUGH PENETRATIONS.
   ALL INSULATION SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.

# 2.06 VALVES & STRAINERS

# A. BALL VALVES:

INSTRUCTIONS.

- 1. VALVES 2—INCHES AND SMALLER SHALL BE CAST BRASS BODY, CHROME—PLATED BRASS BALL, TEFLON SEATS, AND LEVER HANDLE, 600 PSI CWP. VALVES SHALL COMPLY WITH MSS SP—110. VALVES OVER 2—INCHES SHALL BE DUCTILE IRON OR CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEATS, AND LEVER HANDLE. VICTAULIC SERIES 726, ANVIL GRUVLOK, GRINNELL, OR SHURJOINT BALL VALVES ARE ACCEPTABLE IF GROOVED PIPING IS USED.
- B STRAINERS: STRAINERS SHALL BE CAST STEEL BODY, Y-PATTERN, 20-MESH STAINLESS SCREEN.

# 2.07 VIBRATION ISOLATION

- A. FURNISH AND INSTALL VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, SUPPORTS, ANCHORS, AND/OR FOUNDATIONS AS REQUIRED TO PREVENT TRANSMISSION OF VIBRATION FROM EQUIPMENT AND PIPING TO BUILDING STRUCTURE.
- B. ISOLATORS SHALL BE MANUFACTURED BY MASON INDUSTRIES OR APPROVED EQUAL AND SHALL BE SELECTED BY THE ISOLATOR MANUFACTURER FOR EACH ITEM OF EQUIPMENT.

# 2.08 SEISMIC SUPPORTS

- FURNISH AND INSTALL SEISMIC SUPPORTS FOR ALL EQUIPMENT AND PIPING AS REQUIRED BY THE GOVERNING BUILDING CODE.
- 3. SEISMIC SUPPORTS SHALL BE MANUFACTURED BY MASON INDUSTRIES OR APPROVED EQUAL AND SHALL BE SELECTED BY THE MANUFACTURER FOR EACH ITEM OF EQUIPMENT BASED ON SPECIFIC PROJECT CONDITIONS. CONTRACTOR TO COORDINATE SELECTIONS WITH MANUFACTURER AND PROVIDE ENGINEER—SEALED SEISMIC SUPPORT SUBMITTALS AS REQUIRED BY THE AHJ.

## PART 3 - EXECUTION

# 3.01 GENERAL INSTALLATION

- A. MANUFACTURER'S INSTRUCTIONS SHALL BE STRICTLY FOLLOWED IN THE DELIVERY, STORAGE, PROTECTION, INSTALLATION, PIPING AND WIRING OF ALL EQUIPMENT AND MATERIAL.
- B. INSTALL ALL EQUIPMENT, PIPING LEVEL AND PLUMB, UNLESS NOTED OTHERWISE.
- C. ALL PIPING WHICH PASSES THROUGH A CONCRETE SLAB, MASONRY WALL, ROOF OR OTHER PORTION OF THE BUILDING STRUCTURE SHALL PASS THROUGH A SLEEVE FURNISHED AND INSTALLED BY THIS CONTRACTOR. COORDINATE SLEEVE SIZE AND LOCATION WITH OTHER TRADES, AS REQUIRED.
- D. SEE STRUCTURAL DRAWINGS FOR DETAILS ON STRUCTURAL SUPPORTS AND ATTACHMENT TO STRUCTURE. NO SUPPORTS SHALL BE ATTACHED DIRECTY TO THE ROOF DECK UNLESS NOTED OTHERWISE.
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY OBJECTIONABLE SOUND AND/OR VIBRATION ASSOCIATED WITH ANY SYSTEM PROVIDED UNDER THIS DIVISION, AT NO EXPENSE TO THE OWNER.
- F. ALL BUILDING PENETRATIONS TO THE OUTDOORS SHALL BE FLASHED AND COUNTER-FLASHED AS REQUIRED TO ELIMINATE LEAKS.
- G. FIRESTOPPING: ALL PENETRATIONS OF FIRE—RATED CEILINGS, WALLS, PARTITIONS OR FLOORS SHALL BE FIRESTOPPED USING APPROVED MATERIALS TO MAINTAIN THE FIRE RATING OF THE CEILING, WALL, PARTITION OR FLOOR. METHODS AND MATERIALS SHALL BE APPROVED BY LOCAL CODE OFFICIALS.

# 3.02 WORKMANSHIP

- A. THIS CONTRACTOR SHALL USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND REQUIREMENTS TO FULFILL THE SCOPE OF WORK.
- B. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
- C. CONTRACTOR SHALL CONTINUOUSLY MAINTAIN ADEQUATE PROTECTION OF STORED MATERIALS AND INSTALLED EQUIPMENT TO PROTECT FROM DIRT, RUST, MOISTURE AND OTHER DAMAGE. REPAIRS MADE NECESSARY BY DAMAGE SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
- D. PROVIDE CLEAR MAINTENANCE ACCESS AREA AROUND ALL EQUIPMENT AS REQUIRED BY CODES AND AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- PROVIDE ACCESS PANELS IN WALLS AND CEILINGS AS REQUIRED, FOR ACCESS TO VALVES AND EQUIPMENT.

# 3.03 SAFETY

- A. THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY REGARDING THE SAFETY OF HIS PERSONNEL ON THE PROJECT DURING CONSTRUCTION.
- B. NO WATER PIPING SHALL BE ROUTED OVER A THREE-FOOT HORIZONTAL CLEARANCE OF ANY

# 3.04 IDENTIFICATION

ELECTRICAL PANEL OR EQUIPMENT.

AIR SYSTEMS BALANCING IS COMPLETED.

THE OWNERS REQUEST.

ON CEILING BELOW.

A. PROVIDE AND INSTALL ENGRAVED PLASTIC SIGNS AT ALL PLUMBING EQUIPMENT INDICATING EQUIPMENT TAG AND AREA SERVED. SIGN SHALL BE LOCATED AT AN EASILY-VISIBLE LOCATION. FOR EQUIPMENT LOCATED ABOVE A CEILING, PROVIDE AN EQUIPMENT TAG MARKER

# 3.05 PIPING

- A. INSTALL PIPING SYSTEMS APPROXIMATELY AS SHOWN ON THE DRAWINGS, PROPERLY SUPPORTED AND RUN AS DIRECTLY AS POSSIBLE AT PERPENDICULAR OR PARALLEL ANGLES TO BUILDING LINES. LOCATE PIPING AS HIGH AS PRACTICAL WHILE COORDINATING WITH OTHER
- B. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT UNDUE STRESS TO THE PIPE OR CONNECTED EQUIPMENT.
- C. PIPING SHALL BE LEAK-TESTED PRIOR TO THE APPLICATION OF INSULATION. THE USE OF

# CHEMICALS OR COMPOUNDS TO STOP LEAKS IS NOT PERMITTED. 3.06 TESTING

- A. ALL PLUMBING SYSTEMS SHALL BE TESTED PRIOR TO PROJECT CLOSE—OUT TO ENSURE THAT THE SYSTEMS OPERATE AS REQUIRED AND SPECIFIED. TESTING SHALL BE PERFORMED AFTER
- B. RE-TEST OR RE-BALANCE THE SYSTEMS AS REQUIRED DURING THE GUARANTEE PERIOD PER

S BROYCE S BROYCE 33778 CENSED MULTINIAN

06/28/22

nSite

ARCHITECT.
17710 Detroit Avenue Lakewood, Ohio 44107

VERNON, CT

RD.

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# DATE TYPE

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PLUMBING SPECIFICATIONS

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21399

JOB NO.

DATE

P-3.
SHEET NO.

ENGINEERING
(208) 914-5087 (208) 989-2572
www.apexeng.co
Apex Project No. 082129

# **ELECTRICAL SPECIFICATIONS**

# A: DESCRIPTION OF WORK

- 1. The electrical contractor shall provide all labor, material, equipment, and tools necessary for demolition and removal of existing and the complete installation of the new electrical work, ready to use, as shown on the drawings or specified herein. Work shall include, but not be limited to the following:
  - i. Furnish and install new conduit and wire.
  - ii. Furnish and install all fuses, circuit breakers, panelboards etc. iii. Install new lighting fixtures as indicated.
  - iv. Furnish & install new light fixtures as indicated. v. Furnish & install communications devices.
  - vi. Furnish & install intercom system.
- vii. Furnish & install security system. 2. The exact location of all items shown on the electrical drawings is dependent upon field conditions. Review the plans and specifications for all parts and consult with other trades of this project for pertinent data on sizes, locations, wiring, etc., as required for a complete electrical installation.
- 3. The electrical contractor shall not attach to, cover up, or finish against any defective work, or install in a manner which will prevent proper installation of the work of other trades.
- 4. The electrical contractor shall warrant all work & material indicated on these electrical drawings for a period of 1 year from the date of final acceptance. Warranty shall include any additional labor or material required to repair or replace defective item.

# B: CODES, PERMITS AND FEES

- 1. All work included by the drawings and specifications, together with all material (or equipment) furnished, shall comply with the latest published codes and standards listed insofar as such shall apply. All electrical items shall be UL labeled & listed.
- 2. The contractor shall secure all permits and pay all fees that are required by the applicable local and state codes.
- 3. Perform all work in accordance with the latest edition of applicable codes including, but not necessarily limited to
- i. The National Electrical Code sometimes referred to herein as the "NEC" - (NFPA-70).
- ii. National Electrical Safety Code (ANSI-C2).
- iii. All applicable state and local codes. iv. Applicable provisions of the Occupational Safety and Health Act.

## C: GENERAL REQUIREMENTS

- 1. The drawings represent the design for the listed manufacturers' requirements. If any substitutions are accepted by the engineer, this contractor shall be responsible for all necessary modifications, including cost, to the electrical system required because of the substituted equipment or material.
- 2. The electrical, mechanical, architectural, structural, and all other drawings as well as the specifications and addendums are part of the contract documents, any electrical requirements called for on other trades contract documents shall be included in the electrical bid.

The contractor shall visit the job site and become familiar with all existing conditions. Submission of a bid assumes

the contractor has reviewed or accepts all field Conditions and existing conditions. No additional compensations

shall be allowed for labor or material because of ignorance of these conditions before or after bid submission.

4. Discrepancies between the drawings or between the drawings and actual field conditions shall be brought to the attention of the architect and the engineer prior to submitting the bid. The more comprehensive and most expensive scope of work shall be considered for the electrical bid unless written clarification is provided by the architect and the engineer prior to submitting the bid.

# ): RACEWAYS

- 1.EMT conduit shall be used in all locations which call for conduit unless noted therwise. Conduits routed thru areas of significant temperature differences shall be provided with seal-off fittings to minimize condensation. Conduits penetrating fire walls shall be firestopped per NEC & details shown on drawings.
- 2. Rigid PVC Schedule 40 shall be used for all underground or below slab conduit runs.
- 3. Heavy wall rigid steel onduit shall be used in all exposed interior applications below structural ceiling and exterior exposed applications. provide 2 coats of rust inhibiting paint for exterior runs. Paint shall match surface conduit is
- 4. 'MC' cable may be used for all branch circuits as allowed by the National Electrical Code & the authority having jurisdiction. Cable shall be installed in a neat professional manner adhering to industry standards.
- 5. When power or control conductors are installed in a raceway, a green equipment grounding conductor shall be included in each raceway system and shall be sized as shown on the drawings or if not noted on the drawings, then in accordance with Table 250-95 of the NEC, or as indicated on the drawings If green insulation is not available, the grounding conductor shall be bare and clearly and permanently marked at all tap and terminating points by green scotch" marking tape, code markers, or other approved means.
- 6. All conduit shall be securely fastened in full accordance and as directed by the latest edition of the National Electrical Code. In addition to the NEC requirements, conduit hangers, supports, or fastenings shall be provided at
- 7. Conduits or boxes may not be supported by ceiling support wires or other ceiling supporting hardware.

each elbow and at the end (within 6") of each straight run terminating at a box or cabinet.

- 8. Horizontal and vertical conduit runs may be supported by one-hole malleable straps, clamp backs, or other approved devices with suitable bolts, expansion shields (where needed) or beam type clamps for mounting to building structure or special brackets.
- 9. The use of perforated iron for supporting conduits will not be permitted.
- 10. Conduit runs between outlets shall contain not more than the equivalent of three (3) quarter bends. Provide junction and/or pull boxes where shown on the drawings or as required, whether shown on the drawings or not. Pull boxes shall be approved for use in the area where they are to be installed. Pull boxes or junction boxes shall
- be provided in accordance with the following schedule:
- i. Straight runs not over one hundred (100) feet apart. ii. One (1) 90 degree bend - not over seventy five (75) feet apart. iii. Two (2) or more 90 degree bends - not over fifty (50) feet apart.
- 11. In Class I and Class II hazard areas, as designated on the drawings, explosion-proof flexible metal conduit shall be used for all final conduit terminations at motors and to all other devices subject to vibration or movement. This shall include all pendant mounted lighting fixtures and conduit runs at building expansion joints in Class I and Class II hazard areas. Electrical ground continuity shall be provided as noted above.
- 12. Telephone and data (including other special communication systems such as cable TV) conduits shall be a minimum of 3/4" in size unless noted otherwise, and shall run continuous from outlet to outlet and back to the main terminal board, or shall be stubbed into the ceiling space (6" above the ceiling) and provided with a plastic bushing. Bond conduit stub with a #10 bare copper conductor to the nearest electrical outlet box or continuous metal conduit body. Refer to plans for specific details about the routing of the conduits. All empty conduits shall be provided with a #10 pull wire.
- 13. Cables installed without conduit shall be UL classified for low flame resistance and low smoke properties with "FEP" Teflon or Halar insulation suitable for plenum applications per Article 760 of the N.E.C.

# 14. Conduits below grade shall be installed in conformance with:

- i. Provide all necessary trenching, backfill & removal of trenched material from site.
- ii. The bottom of the trench shall be undisturbed earth or thoroughly compacted fill. The contractor shall be responsible for such compaction. the bottom shall be free of projecting rocks or other foreign matter. Where muck or unstable ground is encountered in the bottom of the trench, it shall be excavated to a depth of at least 12in. below the bottom line of the ducts and replaced with pea gravel in the proper grade. Duct shall not be installed on or in frozen ground. sheeting or bracing shall be provided where necessary to protect the work or adjacent property. Sheeting, bracing, and pea gravel shall be installed by the electrical contractor at no additional expense to the owner. Backfill shall consist of 3 inches of compacted sand below conduits and 12" above conduits. Clean screened fill shall be installed and compacted to 6" below final grade or as detailed in architectural specifications. Final grade patch shall be by E.C.
- iii. Duct joints shall be sealed with waterproof joint compound. Ducts shall be supported at least 3in. above the trench bottom on plastic supports with spacing not exceed 5'. Before duct is placed, supports shall be aligned, set to grade, and placed in concrete to prevent movement when encasement is placed. Ducts shall be secured to supports and spacers placed for tiered ducts.
- iv. All secondary power service underground ducts shall be encased with 3000 psi concrete. All underground ducts shall be 4" in diameter schedule 40 rigid non-metallic (P.V.C.) ducts with ground wires, unless specifically indicated otherwise on the drawings. concrete encasement shall be in accordance with the applicable provisions of the general trades portion of the specifications.
- v. Encasement shall be continuous monolithic pour providing a minimum of 3" completely arownd the ducts. Concrete shall not be poured directly on top of the ducts, but shall be poured from the sides and allowed to flow over the ducts.
- vi. Bell ends shall be installed at all duct terminations or as required by the power company. Fittings, couplings and other accessories, as recommended by the manufacturer, shall be provided and installed.
- vii. Ducts shall be cleaned by rodding and brushing. It shall be the contractors responsibility to assure a full bore opening throughout the duct system.

# E: FITTINGS FOR CONDUIT

- 1. Couplings and connectors for EMT: Die cast zinc, steel, or aluminum compression type. Set screw type will also be permitted. Approved manufacturers, Thomas & Betts, Steel City, O-Z Gedney
- 2. Fittings for rigid plastic conduit: Polyvinyl chloride, joints solvent welded in field, providing continuity of mechanical strength and water tightness. Fittings and cement shall be produced by the same manufacturer
- 3. Fittings for rigid conduit: Cast or malleable iron bodies, zinc or cadmium plated, with full threaded hubs, screw covers and gaskets when located in areas requiring gaskets. Approved manufacturers: Crouse-Hinds, Pyle National, Appleton.
- 4. Couplings and connectors for flexible steel conduit: Malleable iron or steel, zinc or cadmium plated and shall fasten to the conduit by a clamping action around the periphery. Connectors for "liquid-tight" flexible conduit shall be approved for the purpose and maintain the liquid-tight feature of the installation. Approved manufacturers: Thomas & Betts, Steel City, O-Z Gedney.

- 5. Bushings: Grounding type, with insulating plastic insert; malleable iron, zinc or cadmium plated, for steel conduit and aluminum alloy for aluminum conduit. Install grounding type bushings as required in the grounding section of this specification.
- 6. Fittings for conduits: All conduit runs at building expansion joints shall be provided with O-Z type expansion fittings. Sizes shall be as dictated by the conduit size. A bonding jumper shall be securely connected to each conduit. Exterior exposed

runs of PVC conduit shall be provided with expansion fittings at intervals not exceeding manufaturers recommendations.

- 7. Outlet, Pull, Terminal and Junction Boxes in Classified (Hazardous) Areas: Cast boxes shall be copper-free aluminum with integral hubs or box wall thickness sufficient for a minimum of five full tapered threads. Covers shall be screw-on bolt-on through 12" x 12" boxes and hinged removable bolt-on covers for larger boxes. Boxes other than outlet boxes shall be equipped with a breather drain and equipment grounding lug and all boxes shall be, as applicable, for installation in the particular classified (hazardous) areas which are designated on the drawings. Approved Manufactures: Crouse-Hinds, Pyle-National, Appleton, Adalet, O-Z Gednev. or Killark.
- 8. Conduit Fittings in Classified (Hazardous) Areas: Conduit seals and/or drain seals shall be installed in strict accordance with the NEC in classified (Hazardous) areas designated on the drawings, with special attention to the following:
- i. Entering or cross-connecting enclosures containing arcing or high temperature devices.
- ii. Two-inch conduit and larger entering any enclosure. iii. Passing from Division 1 to Division 2, from Division 2 to non-classified areas, with or without a barrier. iv. Multi-conductor and shielded cables.

# F: ELECTRICAL SUPPORTING DEVICES

- 1. Supports shall be suitable for the device or equipment to be mounted. All supports shall present a neat appearance, and shall be installed in such a way that they do not detract from the appearance of the space. Supports shall have adequate strength and shall be installed so as to properly support the device or equipment mounted on them.
- 2. Electrical supports shall be attached to the structure by one of the following methods:
- Wood wood screws
- ii. Concrete expansion bolts or cast in place anchors. iii. Structural steel - approved brackets or machine bolts.

# G: CONDUCTORS

- 1. Conductors shall be new, 600 volt, 90c, type XHHW, THHN or THWN insulation, stranded copper for feeders rated above 60 amps. Compact aluminum may be used for feeders of 150 amps or higher sizes indicated on the drawings are for copper conductors. Minimum size shall be #12 AWG for runs of less than 100 feet total circuit length (out and back for single phase circuits and out only for three phase circuits with no neutral). Use #10 AWG for circuits longer than 100 feet. Other sizes shall be as noted. Control wiring may be #14 AWG. All 120 volt and 277 volt circuits shall have a dedicated neutral conductor.
- 2. Compression type lugs and connectors shall be used for all terminations and splices. All terminations shall be permanently identified and numbered, using "Brady" labels or other approved equal. Wire numbering shall be panelboard and circuit numbers. Also, all wiring which passes through junction or pull boxes shall be identified with appropriate numbers. When panelboard/circuit numbers are not appropriate for identification, the contractor shall assign a unique number and record this number on the construction set.

### H: WIRING DEVICES

- 1. Provide wiring devices which are UL listed and which comply with NEMA WD 1 and other applicable UL and NEMA standards. Device Color shall be white unless otherwise noted. Coverplate color shall match device color. Confirm color selection with architect before purchasing and installing.
- 2. Receptacles: Devices shall be specification grade, NEMA 5-20R configuration. Duplex type, Hubbell Cat No. CR5362, single outlet type, Hubbell Cat No. CR5361, GFCI duplex, Hubbell Cat No. CR GF5362. Catalog numbers for Hubbell are shown for reference purposes and equivalent receptacles by other manufacturers as noted above are also approved. Receptacles shall comply with UL 498 and NEMA WD 1. Special receptacles not shown below shall be specification grade with Nema configuration as noted on the drawings. 3. Ground-fault interrupter (GFI or GFCI) receptacles as indicated above shall be designed for and installed in a 2-3/4 inch deep outlet box without adapter, grounding type, Class A, Group 1, per UL Standard 94.3.
- 4. Snap switches: Devices shall be specification grade quiet type, 20 A 120/277V, single pole Hubbell Cat No. CS1221, two pole Hubbell Cat No. CS1222, three pole, Hubbell Cat No. CS1223, and four pole, Hubbell Cat No. CS1224. Catalog numbers for Hubbell are shown for reference purposes and equivalent receptacles by other manufacturers as noted above are also approved. Devices shall be specification grade, quiet type ac switches, and shall comply with UL 20 and NEMA WD1.
- 5. Approved manufacturers for wiring devices:

# P&S

6. Dimmer switches: solid state dimmer switches conforming to NEMA WD 1, mounted in outlet boxes For incandescent fixtures; switch poles and wattage as indicated, 120 V, 60-Hz, continuously adjustable toggle, single-pole, with on-off switch. Equip with electromagnetic filter to eliminate noise, RF and TV

# Wiring device accessories

- i. Wall plates: Single and combination, of types, sizes, and with ganging and cutouts as indicated. Provide plates and attachment screws which mate and match with wiring devices to which attached. Provide wall plates with engraved legend where indicated. Provide smooth nylon coverplates for finished areas, and galvanized steel plate for unfinished areas.
- ii. Floor service outlets: Modular, above-floor service outlets and fittings of types and ratings indicated. Construct of die cast aluminum, satin finish. Use design compatible with floor outlet wiring methods indicated. Provide 20 Amperes, 125 Volts, gray duplex receptacles. NEMA configuration 5-20R where indicated. Provide with 3/4 inch or 1 inch NPT, 1 inch long, locking nipple for installation where compatible with wiring method.

# Wiring device installation:

- i. Install switches and receptacles in outlet boxes as specified elsewhere in this specification. Install single pole toggle switches so that the switch is on in the "up" position. Install receptacles with the U-shaped ground slot at the top or to the left.
- ii. Duplex receptacles shall be wired with the neutral wire to the silver binding screw.
- iii. Three phase receptacles shall be wired such that all have the same phase sequence. iv. The receptacle circuit and panel number shall be indicated on the inside of all outlet boxes, or directly on the conductors by means of a wire labeling system
- v. Combination switch/receptacle shall be installed in a two gang box with a combination switch/receptacle coverplate. Connect the receptacle to the lighting circuit ahead of the switch and locate the switch on the side of the box closest to the door. Note, this method is to be used only for 120 Volt lighting system. 277 Volt lighting switches and 120 Volt receptacles shall be located in
- vi. Confirm final location of all wiring devices and outlet boxes with owner/architect prior to rough-in. 9. Wiring devices listed or noted on the drawings as weatherproof shall be provided with a cover which maintains the weatherproof integrity when the cover is closed. Receptacles noted as suitable for operation
- in a wet locations shall be provided with a cover which will allow the receptacle to remain operational during wet conditions with a plug inserted into the receptacle.

1. Lighting Fixtures: see drawings for manufacturers catolog numbers.

- Indoor Installation: i. The Contractor shall refer to the Architectural drawings for ceiling type, construction and details of mounting. Adjust fixture trim ring as required for correct mounting in ceiling fixture is to be installed. All fixtures shall be supported per NEC Article 410.
  - ii. Suspended ceiling systems shall be supported for fixture installation as noted above, and as a minimum condition, as noted in ANSI/ASTM C636-76, par. 2-7, CEILING FIXTURES.
  - iii. Install fixtures in accordance with the Architectural Reflected Ceiling Plans. Where substantial differences may occur between the Reflected Ceiling Plans and the Electrical Plans, inform the Architect/Engineer for resolution of the discrepancy.
- iv. The Contractor shall coordinate fixture construction details with ceiling system in which they are installed, i.e.: support system dimensions, flanges where required, acoustical tile or pan pattern, etc. v. Rows of fixtures shall be installed accurately as to line and level. Fixtures shall be securely mounted so that they will not be distorted by handling incidental to normal maintenance.
- vi. Surface type fluorescent lighting fixtures mounted on acoustical ceiling must be coordinated with the Architectural drawings in order that a main "T" runner will be placed in the center of each fixture and/or each row of fixtures. Main "T" runner shall be of at least the same length as the lighting fixture and shall be supported to carry at least twice the weight of the lighting fixture.
- vii. All fixtures shall be securely supported with approved hangers. Where fixtures will be installed in suspended ceilings, any Code-required additional ceiling supports as approved by the Architect, shall be provided by this Contractor. viii. Provide supports for all lighting fixtures as detailed on the Drawings, as specified, or as required by the fixture specified. Fixtures installed in unfinished areas (areas including but not necessarily limited

to warehouses, factory areas, manufacturing areas, office spaces without lay-in ceilings, and spaces

channel along with the appropriate fasteners and clips shall be used to support the fixtures. Refer to

above lay-in ceilings) shall not be fastened directly to the structure. In these cases, unistrut type

- the drawings for specific support requirements in addition to those noted here. ix. Fixtures shall not hang directly from conduit boxes unless the boxes have been specifically designed for such purposes. These boxes shall be supported independent of the conduit system and shall not rely upon the conduit for support.
- x. Lay-in troffers in suspended ceilings and surface type fixtures mounted to suspended ceilings shall be secured mechanically by screws, rivets, clips, etc. as per Section 410-16(C), NEC. Additionally, layin fixtures shall also be supported by two independent support wires running from diagonally opposite corners of the fixture to the overhead structure. Surface mount fixtures shall be additionally supported by means of at least two clips for each fixture which surround the T-bar and are tied to the overhead
- xi. Plaster frames shall be furnished for each recessed fixture installed in plaster ceilings and walls. xii. Pendant mounted fixtures shall utilize pipe stems to mount fixtures at elevations as noted on the drawings. Chains or cords will not be accepted. Wherever the mounting surface slopes, fixtures shall be provided with universal type fixture hangers to allow the fixture to hang plumb.

structure with a separate wire. The surface fixtures shall be secured to these clips.

xiii. Fixtures shall be installed with due regard for beams, piping, ductwork, and other mechanical or

- xiv. Incandescent fixtures shall be thermally rated, protected and marked for their application especially in recessed mounting, to protect against over-temperature and combustion. The installation shall comply with Section 410-65 thru 410-72 the NEC.
- xv. Branch circuit conductors shall be run in fluorescent fixture wiring channels only as permitted by the N.E.C. The Contractor shall be responsible for providing all necessary boxes and conduit for an approved installation
- xvi. Where a modular wiring system is installed, all ceiling mounted recessed fluorescent lighting fixtures shall be furnished with suitable receptacles to match the modular wiring system furnished and installed by this Contractor. Each fixture shall be equipped to permit either single or multiple fixture circuit wiring as is appropriate for the fixture type.
- xvii. When fixtures are installed in a fire proof ceiling, the fixture shall be U. L. listed to maintain the fire proof rating or the fixture shall be fire proofed by the electrical contractor using a U. L. accepted standard, see architectual drawings for ceiling ratings.
- and/or reflectors, clean and free of defects. Any glass-ware, or reflectors, etc., which have defects shall be replaced at the Contractor's expense before final acceptance. xix. All lamps shall be in working order at the time of final acceptance of the work by the Owner and

xviii. At the time of final inspection all fixtures and equipment shall be complete with all required glassware

- Architect/Engineer. This Contractor shall replace all defective lamps with new lamps until the work is finally accepted. xx. Low voltage lighting transformers should be protected by fuses. Fuse sizes shall be as
- recommended by the transformer manufacturer. Busman type HRS or Littelfuse 155020, fuse holders are recommended.
- xxi. Solid state transformers for low voltage lighting shall not be used for dimming applications unless the transformer and dimmer are a U. L. listed assembly specifically intended for the application.

# 3. Outdoor and Site Lighting Installation:

J. Lighting and Receptacle Panelboards

- i. Site lighting luminaires shall be as called for on the drawings
- ii. Bases for site and roadway luminaires where required, shall be augered into the earth and concrete shall be poured into the augered hole without a sona tube below grade to allow the concrete to fill the natural crevices in the earth. Portion of base above grade shall be formed using a sonatube. Exposed portion of finished base shall be smoothed, and voids filled with grout.
- iii. Bases shall have reinforcing steel as indicated on the contract drawings and shall be Class 'A' concrete. iv. Anchor bolts for poles shall be performed for the pole bolt circle at the factory.

### 1. Panelboards for 480/277, 208/120, or 240/120 volt lighting and receptacle service shall be dead front type, conforming to NEMA standard PB-1-1-71 and UL 67, and consisting of three phase, three or four wire solid neutral, main lugs or main overcurrent device as indicated, branch overcurrent devices as noted and equipment ground bar, all in a surface or flush mounted code gauge galvanized sheet steel cabinet as indicated. Enclosure to be NEMA 1 unless noted otherwise with primer and finish paint of the manufacturers standard.

- i. Standard enclosure shall be NEMA 1, unless noted otherwise, with primer and finish paint of the manufacturers standard. Cabinets shall be oversized where necessary to accommodate the entrance of several large conduits and/or when necessary to avoid overcrowding except cabinets for panels mounted flush shall be not more than 22 inches wide and 5-3/4 inches deep unless otherwise approved by the architect/engineer. Trims shall contain hinged doors and shall be equipped with flush chrome plated combination key locks and catches. Locks shall be all keyed alike and two keys furnished to the
- ii. Column-type enclosures shall be similar to the standard enclosure except panel shall be approximately 8-1/2 inches wide for mounting between building column webs as indicated, and provided with extension trough and pullbox with neutral bar when shown on the drawings.
- iii. Where spaces are noted on the drawing, equip the panelboard with bus and all necessary hardware for future circuit breaker installation iv. Metal frame and plastic covered typewritten card shall be mounted inside each panel door.
- Information entered onto the cards shall correspond to the circuit numbers as installed in the field. 2. Overcurrent Protective Devices i. General use circuit breakers for panelboards shall be bolt-on molded plastic case type, 1, 2, or 3 pole, quick-make, quick-break, with trip-free operating handle, position indicating and thermal-magnetic
- mechanism. All circuit breakers used for switching applications shall be U.L. listed type "SWD" for that application, all circuit breakers used for protection of motors, refrigeration equipment, or HVAC equipment shall be U.L. listed type "HACR" for that application.

trip device. Furnish 2 and 3 pole breakers with common operating handle and common trip

ii. Circuit breakers furnished with panelboards shall conform to the following interrupting ratings (symmetrical) in amperes unless otherwise noted:

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	Voltage Rating	Trip Rating	No. of Poles	I.c. Am <sub>l</sub> (Symm	oeres etrical)	Frame Size		
	120	15-100 amp	ere	1	22,0	00	100 amp	
	240	15-100 amp	ere	2&3	22,0	00	100 amp	
	240	125-225 am	pere	2&3	22,0	00	225 amp	
	240	250-400 am	pere	2&3	42,0	00	400 amp	
	277	15-100 amp	ere	1	25,0	00	100 amp	
	480	15-100 amp	ere	2&3	25,0	00	100 amp	
	480	125-225 am	pere	2&3	30,0	00	225 amp	
	480	250-400 am	pere	2&3	42,0	00	400 amp	
	480	400-800 am	pere	2&3	42,0	00	800 amp	

- iii. Ground fault circuit interrupters shall be similar to general use circuit breakers specified; 15-20 ampere, 1 or 2 pole with 5ma sensitivity. Furnish when indicated on drawing.
- iv. Fuses over 600 ampere shall be Bussman Hi-cap time delay type KRP-C, or Gould Shawmut A4BQ (601-2000 ampere) or Gould Shawmut A4BY (2001-6000 ampere) 600 volt, UL Class I with minimum interrupting rating of 200,000 ampere rms symmetrical.
- v. Fuses 600 ampere or below shall be Bussman low-peak dual element type LPN-RK (250 volt) or LPS-RK (600 volt) or Gould Shawmut Amp-trap type A2K (250 volt) or A6K (600 volt) UL Class RK1 with minimum interrupting rating of 200,000 ampere rms symmetrical.
- vi. Provide spare circuit breakers installed in panelboards as indicated on the panel schedule as shown on the drawings. Provide 10% spare (minimum of 3) of each type and rating of fuses installed.
- i. Provide fusible or non-fusible safety switches as indicated on the drawings. Switches shall be quickmake, quick-break, heavy duty visible blade type, horsepower and I squared T rated. Use NEMA 12 enclosures in factory areas, NEMA 1 enclosures in other indoor areas and NEMA 4X stainless steel type enclosures outside unless otherwise indicated on the drawings. Furnish three pole, single-throw switches
- unless otherwise indicated, with current and voltage ratings as indicated. ii. Provide safety switches with an external operating handle interlocked with the cover door to prevent the door from being opened while the switch is in the "on" position except by operating an inconspicuous interlock defeating mechanism. Provide means for padlocking the operating handle in
- iii. Fuse clips shall be rejection type for fuses specified (up to 600 ampere). Fuses clips for 601 ampere to 6000 ampere shall be suitable for UL Class I fuses.

the "off" position. Equip switches with auxiliary contacts when indicated.

- 4. Transformers i. Transformers shall be indoor dry, two winding, quiet type, with ventilated enclosure, conforming to NEMA standards, 220 degrees celcius insulation for continuous operation in a 40 degree celsius ambient temperature with a temperature rise not to exceed 80 degrees celsius.
  - Provide a minimum of two 2-1/2% FCAN and four 2-1/2% FCBN taps in the primary winding for transformers over 25 KVA and a minimum of two 2-1/2% FCBN taps for transformers 25 KVA and below. Transformers 25 KVA through 75 KVA shall be designed for floor or wall mounting.
- ii. Sound levels shall not exceed those established in ANSI standard C89 shown in the following table: KVA dB level
- 0-150
- iii. Furnish transformers having voltage, KVA ratings and connections as indicated on the drawings. Panelboard and Transformer Installation
- i. Mount panelboards at uniform height throughout the building, and such that the top switch is not more than 79 inches above floor when measured to the center of the switch handle. ii. Install handle guards on all breakers for night lighting, emergency, and similar circuits when indicated. iii. Each panelboard shall be identified with a legend plate of lamicoid plastic inside the door for

panelboards in finished areas and on the outside of panelboards in unfinished areas with the panel

designation as shown on the drawings. iv. Install not less than two spare 1-1/4 inch conduits from each flush mounted panel to an accessible area above the ceiling. v. When branch circuits are not scheduled on the drawing, they shall be arranged to balance the phase

loads on each panelboard and the loads shall be equally distributed on each of the phases of the

vi. Mount panelboard, safety switches, and similar equipment securely to walls or steel supports. Equipment mounted on the building perimeter foundation walls shall be shimmed at least 1/4 inch from the wall to permit back ventilation vii. Provide supports for truss mounted and wall mounted transformers. All transformers which are

mounted above panelboards shall be mounted away from the wall by an amount equal to the depth of

the panelboard. The width of the panelboard shall also be maintained clear behind the transformer.

viii. Approved Manufacturers for Power Distribution Equipment: General Electric Company Siemens Cutler Hammer/Westinghouse Cleveland Switchboard Co.

Square D

# K: RACEWAY AND GENERAL GROUNDING 1. The entire power, lighting system as well as building structure, mechanical & plumbing systems, fences & simalar metal objects shall be permanently and effectively grounded in accordance with the

minimum requirements of the National Electrical Code, or as specified herein, whichever is the more

- 2. Ground conductors shall be stranded, annealed copper with green insulation (insulation material as specified for general building use).
- 3. The entire power and lighting system shall be permanently and effectively grounded including panels, starter enclosures, motor frames, and other exposed, non-current carrying parts of the electrical equipment. The equipment ground conductor shall be separate from the neutral conductor and shall not be used as a load current carrying conductor.
- 4. Any item covered by the preceding paragraph which is within six feet of grounded metal and not directly interconnected with the grounded metal shall have a flexible bare copper cable connection not smaller than #6 AWG to the grounding system.
- 5. Where building type conductors are installed in a raceway, a green equipment grounding conductor shall be included in each raceway system.
- 6. Lighting fixtures permanently connected to the conduit system shall be grounded by means of a grounding conductor run inside the conduit. Fixtures mounted on trollies or portable lighting units shall be grounded
- 7. Convenience outlets shall be self-grounding type or shall have a green grounding conductor installed from the ground lug on the outlet to the outlet box.
- 8. Motors shall be connected to the equipment ground conductor with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.
- 9. The armor of interlocked armor cable, wiring channels, cable trays, and all metallic conduit including rigid, EMT, and flexible conduit shall be connected at each end to the equipment ground conductor utilizing a conduit grounding bushing. Junction boxes and other enclosures (sizes above 5" x 5") shall utilize an equipment ground lug to securely bond the equipment grounding conductor to the enclosure.
- 10. Where any grounding conductor requires physical protection to maintain grounding integrity, it shall be run through a non-ferrous conduit or bonded to a continuous steel conduit at both ends.
- 11. The grounding electrode system shall consist of  $\frac{3}{4}$ " diameter x 10' copper clad ground rods. Exterior ground rods shall be driven to 12" below finished grade & be provided with a 12" diameter x 30" long rigid pvc pipe w/ screw cover for inspection purposed. center ground rod in pipe & install pipe flush with grade. pvc pipe and cover shall be traffic rated, interior ground rods shall be driven to 6" above grade & installed as close to a wall as possible. all connections to ground rods shall be cadweld type.

# L: COMMUNICATIONS

1. All telephone / data cable and connecting hardware shall be rated category 6.

by means of a grounding conductor in the portable cord.

- 2. All telephone / data cable and connecting hardware shall be terminated in the TIA/EIA 568B 4 pair configurations.
- 3. The communications system shall be installed by qualified contractors who have been certified by the system manufacturer for a period of at least two years prior to commencing this work. All installing workers shall be BICSI certified level 1 installers or have completed the telecommunications installer/technical program offered by the national joint apprenticeship and training committee. The job foreman shall be a BICSI certified technician. Copies of all certificates of the company employees shall be submitted by the contrctor with the shop drawings.
- 4. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the owner or owners representative. Equipment and materials shall be of the quality and manufacturer indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified ad subject to approval.
- 5. Strictly adhere to all category 6 (BICSI and TIA/EIA) installation practices when installing utp data

# Category 6 patch panels.

- i. Panels shall be made of black anodized aluminum in 24, 48, 96 port configurations.
- ii. Panels shall accommodate a minimum of 24 ports for each rack mount space (1rms = 44.5mm (1.7in.))
- iii. Panels shall have modular jacks employing a tri-plane staggered contact array with a flat "hairpin" contact design made of beryllium copper with a minimum 50-micro-inch gold plating on contact surfaces over 50-100 miro-inch of nickel complaint with fcc part
- iv. Panels shall be available in a T568B wiring scheme.

# 7. Category 6 compliant jacks - UTP

- A. Physical Characteristics i. Jacks shall be 8 position un-keyed.
- ii. Each jack shall be an individually contructed unit and shall snap mount in an industry standard keystone opening (.760"x580")
- iii. Contact plating shall be a minimum of 50 micro inches of hard gold in the contact area over 50 micro-inch of nickel.

maintained up to the IDC, terminating all conductors adjacent to its pair mate to better

v. Jacks shall utilize a paired punch down sequence. Cable pair twists shall be

iv. Jack termination shall follow the industry standard 110 IDC.

maintain pair characteristics designed by the cable manufacturer. vi. Jacks shall terminate 22-26 AWG stranded or solid conductors.

# vii. Jacks shall be compatible with TIA/EIA 606 color code labeling. viii. Jacks shall be marked with T568B wiring.

- 8. Unshielded Twisted Pair Cable (UTP) A. Category 6 four pair unshielded twisted pair cable: multi-paired cable, unshielded four
  - B. Cable shall meet or exceed EIA/TIA 568 commercial building wiring standards and EIA/TIA technical systems bulletin 36 unshielded twisted pair cables.
  - C. Plenum cable is required, jacket will be teflon or like material and cable will be fire rated for use in air return spaces or shall be installed in a complete conduit system.
  - D. Data cable outer jacket color shall be blue.

COMPOUND & POLYETHYLENE JACKET

twisted pair, 24 gauge solid copper annealed conductors.

- E. Telephone cable outer jacket color shall be grey F. Cable manufacturer and product shall be a partner to jack manufacturer to qualify for jack
- manufacturer standard 25 year warranty. G.CABLE INSTALLED UNDERGROUND IN-SLAB OR BELOW SLAB SHALL BE RATED FOR DIRECT BURIED APPLICATIONS & COME COMPLETE WITH A FLOODING

# Installation

- A. Patch panels category 6 i. Panels shall be installed to provide minimal signal impairment by preserving wire pair twists as closely to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the patch panel shall be no greater then 0.5 inches
- ii. Panels shall be instaled according to manufacturer's instructions and properly mounted
- to a rack, cabinet, bracket or other appropriate mounting device iii. Panels shall be installed such that cables terminated to the panel can maintain minimum bend radius of at least 4 times the cable diameter into the IDC contacts. Cables shall be

terminated on the panel such that there is no tension on the conductors in the termination

iv. Panels shall be properly labeled on front and back with the cable number and port

# B. Category 6 jacks

connections for each port

i. Jacks shall be installed to provide minimal signal impairment by preserving wire twists as close as possible to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the jack shall be no greater then 0.5 inches (13mm)

ii. Jacks shall be installed according to manufacturers instructions and properly mounted in

plates, frames, housings or other appropriate mounting device. iii. Jacks shall be installed such that cables terminated to the jacks maintain minimum bend radius of at least 4 times the cable diameter into the idc contacts, cables shall be terminated on jacks such that there is no tension on the conductors in the termination

# C. Category 6 UTP cable

i. Provide telephone/data cable of manufacturers standard materials as indicated by published product information, designed and constructed as recommended by manufacturer, for a complete installation and for applications indicated.

ii. Do not exceed the minimum bend radius as recommended by the cable manufacturer.

Maintain a maximum bend radius of 4 times the cable diameter. Never exceed a 90 degree

- iii. Do not exceed the maximum tensile loaded as recommended by the cable manufacturer. Never exceed 25 pounds of pulling tension.
- iv. Minimize outer jacket twisting during installation.
- v. Do not remove more of the outer jacket of the cable then is absolutely necessary for termination. individual pairs may be untwisted a maximum of 0.5 inches from the point of
- termination. vi. Cable pathways shall be routed in such a way as to maintain clearance from sources of electromagnetic interference (i.e. - light fixtures, motors, power conduits, etc.) maintain a
- minimum 6" of air space between cables and EMI sources. Cables shall be routed in such a way as to minimize the overall length of the run. Cable vii. length ahsll not exceed 90 meters.
- viii. Cable management system: Provide a complete cable management system including but not limited to: Cable runways, horizontal and vertical wire management panels, "j" hooks, velcro cable ties, stainless steel cable ties, etc.
- ix. "J" hooks shall be a minimum of 1 3/4" wide and come complete with a removable and reusable retaining strap. J hooks shall support a maximum of 6 cables.
- x. Provide velcro cable ties at the racks as required to finish dress the cable installation. Tie a maximum of four cables. Velcro Cable ties shall be black.

# 10. TIA/EIA 606 complaint labeling

11. Category 6 cable testing

each cable at the rack and in each outlet box.

- A. Provide a complete communications system labeling system. Include but not limited to: Cables, jacks, patch panel racks, etc. All labeling shall comply with standards of TIA/EIA 606.
- B. Provide .8" x .75" typewritten black lattering on white laminated adhesive label on each data/coax cable. Provide the outlet number that the cable feeds. Labels shall be placed on
- C. Provide 1.375" x .280" black typewritten letting on white adhesive polyester label on each data and co-axial jack located at the outlets and in the patch panels. Wrap label on sides of modular iacks.
- D. Each jack at each outlet shall be labeled with its own number. as a preface, a data jack number shall be labeled with a 'D', telephone cables shall be labeled with "T". Where data jacks are mounted in the same outlet box they both shall have the same number designation.
- E. Provide a complete labeling plan to the owner for the review prior to commencement of work for approval.

## A. The contractor shall test each cable after installation and termination to certify that each cable complies with EIA/TIA category 5E standards.

network so that the owner, at his discretion, can observe testing.

- i. The testing methods and apparatus for field testing of cabling links shall be TIA TSB 67 level III complaint ii. Notify the owner a minimum of two working days prior to testing the communication
- iii. Any cable links which do not certify at EIA/TIA category 6 standards shall be repaired or replaced by the contractor at his own expense. iv. The cable shall be tested with owners testing apparatus and any discepancies of the
- the owner at the contractors expense. v. The contractor shall provide the owner with written results of the certification preocess. results shall be provided no more then 10 working days after tests are completed.

test results shall require the contractor to retest the links in question in the presence of

# A. The Jack Manufacturer shall provide a 25 year guarantee on the components,

M: EXECUTION

manufacturer for the entire structured cable system

performance, and installation integrity of the entire structured cabling system.

B. The connection hardware, cable and installer shall all be certified by the jack

- 1. The contractor shall exercise due caution when working so as not to damage that portion of the electrical system that is to remain.
- 3. All circuits shall be identified on the panel directories by this contractor. At the completion of the job, the contractor shall provide each panelboard with a new typed directory with the existing loads as noted from the old directory and the new loads as installed.

4. The contractor shall keep on the job, one complete set of working drawings on which he shall record any

deviations or changes from such contract drawings made during construction. Record drawings shall show changes in the following:

2. Positively no conduit or wire removed shall be reused in the new installation.

i. Size, type, capacity, etc. of any material, device or piece of equipment. ii. Location of any device or piece of equipment. iii. Location of any outlet or source in the building service system. iv. Routing of any conduit, or other building electrical service.

These drawings shall be kept clean and undamaged, and shall not be used for any other purpose than

### recording deviations from working drawings and exact locations of concealed work. After the job is completed, this set of drawings shall be delivered to the owner in good condition, as a permanent record of

the installation as actually constructed.

repair shall be paid by the electrical contractor.

exposed surfaces of finished areas will be permitted.

- N: CUTTING AND REPAIRING 1. All necessary cutting in walls, floors and other such work shall be neatly and carefully done and the work shall be repaired in an approved and workmanlike manner. No cutting into the structural parts of the building, which may impair its strength, shall be permitted without the prior written approval of the owner.
- If such cutting is permitted, the area shall be suitably reinforced to restore the structural integrity of the work to its designed value. 2. The electrical contractor shall be responsible for all damage to work of his, or other trades, caused by his work or through the neglect of his workmen. All patching and repairing of damaged work shall be done by

the trade which originally installed it, at the direction of the owner's representative, and the cost of such

3. Absolutely no cutting of wall, floor or other finished material or fastening of electrical components to the

- O: TESTING 1. The testing work shall include all labor, materials, tools, and equipment to perform and record all necessary
- Voltage Cable, 600 Volt Wire and Cable, and Grounding, as indicated on the drawings, specified herein, or where necessary to verify performance requirements. 2. Inspection tests shall provide a visual inspection of electrical equipment for manufacturing, shipping or installation defects.

4. Operational tests shall show the electrical equipment will perform the functions for which it was designed.

7. Submit test reports, including complete data and actual readings taken, for all equipment tested to the

tests and adjustments of equipment, including Load Center Unit Substations, Motor Control Centers, High

- 3. Acceptance tests shall show that the methods and materials used in the installation of equipment conform to applicable codes and standards, and the manufacturers installation instructions, and to determine that the equipment involved may be energized for operational tests.
- 5. The services of a recognized independent testing laboratory shall be engaged to conduct all tests described herein with the exception of routine insulation resistance, continuity and rotation tests. 6. Perform all acceptance and operational tests in the presence of the Architect/Engineer. Notify the Architect/Engineer of time of test at least two (2) days prior to testing. Notify manufacturers of electrical equipment to permit their representatives to witness the test should they so request.
- Architect/Engineer for approval after each test performed. Do not energize any equipment for operating tests until data has been approved. Include copies of the final approved test reports upon completion of the work as part of the required operating and maintenance data to be furnished as specified in Division 1. 8. Give each power feeder and subfeeder cable (600 Volt Wire and Cable) a continuity and megger test. Isolate power cables to be megger tested by opening switches at each end of cable prior to testing. Apply

megger tests, using a 1000 volt megger, between each conductor and ground with the other two conductors

- in the conduit grounded to the same ground. Minimum acceptable readings for disconnected cables shall be 1 (one) megohm. Cable must pass megger test to be reported as acceptable.
- 9. The following test and inspections shall be made on the grounding system. i. Inspect ground conductors and connections for compliance with plans and specifications and for satisfactory workmanship. After installation of the grounding electrodes, provide ground resistance testing prior to the interconnection of other grounding systems. Do not perform tests under unusually wet weather; tests should be performed during normal weather
- ii. Reports shall include all resistance readings obtained, temperature, humidity and condition of the soil at the time of the tests. 10. Operational tests shall be performed on all electrical systems, and shall include, but not be limited to,
- building lighting system, panelboards, motor starters and control devices, alarm circuits and site lighting equipment. P: GUARANTEE

# 1. Material, equipment and installation shall be guaranteed for a period of one year from the date of

acceptance. Defects which appear during that time period shall be corrected by this contractor at his

06-28-22 No. PEN. 0026628

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**ELECTRICAL** SPECIFICATIONS

REVISIONS

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06/01/22 21399 JOB NO.

# 1)SECONDARY DUCT BANK. SEE DETAIL THIS SHEET. CO-ORDINATE ROUTES AND TERMINATION REQUIREMENTS \_600A CT BOX, METER & SERVICE DISCONNECT SWITCH WITH CIVIL DRAWINGS AND LOCAL UTILITY COMPANIES — —36"x48"x8" NEMA 4X STAINLESS STEEL BOX WITH LOCKING HASP PER TELEPHONE COMPANY REQUIREMENTS 1 COMMUNICATIONS DUCT BANK. SEE DETAIL THIS SHEET. — (19,21) // 30A/WP

SITE PLAN

# ELECTRICAL SITE PLAN NOTES

----- FINISHED GRADE

- 01 COORDINATE WITH CIVIL DRAWINGS, SITE CONTRACTOR, AND UTILITY COMPANIES FOR THE INSTALLATION OF THE ELECTRICAL AND COMMUNICATIONS UTILITIES.
- 02 POLE BASE. REFER TO CIVIL DRAWINGS.

TAPE COLOR AS REQUIRED ——

SELECTED BACKFILL —

5'-0" MAX. CENTERS. —

4" CONDUITS (TYPICAL) —

BASE SPACER ON

03 HOMERUN CONDUIT BELOW GRADE TO NEW ADDITION. TRANSITION TO EMT AT 6" ABOVE GRADE IN SPRINKLER RISER ROOM, RUN UP WALL TO JOIST SPACE AND ROUTE TO LIGHTING CONTACTOR. PATCH EXISTING GRADE TO MATCH SURROUNDINGS.

COMMUNICATIONS DUCT BANK DETAIL

→ AS REQUIRED. → ➤

SECONDARY DUCT BANK DETAIL SCALE: NONE

NOTE: MINIMUM SEPARATION BETWEEN CONDUITS SHALL BE 3".

NOTE: MINIMUM SEPARATION BETWEEN CONDUITS SHALL BE 3".

6" YELLOW MARKING TAPE —

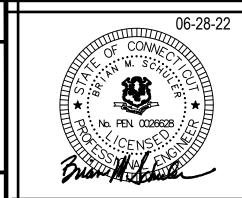
CONCRETE ----

SELECTED BACKFILL -

INTERMEDIATE SPACER 5'-0" MAX. CENTERS.

BASE SPACER ON 5'-0" MAX. CENTERS.—

4" CONDUITS (TYPICAL)—



RNING , ct

REVISIONS

ELECTRICAL SITE PLAN

06/01/22 21399 JOB NO.

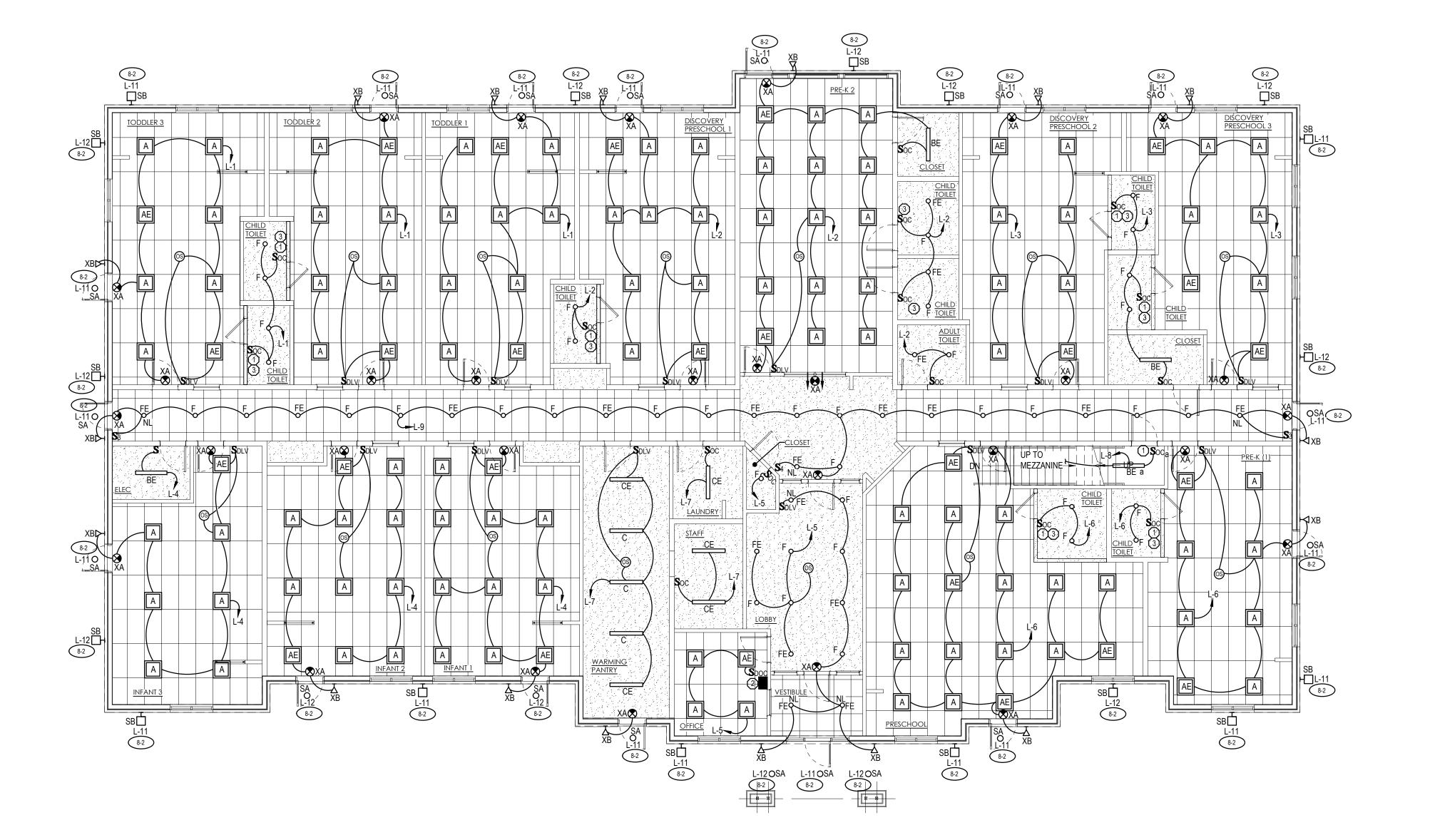
# LIGHTING PLAN NOTES

- 01 PROGRAM OCCUPANCY SENSOR FOR AUTOMATIC 'ON' / AUTOMATIC 'OFF' WITH MANUAL OVERRIDE.
- 02 OVERRIDE SWITCH FOR TIME CLOCK.
- 03 MOUNTED BELOW TOP OF LOW WALL. MAXIMUM HEIGHT 44" TO THE TOP OF THE SWITCH.

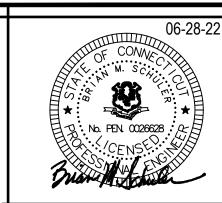
# | EMERGENCY AND NIGHT LIGHT NOTES 'E'

WHEN EMERGENCY LIGHTING FIXTURES ARE SHOWN THEY SHALL BE WIRED TO THE CIRCUIT NUMBER AS INDICATED. PROVIDE HANDLE LOCK ON CIRCUIT BREAKERS. EXIT SIGNS AND NIGHT LIGHT CIRCUITS SHALL BYPASS ALL CONTROL. EM FIXTURES CONNECTED TO LOCAL LIGHTING CIRCUITS WITHOUT AN 'NL' DESIGNATION SHALL BE CONTROLLED WITH LOCAL FIXTURES. PROVIDE EXTRA HOT CONDUCTOR OF THE SAME CIRCUIT SHALL BE INSTALLED TO BYPASS CONTROL FROM LOCAL SWITCHES, OCCUPANCY SENSORS OR LIGHTING CONTACTORS. SEE DETAILS ON SHEET E4.0.

EMERGENCY LIGHT FIXTURES AND EXIT SIGNS HAVE BATTERY BACK UP INSTALLED, DESIGNED, AND MANUFACTURED TO CONFORM WITH THE NATIONAL ELECTRICAL CODE ARTICLE 700. THE EMERGENCY LIGHTING SYSTEM ILLUMINATION IS DESIGNED TO CONFORM WITH STATE BUILDING CODE SECTION 1008. EXIT SIGNS ARE INTERNALLY ILLUMINATED AND CONSTRUCTED TO CONFORM WITH STATE BUILDING CODE SECTION 1013.







**InSite** 

ARCHITECTS

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VERNON, CT

OTTVILLE RD.

# DATE TYPE

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LIGHTING PLAN

DATE 06/01/22 JOB NO. 21399

	MECHANICAL & PLUMBING EQUIPMENT SCHEDULE							
MARK	DESCRIPTION	LOAD	VOLTAGE & PHASE	PANEL	CIRCUIT	C.B.	WIRE	NOTES
CU-1	CONDENSING UNIT	14.0 MCA	208V-1PH	М	1,3	20/2	12-2	1,2
CU-2	CONDENSING UNIT	17.0 MCA	208V-1PH	М	2,4	25/2	10-2	1,2
CU-3	CONDENSING UNIT	14.0 MCA	208V-1PH	М	5,7	20/2	12-2	1,2
CU-4	CONDENSING UNIT	18.0 MCA	208V-1PH	М	6,8	30/2	10-2	1,2
CU-5	CONDENSING UNIT	14.0 MCA	208V-1PH	М	9,11	20/2	12-2	1,2
CU-6	CONDENSING UNIT	12.0 MCA	208V-1PH	М	10,12	20/2	12-2	1,2
CU-7	CONDENSING UNIT	12.0 MCA	208V-1PH	М	13,15	20/2	12-2	1,2
CU-8	CONDENSING UNIT	14.0 MCA	208V-1PH	М	14,16	20/2	12-2	1,2
CU-9	CONDENSING UNIT	12.0 MCA	208V-1PH	М	17,19	20/2	12-2	1,2
ECH-1	ELECTRIC CABINET UNIT HEATER	3000 WATTS	208V-1PH	М	43,45	20/2	10-2	1
ECH-2	ELECTRIC CABINET UNIT HEATER	1500 WATTS	120V-1PH	М	47	20/2	10-2	1
ECH-3	ELECTRIC CABINET UNIT HEATER	1500 WATTS	120V-1PH	М	49	20/2	10-2	1
DOA-CU-1	DOAS CONDENSING UNIT	62 MCA	208V-3PH	L	38,40,42	80/3	4-3	1,2

# MECHANICAL & PLUMBING EQUIPMENT SCHEDULE NOTES:

- VERIFY LOAD, LOCATION AND CONNECTION REQUIREMENTS WITH MECHANICAL & PLUMBING DESIGN DRAWINGS, SHOP DRAWINGS, AND MECHANICAL & PLUMBING CONTRACTOR IN THE FIELD. ADJUST CONNECTION DEVICE, MOUNTING HEIGHT, WIRE, CONDUIT AND CIRCUIT BREAKER AS REQUIRED IN ORDER TO POWER THE EQUIPMENT. COORDINATE WITH THE EQUIPMENT INSTALLING CONTRACTOR PRIOR TO ROUGH-IN.
- 2. PROVIDE A LOCAL NEMA 3R HEAVY DUTY NON FUSED DISCONNECT SWITCH SIZED PER EQUIPMENT NAMEPLATE DATA.
- 3. PROVIDE A LOCAL NEMA 3R HEAVY DUTY FUSED DISCONNECT SWITCH SIZED AND FUSED PER EQUIPMENT NAMEPLATE DATA.
- 4. PROVIDE A LOCAL NEMA 1 MANUAL MAGNETIC MOTOR STARTER. SIZE OVERLOADS PER EQUIPMENT REQUIREMENTS.
- 5. CONTROL CIRCUIT WITH TIME CLOCK.
- 6. INTEGRAL HACR BREAKER & GFCI SERVICE RECEPTACLE, ELECTRICAL CONTRACTOR TO PROVIDE POWER AND FUSIBLE 100KAIC DISCONNECT TO MINIMIZE SHORT CURRENT CIRCUIT.
- 7. PROVIDE A LOCAL COMBINATION MAGNETIC MOTOR STARTER / DISCONNECT SWITCH.

# FURNITURE & EQUIPMENT RECEPTACLE / DATA INSTALLATION

SEE INTERIOR ARCHITECTURAL ELEVATIONS ON DRAWINGS A1.3,A7.0,A7.1,A7.2,A7.3 FOR OUTLET ROUGH-IN LOCATIONS & ELEVATIONS. COORDINATE WITH GC IN THE FIELD. FAILURE TO ADHERE TO ELEVATION ROUGH-IN REQUIREMENTS SHALL RESULT IN OUTLETS BEING RELOCATED, WALLS BEING PATCHED AT ELECTRICAL CONTRACTORS EXPENSE.

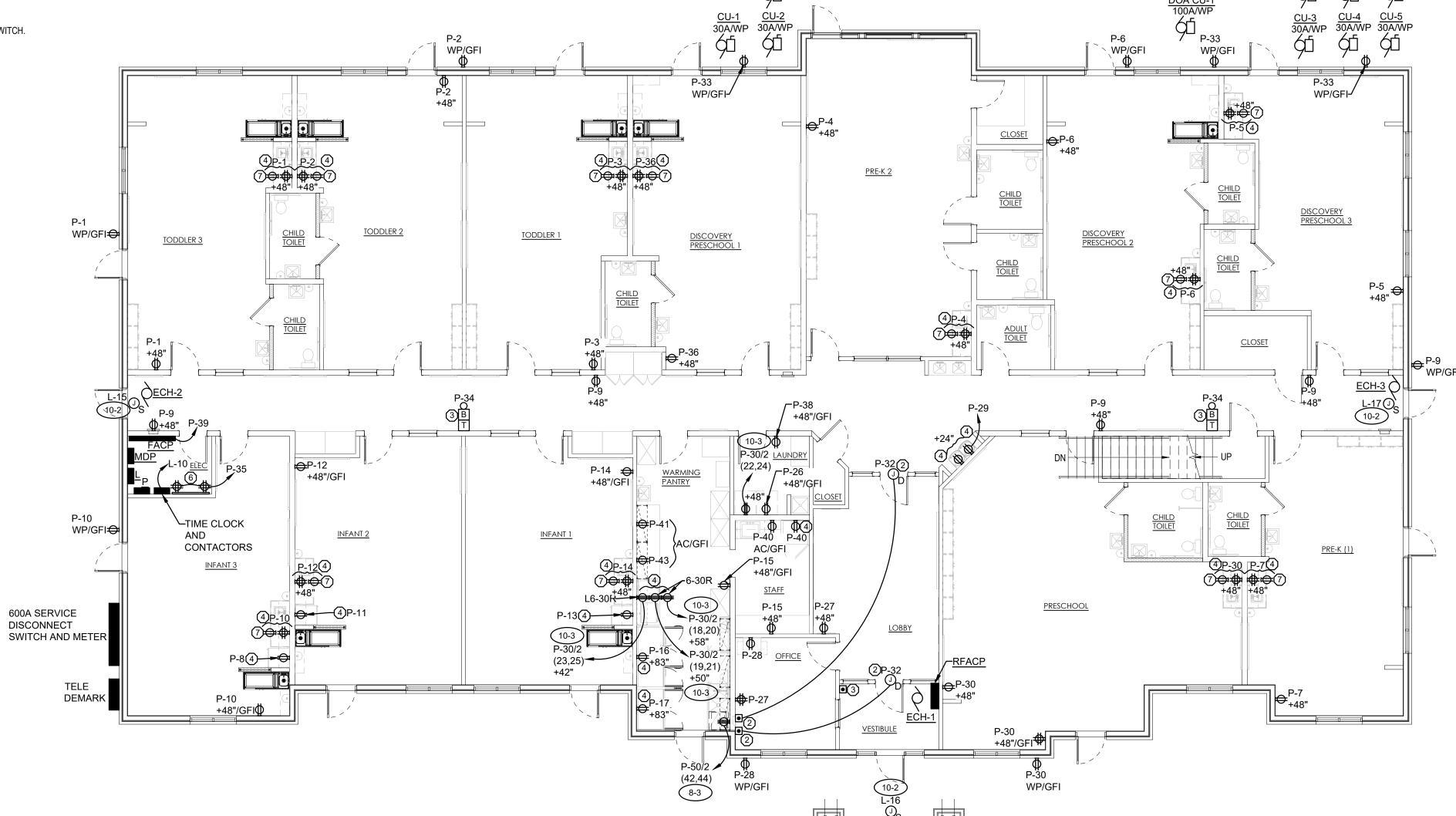
# WARMING PANTRY NOTE:

ALL PLUG AND RECEPTACLE CONNECTIONS IN WARMING PANTRY SHALL SERVE AS MEANS OF DISCONNECT PER NEC 70.

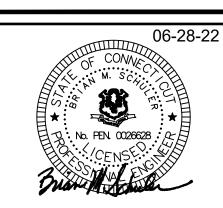
# POWER PLAN KEY NOTES

- 1 ALL 20 AMP 120 VOLT RECEPTACLES SHALL BE TAMPER-PROOF TYPE.
- 2 PROVIDE ALL BOXES, CONDUIT, POWER & CONTROL WIRING FOR DOOR STRIKE SYSTEM.
- 3 SEE ARCHITECTURAL SECTIONS & COORDINATE WITH GENERAL CONTRACTOR FOR CONDUIT ROUTE FOR SIGN ROUGH-IN INDICATED. CONDUIT SHALL BE HIDDEN.
- 4 E.C. SHALL PROVIDE COMPLETE DOOR SIGNAL SYSTEM ALL WIRING BETWEEN TRANSFORMER, BELLS & PUSHBUTTONS SHALL BE FIELD PAINT BELL TO MATCH WALL SURFACE. SEE DETAIL SHEET E3.2.
- 5 SEE MECHANICAL / PLUMBING DRAWINGS FOR ALL REQUIRED ELECTRICAL CONNECTIONS. E.C. SHALL PROVIDE ALL POWER/CONTROL WIRING, BOXES & CONDUITS AS REQUIRED.
- 6 PROVIDE 3"X16"X1/2" COPPER GROUND BAR MOUNTED AT 42". MOUNT ON ISOLATORS. PROVIDE WITH 10 3/8" DIA HOLES & CONNECT TO GROUNDING SYSTEM WITH A #2 COPPER BONDING CONDUCTOR. PROVIDE 4'x4'x3/4" PAINTED FIRE RATED PLYWOOD BACKBOARD.
- 7 CONNECTED TO A GFCI CIRCUIT BREAKER. LABEL RECEPTACLE GFCI PROTECTED.
- 8 COORDINATE ROUGH -IN LOCATIONS WITH SHOP DRAWINGS PRIOR TO INSTALLATION. RECEPTACLES SHALL BE CONNECTED
- TO GFCI CIRCUIT BREAKER.

  9 MOUNTED HORIZONTAL AT 62" AFF. CONNECT GFCI BREAKER.
- 10 STUB (3) 1 1/2" CONDUITS FROM FACP TO CORRIDOR JOIST SPACE. FIRESTOP CONDUITS AFTER WIRE IS INSTALLED.
- 11 MOUNT RECEPTACLE IN WALL HORIZONTALLY IN THE CABINET AT 5'-5" AFF (ABOVE FINISHED FLOOR) COORDINATE EXACT LOCATION WITH GC PRIOR TO ROUGH-IN.
- 12 PROVIDE FLUSH NEMA 14-50R RECEPTACLE AT 14" AFF. PROVIDE MATCHING NEMA 14-50R PLUG WITH (3)#8,#8GND SJO CORD WITH STRAIN RELIEF. CONNECT DISHWASHER AT POWER BOX LOCATED AT 18" ON REAR OF DISHWASHER.
- 13 DUCT MOUNTED SMOKE DETECTORS SHALL BE PROVIDED AND WIRED BY THE FIRE ALARM CONTRACTOR. E.C TO COORDINATE BETWEEN MECHANICAL CONTRACTOR AND FIRE ALARM CONTRACTOR. COORDINATE VOLTAGE OF DUCT DETECTOR PRIOR TO ROUGH-IN.







**InSite** 

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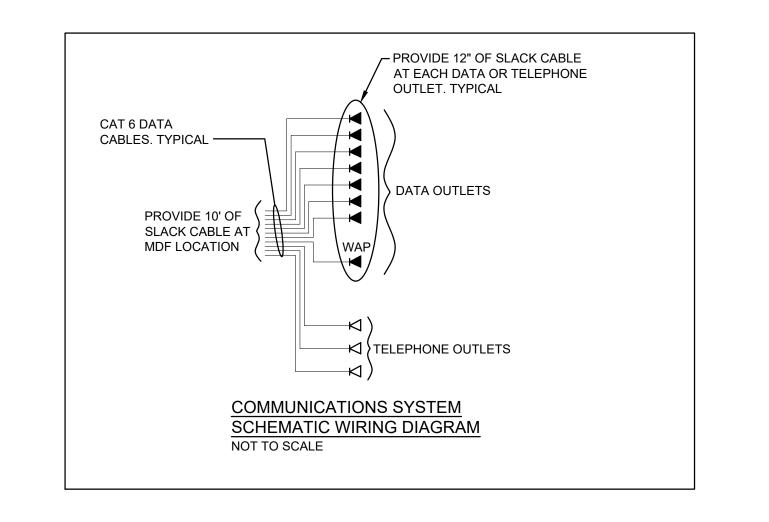
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POWER PLAN

ATE 06/01/22 OB NO. 21399

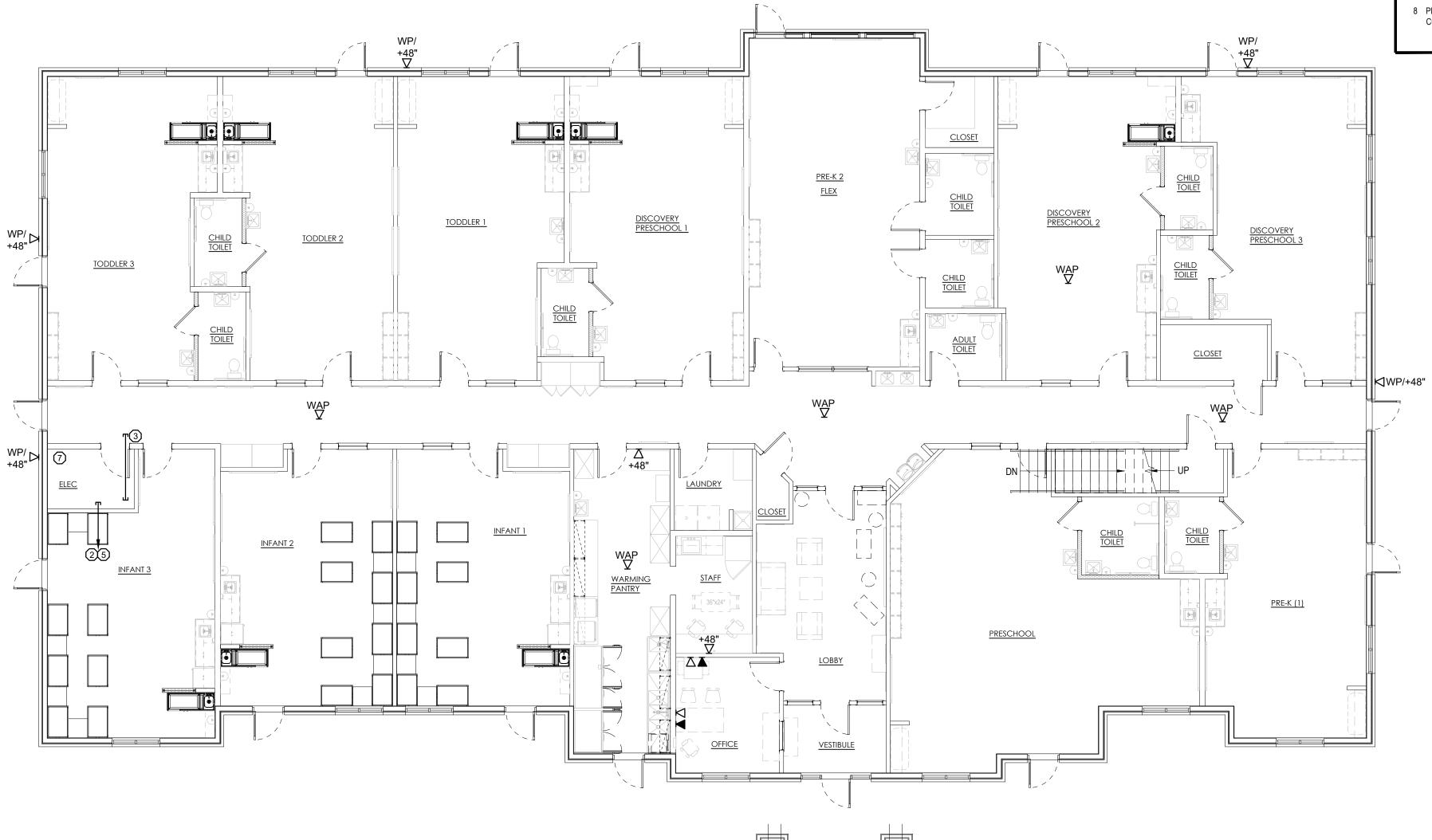


# GENERAL ELECTRICAL DEMOLITION NOTES

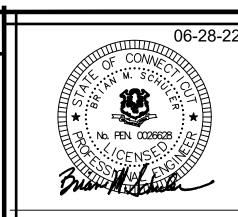
- A) NO ATTEMPT HAS BEEN MADE TO INDICATE ALL EXISTING ELECTRICAL DEVICES, LIGHT FIXTURES, COMMUNICATION DEVICES, WIRING, CONDUIT, ETC. TO BE REMOVED AND/OR RELOCATED. HOWEVER, THE ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THE EXTENT OF DEMOLITION PRIOR TO SUBMITTING BID.
- B) REMOVE AND/OR RELOCATE EXISTING ELECTRICAL DEVICES NOT NOTED AS EXISTING TO REMAIN. COORDINATE SUCH CONDITIONS WITH ARCHITECTURAL DRAWINGS.
- C) EXISTING CONDUITS, CIRCUITS OR SYSTEMS IN WALLS OR CEILING BEING REMOVED WHICH SERVE SURROUNDING UN REMODELED AREAS SHALL BE REWORKED AND MAINTAINED.
- D) EXISTING CONDUITS, CIRCUITS OR SYSTEMS PASSING THROUGH THE REMODELED AREAS WHICH SERVE UNREMODELED AREAS SHALL REMAIN AND BE PROTECTED DURING DEMOLITION AND REMODELING, AND SHALL BE RELOCATED AND REROUTED.
- E) CONTINUITY OF CIRCUITS INTERRUPTED BY REMOVAL OF ELECTRICAL DEVICES SHALL BE MAINTAINED.
- F) ALL UNUSED WIRE (POWER & COMMUNICATION) SHALL BE REMOVED.
- G) ALL EXISTING WIRING (POWER & COMMUNICATION) THAT IS TO REMAIN SHALL BE REWORKED OR REPLACED WITH CODE COMPLIANT MATERIAL & SUPPORTS. ANY EXISTING SURFACE MOUNTED CONDUITS SHALL BE REMOVED OR RELOCATED SO THAT THEY ARE IN THE JOIST SPACE OR WITHIN WALL CAVITIES.
- H) EXISTING LIGHT FIXTURES THAT REMAIN OR ARE BEING RELOCATED SHALL BE CLEANED AND RE-LAMPED WITH 4' T8 LAMPS. BROKEN LENSES SHALL BE REPLACED. PROVIDE NEW T8 BALLASTS IF REQUIRED.
- ) EXISTING LIGHT FIXTURES, ELECTRICAL / TELECOMMUNICATION DEVICES, PANELBOARDS ETC. THAT ARE NOT TO BE REMOVED SHALL BE NOTED AS EXISTING TO REMAIN ON THE DRAWINGS. SEE ARCHITECTURAL & MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION ON SCOPE OF DEMOLITION.

# COMMUNICATIONS PLAN KEY NOTES

- 1 TELEPHONE DEMARK CABINET PER TELEPHONE COMPANY REQUIREMENTS.
- 2 2"C FROM 84" TO ABOVE CEILING. WIRE HOMERUN TO BUILDING TELEPHONE DEMARK FOR TELEPHONE COMPANY CABLE.
- 3 (2) 2" EMT SLEEVES IN JOIST SPACE. TURN CONDUITS DOWN AT MDF & STUB 6" BELOW CEILING.
- 4 ALL COMMUNICATIONS CABLE SHALL BE PURCHASED & INSTALLED BY ELECTRICAL CONTRACTOR & MEET E1A/T1A STANDARDS. COORDINATE CABLE MANUFACTURER WITH KCE PRIOR TO BIDDING.
- 5 25 PAIR CAT 6 CABLE TO TELEPHONE DEMARK. TERMINATE AT MDF AS DIRECTED BY KCE.
- 6 ALL DATA & TELEPHONE CABLE & JACKS SHALL BE CATEGORY 6. CABLE SHALL BE PLENUM RATED 24 AWG 4 PAIR TWISTED. ELECTRICAL CONTRACTOR SHALL ROUTE CABLE FROM JACKS TO MDF. LEAVE 12" SPARE CABLE IN JACKS & 10' SPARE CABLE AT MDF FOR TERMINATIONS BY KCE.
- 7 PROVIDE 4"x20" COPPER GROUND BAR MOUNTED ON ISOLATORS. GROUND BAR SHALL BE PURCHASED WITH 10 1/2" DIAMETER HOLES. EXTEND #4 COPPER BONDING CONDUCTOR FROM GROUND BAR TO PANEL 'M' GROUND BUS. BOND BUS BAR TO RACK WITH #4 COPPER BONDING CONDUCTOR. BOND GROUND BAR WITH #4 BONDING COPPER CONDUCTOR TO TELEPHONE UTILITY ACCESS PANEL.
- 8 PROVIDE A #3/0 COPPER BONDING CONDUCTOR FROM CABINET & TELEPHONE UTILITY ACCESS POINT (IF AVAILABLE) & CONNECT TO GROUNDING ELECTRODE SYSTEM.







InSite

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COMMUNICATIONS PLAN

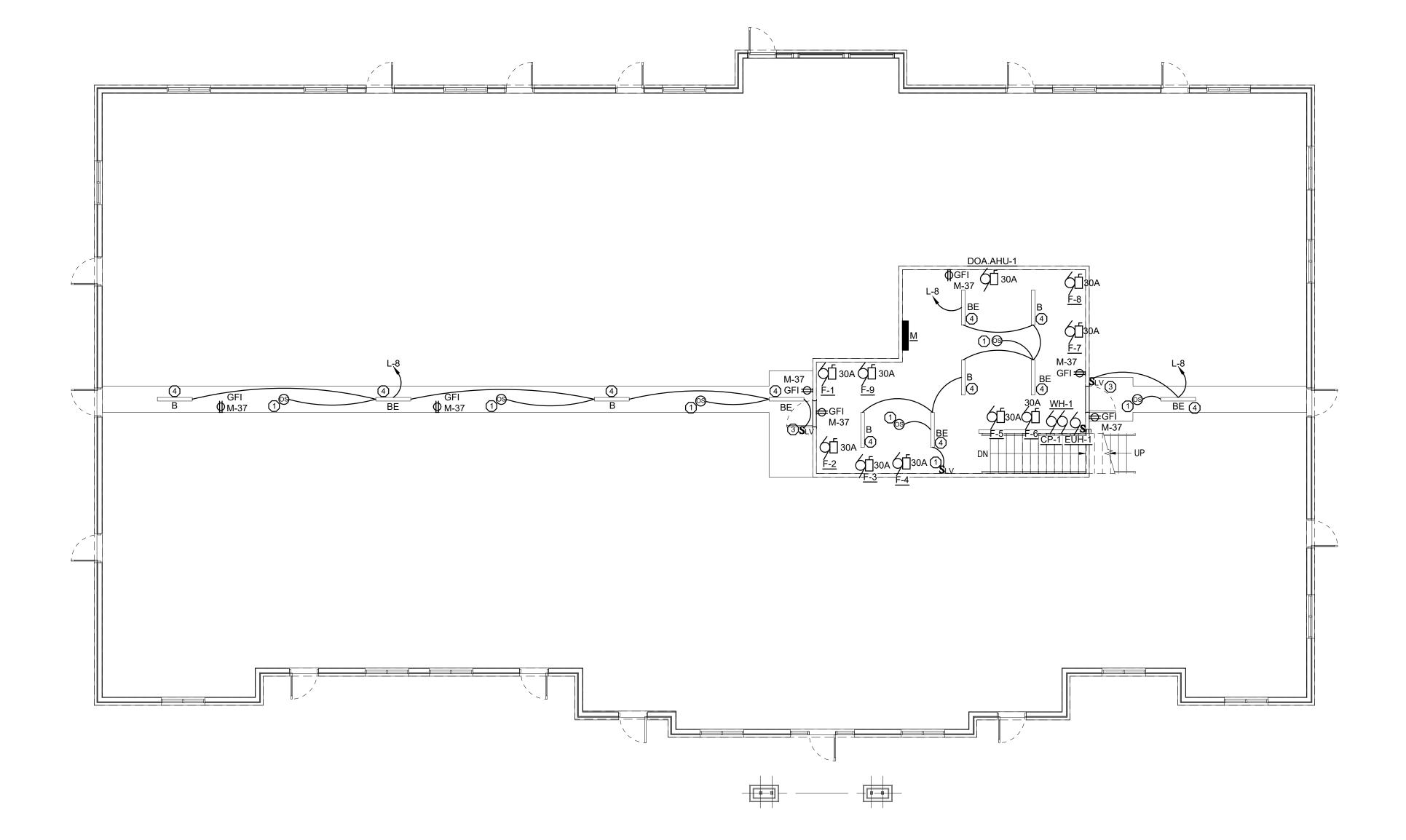
OB NO. 21399

	MECHAN	ICAL & F	PLUMBIN	IG EQU	IPMEN	Γ SCHE	EDULE	
MARK	DESCRIPTION	LOAD	VOLTAGE & PHASE	PANEL	CIRCUIT	C.B.	WIRE	NOTES
FU-1	FURNACE	9.3 MCA	208V-1PH	М	26	15/1	12-2	1,2
FU-2	FURNACE	9.3 MCA	208V-1PH	М	28	15/1	12-2	1,2
FU-3	FURNACE	9.3 MCA	208V-1PH	М	30	15/1	12-2	1,2
FU-4	FURNACE	9.3 MCA	208V-1PH	М	31	15/1	12-2	1,2
FU-5	FURNACE	9.3 MCA	208V-1PH	М	32	15/1	12-2	1,2
FU-6	FURNACE	9.3 MCA	208V-1PH	М	33	15/1	12-2	1,2
FU-7	FURNACE	9.3 MCA	208V-1PH	М	34	15/1	12-2	1,2
FU-8	FURNACE	9.3 MCA	208V-1PH	М	35	15/1	12-2	1,2
FU-9	FURNACE	9.3 MCA	208V-1PH	М	36	15/1	12-2	1,2
OOA.AHU-1	AIR HANDLER UNIT	20 MCA	208V-3PH	М	38,40,42	25/3	10-3	1,6,7
EUH-1	ELECTRIC UNIT HEATER	3000 WATTS	208V-1PH	М	51,53	20/2	12-2	1
WH-1	GAS WATER HEATER	54 WATTS	120V-1PH	L	27	20/1	12-2	1,2
CP-1	RECIRC PUMP	100 WATTS	115V-1PH	L	28	20/1	12-2	1,4,5

# MECHANICAL & PLUMBING EQUIPMENT SCHEDULE NOTES:

1. VERIFY LOAD, LOCATION AND CONNECTION REQUIREMENTS WITH MECHANICAL & PLUMBING DESIGN DRAWINGS, SHOP DRAWINGS, AND MECHANICAL & PLUMBING CONTRACTOR IN THE FIELD. ADJUST CONNECTION DEVICE, MOUNTING HEIGHT, WIRE, CONDUIT AND CIRCUIT BREAKER AS REQUIRED IN ORDER TO POWER THE EQUIPMENT. COORDINATE WITH THE EQUIPMENT INSTALLING CONTRACTOR PRIOR TO ROUGH-IN.

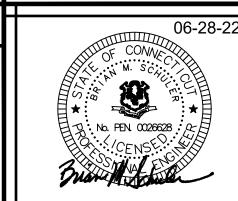
- 2. PROVIDE A LOCAL NEMA 3R HEAVY DUTY NON FUSED DISCONNECT SWITCH SIZED PER EQUIPMENT NAMEPLATE DATA.
- 3. PROVIDE A LOCAL NEMA 3R HEAVY DUTY FUSED DISCONNECT SWITCH SIZED AND FUSED PER EQUIPMENT NAMEPLATE DATA.
- 4. PROVIDE A LOCAL NEMA 1 MANUAL MAGNETIC MOTOR STARTER. SIZE OVERLOADS PER EQUIPMENT REQUIREMENTS.
- CONTROL CIRCUIT WITH TIME CLOCK.
- 6. PROVIDE A LOCAL COMBINATION MAGNETIC MOTOR STARTER / DISCONNECT SWITCH.
- 7. INSTALL GFI RECEPTACLE ON UNIT HOUSING.





# POWER PLAN KEY NOTES

- 1 PROGRAM AS AN OCCUPANCY SENSOR FOR AUTOMATIC 'ON' / AUTOMATIC 'OFF' WITH MANUAL OVERRIDE.
- 2 SEE MECHANICAL / PLUMBING DRAWINGS FOR ALL REQUIRED ELECTRICAL CONNECTIONS. E.C. SHALL PROVIDE ALL
- POWER/CONTROL WIRING, BOXES & CONDUITS AS REQUIRED. 3 FIXTURES IN THE ATTIC SHALL NOT BE DIMMED. DO NOT INSTALL 0-10V CONTROL WIRING FROM SWITCH TO FIXTURES.
- 4 ARRANGE LIGHT FIXTURES TO AVOID DUCT WORK.



ATTIC POWER/LIGHTING

REVISIONS

PLAN

06/01/22 21399 JOB NO.

# FIRE ALARM VOICE EVACUATION SYSTEM SPECIFICATIONS

## 1. The System

i. Furnish and install a complete Fire Alarm System / Voice Evacuation System as described herein and as shown on the plans; to be wired, connected, and left in first class operating condition. Include a control panel, automatic fire detectors, notification devices, remote annunciators, all wiring, connections to devices, outlet boxes, junction boxes, and all other necessary material for a complete operating system.

# ii. All panels and peripheral devices shall be the standard product of a single manufacturer.

iii. The equipment manufacture shall provide all wiring diagrams, equipment shop drawings, battery calculations, etc. per national, state, and local. All prepared & signed by a state certified fire alarm designer. Submit necessary quantity of materials to the authority having jurisdiction for permit.

### Requirements

i. The control panel shall receive 120 VAC power (as noted on the plans).

- ii. The system shall be provided with sufficient battery capacity to operate the entire system upon loss of normal 120 VAC power in a normal supervisory mode for a period off twenty-four (24) hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to the standby batteries upon power failure. All battery charging and recharging operations shall be
- iii. All circuits requiring system operating power shall be 24VDC and shall be individually fused at the
- iv. The panel shall be addressable type with a minimum capacity of 120 addressable points. Signal circuits shall be provided for the annuciation devices shown on plan +(2) 2amp spare circuits. Construction shall be modular w/ solid state microprocessor based electronics.
- v. The control panel shall support class "B" supervised initiation circuits.

# 3. Digital Alarm Communicator Transmitter (DACT)

- i. The control panel shall be provided with a DACT unit. The DACT unit shall transmit fire alarm activity to a central supervising location as chosen by the owner & approved by the AHJ. System shall be capable of seizing a telephone line and sending an alarm signal. Provide a 4G cellular module for primary off site communication if AHJ requires.
- 4. Peripheral Devices
- i. Supply and install where indicated on the plans fire alarm horn and ADA visual unit.
- ii. Audio/visual units shall provide a common enclosure for the fire alarm audible and visual alarm devices The housing shall be designed to accommodate either horns, bells, or chimes. The unit shall be complete with pyramidal shaped lens with "fire" lettering visible from a 180 field of view. Lamp shall provided 4 wire connection to insure properly supervised in/out system connection. Unit shall be complete with all mounting hardware including back box. Audio/visual unit shall meet requirements of the American Disabilities Act for the area served and be UL listed for its intended purpose. Strobe intensity shall be sized to provide a minimum of .0375 footcanoles at any point in any public space. All alarm indicating devices shall be fitted with the manufactures red surface mounted back box for surface mounted applications. All strobes shall be synchronized and continue separately after silence, only upon reset will they discontinue.

# 5. Addressable Device Types

- (1) The system control panel, over its two wire multi drop channel, must be capable of communicating with the types of addressable devices specified below. Addressable devices will be located as shown on the drawings.
- ii. Addressable Pull Stations (Manual Fire Alarm Boxes)

# (1) Addressable pull stations shall:

communicate the station's status (alarm, normal) to the control panel over two wires which also provide power to the pull station. The address will be set on each station. The stations will be manufactured from high impact red Lexan. The station will mechanically latch upon operation and remain so until manually reset by opening with a key common to all system locks. Pull stations will be single action.

- iii. Smoke Detectors
- (1) The sensors shall be a photo electronic type and obtain its operating power from the supervisory current in the fire alarm detection loop. The detectors microprocessor utilizes both elements & measures the signals with respect to time. Detection sensitivity shall be independent of environmental conditions. The sensitivity of the sensor shall be adjustable.

- (2) The duct smoke sensors shall be a photo sensor and obtain its operating power from the supervisory current in the fire alarm detection loop. Auxiliary DPDT relays shall be part of the duct housing. Activation of the relays shall be through the system program. Duct smoke sensors shall also be wired to shut down individual HVAC units upon the detection of smoke. Remote LED indicator/key test switch shall be installed where indicated on the drawings. If not indicated on the drawings, the switches shall be located on the unit when it is accessible or on a nearby corridor wall is the unit is in an inaccessible location. Confirm all locations with the architect before installing if not shown on the drawings.
- iv. Flow and Tamper Switches
- (1) Flow and tamper switches shall consist of a cast aluminum pipe saddle which houses an electrical mechanical device to which is attached a corrosion free, flexible, low density, polyethylene paddle. The paddle conforms with the inside diameter of the sprinkler pipe and senses water movements. The flow switch shall incorporate an adjustable time delay mechanism between paddle operated stem and alarm initiating contacts. Flow switch shall be UL listed.
- iv. CARBN MONOXIDE SENSORS

equipment after completion of the installation.

(1) The sensor can be stand alone type or combination smoke/carbon monoxide sensor. The sensor shall be provided with a sounder base for local alarm purposes.

### 6. Installation

- i. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of NEC - Article 760 A and C, Power-Limited Fire Protective Signaling Circuits. All junction boxes and covers shall be sprayed red. Wiring color code shall be maintained throughout.
- ii. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.
- iii. The contractor shall clean all dirt and debris from the inside and the outside of the fire alarm
- iv. The manufacturer's authorized representative shall provide on-site supervision of installation and all
- v. Fire Alarm wiring shall be run in a conduit system below lay-in ceiling or joists in exposed areas. Wiring and

related programming. Descriptions for each addressable device shall be provided by the Owner at the

conduit shall be run parallel or perpendicular to existing ceilings, floors and walls. Open cable may be used above lay-in ceilings shall be plenum rated

7. Testing

i. The completed fire alarm system shall be fully tested in accordance with NFPA-72H by the contractor in the presence of the owner's representative and the Local Fire Marshal. Upon completion of a successful test, the contractor shall so certify in writing to the owner.

# 8. Warranty

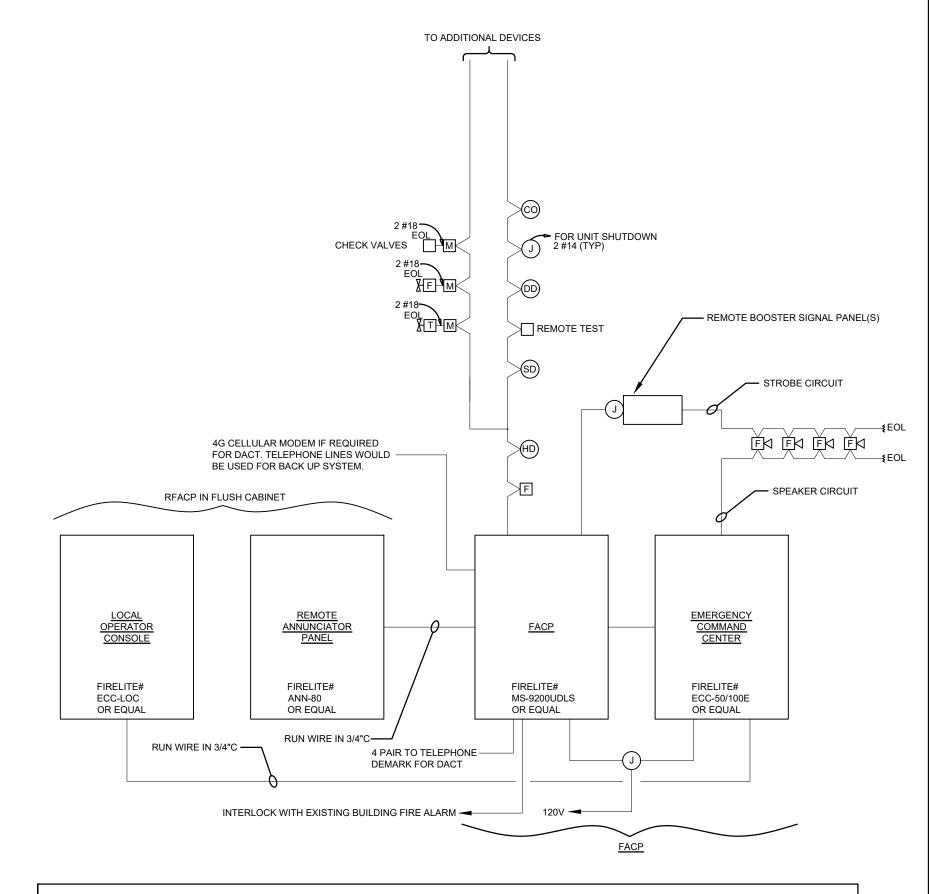
i. The contractor shall warrant the completed sprinkler alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of the completed and certified test or from the date of first beneficial use.

- ii. The equipment manufacturer shall make available to the owner a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with the NFPA-72H
- 9. Quality Assurance
- i. Each and all items of the Fire/Sprinkler Alarm System shall be listed as a product of a SINGLE fire alarm system manufacturer under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the "U.L." label. All control equipment is to be listed under UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable.
- ii. Complete installation shall conform to applicable sections of NFPA 72 and 72 E, NEC (NFPA-70) and Local requirements.
- iii. The equipment and installation supervision furnished under this specification is to be provided by a manufacturer who has been engaged in production of this type of equipment (software driven) for at least ten (10) years, and has a fully-equipped service organization within fifty (50) miles of the
- iv. All control equipment must have transient protection devices to comply with UL 864 requirements.

	FIRE ALARM SYSTEM SYMBOL LEGEND
SYMBOL	DESCRIPTION
► A-2	HOMERUN TO PANEL "A" INDICATING CIRCUIT NUMBER(S) - ALL WIRING SHALL BE #12 WITH EQUIPMENT GROUND WIRE UON (INCREASE TO #10 FOR CIRCUITS OVER 100 FT.) - ALL HOMERUNS ARE TO A 20 AMPERE, 1 POLE CIRCUIT BREAKER U.O.N QUANITY OF CONDUCTORS AS NECESSARY TO ACCOMMODATE CIRCUITS AND CONTROL INDICATED. CROSS HATCHES INDICATE REQUIRED LIGHTING CONTROL U.O.N.
F	FIRE ALARM PULL STATION MOUNTED AT 48" AFF UON WITH INTEGRAL FLIP COVER & LOCAL ALARM.
F 120	FIRE ALARM SPEAKER WITH STROBE LIGHT - WALL MOUNTED AT 80" AFF UON. C= MOUNTED FLUSH IN CEILING, PROVIDE WHITE HOUSING. SPACING HAS BEEN REDUCED TO ACCOMMODATE INCREASED MOUNTING HEIGHT. ALL STROBES SHALL BE SYNCHRONIZED. NUMBER INDICATES MINIMUM STROBE CANDELA RATING.  PROVIDE WHITE CEILING MOUNTED ANNUNCIATION DEVICES IN CLASSROOMS
F 60	FIRE ALARM STROBE LIGHT ALL STROBES SHALL BE SYNCHRONIZED - WALL MOUNTED AT 80" NUMBER INDICATES MINIMUM STROBE CANDELA RATING.
SD	FIRE ALARM SMOKE/HEAT DETECTOR - CEILING MOUNTED ("D" = DOOR CONTROL, "E" =  ELEVATOR CONTROL, "N" = PATIENT ROOM FIRE ALARM/NURSE CALL, "S" = SINGLE  STATION WITH AUDIBLE/ADA VISUAL ALARM)  FIRE ALARM SYSTEM VENDOR SHALL PROVIDE STROBES WITH INTENSITY RATINGS (15 TO 117 CANDELA) LARGE ENOUGH TO PROVIDE .0375 FOOTCANDLES AT ANY POINT IN ANY
HD	FIRE ALARM FIXED TEMP/RATE OF RISE HEAT DETECTOR - CEILING MOUNTED ("E" = ELEVATOR)  PUBLIC AREA AS REQUIRED BY NFPA.
(DD) Ts	FIRE ALARM DUCT SMOKE DETECTOR - WITH REMOTE TEST STATION FURNISHED, WIRED BY E.C. & INSTALLED BY M.C. MOUNT TEST SWITCH NEXT TO CONTROL PANEL. "V" = SMOKE DAMPER CONTROL.
CO	CEILING MOUNTED CARBON MONOXIDE DETECTOR WITH LOCAL ALARM. WIRED TO FIRE ALARM SYSTEM.  CAN BE COMBINED WITH AREA SMOKE DETECTORS
TY/FY	SPRINKLER SYSTEM TAMPER SWITCH/FLOW SWITCH - FURNISHED AND INSTALLED BY MC, WIRED BY EC
AFF	ABOVE FINISHED FLOOR
AC	INDICATES DEVICE MOUNTED AT 8" ABOVE COUNTER
EC	ELECTRICAL CONTRACTOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER TYPE
UON	UNLESS OTHERWISE NOTED
С	MOUNTED FLUSH IN CEILING. SPACING HAS BEEN REDUCED TO ACCOMODATE INCREASED MOUNTING HEIGHT.

THE FIRE ALARM DESIGNER SHALL CO-ORDINATE WITH THE **AUTHORITY JURISDICTION TO DETERMINE IF THE LOCATION OF THIS** PROJECT IS LOCATED IN THE EMERGENCY COMMUNICATIONS DEAD ZONE. IF SO, THE FIRE ALARM DESIGNER SHALL INCORPORATE A BI DIRECTIONAL AMPLIFIER SYSTEM DESIGNED TO NFPA 72. NFPA 1221. AND ALL LOCAL REQUIREMENTS IN CONFORMANCE WITH UL2524.

THE ELECTRICAL CONTRACTOR SHALL HIRE A LICENSED FIRE ALARM DESIGNER TO PROVIDE DESIGN DRAWINGS AND SPECIFICATIONS TO THE AUTHORITY HAVING JURISDICTION AS A DEFERRED SUBMITTAL. THE SYSTEM DESIGN SHALL BE BASED ON THE SPECIFICATIONS, NOTES, AND RISER DIAGRAM SHOWN ON THIS SHEET. THE SYSTEM SHALL BE DESIGNED AS A VOICE EVACUATION SYSTEM WITH FULL AREA SMOKE DETECTOR COVERAGE AND FULL CARBON MONOXIDE SENSOR COVERAGE. SEE MECHANICAL DRAWINGS FOR DUCT MOUNTED SMOKE DETECTOR AND HVAC UNIT SHUT DOWN REQUIREMENTS. CARBON MONOXIDE SENSORS SHALL RECEIVE OPERATING POWER AND COMMUNICATE WITH THE FIRE ALARM CONTROL PANEL. FIRE ALARM DRAWINGS AND CUT SHEETS SHALL BE PROVIDED BY THE CONTRACTOR AS SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL.

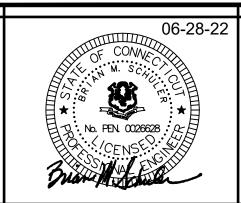


# FIRE ALARM VOICE EVACUATION SYSTEM NOTES:

- 1) THIS RISER REPRESENTS A TYPICAL SYSTEM AND IS NOT INTENDED FOR INSTALLATION. SYSTEM SUPPLER SHALL PROVIDE INSTALLATION DRAWINGS AND SCHEMATIC WIRING DIAGRAMS. EXACT SYSTEM REQUIREMENTS SHALL BE COORDINATED WITH THE SYSTEM SUPPLIER & FLOOR PLANS. THE INSTALLATION SHALL MEET NEC, NFPA & ALL APPLICABLE STATE & LOCAL CODES.
- 2) SYSTEM SUPPLIER SHALL SUPERVISE INSTALLATION, PROGRAM AND TEST SYSTEM, AND INSTRUCT OWNER ON SYSTEM OPERATION.
- 3) ALL FIRE ALARM WIRING SHALL BE IN 1/2" MINIMUM CONDUIT. OPEN WIRING MAY BE USED ABOVE ACCESSIBLE CEILING PROVIDED THAT IT IS PLENUM RATED.
- 4) PROVIDE ADDITIONAL MONITOR AND CONTROL MODULES AS RECOMMENDED BY SYSTEM SUPPLIER.
- 5) ALL CONTROL CABINETS SHALL BE IN GROUNDED PER N.E.C. REQUIREMENTS AND PER SPECIFICATIONS. 6) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. REFER TO DRAWINGS FOR DEVICE QUANTITY AND
- LOCATIONS. 7) THE E.C. SHALL PROVIDE ALL CONDUITS, SLEEVES, BOXES & FIRE STOPPING FOR THE FIRE ALARM

CONTRACTOR. THE E.C. SHALL PAY THE BUILDINGS FIRE ALARM CONTRACTOR & INCLUDE ALL FA CONTRACTOR CHARGES IN BID. CONTACT LANDLORD FOR FIRE ALARM CONTRACTOR INFORMATION.

8) COORDINATE WITH KCE AS FAR AS WHICH FIRE ALARM MONITORING COMPANY IS TO USED FOR THIS SYSTEM.



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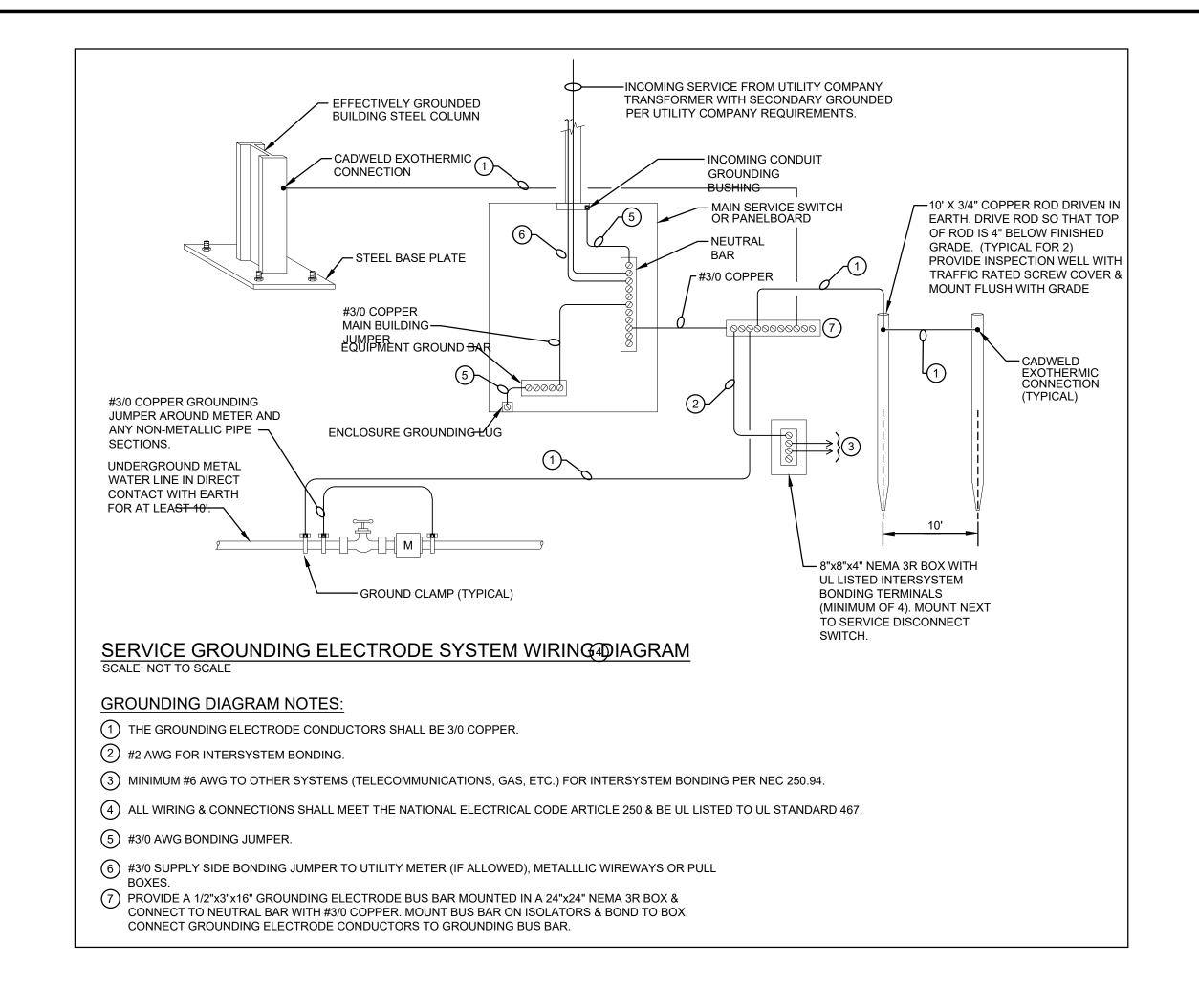
> FIRE ALARM SYSTEM NOTES

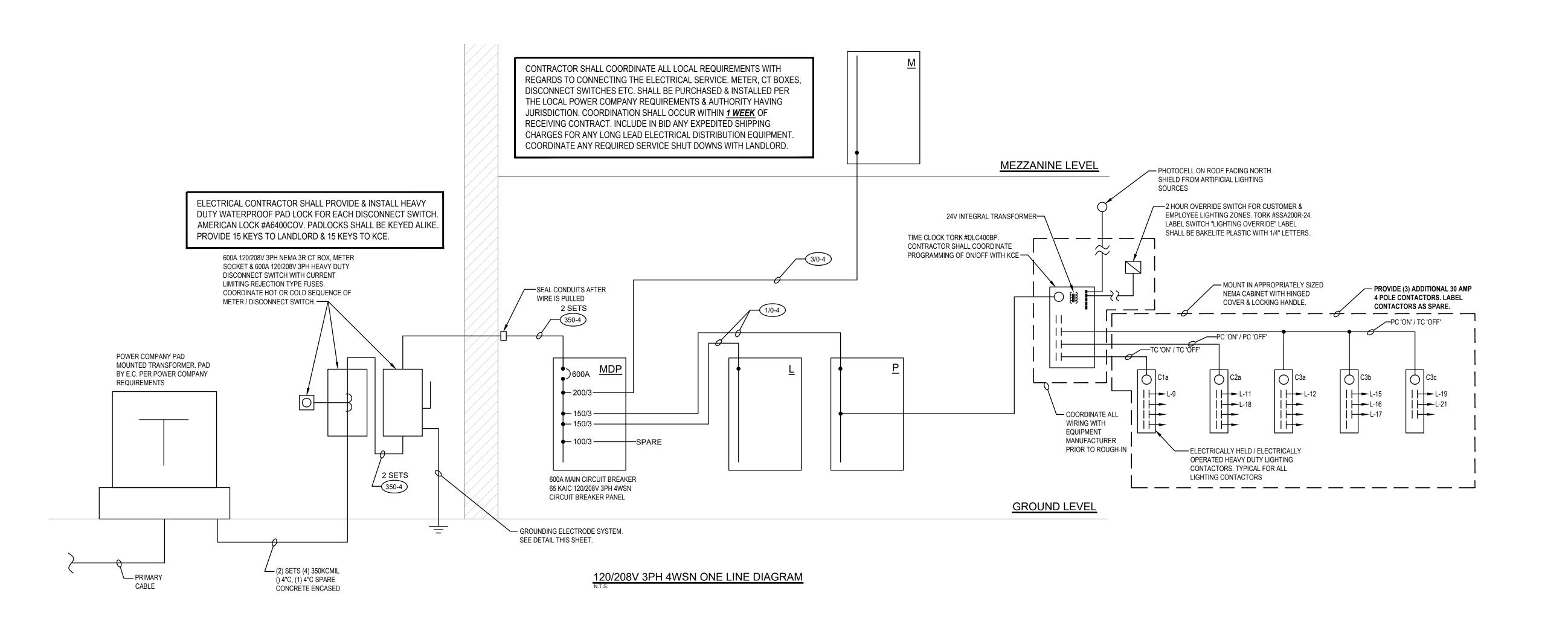
06/01/22 21399 JOB NO.

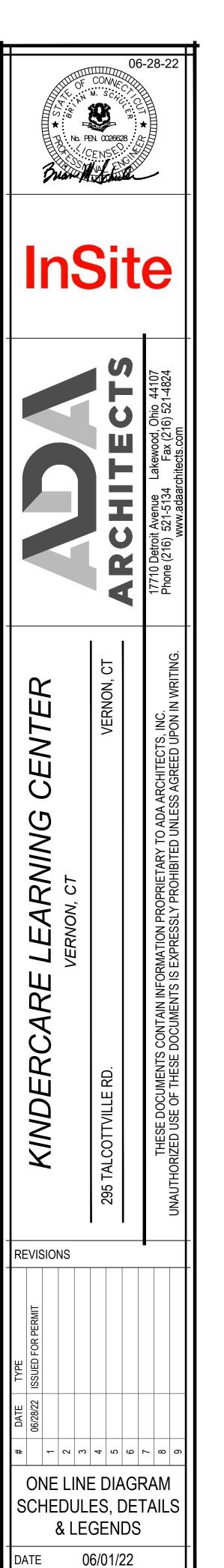
		WI	RE LEGEND										
Tag	Fill	Tag	Fill	Tag	Fill								
No Tag	(2) #12, #12GND-3/4"C	4-4	(4) #4, #4GND-1 1/4 "C	4/0-3	(3) #4/0, #2GND-2" C								
12-3	(3) #12, #12GND-3/4"C	2-2	(2) #2, #4GND-1"C	4/0-4	(4) #4/0, #2GND-2 1/2"C								
(4) #12, #12GND-3/4"C													
(2) #10, #10GND-3/4"C (2) #2, #4GND-1 1/4" C (3) 300KCMIL, #1/0GND-21/2" C													
10-3	(3) #10, #10GND-3/4"C (2) #1, #4GND-1 1/4" C (4) 300KCMIL, #1/0GND-2 1/2"C												
10-4	(4) #10, #10GND-3/4"C	1-3	(3) #1, #4GND-1 1/4" C	350-2	(2) 350KCMIL, #3/0GND-2"C								
8-2	(2) #8, #8GND-3/4"C	1-4	(4) #1, #4GND-1 1/2" C	350-3	(3) 350KCMIL, #3/0GND-2 1/2"C								
8-3	(3) #8, #8GND-1"C	1/0-2	(2) #1/0, #2GND-1 1/4" C	350-4	(4) 350KCMIL, #3/0GND-3"C								
8-4	(4) #8, #8GND-1"C	1/0-3	(3) #1/0, #2GND-1 1/2" C	500-2	(2) 500KCMIL, #3/0GND-2 1/2"C								
6-2	(2)#6, #6GND-1"c	1/0-4	(4) #1/0, #2GND-1 1/2" C	500-3	(3) 500KCMIL, #3/0GND-3"C								
6-3	(3) #6, #6GND-1"C	3/0-2	(2) #3/0, #2GND-1 1/2" C	500-4	(4) 500KCMIL, #3/0GND-3 1/2" C								
6-4	(4) #6, #6GND-1"C	3/0-3	(3) #3/0, #2GND-2" C	600-2	(2) 600KCMIL, #3/0GND-3"C								
4-2	4-2 (2) #4, #4GND-1"C (4) #3/0, #2GND-2" C (3) 600KCMIL, #3/0GND-3 1/2" C												
4-3 (3) #4, #4GND-1"C (2) #4/0, #2GND-2" C (4) 600KCMIL, #3/0GND-3 1/2" C													
NOT	TE: CONDUIT SIZES ARE FOR E	MT & IMC. FO	R PVC & RGC INCREASE CON	IDUIT BY (1) T	TRADE SIZE. FOR								

FLEXIBLE CONDUIT SIZES REFER TO NEC. ALL WIRE SIZES SHOWN ON DRAWINGS ARE FOR COPPER CONDUCTORS

D SUMMAF	RY	
CONNECTED	POWER	DEMAND
LOAD (KVA)	FACTOR	LOAD (KVA)
18.0	x 1.25 =	22.5
64.0	x 1.00 =	64.0
13.1	SQ. FT X 3 =	30.0
10.0	x 1.00 =	10.0
5.2	x 0.50 =	2.6
33.2	x 1.00 =	33.2
143.5		162.3
398.6		450.8
	CONNECTED LOAD (KVA)  18.0 64.0 13.1  10.0 5.2 33.2 143.5	18.0







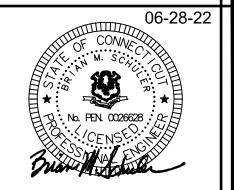
21399

JOB NO.

M															
MOUN	ITING: SURFACE			LOCA	TION : ME	ZZANINE	Ξ							DDEAKED DEMARKO	
BUS F	RATING: 200A			A.I.C.:	65,000	)		Al	MPS CON	IN.:	180.0			BREAKER REMARKS C-CONTACTOR CONTROLLED, S-SHU	NT TRIP.
1 A00	MAIN LUG ONLY							Al	MPS DEN	IAND:	183.9			L-LOCK ON, G-GFCI, A-ARC FAUI	LT,
/OLT/	AGE: 120/208V-3PH-4W													SW-SWITCHING DUTY, HA-HACR, F	H-HID
COMN	MENTS: 2 SECTION PANEL														
														1	
CVT	DESCRIPTION		KVA CON	INECTED	)	C/B	DEM	IARKS	C/B		KVA CON	NECTED	)	DESCRIPTION	CK
CKT.	DESCRIPTION	LTG.	REC.	HVAC	MISC.	C/B	KEIV	IAKNO	C/B	MISC.	HVAC	REC.	LTG.	DESCRIPTION	CK
1	011.4			2.0		00/0	-	-	00/0		2.4			011.0	2
3	-CU-1			2.0		20/2	-	-	30/2		2.4			-CU-2	4
5				2.0		00/0	-	-	1-10		2.6				6
7	-CU-3			2.0		20/2	-	-	45/2		2.6			-CU-4	8
9				2.0			-	-			1.7				10
11	-CU-5			2.0		20/2	_	_	30/2		1.7			-CU-6	12
13				1.7			-	_			2.0				14
15	-CU-7			1.7		20/2	_	_	30/2		2.0			-CU-8	16
17				1.7			_	_			2.0		_	1	18
19	CU-9			1.7		20/2	<u> </u>		30/2					SPARE	20
21				1.7			<u> </u>	-							22
	SPARE	-				45/2	_	-	30/2				-	SPARE	
23							-	-	4514		4.5		-	Eu a	24
25	SPARE	-				20/2		-	15/1		1.5			FU-1	26
27		-					-	-	15/1		1.5			FU-2	28
29	SPARE	-				15/1	-	-	15/1		1.5			FU-3	30
31	FU-04			1.5		15/1	-	-	15/1		1.5			FU-5	32
33	FU-06			1.5		15/1	-	-	15/1		1.5			FU-7	34
35	FU-08			1.5		15/1	-	-	15/1		1.1			FU-9	36
37	SERVICE RECEPTACLE		0.8			15/1	-	-			1.9			1	38
39	SPARE	-				15/1	-	-	25/3		1.9			DOA.AHU-1	40
41	SPARE	-				15/1	-	-			1.9				42
43	ECH-1			1.5		20/2	-	-	20/1				-	SPARE	44
45	7EGN-1			1.5		20/2	-	-	20/1				-	SPARE	46
47	ECH-2			1.5		20/1	-	-	20/1				-	SPARE	48
49	ECH-3			1.5		20/1	-	-	20/1				-	SPARE	50
51	EUH-1			1.5		00/0	-	-	20/1				-	SPARE	52
53				1.5		20/2	-	-	20/1				-	SPARE	54
55	ODADE	-				00/0	-	-			-				56
57	SPARE	-				20/2	-	-	25/3		-			-   SPARE	58
	SPARE	-				20/1	-	-			-			1	60
TOTA		0.00	0.8	32.3	0.00		I	1	l .	0.00	31.7	0.00	0.00	TOTALS	1
,	LOAD	CONNEC				EMAND				L	1	L	1	I	
	LIGHTING	-													
	RECEPTACLE	0.8			0.	.8									
	HVAC	64.0				5.4									
	MISC	-			-										
	KITCHEN	-			-										

MOUN	TING: SURFACE			LOCA	TION : EL	ECT/TEL	.CO RO	MC							
BUS R	ATING: 200A	_		A.I.C.:	65,000	0		AM	PS CONN	l.:	86.9			BREAKER REMARKS C-CONTACTOR CONTROLLED, S-SHUN	T TRIP
MAIN L	LUG ONLY	_						AM	PS DEMA	ND:	108.6			L-LOCK ON, G-GFCI, A-ARC FAUL	
VOLTA	AGE: 120/208V-3PH-4W	_												SW-SWITCHING DUTY, HA-HACR, HI	-HID
COMM	IENTS:	_													
														1	
CKT.	DESCRIPTION	KVA CONNECTED		C/B	REMA	\DK6	C/B		KVA CON	INECTED		DESCRIPTION	CKT		
CKI.	DESCRIPTION	LTG.	REC.	HVAC	MISC.	C/B	KEIVIA	AKNS	C/B	MISC.	HVAC	REC.	LTG.	- DESCRIPTION	CK
1	TODDLER 1,2,3 LIGHTING	1.1				20/1	-	-	20/1				1.2	PRE-K (2), DISC 1 LIGHTING	2
3	DISC 2,3, CLOSET LIGHTING	0.7				20/1	-	-	20/1				1.2	INFANT 1,2,3 LIGHTING	4
5	LOBBY, VEST., OFFICE LIGHTING	0.4				20/1	-	-	20/1				1.0	PRE-SCHOOL, PRE-K (1) LIGHTING	6
7	KITCHEN, STAFF, LAUNDRY LIGHTING	0.5				20/1	-	-	20/1				0.4	MEZZANINE LIGHTING	8
9	CORRIDOR LIGHTING	0.6				20/1	С	L	20/1	0.2				TIME CLOCK	10
11	EXTERIOR SEC LIGHTING	0.4				20/1	С	С	20/1				0.4	EXTERIOR WALL LIGHTING	12
13	SPARE	-				20/1	-	-	20/1				-	SPARE	14
15	WALL SIGN	1.2				20/1	С	С	20/1				1.2	WALL SIGN	16
17	WALL SIGN	1.2				20/1	С	С	20/1				1.2	PYLON SIGN	18
19	DADKING LOT LIGHTING	0.2				20/0	С	-	20/0				-	CDADE	20
21	PARKING LOT LIGHTING	0.2				20/2	С	-	20/2				-	-SPARE	22
23	SPARE	-				20/1	-	-	20/1				-	SPARE	24
25	SPARE	-				20/1	-	-	20/1				-	SPARE	26
27	SPARE	-				20/1	-	-	20/1				-	SPARE	28
29	SPARE	-				20/1	-	-	20/1				-	SPARE	30
31	SPARE	-				20/1	-	-	20/1				-	SPARE	32
33	SPARE	-				20/1	-	-	20/1				-	SPARE	34
35	SPARE	-				20/1	-	-	20/1				-	SPARE	36
37		-					-	-			6.0				38
39	SPARE	-				80/3	-	•	80/3		6.0			DOA.CU-1	40
42		-					-	-			6.0			1	42
TOTA	ALS	6.5	0.00	0.00	0.2					0.00	18.0	0.00	6.6	TOTALS	•
	LOAD	CONNEC	TED		С	EMAND				•			-		
	LIGHTING	13.1			1	6.4									
	RECEPTACLE	-			-										
	HVAC	18.0			2	2.5									
	MISC	0.2			0	.2									

Р																	
MOUN	ING: SURFACE			LOCA	TION : EL	_ECT/TEL	CO RO	MC						BREAKER REMARKS			
BUS RA	ATING: 200A			A.I.C.:	65,000	ວ		AM	PS CONN	l.:	131.7			C-CONTACTOR CONTROLLED, S-SHUN			
200A N	AIN LUG ONLY					_		AM	PS DEMA	ND:	125.6			L-LOCK ON, G-GFCI, A-ARC FAULT, SW-SWITCHING DUTY, HA-HACR, HI-HID			
VOLTA	GE: 120/208V-3PH-4W													R-RED HANDLE	<u>יחוט</u>		
COMM	ENTS: SINGLE SECTION PANEL																
						,											
OLIT	DECORPORTION		KVA CO	NNECTED		0/0	DEM	4 DIVO	C/B		KVA CON	ONNECTED		DECODIDATION	OLIT		
CKT.	DESCRIPTION	LTG.	REC.	HVAC	MISC.	C/B	REM/	REMARKS		MISC.	HVAC	REC.	LTG.	DESCRIPTION	CKT		
1	TODDLER 3 RECEPTACLE		0.8			20/1	G	-	20/1			0.6		TODDLER RECEPTACLE	2		
3	TODDLER 1 RECEPTACLE		0.8			20/1	G	-	20/1			0.8		PRE-K (2)	4		
5	DISC 3 RECEPTACLE		0.8			20/1	G	G	20/1			0.8		DISC 2 RECEPTACLE	6		
7	PRE K RECEPTACLE		0.8			20/1	G	G	20/1	0.8				INFANT 3 REFRIGERATOR	8		
9	CORRIDOR RECEPTACLE		0.8			20/1	_	G	20/1			0.8		INFANT 3 RECEPTACLE	10		
	INFANT 2 REFRIGERATOR	<u> </u>			0.8	20/1	G	G	20/1			0.8		INFANT 2 RECEPTACLE	12		
	INFANT 1 REFRIGERATOR	+			0.8	20/1	G	G	20/1			0.8		INFANT 1 RECEPTACLE	14		
	WARMING PANTRY / STAFF RECEPTACLE	+	0.4		0.5	20/1	<del>-</del>	G	20/1	1.2				REFRIGERATOR	16		
	FREEZER	+	0.4		1.4	20/1	G	<u> </u>	20/1	1.6				The state of the s	18		
19	INLLELIN	+			1.4	20/1		G	30/2	1.6				MICROWAVE	20		
	MICROWAVE				1.6	30/2	G										
21								-	30/2	2.5				DRYER	22		
23	OVEN				2.5	30/2	G	-	00/4	2.5				MAGUED	24		
25					2.5			-	20/1	1.0				WASHER	26		
	OFFICE / LOBBY RECEPTACLE		0.8			20/1	-	-	20/1	1.0				COPIER	28		
29	EWC				0.9	20/1	G	G	20/1			0.8		PRE-SCHOOL RECEPTACLE	30		
31	SPARE	-				20/1	-	-	20/1	0.1				DOOR STRIKE	32		
33	SERVICE RECEPTACLE		0.8			20/1	-	-	20/1	0.1				DOOR BELL	34		
35	COMM. RACK RECEPTACLE		0.8			20/1	-	G	20/1			0.8		DISC 1 RECEPTACLE	36		
37	SPARE	-				20/1	-	-	20/1			0.2		LAUNDRY RECEPTACLE	38		
39	FACP				0.5	20/1	L,R	-	20/1			0.4		STAFF RECEPTACLE	40		
41	KITCHEN RECEPTACLE		0.4			20/1	-	G	50/2	4.0				DISHWASHER	42		
43	KITCHEN RECEPTACLE		0.4			20/1	-	٦	30/2	4.0				DISHWASHER	44		
45	SPARE	-				20/1	-	-	20/1				-	SPARE	46		
47	SPARE	-				20/1	-	-	20/1				-	SPARE	48		
49	SPARE	-				20/1	-	-	20/1				-	SPARE	50		
51	SPARE	-				20/1	-	-	20/1				-	SPARE	52		
53	SPARE	-				20/1	-	-	20/1				-	SPARE	54		
	SPARE	<u> </u>				20/1	-	-	20/1				_	SPARE	56		
57		-						-	20/1				_	SPARE	58		
59	SPARE	_				30/2	G	_	20/1				_	SPARE	60		
TOTA	S	0.00	7.6	0.00	12.6					20.4	0.00	6.8	0.00	TOTALS			
. 51/1	LOAD	CONNEC		1 3.50		L DEMAND					1 3.00		L 3.00	1			
	LIGHTING	-															
	RECEPTACLE	14.4				2.2											
	HVAC				I	۷.۷											
		-			-	20											
	MISC	33.0			3	33.0											



KINDERCARE LEARNING CENTER

295 TALCOTTVILLE RD.

REVISIONS

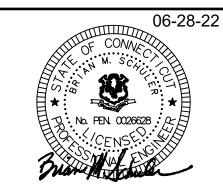
ELECTRICAL PANEL SCHEDULES

DATE

JOB NO. 06/01/22 21399

			LIGHTING FIXTURE SCHEDULE	
TYPE	LAMP	WATTS	DESCRIPTION	CATALOG NO.
A	LED 4000K	39	2'x2' RECESSED LED FIXTURE WITH FROSTED ACYLIC LENS, UNIVERSAL VOLTAGE, STANDARD 0-10V DIMMING DRIVER.	LITHONIA# CPANL-2X2-44LM-40K
AE	LED 4000K	39	2'x2' RECESSED LED FIXTURE WITH FROSTED ACYLIC LENS, UNIVERSAL VOLTAGE 10 WATT FIELDED INSTALLED EMERGENCY BATTERY, STANDARD 0-10V DIMMING DRIVER.	LITHONIA# CPANL-2X2-44LM-40K-PS1055CP-FMC-EMI
В	LED 4000K	35	4' LONG LENSED SURFACE MOUNTED LED FIXTURE WITH FROSTED ACYLIC LENS, UNIVERSAL VOLTAGE, STANDARD 0-10V DIMMING DRIVER.	METALUX# 4SNLED-LD5-41SL-LW-UNV-L-840-CD1-U
BE	LED 4000K	35	4' LONG LENSED SURFACE MOUNTED LED FIXTURE WITH FROSTED ACYLIC LENS, UNIVERSAL VOLTAGE 14 WATT EMERGENCY BATTERY, STANDARD 0-10V DIMMING DRIVER.	METALUX# 4SNLED-LD5-41SL-LW-UNV-L-840-CD1-U-EL14W
С	LED 4000K	62	4' LONG LENSED SURFACE MOUNTED LED FIXTURE WITH FROSTED ACRYLIC LENS, UNIVERSAL VOLTAGE, STANDARD 0-10V DIMMING DRIVER. COORDINATE RECESSED MOUNTING WITH GC PRIOR TO BIDDING.	METALUX# 4SNLED-LD5-65HL-LW-UNV-L840-CD1-U
CE	LED 4000K	62	4' LONG LENSED SURFACE MOUNTED LED FIXTURE WITH CENTER BASKET WITH PERFORATED SHIELD, UNIVERSAL VOLTAGE, STANDARD 0-10V DIMMING DRIVER. EMERGENCY BACK-UP. COORDINATE RECESSED MOUNTING WITH GC PRIOR TO BIDDING.	METALUX# 4SNLED-LD5-65HL-LW-UNV-L840-CD1-U-EL14W
D	LED 4000K	18	6" DIAMETER RECESSED LED FIXTURE, SLOPED HOUSING WITH WHITE BAFFLE, UNIVERSAL VOLTAGE 0-10V DIMMING DRIVER	NORA LTG# HFNRMZ-6S12-L14-40-F-W-0-10V
DE	LED 4000K	18	6" DIAMETER RECESSED LED FIXTURE, SLOPED HOUSING, UNIVERSAL VOLTAGE FIELD INSTALLED 7 WATTS EMERGENCY BATTERY W/ REMOTE TEST SWITCH. (MOUNT IN CEILING NEXT TO FIXTURE)	NORA LTG# NRMZ-6S12-L14-F-W-0-10V-BSL17C-C2-REMOTE TEST
F	LED 4000K	22	6" DIAMETER RECESSED LED FIXTURE, REGRESSED LENS WITH WHITE BAFFLE, UNIVERSAL VOLTAGE 0-10V DIMMING DRIVER	HALO# HC6-20-D010-HM6-12-840-61WDWB
FE	LED 4000K	22	6" DIAMETER RECESSED LED FIXTURE, REGRESSED LENS, UNIVERSAL VOLTAGE 14W` EMERGENCY BATTERY W/ INTEGRAL TEST SWITCH.	HALO# HC6-20-D010-HM6-12-840-61WDWB-IEM-IEMV-14
XA	LED	5	UNIVERSAL MOUNTED EDGE LIT EXIT SIGN WITH WHITE FINISH, BATTERY BACK-UP & 6" HIGH RED LETTERS. DARKENED QUADRANTS INDICATE SIDES WITH FACES.	SURE-LITES# EUX7-10RZ-WH-SD
ХВ	LED	5	EXTERIOR WALL MOUNTED LED EMERGENCY FIXTURE WITH ALL WEATHER BATTERY & BRONZE FINISH.	CHLORIDE# PLEMBZ-PLHTR
SA	LED 4000K	15	SURFACE MOUNTED LED EXTERIOR FIXTURE WITH UNIVERSAL DRIVER. WHITE HOUSING.	TRULY GREEN SOLUTIONS# 880712-R-TM-CC-4000K-90CRI
SB	LED 4000K	38	SURFACE MOUNTED EXTERIOR LED FIXTURE WITH UNIVERSAL DRIVER. BRONZE FINISH	TRACE LITE# WLZ4-3-BLANK-4K-BR
SC	LED 4000K	129	POLE MOUNTED LED FIXTURE WITH TYPE IV DISTRIBUTION, UNIVERSAL DRIVER AND BLACK FINISH. MOUNT TO 20-' STRAIGHT SQUARE NON TAPERED STEEL POLE	SOLID STATE AREA LIGHTING# VLL-LED-PLED-IV-FT-80-525mA-NW-1-RAL-9005-T-HS-PLED POLE # SNTS-204-11-1-RAL-9005-S
SD	LED 4000K	129	POLE MOUNTED LED FIXTURE WITH TYPE V DISTRIBUTION, UNIVERSAL DRIVER AND BLACK FINISH. MOUNT TO 20-' STRAIGHT SQUARE NON TAPERED STEEL POLE	SOLID STATE AREA LIGHTING# VLL-LED-PLED-V-SQ-M-80-525mA-NW-1-RAL-9005-S-HS-PLED POLE # SNTS-204-11-1-RAL-9005-S

	ELECTRICAL SYMBOL LEGEND	
SYMBOL	DESCRIPTION	
——► A-2	HOMERUN TO PANEL "A" INDICATING CIRCUIT NUMBER(S) - ALL WIRING SHALL BE #12 WITH EQUIPMENT GROUND WIRE UON (INCREASE TO #10 FOR CIRCUITS OVER 100 FT.) - ALL HOMERUNS ARE TO A 20 AMPERE, 1 POLE CIRCUIT BREAKER U.O.N QUANITY OF CONDUCTORS AS NECESSARY TO ACCOMMODATE CIRCUITS AND CONTROL INDICATED. CROSS HATCHES INDICATE REQUIRED LIGHTING CONTROL U.O.N. DOES NOT INLCUDE EQUIPMENT GROUND CONDUCTOR.	
	CONDUIT RUN IN OR UNDER FLOOR SLAB (1" C. MINIMUM, UON)	
	SCHEDULE 40 PVC CONDUIT RUN AT 36" BELOW FINISHED GRADE. CONTRACTOR SHALL BORE BELOW STREET. COORDINATE WITH CITY. TRANSITION TO HEAVYWALL RIGID STEEL CONDUIT 2 FEET BELOW GRADE WHEN CONDUIT IS TO RISE ABOVE GRADE.	
S	SWITCH - 20 AMPERE, 120/277 VOLT, SINGLE POLE - MTD AT 48" AFF UON ("a"=DENOTES SWITCHING,"K" = KEY OPERATED, "P" = PILOT LIGHT, "IL"= ILLUMINATED TOGGLE, "3" = THREE-WAY, "4" = FOUR-WAY, "M"= MANUAL MOTOR STARTER.	
<b>S</b> D	0-10V LED DIMMER. LEVITON# AWSMG-70W	ALL DEVICES SHA
$\Theta$	DUPLEX RECEPTACLE - 20 AMPERE, 125 VOLT - MOUNTED AT 18" AFF UON. SUBSCRIPT "T" OR AS NOTED DENOTES TAMPER RESISTANT. C=WHITE RECEPTACLE & COVER MOUNTED FLUSH IN CEILING. IG= ISOLATED GROUND TYPE. TVSS= SURGE PROTECTED TYPE.	BE WHITE WITH WHITE COVER PLA
$\oplus$	DOUBLE DUPLEX RECEPTACLE - 20 AMPERE, 125 VOLT - MOUNTED AT 18" AFF UON	
$\Box \Phi$	2 GANG FLUSH FLOOR BOX WITH TAMPERPROOF DUPLEX RECEPTACLE AND DUPLEX RECEPTACLE CONFIGURED DATA OUTLET. RUN (2) 1" CONDUITS FROM BOX UP NEAREST WALL TO CEILING JOIST. EXTEND POWER TO PANEL AS INDICATED. PROVIDE (2) DUAL FLIP LID METAL ACTIVATION KITS.	
Ф	SINGLE 20 AMP 120 VOLT REGRESSED RECEPTACLE	
<u> </u>	JUNCTION BOX - MOUNTING HEIGHT AND SIZE AS REQUIRED BY CODE OR AS NOTED ON DRAWINGS	
$\mathbb{O}_{\mathbb{S}}$	JUNCTION BOX - FOR SIGN. PROVIDE LOCAL DISCONNECT & COORDINATE LOCATION & MOUNTING	
_	HEIGHT WITH SIGN CONTRACTOR IN THE FIELD.  JUNCTION BOX ABOVE CEILING WITH 3/4" CONDUIT STUBBED INTO	
⊙ <sub>D</sub>	DOORFRAME & CONNECT TO ALL CONTROLLERS.	
<u></u>	HEAVY DUTY NON FUSIBLE DISCONNECT SWITCH.  HEAVY DUTY FUSIBLE DISCONNECT SWITCH. FUSE SIZE TO BE DETERMINED FROM	
15 <b>∑-¹</b> A.F.	EQUIPMENT TO BE SERVED NAMEPLATE DATA	
$\nabla$	FLUSH COMMUNICATIONS OUTLET FOR TELEPHONE WITH TWO GANG BOX SINGLE GANG EXTENSION RING, MOUNTED AT 18" AFF U.O.N., AND 1" CONDUIT, STUBBED TO NEAREST ACCESSIBLE CEILING. PROVIDE BUSHING & BLANK COVER. W=MOUNTED 48" AFF.	ALL DEVICES SHALL BE WHITE WITH
Φ	SPECIAL NEMA CONFIGURED OUTLET MOUNTED AS REQUIRED TO SERVE APPLIANCE. VERIFY CONFIGURATION PRIOR TO ROUGH-IN AND ADJUST WIRING AND CIRCUIT BREAKER SIZE AS REQUIRED.	WHITE COVER PLATE
•	FLUSH COMMUNICATIONS OUTLET FOR DATA WITH TWO GANG BOX SINGLE GANG EXTENSION RING, MOUNTED AT 18" AFF U.O.N., AND 1" CONDUIT, STUBBED TO NEAREST ACCESSIBLE CEILING. PROVIDE BUSHING & BLANK COVER. W=MOUNTED 48" AFF.	
12-4	WIRE LEGEND TAG (12= CONDUCTOR SIZE, 4= QUANTITY OF CONDUCTORS.)	
PC	PHOTO-CELL - MOUNT ON WALL FACING NORTH.	
Р	DOORSTRIKE PUSHBUTTON RELEASE	
Bo —	DOOR BELL - E.C. SHALL PROVIDE, WIRE & INSTALL  BUSH BUTTON A COMPLETE OPERATIONAL SYSTEM.	
▼	PUSH BUTTON ) A COMPLETE OPERATIONAL SYSTEM.  TRANSFORMER	
K	KEYPAD	
<b>S</b> Doc	WALL MOUNTED INFRARED OCCUPANCY / VACANCY SENSOR WITH INTEGRAL DIMMER. CONNECT TO NEUTRAL. HUBBELL #LHD-IRS-3-N-WH.	
<b>⊠</b> ¹	COMBINATION MAGNETIC MOTOR STARTER / FUSIBLE DISCONNECT SWITCH.	
• •	LIFT CONTROLLER	
$\bigcirc$	MOTOR / MECHANICAL EQUIPMENT CONNECTION. SEE MECH / PLUMBING DRAWINGS FOR EXACT LOCATIONS & DETAILS.	
AFF	ABOVE FINISHED FLOOR	
AC BC	INDICATES DEVICE MOUNTED AT 8" ABOVE COUNTER INDICATES DEVICE MOUNTED RELIGIA COUNTED VERIEV EXACT LOCATION	
BC EC	INDICATES DEVICE MOUNTED BELOW COUNTER, VERIFY EXACT LOCATION.  ELECTRICAL CONTRACTOR	
GFI	GROUND FAULT CIRCUIT INTERRUPTER TYPE	
UON	UNLESS OTHERWISE NOTED	
NL EX	NIGHT LIGHT  EXISTING TO REMAIN. ALL ITEMS ON DRAWINGS ARE NEW UNLESS TAGGED WITH AN 'EX'.	
WP	WEATHER PROOF - NEMA 3R. DEVICE SHALL BE WEATHER RESISTANT.	
os	INTEGRAL ROOM CONTROLLER OCCUPANCY SENSOR	
PS	SEE DETAIL ON   INTEGRAL ROOM CONTROLLER PHOTO SENSOR   DRAWING E3.3	
ф	INTEGRAL ROOM CONTROLLER 4 BUTTON SWITCH FOR DETAILS	
<u> </u>	CEILING MOUNTED VACANCY SENSOR / POWER PACK. WATTSTOPPER #DT300-BZ-250.	
$S_{DLV}$	LOW VOLTAGE CONTROLLER WITH DIMMING CAPABILITY MOUNTED AT 46" TO TOP. WATTSTOPPER #DCLV2	
Soc	WALL MOUNTED MULTI TECHNOLOGY SINGLE CIRCUIT OCCUPANCY SENSOR WITH WHITE FINISH. HUBBEL# LHMTS1WH	
$S_{LV}$	LOW VOLTAGE CONTROLLER. (DO NOT WIRE DIMMING FUNCTION.) WATTSTOPPER #DCLV2	
	1	I



**InSite** 

ARCHITECTS

ARCHITECTS

KINDERCARE LEARNING CENTER

VERNON, 295 TALCOTTVILLE RD.

# DATE TYPE

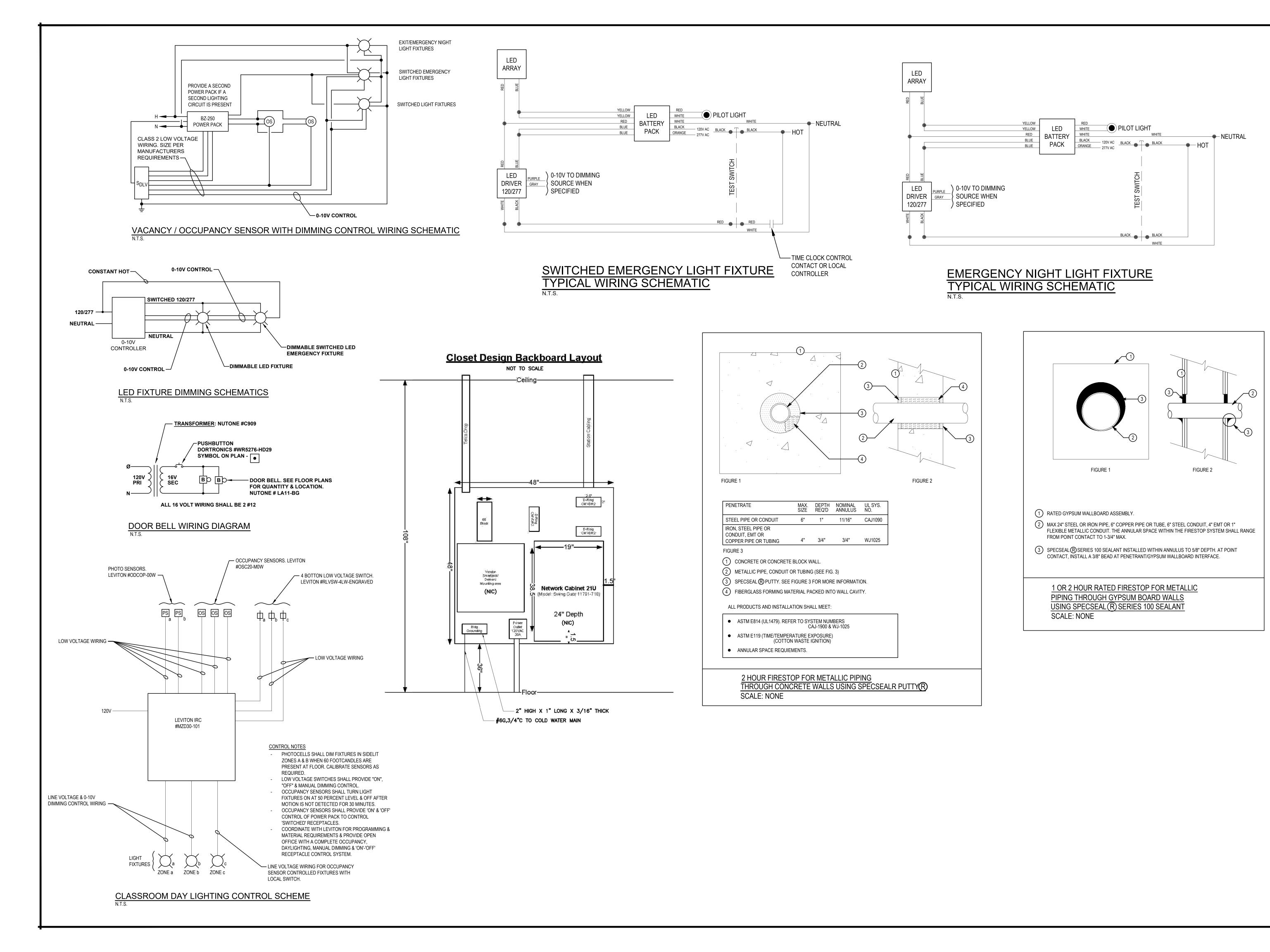
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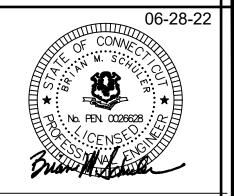
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ELECTRICAL DETAILS

DATE 06/01/22 JOB NO. 21399

E3.2





CENTER RNING , cr LEA RE

**KINDER**(

REVISIONS **ELECTRICAL** 

**DETAILS** 

06/01/22 21399 JOB NO.

E3.3





ASPHALT SHINGLES **GAS ROOFING** TIMBERLINE HD- LIFETIME SHINGLES **WEATHERED WOOD** 



SPLIT-FACE CMU MICHIGAN CERTIFIED CONCRETE SPLIT FACED VAOLS



SILLS & COLUMNS **ESCHELON MASONRY** CORDOVA STONE LIMESTONE, GROUNDFACE

PRE-FINISHED GUTTER PEBBLESTONE CLAY







**ELEVATION** 

SCALE: 1/8"=1'-0"





**ELEVATION** SCALE: 1/8"=1'-0"







**EXTERIOR ELEVATIONS** DATE 11/01/2021

JOB NO. 21399

# Traffic Investigation Memo Proposed Day Care Center 273 Talcottville Road Hartford, CT

Prepared for: Insite Real Estate, LLC Oak Brook, IL 60523

Prepared by: Freeman Companies Hartford, CT

May 27, 2022

### Introduction

The project site (see Figure 1) is located at the northwest quadrant of the intersection of Talcottville Road and Trail Run Drive.

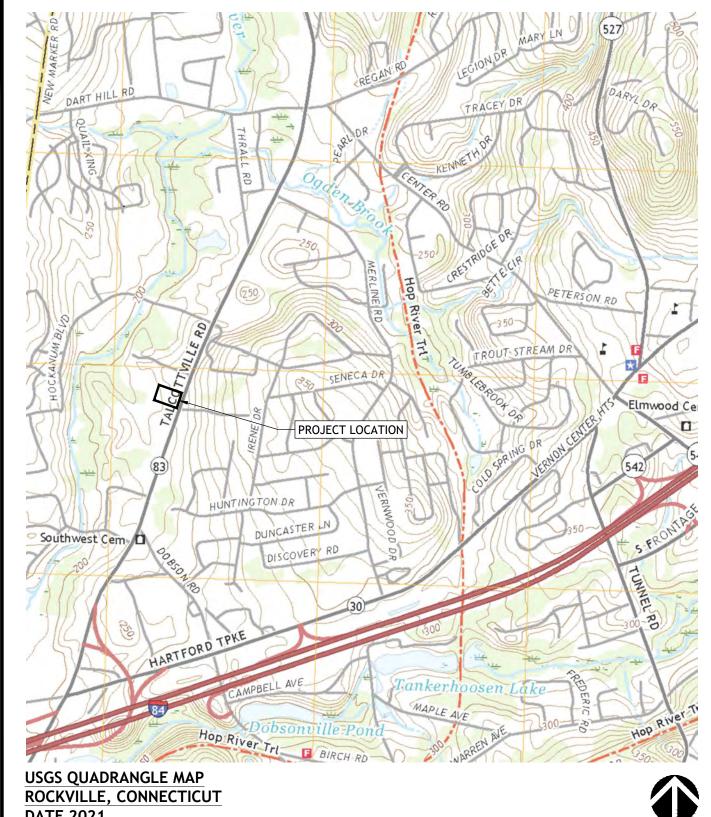
This site was originally part of the Trail Run Mixed-Use Development, which consists of consist of 300 apartment units,  $\pm 21,318$  square feet of retail space,  $\pm 6,117$  square feet of restaurant space, and a  $\pm 3,570$  square-foot bank. A certificate (No. 146-1602-01) was issued by the Office of the State Traffic Administration (OSTA) in May 2018 for that project.

Currently, the apartment portion and off-site improvements associated with the fully developed Trail Run Mixed-Use Development project were completed and opened to the public, but the remaining mixed-use development was not completed at the same time.

In 2022, Insite Real Estate, LLC reached an agreement to develop the originally approved 9,000± square feet retail site and propose a new 10,474± square feet day care center.

This memo supplements the original Trail Run Mixed-Use Development traffic study and investigate the potential traffic impacts associated with the proposed day care center, during the weekday AM and PM commuter peak hours as well as the Saturday midday peak hours.





**DATE 2021** 





**ELEVATE YOUR EXPECTATIONS** 

2022-4:10pm Plotted By:

1.dwg May 26,

Road-Vernon\DWG\Figure

R:\2022\2022-0303 273 Talcottville

SITE LOCATION MAP

**273 TALCOTVILLE RD** VERNON, CONNECTICUT APPROVED: SCALE: FC PROJECT NO.: DATE:

J.N.L. 1"=1000' 2022-0303 05/26/2022

SHEET NO.

FIGURE 1

### **Development Access Assumptions**

Based on the site plan, access to the new day care center will be thru a full access driveway located on Trail Run Drive approximately 220' from the intersection with Route 83 (Talcottville Road). A traffic signal was constructed at this intersection as part of the off-site improvement for the Trail Run Mixed-Use Development.

### **Anticipated Site Traffic Volumes**

Trip generation defines the number of trips oriented to and from particular land use. Typically, trip generation rates quantify a per unit relationship between the independent variable of specific land use and the number of vehicles generated per unit of time. For the purposes of this memo land use code 565 "Day Care Center" and land use code 822 Strip Retail Plaza (<40K) from the Institute of Transportation Engineers (ITE) <u>Trip Generation,11<sup>th</sup> Edition</u> were utilized.

Table 1 summarizes the estimated trip generation change for the proposed new day care center.

Table 1
Trip Generation

	Trips											
273 Talcottville Road	Week	day Al	/ Peak	Week	day PM	Peak	Saturday Midday Peak					
	Total	In	Out	Total	In	Out	Total	In	Out			
10,474 sf Day Care Center	116	62	54	117	55	62	18	9	9			
9,000 sf Strip Retail Plaza	-29	-17	-12	-72	-36	-36	-59	-30	-29			
20% pass by for Retail credit <sup>1</sup>	6	4	2	15	8	7	12	6	6			
Net Trips	93	49	44	60	27	33	-29	-15	-14			

<sup>&</sup>lt;sup>1</sup>This credit was taken for the retail spaces in the original study but not applicable for the Day Care Center.



The trip distribution of the site traffic was based on demographic information, distance, and likely travel routes as defined in the original Trail Run Mixed-Use Development traffic study. The projected directional distribution is depicted in Figure 2. The projected traffic volumes generated by the proposed new day care center are distributed to the adjacent roadway as shown in Figure 3.

### **Conclusions and Recommendations**

The project site was last reviewed as part of a major traffic generator (Certificate #146-1602-01 for Trail Run Mixed-Use Development) by the Office of State Traffic Admission (OSTA) in 2018. The proposed project will require a new review by the OSTA. That process is triggered by the change use from retail space to a day care center.

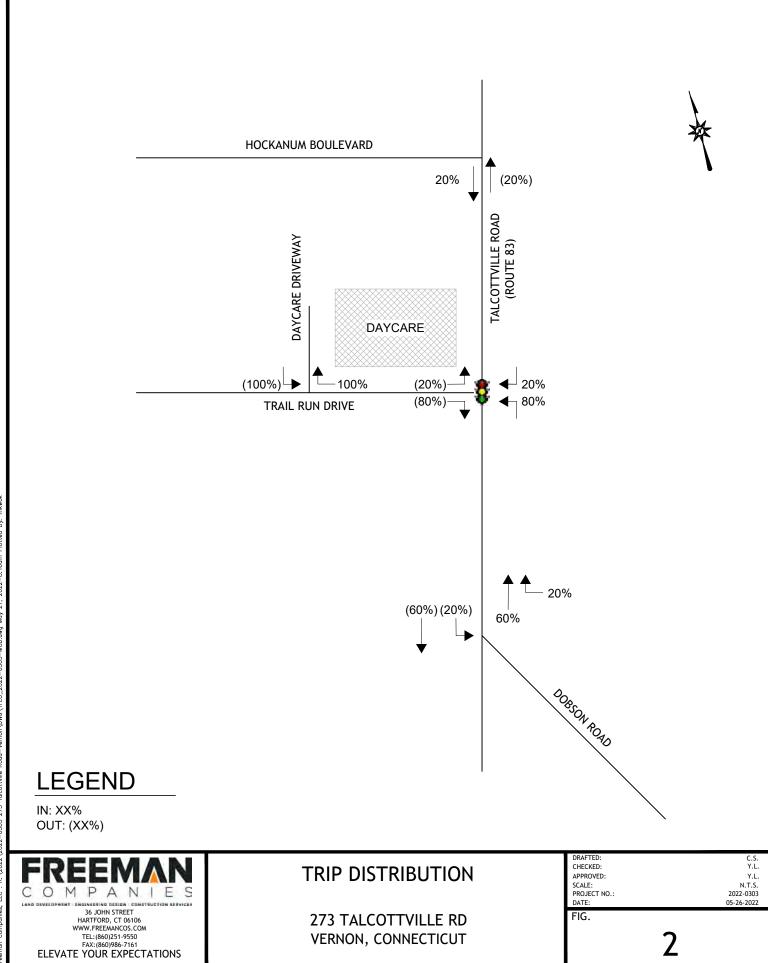
As shown in Table 1, there is an increase in trip generation in the amount of 93 and 60 during the AM and PM peak hours, respectively. However, a decrease of 29 trips is expected during the Saturday midday peak hour.

As mentioned earlier in the report, off-site traffic improvements associated with the original fully developed Trail Run Mixed-Use Development project have been completed in the area. As such, there is ample reserved capacity for the nearby roadway network to absorb the additional traffic generated by the proposed day care center.

The field review of the adjacent roadway system and intersections reveals no operational issues.

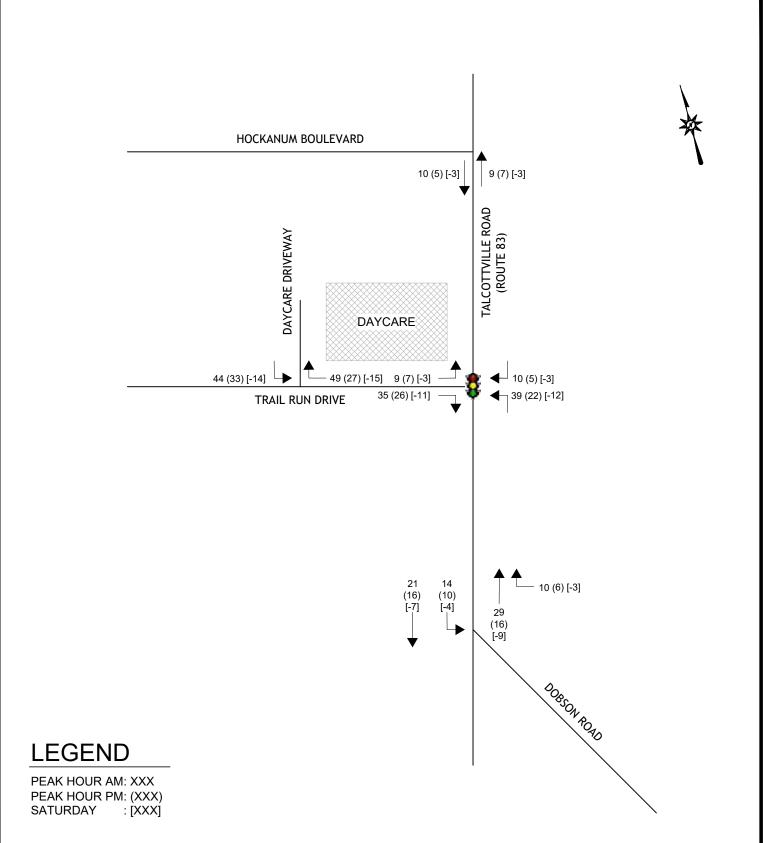
It is our professional opinion that the proposed project will not affect the adjacent roadway system in the area.





**273 TALCOTTVILLE RD** VERNON, CONNECTICUT FIG.

R:\2022\2022-0303 273 Talcottville





R: \2022\2022-0303 273 Talcottville

AS JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
TEL:(860)251-9550
FAX:(860)986-7161
ELEVATE YOUR EXPECTATIONS

# **NEW SITE TRAFFIC VOLUMES**

273 TALCOTVILLE RD VERNON, CONNECTICUT

DRAFTED:	C.S.
CHECKED:	Y.L.
APPROVED:	Y.L.
SCALED:	N.T.S.
PROJECT NO.:	2022-0303
DATE:	05-26-2022
FIG.	

3



# Stormwater Management Plan

Kindercare Learning Center 273 Talcottville Rd (CT Rt 83) Vernon, Connecticut 06066

June 29, 2022 Freeman File No.: 2022-0303

Prepared for:

INSITE Real Estate 1400 16<sup>th</sup> Street, Suite 300 Oak Brook, Illinois, 60523-8854

Prepared by:

Freeman Companies, LLC 36 John Street Hartford, CT 06106



### Table of Contents

1.	Introduction	1
	Project and Site Description	
	Existing & Proposed Drainage Conditions	
	Peak Runoff and Attenuation	
5.	Water Quality	3
6.	Erosion and Sedimentation Control	4
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8.	Summary	6

## Appendix A

Figure 1 – Site Location Map

Figure 2 – Pre Development Drainage Area Map

Figure 3 – Post Development Drainage Area Map

FEMA Flood Insurance Rate Map (FIRMette)

NRCS Web Soil Survey: Hydrologic Soil Group

Appendix B

HydroCAD Pre Development Hydrologic Calculations

HydroCAD Post Development Hydrologic Calculations

WQV Worksheet

TSS Worksheet

Stormwater Management Plan Kindercare Learning Center - INSITE Real Estate 273 Talcottville Rd (CT RT 83), Vernon, CT 06066



### 1. Introduction

The purpose of this report is to present the engineering design of the drainage system for the project and to review the potential impacts associated with the project. The analysis will address the pre- and post- development drainage patterns, and the associated peak runoff conditions at the drainage discharge point. All the proposed site improvements are intended to be in full compliance with Municipal and State codes while considering prevailing site conditions and practical needs. The site improvements have been designed to be compatible with the surrounding neighborhood, improve overland stormwater runoff conditions, and not have any significant negative impacts on the existing infrastructure.

### 2. Project and Site Description

The site is located at 273 Talcottville Rd (CT Rt 83), Vernon CT, 06066. The site is a  $\pm 1.47$  acre vacant lot which consists of vegetation, shrub growth, and an existing curb cut in the southwest corner. The site is bounded by Talcottville Rd to the east, Trail Run to the south, the Trail Run Development North Detention Pond to the west and Private Property to the north.

The proposed project will include but is not limited to the construction of a new day care facility, an enclosed playground area, a parking lot, utility infrastructure, and a stormwater management system consisting of catch basins, a pipe network, and a subsurface infiltration system.

Per the FEMA Flood Insurance Rate Map (FIRM), the site is not located within a flood plain.

No wetlands were identified at the site.

### 3. Existing & Proposed Drainage Conditions

The design point used for the pre- and post- development hydrologic analysis is the existing "north detention pond" that has been constructed as part of the Trail Run Apartment Development Project in coordination with the original plans developed by VHB.

The existing conditions of the ±1.47 acre site is 97.67% vegetated land coverage with minor impervious surfaces consisting of the existing curb cut and parts of the sidewalk totaling 2.33% of the site. The site's high point is the northeast corner and drains in the westerly direction with an approximate slope of ±5.0%. Approaching the northern property line from the south, there is a slight hillside going uphill in the northern direction of approximately ±30.0% covered with brush.

As per the NRCS Web Soil Survey (Appendix A) the site's soil is a HSG B soil meaning it is well draining and overland flow will infiltrate well. For reference, the hydrologic soil group (HSG) is classified based on the soil's infiltration rate. Ranging from HSG A to D, HSG A soils have a high infiltration rate, while a HSG D has a low infiltration rate. The Geotechnical Report developed by Welti Geotechnical, P.C. dated March 31, 2022 depicts the analysis of nine borings performed on site. The analysis confirmed sand to a depth of 21+ feet and groundwater at a depth of 16.5-20 feet below existing grade. Please refer to the Geotechnical Report for more information on the site's soils.

As part of the VHB Trail Run development plans, a catch basin and hydrodynamic separator water quality unit (WQU) have been installed uphill of the north detention pond, is located at the western side of the existing curb cut entrance, and will be utilized for this project. The existing catch basin is discharges into the WQU which discharges into the north detention pond. The proposed stormwater management system will discharge into the WQU and any overland flow not captured by the proposed stormwater management system will discharge directly into the north detention pond via overland flow.

Stormwater Management Plan Kindercare Learning Center - INSITE Real Estate 273 Talcottville Rd (CT RT 83), Vernon, CT 06066



The proposed project will include a significant increase to impervious coverage resulting in 0.823 acres of impervious land coverage and 0.651 acres of pervious land coverage totaling in 55.82% impervious coverage. This is an increase of 53.49% impervious coverage. The proposed site will mimic existing drainage patterns by keeping the highpoint in the northeast corner influencing runoff to flow in the westerly direction. The site, both lawn and parking lot, will be graded to influence runoff to enter the proposed stormwater management system via overland flow, and catch basins connected by a pipe network. Roof drains will be connected to the proposed stormwater management system ensuring that all runoff from the roof footprint will be captured and treated.

The majority of the proposed project's impervious coverage will be captured and treated by the proposed stormwater management system. Since the existing catch basin and WQU are installed at the most downhill location of the impervious coverage of the proposed project, there is a small area of approximately 2600 sf or 0.059 acres that will enter the WQU via the existing catch basin, and will not be captured or treated by the proposed stormwater management system, but will be treated by the WQU prior to entering the north detention pond. Comparatively, the VHB plans accounted for approximately 12,000 sf of impervious parking lot coverage to enter the WQU without being treated by their subsurface infiltration system that was originally developed for the subject site in the 2016 plans.

Please refer to Figures 2 and 3 for drainage area maps of each group for the pre- and post- conditions.

### 4. Peak Runoff and Attenuation

This hydrologic analysis quantified the change in peak runoff flow and peak runoff volume for both the pre- and post-development conditions. The design storms analyzed were the 2, 10, 25, and 100-year storm events using values from NOAA Atlas 14 Point Precipitation Frequency Estimates based on the station location for Vernon-Rockville, CT. HydroCAD Stormwater Modeling System computer program by Applied Microcomputer Systems was used to analyze the stormwater management system. The SCS TR-20 method was used to compute peak runoff flows and volumes. The curve numbers (CN) used are based off the HSG of the soil. This analysis used the following curve number data:

- Pervious Surfaces: 50-75% Grass cover, Fair, HSG B, CN=69
- Impervious Surfaces: Paved Parking/Roof, CN=98

Time of concentration computations for pre-development conditions results in 20.2 minutes. This flow path begins in the northeast corner of the site and ends in the westerly edge of the site. This is based on 100 feet of sheet flow through defined 'woods low underbrush', manning's no.=0.40, at a slope of approximately 3.0% followed by 266 feet of shallow flow through defined 'short grass pasture', velocity factor=7 feet/sec., at a slope of approximately 5%. The minimum time of concentration of 6 minutes was used for the post-development conditions.

The increase in impervious coverage by approximately 53.49% results in an increase in both peak runoff flow and peak runoff volume that needs to be mitigated prior to discharge to the design point. The water quality volume (WQV) determined for the site using the total impervious area of the proposed conditions based on the 2004 CT Stormwater Quality Manual results in 0.068 acre-feet (ac-ft) to be retained prior to discharge.

The proposed stormwater management system has been designed to detain and infiltrate stormwater runoff from the site and consists of two bioswales each with subsurface media and pipe storage, and one subsurface infiltration system. Bioswale #1 is on the eastern side of the property collecting runoff from the eastern hillside, a section of the playscape area, a section of the parking lot sloped towards bioswale #1, and a section of the building's roof footprint. Bioswale #2 is on the northern side of the property collecting runoff from the northern hillside, the remainder of the playscape area, and the remainder of the building's roof footprint. The subsurface infiltration system will collect runoff from the majority of parking lot area via a double catch basin located near the driveway entrance, a catch basin in the middle of the parking lot, and any overflow from bioswale #1.



Each bioswale will have a cross section starting with 3 inches of mulch, atop 21 inches of soil media mix, atop 4 feet of gravel with a 24 inch diameter perforated HDPE pipe embedded in the gravel. The gravel has a void ratio of approximately 40%, and the soil media mix has a void ratio of approximately 20%. The soil media mix will be 50% sand, 30% compost, and 20% topsoil. Bioswale #1 will have an overflow yard drain discharging to the infiltration system under the parking lot via a subsurface pipe network. Bioswale #2 will have a broad crested weir as the overflow point draining westerly towards the existing detention pond via overland flow. Both bioswale #1 and #2 are designed to retain and infiltrate 100% of their incoming stormwater runoff and discharge no runoff from their overflow points for the 100 year storm. The proposed infiltration system will be three 36 inch diameter perforated HDPE pipes with 12 inches of gravel above, below, and to the sides of the pipes.

A design parameter followed for this design is that a maximum freeboard of 1 foot shall be between the 100-year storm peak elevation and the grade elevation of the lowest proposed catch basin. The double catch basin near the entrance has an elevation of 225.95 ft. The peak elevation for the infiltration system is 223.04 ft which is 2.91 ft below grade meeting the design criteria.

Infiltration through the soil was used in this analysis with an assumed hydraulic conductivity rate of 10 in/hour along the wetted perimeter based on the HSG B well-draining soils of the site. This metric is consistent with the infiltration unit used in the VHB design.

The geotechnical report stated evidence of ground water between 16.5 to 20 feet below existing grade based on certain boring locations. The boring locations that found evidence of groundwater pertaining to the proposed stormwater network are boring B1 and B4. Boring B4 pertains to bioswale #1 and boring B1 pertains to bioswale #2. B4 shows groundwater at an elevation of 214 ft meaning that the lowest elevation bioswale #1 can be set to is 216 ft to begin counting detention. The lowest elevation for bioswale #1 is the bottom of the gravel at 222 feet which meets state requirements. B1 shows groundwater at an elevation of 209 ft meaning that the lowest elevation bioswale #2 can be set to is 211 ft. The lowest elevation for bioswale #2 is 223.5 ft which meets state requirements.

The hydrologic analysis comparing the HydroCAD models of pre- and post- development conditions, show a uniform decrease in both peak flow rates and total runoff volumes for the design point from pre- to post- development conditions. Below are Tables 1 and 2 comparing pre- and post- development condition results for both peak flow rates and runoff volumes.

DP	2 Year Storm			10 Year Storm			25	Year Stor	m	100 Year Storm			
	$q_{ex} (ft^3/s)$	$q_p (ft^3/s)$	$\Delta q (ft^3/s)$	$q_{ex}$ (ft <sup>3</sup> /s)	$q_p (ft^3/s)$	$\Delta q (ft^3/s)$	$q_{ex} (ft^3/s)$	$q_p (ft^3/s)$	$\Delta q (ft^3/s)$	$q_{ex} (ft^3/s)$	$q_p (ft^3/s)$	$\Delta q (ft^3/s)$	
1L	0.83	0.46	-0.37	2.24	1.00	-1.24	3.23	1.37	-1.86	4.48	1.93	-2.55	

Table 1: Comparison of Existing and Proposed Peak Flow Rates for the Design Point.

DP	2 Year Storm			10	) Year Sto	rm	25	Year Stor	m	100 Year Storm			
Dr	<sub>Vex</sub> (af)	<sub>Vp</sub> (af)	Δv (af)	<sub>Vex</sub> (af)	<sub>Vp</sub> (af)	Δv (af)	<sub>Vex</sub> (af)	Vp (af)	Δv (af)	<sub>Vex</sub> (af)	<sub>Vp</sub> (af)	Δv (af)	
1L	0.088	0.030	-0.058	0.224	0.065	-0.159	0.323	0.089	-0.234	0.487	0.140	-0.347	

Table 2: Comparison of Existing and Proposed Runoff Volumes for the Design Point.

### 5. Water Quality

The amount of Total Suspended Solids (TSS) required to be removed from runoff prior to runoff is 80%. The bioswales provide 90% TSS removal, the hooded catch basin outlets provide 25% TSS removal, and the infiltration system provides 80% TSS removal resulting in a total of 99% TSS removal for the proposed project. The amount of WQV to be retained prior to discharge is 0.068 ac-ft and the volume retained prior to discharge is 0.140 ac-ft which is a combination of the entire proposed stormwater management system.

Stormwater Management Plan Kindercare Learning Center - INSITE Real Estate 273 Talcottville Rd (CT RT 83), Vernon, CT 06066



The proposed project meets all regulations set by the 2004 CT Stormwater Water Quality Manual. Both the WQV and TSS amounts required to be treated for this project have been met. Please refer to the Appendix B for both the WQV and TSS worksheet tables.

### 6. Erosion and Sedimentation Control

It is important that the existing and proposed storm drain systems and their discharges to downstream water resource areas be protected during and after construction from sedimentation and pollutants to the maximum extent possible. All materials generated by demolition operations shall be removed off-site and disposed of in accordance with local and state regulations at approved disposal sites. No demolition debris will be allowed to enter any resource area or to be stored beyond the limits of work. All demolition debris shall be removed from the site as soon as possible, if not immediately. For any shortcomings of the control measures, corrective measures shall be taken. These include but are not limited to: removal of any sediment/debris within the stormwater management system, cleaning any area that needs it, replacement or rebuilding of any non-functioning or damaged components or infrastructure, reseeding any area that needs it, placement of erosion control fabric as needed. The following are erosion and sedimentation control measures to be used on site and are delineated on the plan set.

Inlet Protection (Silt Sack) – Inlet protection measures are used to prevent sediment from entering storm drainage systems. Install inlet protection as soon as storm drain inlets are installed and before land-disturbance activities begin in area with existing storm drain systems. Clean or replace the protection measure as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, the deposited sediment must be removed as soon as possible. Inspect once every 7 calendar days or within 24 hours of the end of a storm event.

Compost Filter Sock – The purpose of compost filter sock is to filter sediment as sediment laden water flows downhill from the disturbance area to the downstream location. Install compost filter sock as shown on the plan set. Leave space for maintenance between toe of slope and compost filter sock. Install through middle of compost filter sock 10' apart. Curve the end of the compost filter sock to help contain run off. Remove sediment if it reaches 1/3 the height of the compost filter sock. Should the compost filter sock decompose or become ineffective, replace section promptly. Inspect once every 7 calendar days or within 24 hours of the end of a storm event. Inspect compost filter sock for accumulated sediment height, damage, and gaps between fence and ground.

Soil Stockpiles – The soil stockpiles shall be surrounded by two rows of silt fence. Stockpiles stored for more than 30 days shall be seeded with temporary cover to prevent erosion. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any storm drain structures.

Temporary Seed and Mulch – Temporary seeding and mulch shall be used no later than 14 days from the last construction activity on exposed soil areas. Temporary seeding shall be conductive to the season. Seeded areas shall also be mulched with straw reasonably free from noxious and foreign matter detrimental to the seeded grasses. Records of all stabilization activities and buffer zone condition shall be kept and noted on inspection reports. Inspect weekly seeded areas for failure and if needed reseed and repair as soon as possible.

Soil Stabilization – Hay, straw matting, and/or stone, per the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, shall be used in conjunction with each other and used with sediment control measures to reduce erosion and sediment transport. The soil stabilization measures shall be inspected routinely and if needed repair/replenish as soon as possible. Stabilize exposed soil areas prior to any forecasted storm events to mitigate sediment laden runoff.



#### 7. Maintenance and Operations

It is important that the existing and proposed storm drain systems and their discharges to downstream water resource areas be protected during and after construction from sedimentation and pollutants to the maximum extent possible. All materials generated by demolition operations shall be removed off-site and disposed of in accordance with local and state regulations at approved disposal sites. No demolition debris will be allowed to enter any resource area or to be stored beyond the limits of work. All demolition debris shall be removed from the site as soon as possible, if not immediately. Work in high groundwater areas shall be scheduled, when possible, so it can be completed in a dry period and in the shortest time possible. The following are maintenance recommendations for the various stormwater management items:

Drainage Structure – New structures shall be installed with hooded outlets for pipes. Each drainage structure shall be inspected at the end of the foliage and snow- removal seasons annually. Clean out catch basin and yard drains once 50% of the sump volume is filled.

Infiltration System – The infiltration system shall be maintained based on the manufacturer's specifications.

Paved Areas – Proposed driveways and parking areas, existing sidewalk along Washington Ave. and the roadway of Washington Ave. shall be swept bi-annually: at the beginning of spring after snowmelt, and at the end of fall before snowfall.

Landscape Areas – Landscape areas shall be mowed regularly. Vegetation shall be pruned as necessary.

Dust Control – Construction activities will result in emissions of dust to the surrounding areas. Spray water as necessary to control dust from construction activities.

Containment Areas - All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy this requirement.

Dewatering – If dewatering is needed during the construction, it shall be in accordance with the General Permit and not result in any direct discharges in the storm drain system. Temporary measures shall be utilized to hold, minimize and reduce the velocities exiting any pumped dewatering waters.

Special Material Precautions – To minimize the potential for discharge of construction materials to the receiving waters, the following additional precautions shall be followed on the site:

- a. <u>Petroleum Products</u>: All on-site vehicles will be monitored for leaks and receive maintenance as needed. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on-site will be applied according to the manufacturer's recommendations.
- b. <u>Fertilizers</u>: Fertilizers are not expected as part of this project but if they are used, this Plan shall be updated accordingly and proper measures shall be taken to cover and prevent spills.
- c. <u>Paints and Solvents</u>: All containers will be tightly sealed and stored when not required for use. Washing or rinsing of paint buckets, brushes or accessories and/or excess material will not be discharged to the ground surface or the storm sewer system but will be properly disposed of according to manufacturer's instructions and State and local regulations.



Spill Cleanup - The following practices shall be implemented during construction activities to mitigate spills of materials and prevent their release to the waters or the State.

- a. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- b. Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

Potential spills will most likely be related to fuels and lubricants used by the construction equipment. This use will be monitored and controlled.

#### 8. Summary

As a result of the data provided, the proposed stormwater management system will reduce both peak runoff flow rate and peak runoff volume from pre- to post- development conditions, capture and treat the WQV and TSS of the proposed developed prior to discharge, and meet regulations set by the 2004 CT Stormwater Quality Manual.

The proposed development will have no negative impacts on adjacent downstream properties related to stormwater flows.

# FREEMAN

### Appendix A

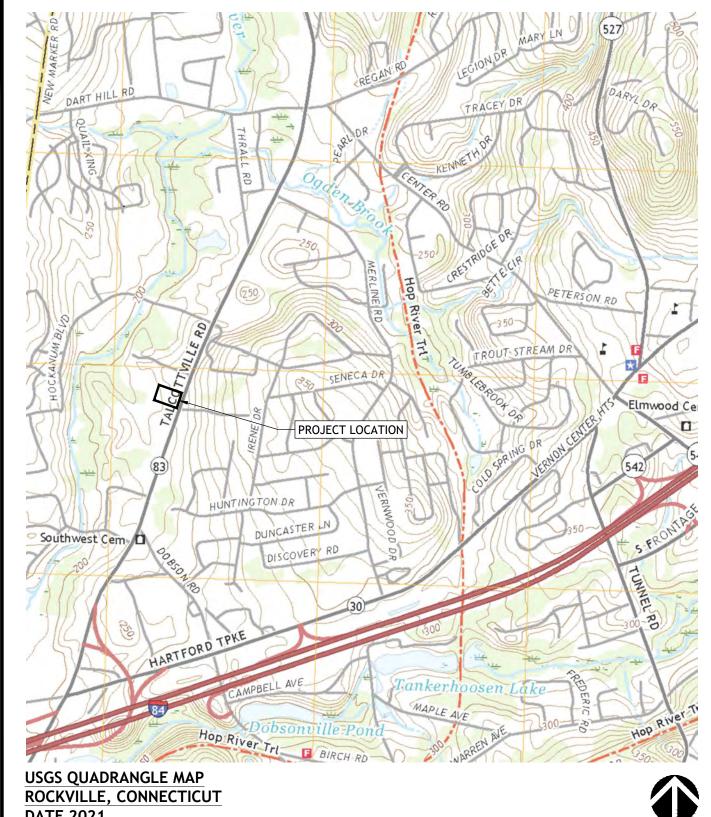
Figure 1 – Site Location Map

Figure 2 – Pre Development Drainage Area Map

Figure 3 – Post Development Drainage Area Map

FEMA Flood Insurance Rate Map (FIRMette)

NRCS Web Soil Survey: Hydrologic Soil Group



**DATE 2021** 





**ELEVATE YOUR EXPECTATIONS** 

2022-4:10pm Plotted By:

1.dwg May 26,

Road-Vernon\DWG\Figure

R:\2022\2022-0303 273 Talcottville

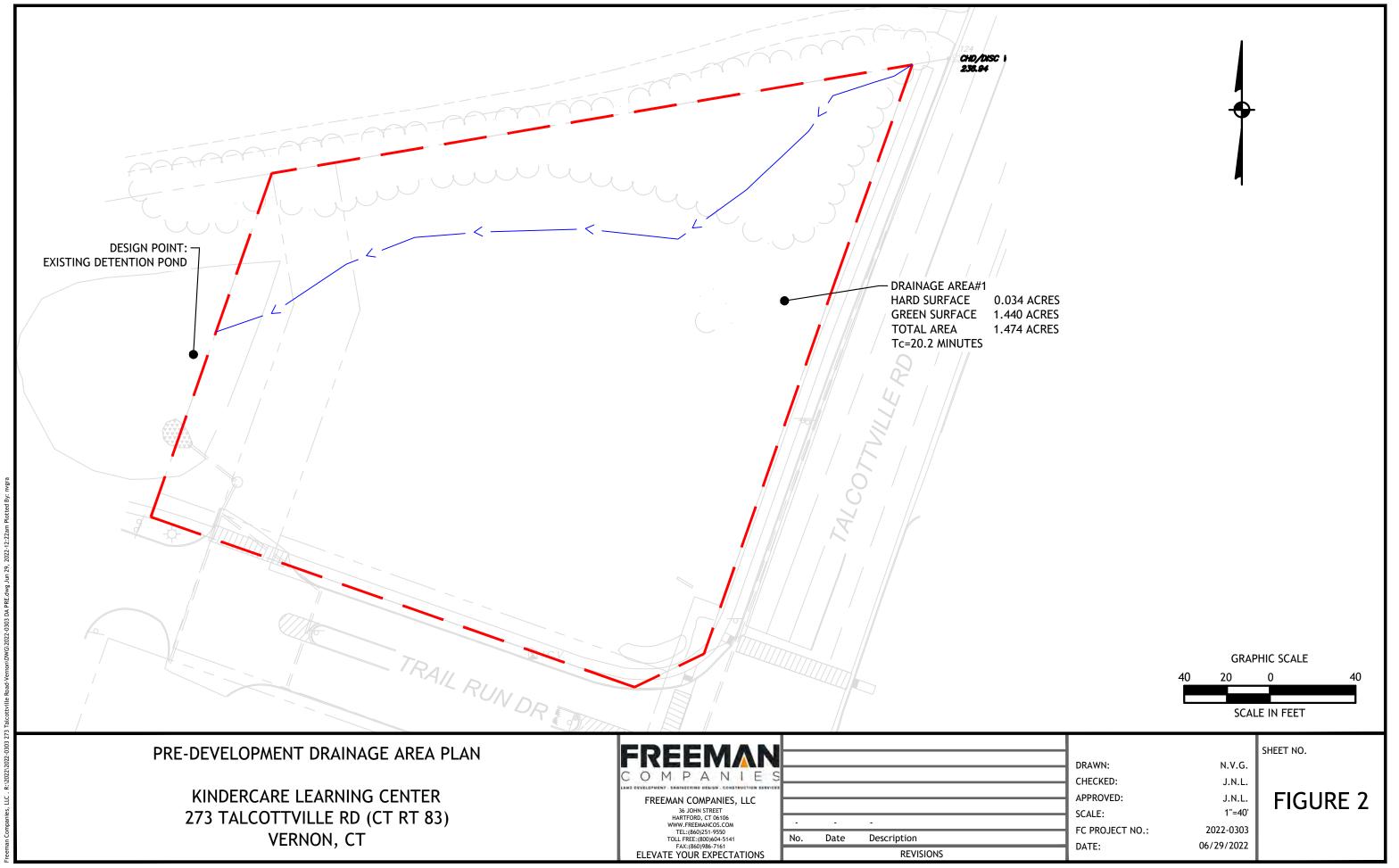
SITE LOCATION MAP

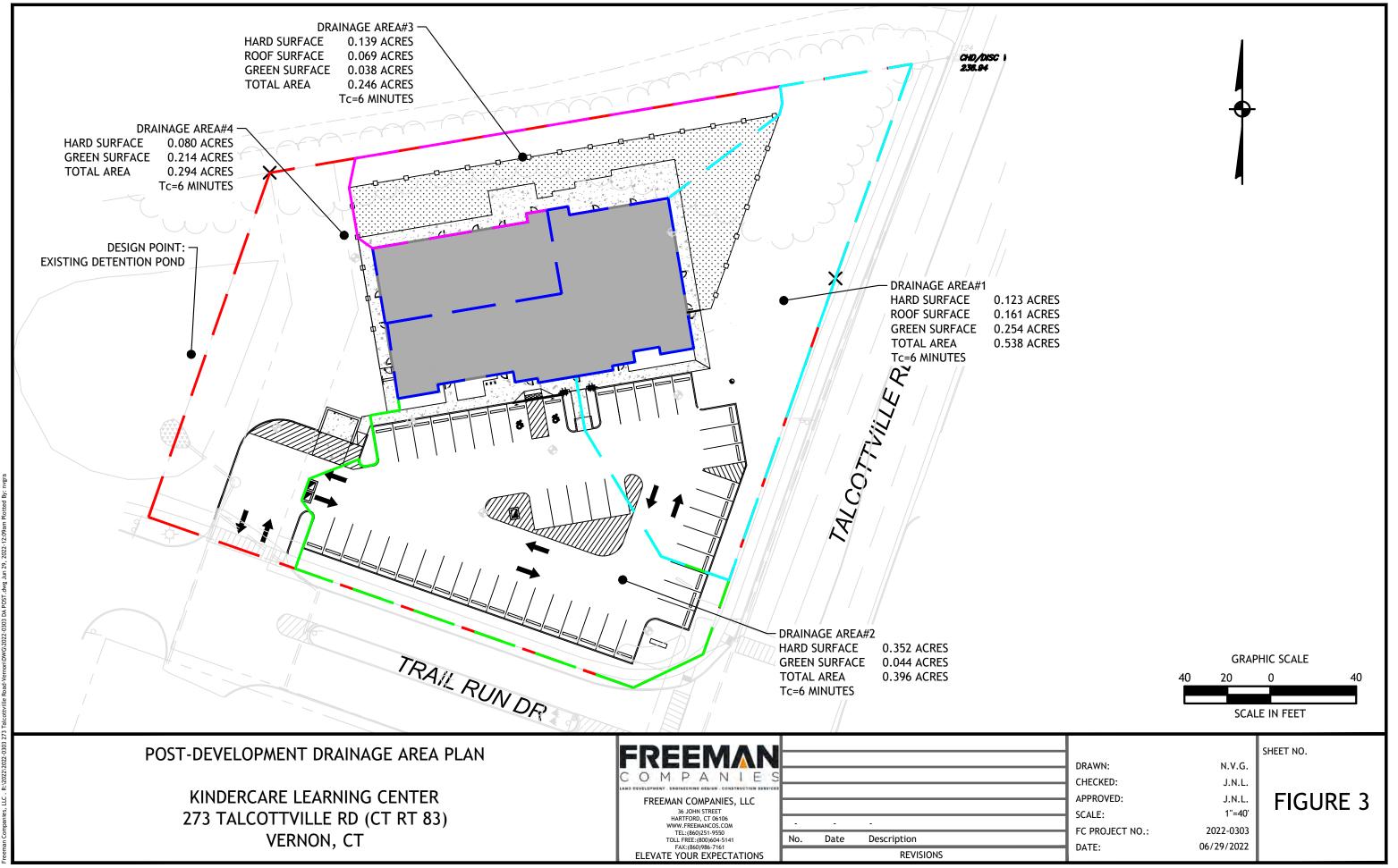
**273 TALCOTVILLE RD** VERNON, CONNECTICUT APPROVED: SCALE: FC PROJECT NO.: DATE:

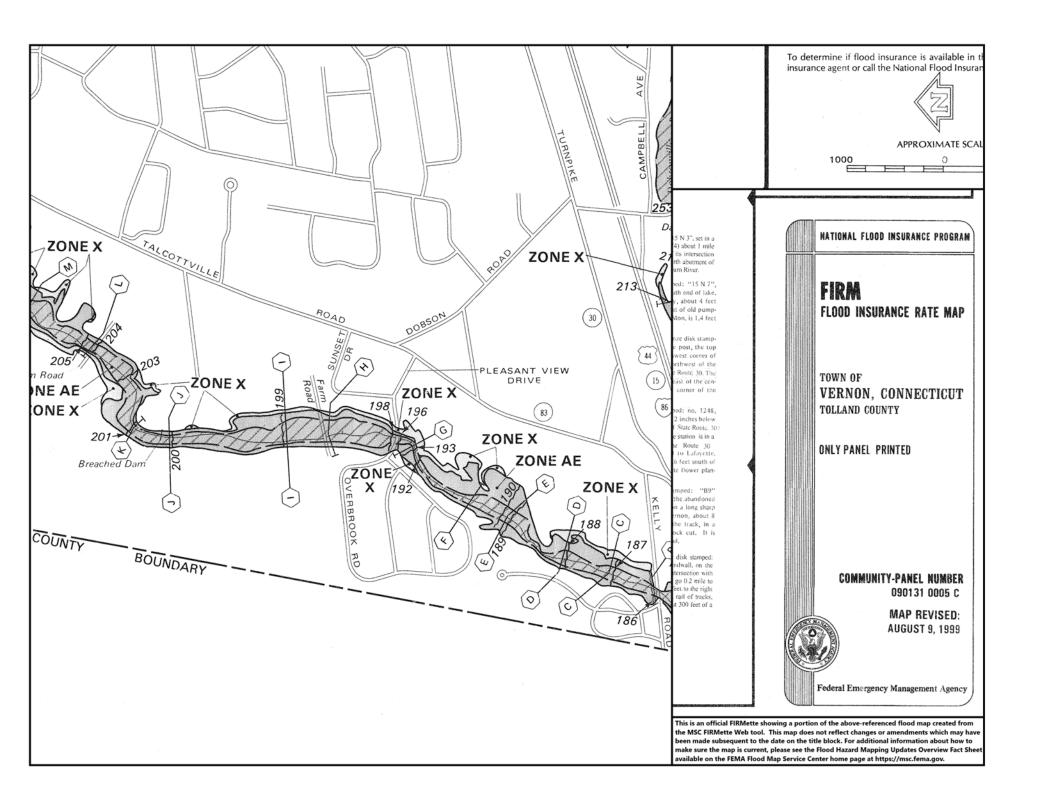
J.N.L. 1"=1000' 2022-0303 05/26/2022

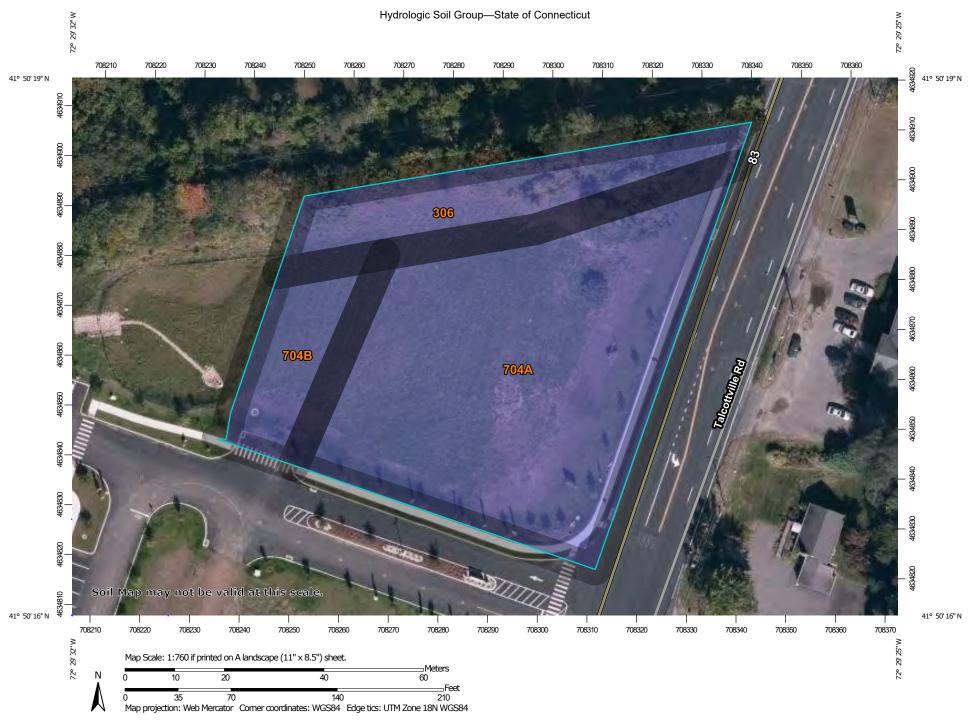
SHEET NO.

FIGURE 1









#### MAP LEGEND MAP INFORMATION The soil surveys that comprise your AOI were mapped at Area of Interest (AOI) С 1:12.000. Area of Interest (AOI) C/D Soils Warning: Soil Map may not be valid at this scale. D Soil Rating Polygons Enlargement of maps beyond the scale of mapping can cause Not rated or not available Α misunderstanding of the detail of mapping and accuracy of soil **Water Features** line placement. The maps do not show the small areas of A/D Streams and Canals contrasting soils that could have been shown at a more detailed Transportation B/D Rails ---Please rely on the bar scale on each map sheet for map measurements. Interstate Highways C/D Source of Map: Natural Resources Conservation Service **US Routes** Web Soil Survey URL: D Major Roads Coordinate System: Web Mercator (EPSG:3857) Not rated or not available -Local Roads Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts Soil Rating Lines Background distance and area. A projection that preserves area, such as the Aerial Photography Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required. This product is generated from the USDA-NRCS certified data as of the version date(s) listed below. B/D Soil Survey Area: State of Connecticut Survey Area Data: Version 21, Sep 7, 2021 Soil map units are labeled (as space allows) for map scales 1:50.000 or larger. Not rated or not available Date(s) aerial images were photographed: Sep 3, 2019—Oct 22. 2019 **Soil Rating Points** The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background A/D imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident. B/D

# **Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
306	Udorthents-Urban land complex	В	0.3	20.1%
704A	Enfield silt loam, 0 to 3 percent slopes	В	1.0	68.2%
704B	Enfield silt loam, 3 to 8 percent slopes	В	0.2	11.8%
Totals for Area of Intere	est	1.5	100.0%	

## **Description**

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

# **Rating Options**

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified

Tie-break Rule: Higher



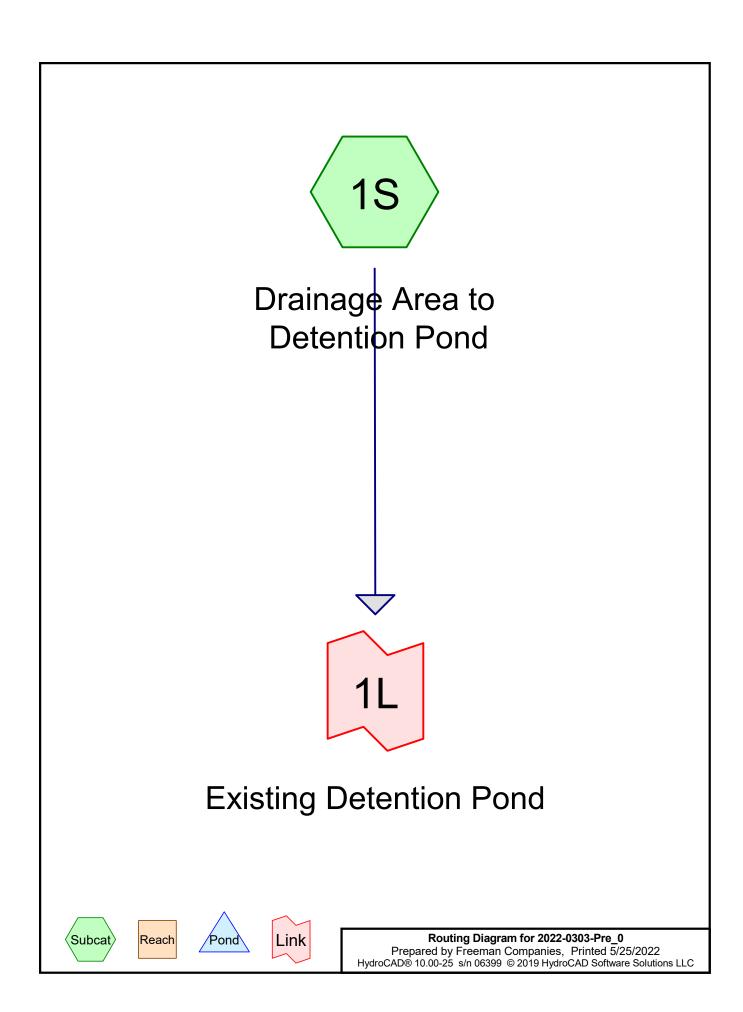
Appendix B

HydroCAD Pre Development Hydrologic Calculations

HydroCAD Post Development Hydrologic Calculations

WQV Worksheet

TSS Worksheet



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# **Area Listing (all nodes)**

Area	CN	Description
(acres)		(subcatchment-numbers)
1.439	69	50-75% Grass cover, Fair, HSG B (1S)
0.034	98	Paved parking, HSG B (1S)
1.474	70	TOTAL AREA

2022-0303-Pre\_0

2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

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Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area to

Runoff Area=64,199 sf 2.33% Impervious Runoff Depth>0.72" Flow Length=366' Tc=20.2 min CN=70 Runoff=0.83 cfs 0.088 af

**Link 1L: Existing Detention Pond** 

Inflow=0.83 cfs 0.088 af Primary=0.83 cfs 0.088 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.088 af Average Runoff Depth = 0.72" 97.67% Pervious = 1.439 ac 2.33% Impervious = 0.034 ac

Page 4

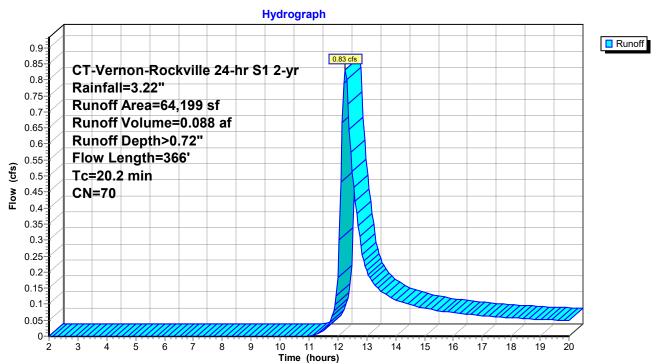
#### **Summary for Subcatchment 1S: Drainage Area to Detention Pond**

Runoff = 0.83 cfs @ 12.25 hrs, Volume= 0.088 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

	Α	rea (sf)	CN [	Description							
		62,701	69 5	69 50-75% Grass cover, Fair, HSG B							
*		1,498	98 F								
		64,199	70 \	Veighted A	verage						
	62,701 97.67% Pervious Area										
		1,498	2	2.33% Impe	ervious Area	a					
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description					
	17.4	100	0.0300	0.10		Sheet Flow, Sheet Flow					
	2.8	266	0.0500	1.57		Woods: Light underbrush n= 0.400 P2= 3.52" <b>Shallow Concentrated Flow, Shallow Flow</b> Short Grass Pasture Kv= 7.0 fps					
	20.2	366	Total								

# **Subcatchment 1S: Drainage Area to Detention Pond**



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#### **Summary for Link 1L: Existing Detention Pond**

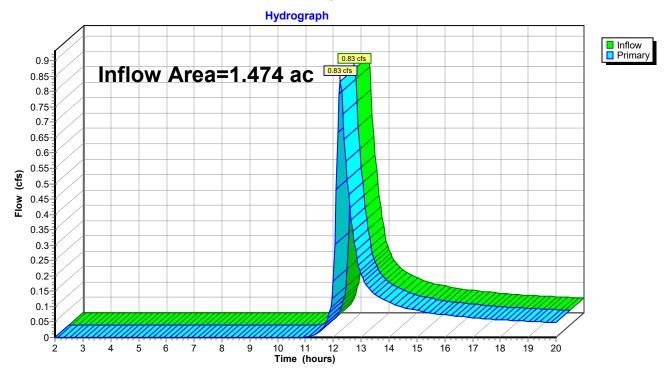
Inflow Area = 1.474 ac, 2.33% Impervious, Inflow Depth > 0.72" for 2-yr event

Inflow = 0.83 cfs @ 12.25 hrs, Volume= 0.088 af

Primary = 0.83 cfs @ 12.25 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

#### **Link 1L: Existing Detention Pond**



2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

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Primary=2.24 cfs 0.224 af

Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area to

Runoff Area=64,199 sf 2.33% Impervious Runoff Depth>1.82"
Flow Length=366' Tc=20.2 min CN=70 Runoff=2.24 cfs 0.224 af

Link 1L: Existing Detention Pond Inflow=2.24 cfs 0.224 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.224 af Average Runoff Depth = 1.82" 97.67% Pervious = 1.439 ac 2.33% Impervious = 0.034 ac

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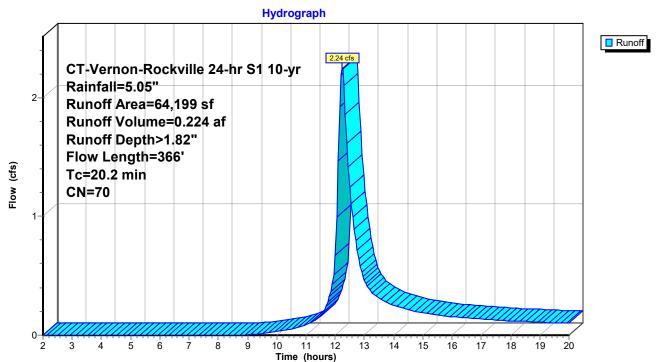
#### **Summary for Subcatchment 1S: Drainage Area to Detention Pond**

Runoff = 2.24 cfs @ 12.24 hrs, Volume= 0.224 af, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

_	Α	rea (sf)	CN E	escription)							
		62,701	69 5	69 50-75% Grass cover, Fair, HSG B							
*		1,498	98 F	aved park	ing, HSG B						
	64,199 70 Weighted Average										
		62,701	9	7.67% Per	vious Area						
		1,498	2	33% Impe	ervious Area	a					
	Tc	Length	Slope	Velocity	Capacity	Description					
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
	17.4	100	0.0300	0.10		Sheet Flow, Sheet Flow					
						Woods: Light underbrush n= 0.400 P2= 3.52"					
	2.8	266	0.0500	1.57		Shallow Concentrated Flow, Shallow Flow					
						Short Grass Pasture Kv= 7.0 fps					
	20.2	366	Total								

# **Subcatchment 1S: Drainage Area to Detention Pond**



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#### **Summary for Link 1L: Existing Detention Pond**

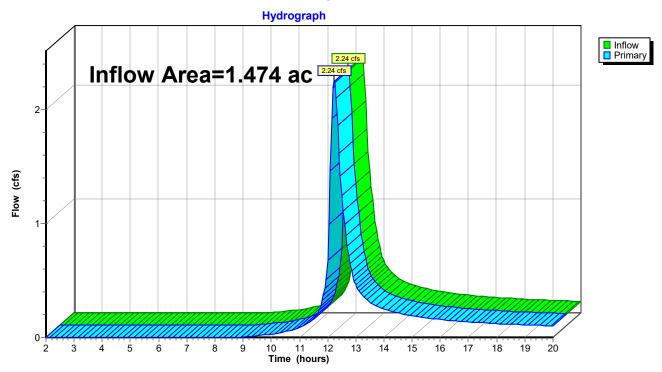
Inflow Area = 1.474 ac, 2.33% Impervious, Inflow Depth > 1.82" for 10-yr event

Inflow = 2.24 cfs @ 12.24 hrs, Volume= 0.224 af

Primary = 2.24 cfs @ 12.24 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

#### **Link 1L: Existing Detention Pond**



2022-0303 273 Talcottville Rd Vernon CT 2022-0303-Pre 0

CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20" Printed 5/25/2022

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Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Runoff Area=64,199 sf 2.33% Impervious Runoff Depth>2.63" Subcatchment 1S: Drainage Area to

Flow Length=366' Tc=20.2 min CN=70 Runoff=3.23 cfs 0.323 af

**Link 1L: Existing Detention Pond** Inflow=3.23 cfs 0.323 af Primary=3.23 cfs 0.323 af

> Total Runoff Area = 1.474 ac Runoff Volume = 0.323 af Average Runoff Depth = 2.63" 97.67% Pervious = 1.439 ac 2.33% Impervious = 0.034 ac

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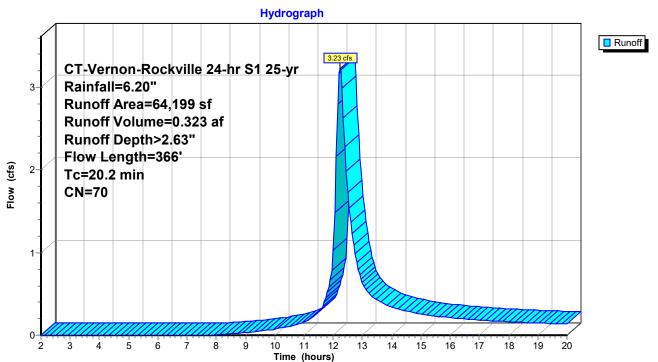
#### **Summary for Subcatchment 1S: Drainage Area to Detention Pond**

Runoff = 3.23 cfs @ 12.23 hrs, Volume= 0.323 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

	Α	rea (sf)	CN [	Description							
		62,701	69 5	69 50-75% Grass cover, Fair, HSG B							
*		1,498	98 F								
	64,199 70 Weighted Average										
	62,701 97.67% Pervious Area				vious Area						
1,498 2.33% Impervious Area						а					
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description					
_	17.4	100	0.0300	0.10	,	Sheet Flow, Sheet Flow					
_	2.8	266	0.0500	1.57		Woods: Light underbrush n= 0.400 P2= 3.52" <b>Shallow Concentrated Flow, Shallow Flow</b> Short Grass Pasture Kv= 7.0 fps					
	20.2	366	Total								

# **Subcatchment 1S: Drainage Area to Detention Pond**



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#### **Summary for Link 1L: Existing Detention Pond**

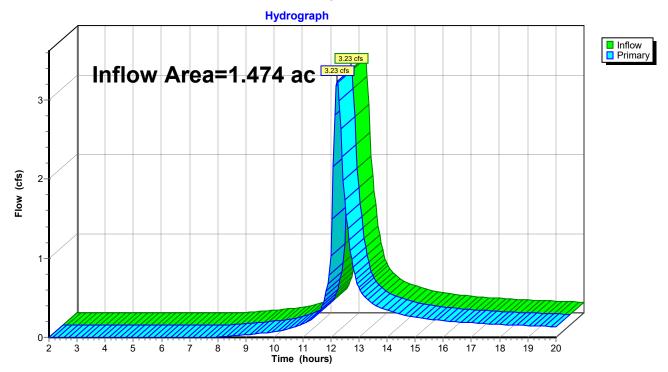
Inflow Area = 1.474 ac, 2.33% Impervious, Inflow Depth > 2.63" for 25-yr event

Inflow = 3.23 cfs @ 12.23 hrs, Volume= 0.323 af

Primary = 3.23 cfs @ 12.23 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

#### **Link 1L: Existing Detention Pond**



2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

2022-0303-Pre\_0

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Time span=2.00-20.00 hrs, dt=0.05 hrs, 361 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area to Runoff Area=64,199 sf 2.33% Impervious Runoff Depth>3.97"

Flow Length=366' Tc=20.2 min CN=70 Runoff=4.84 cfs 0.487 af

Link 1L: Existing Detention Pond Inflow=4.84 cfs 0.487 af Primary=4.84 cfs 0.487 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.487 af Average Runoff Depth = 3.97" 97.67% Pervious = 1.439 ac 2.33% Impervious = 0.034 ac

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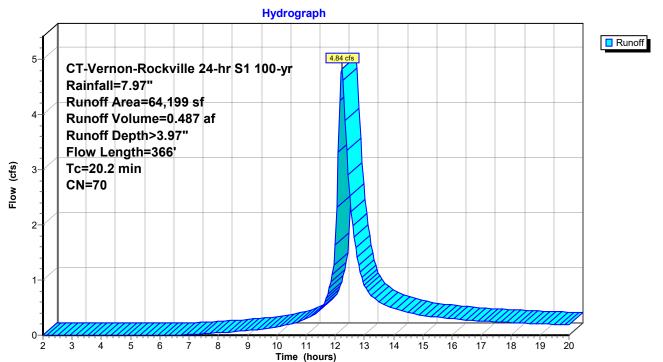
#### **Summary for Subcatchment 1S: Drainage Area to Detention Pond**

Runoff = 4.84 cfs @ 12.23 hrs, Volume= 0.487 af, Depth> 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

_	Α	rea (sf)	CN [	Description						
		62,701	,701 69 50-75% Grass cover, Fair, HSG B							
*		1,498	98 F	Paved park	ing, HSG B					
		64,199	70 \	Neighted A	verage					
		62,701	ç	97.67% Pei	rvious Area					
		1,498	2	2.33% Impe	ervious Are	a				
	_				_					
	Tc	Length	Slope	•	Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	17.4	100	0.0300	0.10		Sheet Flow, Sheet Flow				
						Woods: Light underbrush n= 0.400 P2= 3.52"				
	2.8	266	0.0500	1.57		Shallow Concentrated Flow, Shallow Flow				
						Short Grass Pasture Kv= 7.0 fps				
	20.2	366	Total							

# **Subcatchment 1S: Drainage Area to Detention Pond**



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#### **Summary for Link 1L: Existing Detention Pond**

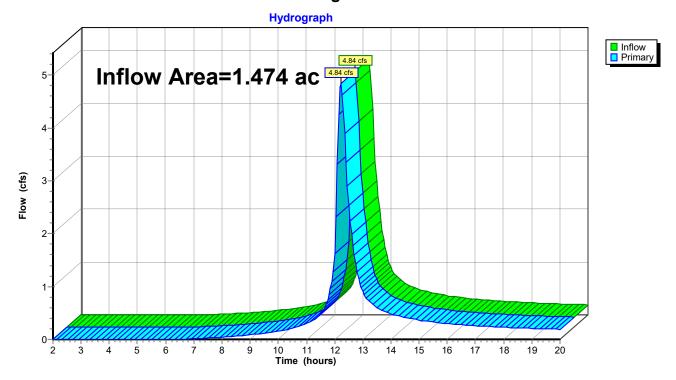
Inflow Area = 1.474 ac, 2.33% Impervious, Inflow Depth > 3.97" for 100-yr event

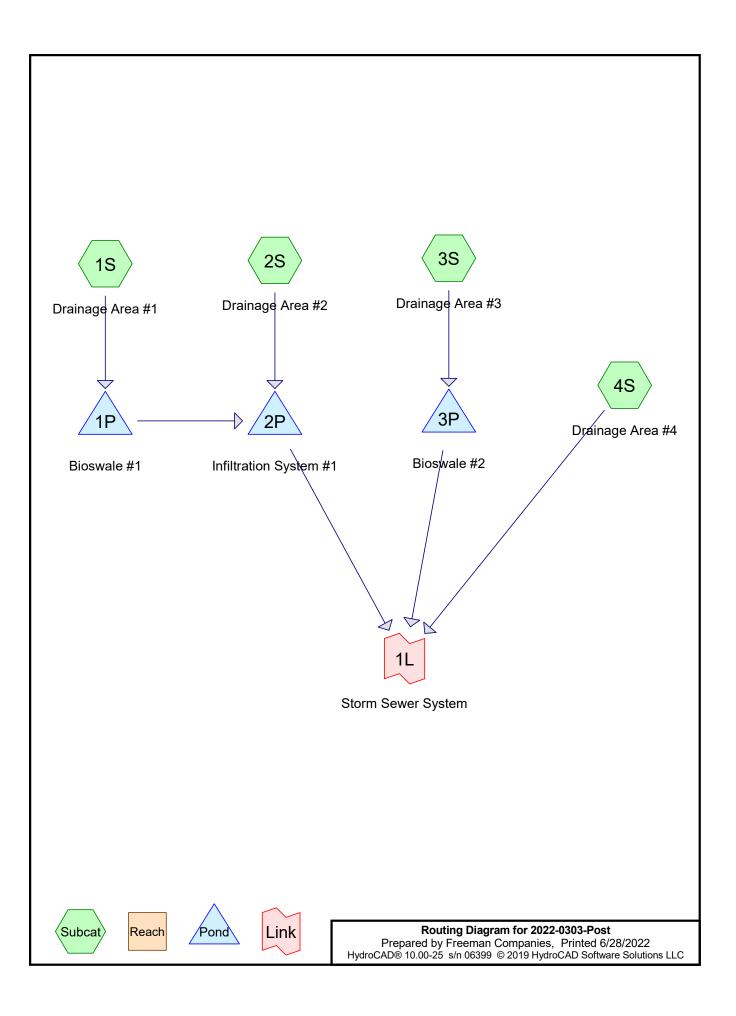
Inflow = 4.84 cfs @ 12.23 hrs, Volume= 0.487 af

Primary = 4.84 cfs @ 12.23 hrs, Volume= 0.487 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

#### **Link 1L: Existing Detention Pond**





2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

2022-0303-Post

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Time span=2.00-24.00 hrs, dt=0.05 hrs, 441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area #1 Runoff Area=23,450 sf 52.74% Impervious Runoff Depth>1.70"

Tc=6.0 min CN=84 Runoff=1.20 cfs 0.076 af

Subcatchment 2S: Drainage Area #2 Runoff Area=17,249 sf 88.99% Impervious Runoff Depth>2.66"

Tc=6.0 min CN=95 Runoff=1.32 cfs 0.088 af

Subcatchment 3S: Drainage Area #3 Runoff Area=10,711 sf 43.28% Impervious Runoff Depth>1.55"

Tc=6.0 min CN=82 Runoff=0.50 cfs 0.032 af

Subcatchment 4S: Drainage Area #4 Runoff Area=12,789 sf 27.23% Impervious Runoff Depth>1.22"

Tc=6.0 min CN=77 Runoff=0.46 cfs 0.030 af

Pond 1P: Bioswale #1 Peak Elev=224.95' Storage=796 cf Inflow=1.20 cfs 0.076 af

Discarded=0.22 cfs 0.076 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.076 af

Pond 2P: Infiltration System #1 Peak Elev=220.94' Storage=0.015 af Inflow=1.32 cfs 0.088 af

Discarded=0.31 cfs 0.088 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.088 af

Pond 3P: Bioswale #2 Peak Elev=225.19' Storage=268 cf Inflow=0.50 cfs 0.032 af

Discarded=0.11 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.032 af

Link 1L: Storm Sewer System

Inflow=0.46 cfs 0.030 af
Primary=0.46 cfs 0.030 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.226 af Average Runoff Depth = 1.84" 44.18% Pervious = 0.651 ac 55.82% Impervious = 0.823 ac Prepared by Freeman Companies

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#### Summary for Subcatchment 1S: Drainage Area #1

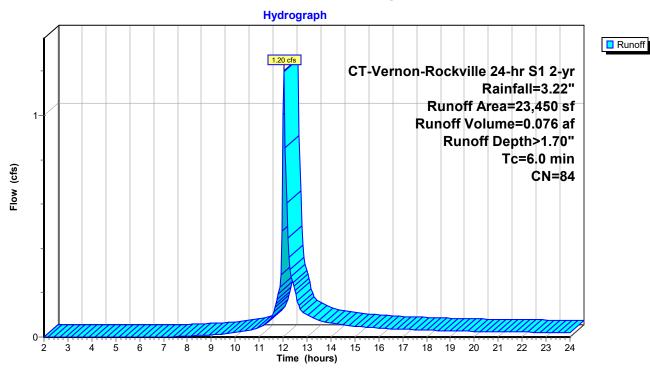
Runoff 1.20 cfs @ 12.04 hrs, Volume= 0.076 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

	Ar	rea (sf)	CN I	Description						
		11,083	69	69 50-75% Grass cover, Fair, HSG B						
*		5,360	98	Paved parking, HSG B						
		7,007	98	Unconnected roofs, HSG B						
		23,450	84 \	84 Weighted Average						
		11,083	4	47.26% Pervious Area						
		12,367	!	52.74% Impervious Area						
		7,007	!	56.66% Unconnected						
	Тс	Length	Slope	Velocity	Capacity	Description				
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	6.0					Direct Entry, Direct Entry				

**Direct Entry, Direct Entry** 

# Subcatchment 1S: Drainage Area #1



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#### Summary for Subcatchment 2S: Drainage Area #2

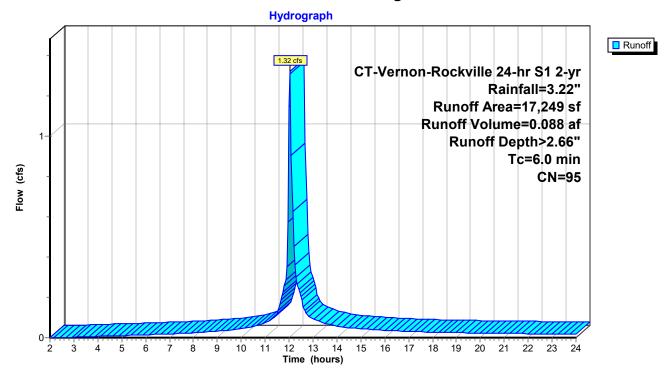
Runoff 1.32 cfs @ 12.04 hrs, Volume= 0.088 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

A	rea (sf)	CN	Description				
	1,899	69	50-75% Grass cover, Fair, HSG B				
	15,350	98	Paved parking, HSG B				
	17,249	95	Weighted A	verage			
	1,899 11.01% Pervious Area						
	15,350	88.99% Impervious Area			ea		
_				_			
Tc	Length	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
6.0					Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

### Subcatchment 2S: Drainage Area #2



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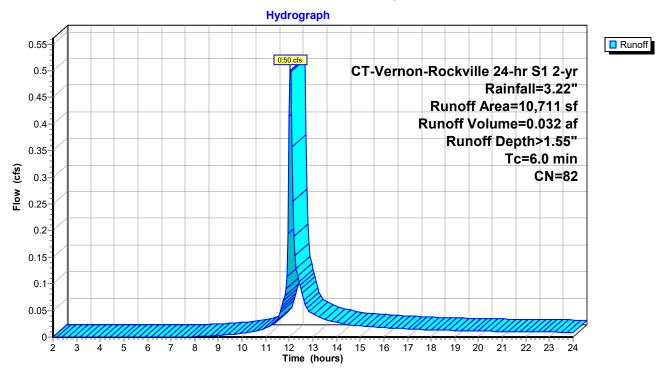
#### **Summary for Subcatchment 3S: Drainage Area #3**

Runoff = 0.50 cfs @ 12.04 hrs, Volume= 0.032 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

A	rea (sf)	CN	Description					
	6,075	69	50-75% Gra	ass cover, F	Fair, HSG B			
	1,643	98	Paved park	ing, HSG B	3			
	2,993	98	Unconnecte	ed roofs, HS	SG B			
	10,711	82	Weighted A	verage				
	6,075		56.72% Pervious Area					
	4,636		43.28% Impervious Area					
	2,993		64.56% Unconnected					
Tc	Length	Slope	•	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
6.0					Direct Entry, Direct Entry			

# Subcatchment 3S: Drainage Area #3



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#### Summary for Subcatchment 4S: Drainage Area #4

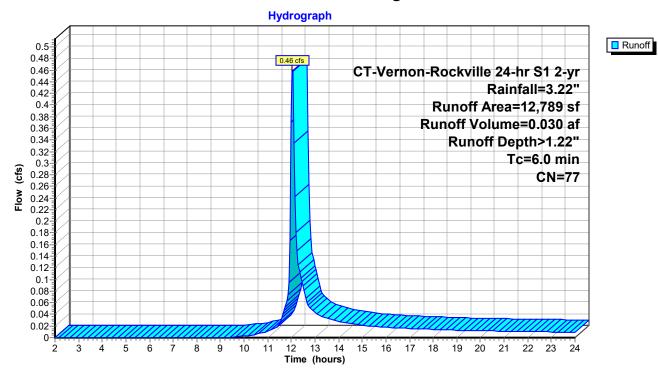
Runoff 0.46 cfs @ 12.05 hrs, Volume= 0.030 af, Depth> 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 2-yr Rainfall=3.22"

	rea (sf)	CN	Description				
	9,306	69	50-75% Grass cover, Fair, HSG B				
	3,483	98	Paved parking, HSG B				
	12,789	77	Weighted A	verage			
	9,306		72.77% Pervious Area				
	3,483		27.23% Impervious Area				
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	,	(cfs)	2000 paon		
6.0					Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

#### Subcatchment 4S: Drainage Area #4



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#### **Summary for Pond 1P: Bioswale #1**

0.538 ac, 52.74% Impervious, Inflow Depth > 1.70" for 2-yr event Inflow Area =

Inflow 0.076 af

1.20 cfs @ 12.04 hrs, Volume= 0.22 cfs @ 12.49 hrs, Volume= 0.076 af, Atten= 82%, Lag= 26.8 min Outflow

Discarded = 0.22 cfs @ 12.49 hrs, Volume= 0.076 af Primary 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 224.95' @ 12.49 hrs Surf.Area= 484 sf Storage= 796 cf

Plug-Flow detention time= 25.6 min calculated for 0.076 af (100% of inflow)

Center-of-Mass det. time= 25.0 min (873.6 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	3,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	226.00'	282 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,408 cf Overall x 20.0% Voids
#3	222.00'	624 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,936 cf Overall - 377 cf Embedded = 1,559 cf x 40.0% Voids
#4	223.00'	377 cf	24.0" Round Pipe Storage Inside #3
			L= 120.0'

4,647 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	704	0	0	704
229.00	1,737	1,182	1,182	1,744
230.00	2,660	2,182	3,364	2,682
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
226.00	704	0	0	704
228.00	704	1,408	1,408	892
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
222.00	484	0	0	484
226.00	484	1,936	1,936	796

Device	Routing	Invert	Outlet Devices
#1	Discarded	222.00'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 214.00'
#2	Primary	224.40'	<b>12.0" Round Culvert</b> L= 115.0' Ke= 0.500
			Inlet / Outlet Invert= 224.40' / 222.85' S= 0.0135 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.79 sf
#3	Device 2	229.25'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600
			Limited to weir flow at low heads

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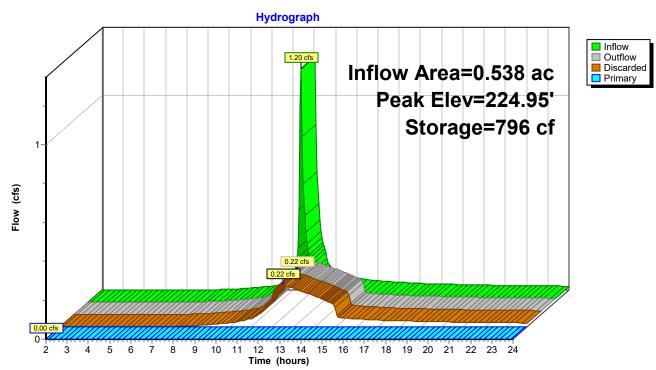
**Discarded OutFlow** Max=0.22 cfs @ 12.49 hrs HW=224.95' (Free Discharge) **1=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=222.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

3=Orifice/Grate (Controls 0.00 cfs)

#### Pond 1P: Bioswale #1



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# Stage-Area-Storage for Pond 1P: Bioswale #1

Elevation   Wetted   Storage   (feet)   (sq-ft)   (cubic-feet)   (222.00   484   0   227.10   1,603   1,155   222.10   4892   19   227.20   1,613   1,170   222.20   500   39   227.30   1,622   1,184   222.30   507   58   227.40   1,632   1,198   222.40   515   77   227.50   1,641   1,212   222.50   523   97   227.60   1,650   1,226   222.60   531   116   227.70   1,660   1,240   222.70   539   136   227.80   1,669   1,254   222.80   546   155   227.90   1,679   1,268   222.90   554   174   228.00   2,392   1,282   223.00   562   194   228.10   2,475   1,357   223.10   570   217   228.20   2,563   1,440   223.20   578   244   228.30   2,656   1,532   223.30   585   273   228.40   2,753   1,633   223.40   593   303   228.50   2,854   1,744   223.50   601   335   228.60   2,961   1,866   223.60   609   367   228.70   3,072   1,998   223.70   617   400   228.80   3,187   2,142   223.90   632   467   229.00   3,432   2,464   223.20   666   658   229.30   3,693   3,024   224.40   664   500   229.10   3,517   2,642   224.10   648   534   229.20   3,604   2,829   224.40   6671   634   229.50   3,876   3,440   224.50   667   668   568   229.30   3,693   3,024   224.50   667   668   667   667   667   667   667   667   667   667   667   667   667   667   667   667   679   666   229.60   3,971   3,662   224.50   773   943   225.50   775   773   943   225.50   775   773   943   225.50   788   981   225.50   788   981   225.50   788   981   225.50   788   981   225.50   788   981   226.60   1,500   1,001   226.60   1,500   1,001   226.60   1,500   1,001   226.60   1,500   1,001   226.60   1,566   1,099   226.80   1,575   1,113   226.60   1,566   1,099   226.80   1,575   1,113   226.60   1,564   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,156   1,000   1,504   1,141   1,141   1,141   1,156   1,000   1,504   1,141		144 44 1	0.	l =,		<b>.</b>
222.00         484         0         227.10         1,603         1,155           222.10         492         19         227.20         1,613         1,170           222.20         500         39         227.30         1,622         1,184           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.80         1,660         1,240           222.80         546         155         227.90         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         322.55         2,854         1,744           223.50						
222.10         492         19         227.20         1,613         1,170           222.20         500         39         227.30         1,622         1,184           222.30         507         58         227.40         1,632         1,198           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,240           222.80         531         116         227.70         1,660         1,240           222.80         546         155         227.90         1,679         1,268           222.80         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,566         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.60						
222.20         500         39         227.30         1,622         1,184           222.30         507         58         227.40         1,632         1,198           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,260           222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,864         1,744           223.50         601         335         228.60         2,961         1,866           223.60						
222.30         507         58         227.40         1,632         1,198           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.30         585         273         228.40         2,753         1,633           223.30         585         273         228.40         2,753         1,633           223.50         601         335         228.60         2,961         1,866           223.50         601         335         228.60         2,961         1,866           223.70						
222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.70         1,660         1,240           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         328.40         2,753         1,632           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.70         617         400         228.80         3,187         2,142           223.50         606         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142						
222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
222.80         546         155         227.90         1,679         1,288           222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         2,198           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
222.90         554         174         228.00         2,392         1,282           223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.10         648         534         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.10         648         534         229.90         3,693         3,024           224.10 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.00         562         194         228.10         2,475         1,357           223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.20         656         568         229.30         3,693         3,227           224.30 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.10         570         217         228.20         2,563         1,440           223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.20         656         568         229.30         3,693         3,227           224.40         671         634         229.50         3,876         3,440           224.50 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.20         578         244         228.30         2,656         1,532           223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.50         601         335         228.60         2,961         1,866           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.20         656         568         229.30         3,693         3,227           224.40         671         634         229.50         3,876         3,440           224.50         679         666         229.60         3,971         3,662           224.50 </td <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td>					•	
223.30         585         273         228.40         2,753         1,633           223.40         593         303         228.50         2,854         1,744           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.30         663         601         229.40         3,783         3,227           224.40         671         634         229.50         3,876         3,440           224.50         679         666         229.60         3,971         3,662           224.50         687         697         229.90         4,267         4,38           224.70 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.40       593       303       228.50       2,854       1,744         223.50       601       335       228.60       2,961       1,866         223.60       609       367       228.70       3,072       1,998         223.70       617       400       228.80       3,187       2,142         223.80       624       433       228.90       3,307       2,297         223.90       632       467       229.00       3,432       2,464         224.00       640       500       229.10       3,517       2,642         224.10       648       534       229.20       3,604       2,829         224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.90       710       783       230.00       4,370       4,647         225.00						
223.50         601         335         228.60         2,961         1,866           223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.30         663         601         229.40         3,783         3,227           224.40         671         634         229.50         3,876         3,440           224.50         679         666         229.60         3,971         3,662           224.50         679         666         229.60         3,971         3,662           224.70         695         728         229.80         4,166         4,135           224.80 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.60         609         367         228.70         3,072         1,998           223.70         617         400         228.80         3,187         2,142           223.80         624         433         228.90         3,307         2,297           223.90         632         467         229.00         3,432         2,464           224.00         640         500         229.10         3,517         2,642           224.10         648         534         229.20         3,604         2,829           224.20         656         568         229.30         3,693         3,024           224.30         663         601         229.40         3,783         3,227           224.40         671         634         229.50         3,876         3,440           224.50         679         666         229.60         3,971         3,662           224.50         687         697         229.70         4,068         3,894           224.70         695         728         229.80         4,166         4,135           224.80         702         757         229.90         4,267         4,386           225.00 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.70       617       400       228.80       3,187       2,142         223.80       624       433       228.90       3,307       2,297         223.90       632       467       229.00       3,432       2,464         224.00       640       500       229.10       3,517       2,642         224.10       648       534       229.20       3,604       2,829         224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       734       846       225.00       765       923         225.60						
223.80       624       433       228.90       3,307       2,297         223.90       632       467       229.00       3,432       2,464         224.00       640       500       229.10       3,517       2,642         224.10       648       534       229.20       3,604       2,829         224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.10       726       826         225.20       734       846         225.50       788       981         226.00       1,519       1,029 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
223.90       632       467       229.00       3,432       2,464         224.00       640       500       229.10       3,517       2,642         224.10       648       534       229.20       3,604       2,829         224.20       656       568       529.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       734       846       225.30       741       865         225.40       749       884       225.50       757       904         225.80       780       962       225.90       788       981       226.00       1,509       1						
224.00       640       500       229.10       3,517       2,642         224.10       648       534       229.20       3,604       2,829         224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.10       726       826       225.20       734       846         225.20       734       846       225.40       749       884         225.50       757       904       225.60       765       923         225.70       773       943       226.00       1,500       1,015         226.20       1,5						
224.10       648       534       229.20       3,604       2,829         224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       229.90       4,267       4,386         225.10       726       826       225.20       734       846         225.30       741       865       225.40       749       884         225.50       757       904       225.80       780       962       225.90       788       981         226.90       1,509       1,015       226.30       1,528       1						
224.20       656       568       229.30       3,693       3,024         224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       225.00       4,647       4,647         225.10       726       826       225.20       734       846       225.40       749       884       225.50       757       904       225.60       765       923       225.70       773       943       225.80       780       962       225.90       788       981       226.00       1,519       1,001       226.10       1,599       1,015       226.20       1,519       1,029       26.50       1,547       1,071						
224.30       663       601       229.40       3,783       3,227         224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       225.10       726       826         225.20       734       846       225.30       741       865         225.40       749       884       225.50       767       904         225.50       767       904       225.80       780       962         225.90       788       981       226.00       1,509       1,015         226.20       1,519       1,029       26.30       1,528       1,043         226.50       1,547       1,071       226.60       1,566       1,099         226.70						
224.40       671       634       229.50       3,876       3,440         224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       225.10       726       826       225.20       734       846         225.30       741       865       225.40       749       884       225.50       757       904         225.60       765       923       225.70       773       943       226.80       788       981         226.10       1,509       1,015       226.20       1,519       1,029         226.30       1,528       1,043       226.40       1,538       1,057         226.50       1,547       1,071       226.60       1,566       1,099         226.80       1,575       1,113       226.90       1,585       1,127						
224.50       679       666       229.60       3,971       3,662         224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       807       807       225.10       726       826       826       826       825.20       734       846       846       825.40       749       884       846       825.40       749       884       846       825.40       749       884       846       825.40       749       884       846       825.40       749       884						
224.60       687       697       229.70       4,068       3,894         224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807         225.10       726       826         225.20       734       846         225.30       741       865         225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
224.70       695       728       229.80       4,166       4,135         224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       230.00       4,370       4,647         225.10       726       826       225.20       734       846       225.30       741       865       225.40       749       884       225.50       757       904       225.60       765       923       225.70       773       943       225.80       780       962       225.90       788       981       226.00       1,500       1,001       226.10       1,509       1,015       226.20       1,519       1,029       226.30       1,528       1,043       226.40       1,538       1,057       226.50       1,547       1,071       226.60       1,556       1,085       226.70       1,566       1,099       226.80       1,575       1,113       226.90       1,585       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127       1,127						
224.80       702       757       229.90       4,267       4,386         224.90       710       783       230.00       4,370       4,647         225.00       718       807       230.00       4,370       4,647         225.10       726       826       826       826       826       826       826       826       826       826       826       826       826       826       826       826       825       823       825       84       826       825       825       825       823       825       825       823       825       825       826 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
224.90       710       783       230.00       4,370       4,647         225.00       718       807       225.10       726       826         225.20       734       846       848       846       848       846       848       846       848       846       848       846       848       846       848       846       848       846       848       846       8						
225.00       718       807         225.10       726       826         225.20       734       846         225.30       741       865         225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.10       726       826         225.20       734       846         225.30       741       865         225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127				230.00	4,370	4,047
225.20       734       846         225.30       741       865         225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.30       741       865         225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.40       749       884         225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.50       757       904         225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.60       765       923         225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.70       773       943         225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.80       780       962         225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
225.90       788       981         226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.00       1,500       1,001         226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.10       1,509       1,015         226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.20       1,519       1,029         226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127		1 509				
226.30       1,528       1,043         226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.40       1,538       1,057         226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.50       1,547       1,071         226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.60       1,556       1,085         226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.70       1,566       1,099         226.80       1,575       1,113         226.90       1,585       1,127						
226.80 1,575 1,113 226.90 1,585 1,127						
226.90 1,585 1,127						
	227.00	1,594	1,141			

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#### Summary for Pond 2P: Infiltration System #1

Inflow Area = 0.934 ac, 68.10% Impervious, Inflow Depth > 1.13" for 2-yr event
Inflow = 1.32 cfs @ 12.04 hrs, Volume= 0.088 af
Outflow = 0.31 cfs @ 12.30 hrs, Volume= 0.088 af, Atten= 77%, Lag= 15.5 min
Discarded = 0.00 cfs @ 12.30 hrs, Volume= 0.088 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 220.94' @ 12.30 hrs Surf.Area= 0.023 ac Storage= 0.015 af

Plug-Flow detention time= 10.7 min calculated for 0.088 af (100% of inflow)

Center-of-Mass det. time= 10.4 min (798.0 - 787.7)

Volume	Invert	Avail.Storag	ge Storage Description	
#1	219.50'	0.030	af 12.00'W x 82.00'L x 5.00'H Prismatoid	
			0.113 af Overall - 0.039 af Embedded = 0.074 af x 40.0% Voids	
#2	220.50'	0.039 a	36.0" Round Pipe Storage x 3 Inside #1	
L= 80.0'		L- 80.0		
		0.069	af Total Available Storage	
			· ·	
Device	Routing	Invert	Outlet Devices	
#1	Primary	222.70'	<b>12.0" Round Culvert</b> L= 31.0' Ke= 0.500	
	,		Inlet / Outlet Invert= 222.70' / 219.30' S= 0.1097 '/' Cc= 0.900	
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf	
		10.000 in/hr Exfiltration over Wetted area		
#2	Discarded	219.50'	10.000 III/III Exilitiation over wetted area	
			Conductivity to Groundwater Elevation = 200.00'	

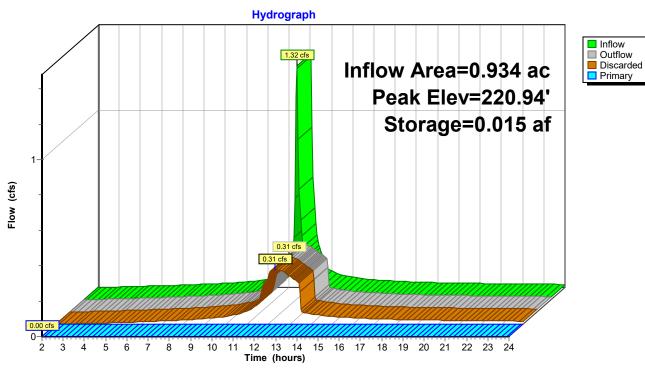
**Discarded OutFlow** Max=0.31 cfs @ 12.30 hrs HW=220.94' (Free Discharge) **2=Exfiltration** (Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=219.50' (Free Discharge) 1=Culvert (Controls 0.00 cfs)

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# Pond 2P: Infiltration System #1



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# Stage-Area-Storage for Pond 2P: Infiltration System #1

Elevation (sers) (acres)         (acres)         (acre-feet)         (eet)         (acres)         (acre-feet)           219.50         0.023         0.000         222.05         0.034         0.035           219.55         0.023         0.000         222.10         0.034         0.036           219.65         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.001         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.45         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.041           219.95         0.025         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.75	- ·	147 (1 1	0.1	l =,	187 (/ 1	01
219.50						
219.55         0.023         0.0001         222.10         0.034         0.036           219.60         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.002         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.50         0.036         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.047           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         <						
219.60         0.023         0.001         222.15         0.034         0.037           219.65         0.023         0.001         222.20         0.034         0.039           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.044           220.00         0.025         0.004         222.55         0.036         0.044           220.01         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.15         0.025         0.005         222.55         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.046           220.15         0.026         0.007         222.85         0.037         0.049           220.20         0.026         0.007         222.85         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.65         0.023         0.001         222.20         0.034         0.038           219.75         0.024         0.002         222.25         0.034         0.039           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.46         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.005         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.16         0.026         0.006         222.75         0.037         0.049           220.25         0.026         0.007         222.80         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.70         0.023         0.002         222.25         0.034         0.039           219.80         0.024         0.002         222.35         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.045           220.15         0.025         0.006         222.77         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.048           220.35         0.026         0.007         222.85         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.95         0.025         0.004         222.45         0.035         0.043           219.95         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.006         222.70         0.036         0.046           220.10         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.050           220.35         0.026         0.008         222.95         0.037         0.051           220.40         0.027         0.009         223.00         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.99         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.052           220.35         0.026         0.008         222.95         0.037         0.052           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.95         0.025         0.004         222.50         0.036         0.044           220.06         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.90         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.45         0.027         0.009         223.05         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038 <t< td=""><td>219.90</td><td></td><td></td><td></td><td>0.035</td><td></td></t<>	219.90				0.035	
220.05         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.006         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.052           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.60         0.027         0.010         223.15         0.038 <t< td=""><td>219.95</td><td>0.025</td><td>0.004</td><td>222.50</td><td>0.036</td><td>0.044</td></t<>	219.95	0.025	0.004	222.50	0.036	0.044
220.10         0.025         0.006         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.059           220.35         0.026         0.008         222.90         0.037         0.050           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039 <t< td=""><td>220.00</td><td>0.025</td><td>0.005</td><td>222.55</td><td>0.036</td><td>0.045</td></t<>	220.00	0.025	0.005	222.55	0.036	0.045
220.15         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039 <t< td=""><td>220.05</td><td>0.025</td><td>0.005</td><td>222.60</td><td>0.036</td><td>0.045</td></t<>	220.05	0.025	0.005	222.60	0.036	0.045
220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.050           220.30         0.026         0.007         222.85         0.037         0.051           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.65         0.028         0.011         223.15         0.038         0.054           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039 <t< td=""><td>220.10</td><td>0.025</td><td>0.005</td><td>222.65</td><td>0.036</td><td>0.046</td></t<>	220.10	0.025	0.005	222.65	0.036	0.046
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.15</td><td>0.025</td><td>0.006</td><td>222.70</td><td>0.036</td><td>0.047</td></t<>	220.15	0.025	0.006	222.70	0.036	0.047
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.20</td><td>0.026</td><td>0.006</td><td>222.75</td><td>0.037</td><td>0.048</td></t<>	220.20	0.026	0.006	222.75	0.037	0.048
220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.10         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td></td><td></td><td>0.007</td><td>222.80</td><td>0.037</td><td>0.049</td></t<>			0.007	222.80	0.037	0.049
220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.013         223.35         0.039         0.058           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.95         0.029         0.015         223.45         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.99         0.029         0.015         223.45         0.040         0.060           221.00         0.029         0.016         223.55         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.058           220.95         0.029         0.015         223.55         0.040         0.059           221.00         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.017         223.60         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.55         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.15         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.90         0.042         0.063           221.45         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.05         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.024         224.00         0.042         0.064           221.45         0.031         0.025         224.05         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.50         0.031         0.025         224.00         0.042         0.064           221.55         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.030         224.30         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.80         0.033         0.030         224.35         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.031         224.40         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.033         224.45         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044</b>						
221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.60       0.032       0.027       224.15       0.043       0.065         221.65       0.032       0.028       224.20       0.043       0.066         221.70       0.032       0.029       224.25       0.043       0.066         221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.65       0.032       0.028       224.20       0.043       0.066         221.70       0.032       0.029       224.25       0.043       0.066         221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.70     0.032     0.029     224.25     0.043     0.066       221.75     0.032     0.030     224.30     0.043     0.067       221.80     0.033     0.030     224.35     0.044     0.067       221.85     0.033     0.031     224.40     0.044     0.068       221.90     0.033     0.032     224.45     0.044     0.068       221.95     0.033     0.033     224.50 <b>0.044 0.069</b>						
221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.95 0.033 0.033 224.50 <b>0.044 0.069</b>				-		
222.00 0.033 0.034				224.50	0.044	0.069
	222.00	0.033	0.034			

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## Summary for Pond 3P: Bioswale #2

Inflow Area = 0.246 ac, 43.28% Impervious, Inflow Depth > 1.55" for 2-yr event

Inflow = 0.50 cfs @ 12.04 hrs, Volume= 0.032 af

Outflow = 0.11 cfs @ 12.37 hrs, Volume= 0.032 af, Atten= 78%, Lag= 19.6 min

Discarded = 0.11 cfs @ 12.37 hrs, Volume= 0.032 af Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 225.19' @ 12.37 hrs Surf.Area= 328 sf Storage= 268 cf

Plug-Flow detention time= 14.3 min calculated for 0.032 af (100% of inflow)

Center-of-Mass det. time= 13.7 min (870.7 - 856.9)

Volume	Invert	Avail.Storage	Storage Description
#1	229.50'	504 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	227.50'	135 cf	Custom Stage Data (Conic) Listed below (Recalc)
			676 cf Overall x 20.0% Voids
#3	223.50'	424 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,312 cf Overall - 251 cf Embedded = 1,061 cf x 40.0% Voids
#4	224.50'	251 cf	24.0" Round Pipe Storage Inside #3
			L= 80.0'

1,315 cf Total Available Storage

Elevation	Surf.Area	Inc.Store	Cum.Store (cubic-feet)	Wet.Area
(feet)	(sq-ft)	(cubic-feet)		(sq-ft)
229.50	338	0	0	338
230.00	916	302	302	918
230.20	1,110	202	504	1,113
Elevation	Surf.Area	Inc.Store	Cum.Store (cubic-feet)	Wet.Area
(feet)	(sq-ft)	(cubic-feet)		(sq-ft)
227.50	338	0	0	338
229.50	338	676	676	468
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
223.50	328	0	0	328
227.50	328	1,312	1,312	585

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.50'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 209.00'
#2	Primary	230.10'	1.5' long x 4.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

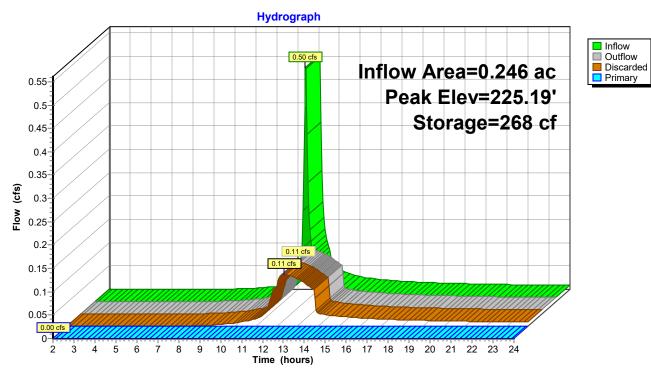
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**Discarded OutFlow** Max=0.11 cfs @ 12.37 hrs HW=225.19' (Free Discharge) **1=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=223.50' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Bioswale #2



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# Stage-Area-Storage for Pond 3P: Bioswale #2

		J	•		
Elevation	Wetted	Storage	Elevation	Wetted	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
223.50	328	0	228.60	994	750
223.60	334	13	228.70	1,001	757
223.70	341	26	228.80	1,008	763
223.80	347	39	228.90	1,014	770
223.90	354	52	229.00	1,021	777
224.00	360	66	229.10	1,027	784
224.10	367	79	229.20	1,034	791
224.20	373	92	229.30	1,040	797
224.30	379	105	229.40	1,047	804
224.40	386	118	229.50	1,391	811
224.50	392	131	229.60	1,484	849
224.60	399	147	229.70	1,589	897
224.70	405	165	229.80	1,705	957
224.80	411	185	229.90	1,832	1,028
224.90	418	205	230.00	1,971	1,113
225.00	424	226	230.10	2,066	1,209
225.10	431	248	230.20	2,166	1,315
225.20	437	270			
225.30	444	292			
225.40	450 450	315			
225.50	456 463	338			
225.60 225.70	463 469	361 383			
225.80	476	406			
225.90	482	428			
226.00	489	449			
226.10	495	470			
226.20	501	491			
226.30	508	510			
226.40	514	528			
226.50	521	544			
226.60	527	558			
226.70	533	571			
226.80	540	584			
226.90	546	597			
227.00	553	610			
227.10	559	623			
227.20	566	636			
227.30	572	649			
227.40	578	662			
227.50	923	676			
227.60	929	682			
227.70	936	689			
227.80	942	696			
227.90	949	703			
228.00	955	709			
228.10	962	716			
228.20	968 075	723			
228.30	975	730 736			
228.40	981	736			
228.50	988	743			

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## **Summary for Link 1L: Storm Sewer System**

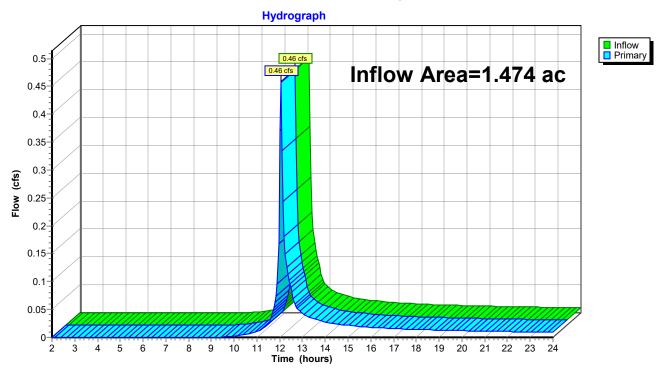
Inflow Area = 1.474 ac, 55.82% Impervious, Inflow Depth > 0.24" for 2-yr event

Inflow = 0.46 cfs @ 12.05 hrs, Volume= 0.030 af

Primary = 0.46 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs

## Link 1L: Storm Sewer System



2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

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Time span=2.00-24.00 hrs, dt=0.05 hrs, 441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area #1 Runoff Area=23,450 sf 52.74% Impervious Runoff Depth>3.31"

Tc=6.0 min CN=84 Runoff=2.28 cfs 0.149 af

Subcatchment 2S: Drainage Area #2 Runoff Area=17,249 sf 88.99% Impervious Runoff Depth>4.46"

Tc=6.0 min CN=95 Runoff=2.10 cfs 0.147 af

Subcatchment 3S: Drainage Area #3 Runoff Area=10,711 sf 43.28% Impervious Runoff Depth>3.12"

Tc=6.0 min CN=82 Runoff=0.99 cfs 0.064 af

Subcatchment 4S: Drainage Area #4 Runoff Area=12,789 sf 27.23% Impervious Runoff Depth>2.66"

Tc=6.0 min CN=77 Runoff=1.00 cfs 0.065 af

Pond 1P: Bioswale #1 Peak Elev=228.19' Storage=1,433 cf Inflow=2.28 cfs 0.149 af

Discarded=0.74 cfs 0.148 af Primary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.148 af

Pond 2P: Infiltration System #1 Peak Elev=221.85' Storage=0.031 af Inflow=2.10 cfs 0.147 af

Discarded=0.36 cfs 0.147 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.147 af

Pond 3P: Bioswale #2 Peak Elev=227.49' Storage=674 cf Inflow=0.99 cfs 0.064 af

Discarded=0.22 cfs 0.064 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.064 af

Link 1L: Storm Sewer System

Inflow=1.00 cfs 0.065 af
Primary=1.00 cfs 0.065 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.425 af Average Runoff Depth = 3.46" 44.18% Pervious = 0.651 ac 55.82% Impervious = 0.823 ac

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### Summary for Subcatchment 1S: Drainage Area #1

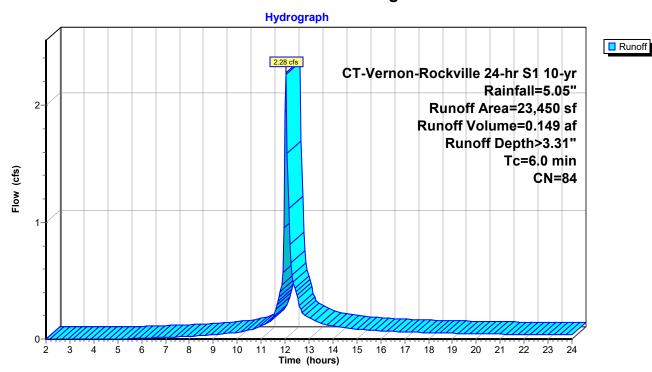
Runoff 2.28 cfs @ 12.04 hrs, Volume= 0.149 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

	Area (sf)	CN	Description				
	11,083	69	50-75% Gra	ass cover, l	Fair, HSG B		
*	5,360	98	Paved park	ing, HSG B	3		
	7,007	98	Unconnecte	ed roofs, H	SG B		
	23,450	84	Weighted A	verage			
	11,083		47.26% Per	47.26% Pervious Area			
	12,367		52.74% Imp	ervious Ar	rea		
	7,007		56.66% Und	connected			
	Tc Length	Slop	e Velocity	Capacity	Description		
(n	nin) (feet)	(ft/f	t) (ft/sec)	(cfs)			
	6.0				Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

## Subcatchment 1S: Drainage Area #1



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## Summary for Subcatchment 2S: Drainage Area #2

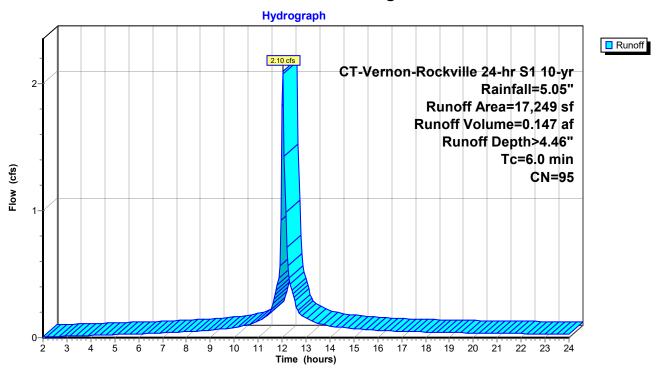
Runoff 2.10 cfs @ 12.04 hrs, Volume= 0.147 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

A	rea (sf)	CN	Description		
	1,899	69	50-75% Gra	ass cover, l	Fair, HSG B
	15,350	98	Paved parking, HSG B		
	17,249	95 Weighted Average			
	1,899		11.01% Per	vious Area	
	15,350		88.99% Imp	pervious Ar	ea
_				_	
Tc	Length	Slope	,	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0					Direct Entry, Direct Entry

**Direct Entry, Direct Entry** 

## Subcatchment 2S: Drainage Area #2



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### Summary for Subcatchment 3S: Drainage Area #3

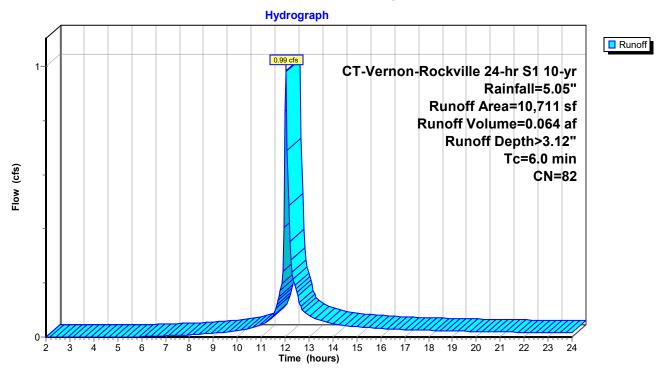
Runoff 0.99 cfs @ 12.04 hrs, Volume= 0.064 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

Aı	rea (sf)	CN	Description			
	6,075	69	50-75% Gra	ass cover, F	Fair, HSG B	
	1,643	98	Paved park	ing, HSG B	3	
	2,993	98	Unconnecte	ed roofs, HS	SG B	
	10,711	82	Weighted A	verage		
	6,075		56.72% Pervious Area			
	4,636		43.28% Imp	ervious Ar	ea	
	2,993		64.56% Un	connected		
Тс	Length	Slope	<ul><li>Velocity</li></ul>	Capacity	Description	
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)		
6.0					Direct Entry, Direct Entry	

**Direct Entry, Direct Entry** 

## Subcatchment 3S: Drainage Area #3



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### Summary for Subcatchment 4S: Drainage Area #4

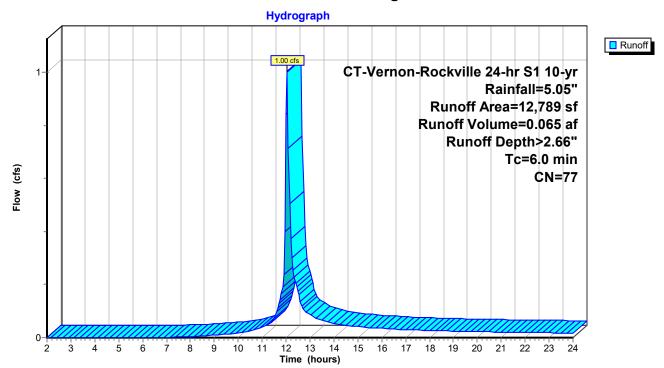
Runoff 1.00 cfs @ 12.04 hrs, Volume= 0.065 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 10-yr Rainfall=5.05"

Are	ea (sf)	CN	Description			
	9,306	69	50-75% Grass cover, Fair, HSG B			
	3,483	98	Paved parking, HSG B			
1	2,789	77	Weighted Average			
	9,306		72.77% Per	vious Area		
	3,483		27.23% Imp	ervious Ar	ea	
т.	ما المحدد ا	Clana	\/alaaitu	Conneitu	Description	
	Length	Slope	,	Capacity	Description	
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
6.0					Direct Entry, Direct Entry	

**Direct Entry, Direct Entry** 

## Subcatchment 4S: Drainage Area #4



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## **Summary for Pond 1P: Bioswale #1**

0.538 ac, 52.74% Impervious, Inflow Depth > 3.31" for 10-yr event Inflow Area =

2.28 cfs @ 12.04 hrs, Volume= 0.74 cfs @ 12.20 hrs, Volume= Inflow 0.149 af

0.148 af, Atten= 67%, Lag= 9.5 min Outflow

Discarded = 0.74 cfs @ 12.20 hrs, Volume= 0.148 af Primary 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 228.19' @ 12.22 hrs Surf.Area= 2,056 sf Storage= 1,433 cf

Plug-Flow detention time= 28.5 min calculated for 0.148 af (100% of inflow)

Center-of-Mass det. time= 27.2 min (853.0 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	3,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	226.00'	282 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,408 cf Overall x 20.0% Voids
#3	222.00'	624 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,936 cf Overall - 377 cf Embedded = 1,559 cf x 40.0% Voids
#4	223.00'	377 cf	24.0" Round Pipe Storage Inside #3
			L= 120.0'

4,647 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	704	0	0	704
229.00	1,737	1,182	1,182	1,744
230.00	2,660	2,182	3,364	2,682
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
226.00	704	0	0	704
228.00	704	1,408	1,408	892
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
222.00	484	0	0	484
226.00	484	1,936	1,936	796

Device	Routing	Invert	Outlet Devices
#1	Discarded	222.00'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 214.00'
#2	Primary	224.40'	<b>12.0" Round Culvert</b> L= 115.0' Ke= 0.500
			Inlet / Outlet Invert= 224.40' / 222.85' S= 0.0135 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.79 sf
#3	Device 2	229.25'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600
			I imited to weir flow at low heads

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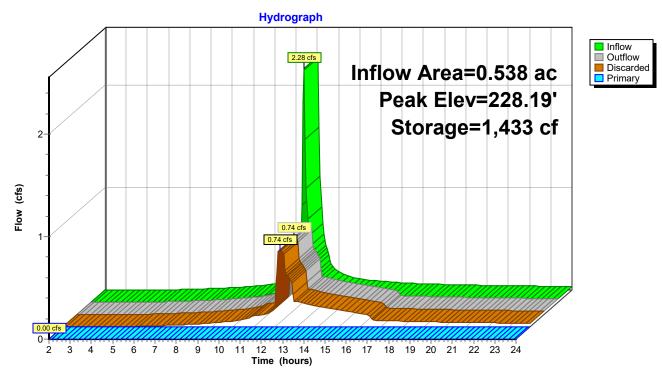
**Discarded OutFlow** Max=0.74 cfs @ 12.20 hrs HW=228.19' (Free Discharge) **1=Exfiltration** (Controls 0.74 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=222.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

3=Orifice/Grate (Controls 0.00 cfs)

### Pond 1P: Bioswale #1



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# Stage-Area-Storage for Pond 1P: Bioswale #1

Elevation	Wetted	Storage	Elevation	Wetted	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
222.00	484	0	227.10	1,603	1,155
222.10	492	19	227.20	1,613	1,170
222.20	500	39	227.30	1,622	1,184
222.30	507	58	227.40	1,632	1,198
222.40	515	77	227.50	1,641	1,190
222.50	523	97	227.60	1,650	1,212
222.60					
	531	116	227.70	1,660	1,240
222.70	539	136	227.80	1,669	1,254
222.80	546	155	227.90	1,679	1,268
222.90	554	174	228.00	2,392	1,282
223.00	562	194	228.10	2,475	1,357
223.10	570	217	228.20	2,563	1,440
223.20	578	244	228.30	2,656	1,532
223.30	585	273	228.40	2,753	1,633
223.40	593	303	228.50	2,854	1,744
223.50	601	335	228.60	2,961	1,866
223.60	609	367	228.70	3,072	1,998
223.70	617	400	228.80	3,187	2,142
223.80	624	433	228.90	3,307	2,297
223.90	632	467	229.00	3,432	2,464
224.00	640	500	229.10	3,517	2,642
224.10	648	534	229.20	3,604	2,829
224.20	656	568	229.30	3,693	3,024
224.30	663	601	229.40	3,783	3,227
224.40	671	634	229.50	3,876	3,440
224.50	679	666	229.60	3,971	3,662
224.60	687	697	229.70	4,068	3,894
224.70	695	728	229.80	4,166	4,135
224.80	702	757	229.90	4,267	4,386
224.90	710	783	230.00	4,370	4,647
225.00	718	807		,	,
225.10	726	826			
225.20	734	846			
225.30	741	865			
225.40	749	884			
225.50	757	904			
225.60	765	923			
225.70	773	943			
225.80	780	962			
225.90	788	981			
226.00	1,500	1,001			
226.10	1,509	1,015			
226.20	1,519	1,029			
226.30	1,528	1,043			
226.40	1,538	1,057			
226.50	1,547	1,071			
226.60	1,556	1,085			
226.70	1,566	1,099			
226.80	1,575	1,113			
226.90	1,585	1,113			
227.00	1,594	1,141			
221.00	1,004	1,171			
			1		

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## **Summary for Pond 2P: Infiltration System #1**

Inflow Area = 0.934 ac, 68.10% Impervious, Inflow Depth > 1.89" for 10-yr event Inflow = 2.10 cfs @ 12.04 hrs, Volume= 0.147 af

Outflow = 0.36 cfs @ 12.42 hrs, Volume= 0.147 af, Atten= 83%, Lag= 23.0 min Discarded = 0.36 cfs @ 12.42 hrs, Volume= 0.147 af

Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 221.85' @ 12.42 hrs Surf.Area= 0.023 ac Storage= 0.031 af

Plug-Flow detention time= 20.8 min calculated for 0.147 af (100% of inflow) Center-of-Mass det. time= 20.3 min (792.9 - 772.7)

Volume	Invert	Avail.Stora	ge Storage Description
#1	219.50'	0.030	af 12.00'W x 82.00'L x 5.00'H Prismatoid
#2	220.50'	0.039	0.113 af Overall - 0.039 af Embedded = 0.074 af x 40.0% Voids af <b>36.0" Round Pipe Storage</b> x 3 Inside #1 L= 80.0'
		0.069	af Total Available Storage
Device	Routing	Invert	Outlet Devices
#1	Primary	222.70'	<b>12.0" Round Culvert</b> L= 31.0' Ke= 0.500
	,		Inlet / Outlet Invert= 222.70' / 219.30' S= 0.1097 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	219.50'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 200.00'

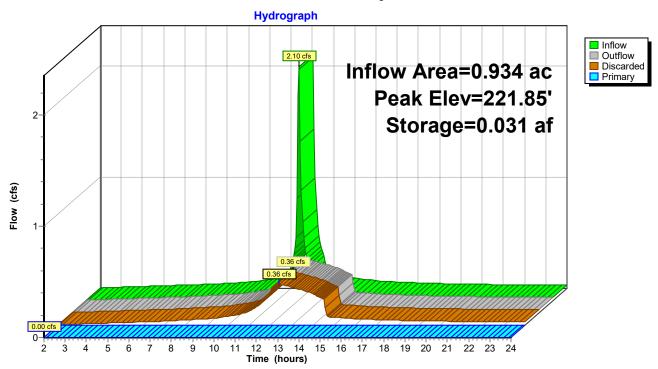
**Discarded OutFlow** Max=0.36 cfs @ 12.42 hrs HW=221.85' (Free Discharge) **2=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=219.50' (Free Discharge) 1=Culvert (Controls 0.00 cfs)

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# Pond 2P: Infiltration System #1



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# Stage-Area-Storage for Pond 2P: Infiltration System #1

Elevation (sers) (acres)         (acres)         (acre-feet)         (eet)         (acres)         (acre-feet)           219.50         0.023         0.000         222.05         0.034         0.035           219.55         0.023         0.000         222.10         0.034         0.036           219.65         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.001         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.45         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.041           219.95         0.025         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.75	- ·	147 (1 1	0.1	l =,	187 (/ 1	01
219.50						
219.55         0.023         0.0001         222.10         0.034         0.036           219.60         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.002         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.50         0.036         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.047           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         <						
219.60         0.023         0.001         222.15         0.034         0.037           219.65         0.023         0.001         222.20         0.034         0.039           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.044           220.00         0.025         0.004         222.55         0.036         0.044           220.01         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.15         0.025         0.005         222.55         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.046           220.15         0.026         0.007         222.85         0.037         0.049           220.20         0.026         0.007         222.85         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.65         0.023         0.001         222.20         0.034         0.038           219.75         0.024         0.002         222.25         0.034         0.039           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.46         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.005         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.16         0.026         0.006         222.75         0.037         0.049           220.25         0.026         0.007         222.80         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.70         0.023         0.002         222.25         0.034         0.039           219.80         0.024         0.002         222.35         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.045           220.15         0.025         0.006         222.77         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.048           220.35         0.026         0.007         222.85         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.95         0.025         0.004         222.45         0.035         0.043           219.95         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.006         222.70         0.036         0.046           220.10         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.050           220.35         0.026         0.008         222.95         0.037         0.051           220.40         0.027         0.009         223.00         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.99         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.052           220.35         0.026         0.008         222.95         0.037         0.052           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.95         0.025         0.004         222.50         0.036         0.044           220.06         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.90         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.45         0.027         0.009         223.05         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038 <t< td=""><td>219.90</td><td></td><td></td><td></td><td>0.035</td><td></td></t<>	219.90				0.035	
220.05         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.006         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.052           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.60         0.027         0.010         223.15         0.038 <t< td=""><td>219.95</td><td>0.025</td><td>0.004</td><td>222.50</td><td>0.036</td><td>0.044</td></t<>	219.95	0.025	0.004	222.50	0.036	0.044
220.10         0.025         0.006         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.059           220.35         0.026         0.008         222.90         0.037         0.050           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039 <t< td=""><td>220.00</td><td>0.025</td><td>0.005</td><td>222.55</td><td>0.036</td><td>0.045</td></t<>	220.00	0.025	0.005	222.55	0.036	0.045
220.15         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039 <t< td=""><td>220.05</td><td>0.025</td><td>0.005</td><td>222.60</td><td>0.036</td><td>0.045</td></t<>	220.05	0.025	0.005	222.60	0.036	0.045
220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.050           220.30         0.026         0.007         222.85         0.037         0.051           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.65         0.028         0.011         223.15         0.038         0.054           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039 <t< td=""><td>220.10</td><td>0.025</td><td>0.005</td><td>222.65</td><td>0.036</td><td>0.046</td></t<>	220.10	0.025	0.005	222.65	0.036	0.046
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.15</td><td>0.025</td><td>0.006</td><td>222.70</td><td>0.036</td><td>0.047</td></t<>	220.15	0.025	0.006	222.70	0.036	0.047
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.20</td><td>0.026</td><td>0.006</td><td>222.75</td><td>0.037</td><td>0.048</td></t<>	220.20	0.026	0.006	222.75	0.037	0.048
220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.10         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td></td><td></td><td>0.007</td><td>222.80</td><td>0.037</td><td>0.049</td></t<>			0.007	222.80	0.037	0.049
220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.013         223.35         0.039         0.058           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.95         0.029         0.015         223.45         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.99         0.029         0.015         223.45         0.040         0.060           221.00         0.029         0.016         223.55         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.058           220.95         0.029         0.015         223.55         0.040         0.059           221.00         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.017         223.60         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.55         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.15         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.90         0.042         0.063           221.45         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.05         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.024         224.00         0.042         0.064           221.45         0.031         0.025         224.05         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.50         0.031         0.025         224.00         0.042         0.064           221.55         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.030         224.30         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.80         0.033         0.030         224.35         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.031         224.40         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.033         224.45         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044</b>						
221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
221.60       0.032       0.027       224.15       0.043       0.065         221.65       0.032       0.028       224.20       0.043       0.066         221.70       0.032       0.029       224.25       0.043       0.066         221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.65       0.032       0.028       224.20       0.043       0.066         221.70       0.032       0.029       224.25       0.043       0.066         221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.70     0.032     0.029     224.25     0.043     0.066       221.75     0.032     0.030     224.30     0.043     0.067       221.80     0.033     0.030     224.35     0.044     0.067       221.85     0.033     0.031     224.40     0.044     0.068       221.90     0.033     0.032     224.45     0.044     0.068       221.95     0.033     0.033     224.50 <b>0.044 0.069</b>						
221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.95 0.033 0.033 224.50 <b>0.044 0.069</b>				-		
222.00 0.033 0.034				224.50	0.044	0.069
	222.00	0.033	0.034			

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### Summary for Pond 3P: Bioswale #2

Inflow Area = 0.246 ac, 43.28% Impervious, Inflow Depth > 3.12" for 10-yr event

Inflow = 0.99 cfs @ 12.04 hrs, Volume= 0.064 af

Outflow = 0.22 cfs @ 12.34 hrs, Volume= 0.064 af, Atten= 77%, Lag= 17.6 min

Discarded = 0.22 cfs @ 12.34 hrs, Volume= 0.064 af Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 227.49' @ 12.34 hrs Surf.Area= 328 sf Storage= 674 cf

Plug-Flow detention time= 29.3 min calculated for 0.064 af (100% of inflow)

Center-of-Mass det. time= 29.2 min ( 862.4 - 833.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	229.50'	504 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	227.50'	135 cf	Custom Stage Data (Conic) Listed below (Recalc)
			676 cf Overall x 20.0% Voids
#3	223.50'	424 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,312 cf Overall - 251 cf Embedded = 1,061 cf x 40.0% Voids
#4	224.50'	251 cf	24.0" Round Pipe Storage Inside #3
			L= 80.0'

1,315 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
229.50	338	0	0	338
230.00	916	302	302	918
230.20	1,110	202	504	1,113
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
227.50	338	0	0	338
229.50	338	676	676	468
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
223.50	328	0	0	328
227.50	328	1,312	1,312	585

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.50'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 209.00'
#2	Primary	230.10'	1.5' long x 4.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

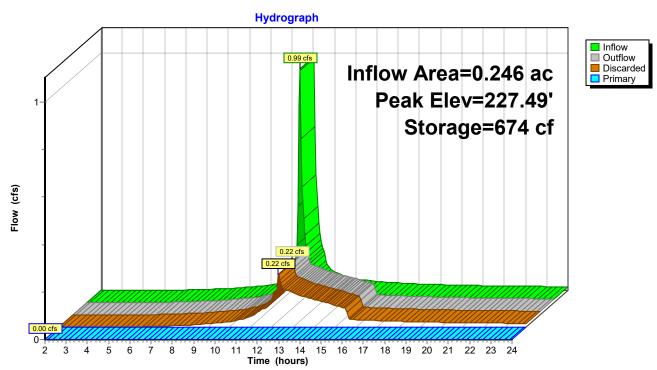
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**Discarded OutFlow** Max=0.16 cfs @ 12.34 hrs HW=227.49' (Free Discharge) **1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=223.50' (Free Discharge) —2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Bioswale #2



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# Stage-Area-Storage for Pond 3P: Bioswale #2

Elevation	Wetted	Storage	Elevation	Wetted	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
223.50	328	0	228.60	994	750
223.60	334	13	228.70	1,001	757
223.70	341	26	228.80	1,008	763
223.80	347	39	228.90	1,014	770
223.90	354	52	229.00	1,021	777
224.00	360	66	229.10	1,027	784
224.10	367	79	229.20	1,034	791
224.20	373	92	229.30	1,040	797
224.30	379	105	229.40	1,047	804
224.40	386	118	229.50	1,391	811
224.50	392	131	229.60	1,484	849
224.60	399	147	229.70	1,589	897
224.70	405	165	229.80	1,705	957
224.80	411	185	229.90	1,832	1,028
224.90	418	205	230.00	1,971	1,113
225.00	424	226	230.10	2,066	1,209
225.10	431	248	230.20	2,166	1,315
225.20	437	270			
225.30	444	292			
225.40	450	315			
225.50	456 463	338			
225.60	463	361			
225.70	469 476	383			
225.80 225.90	476 482	406 428			
226.00	489	449			
226.10	495	470			
226.20	501	491			
226.30	508	510			
226.40	514	528			
226.50	521	544			
226.60	527	558			
226.70	533	571			
226.80	540	584			
226.90	546	597			
227.00	553	610			
227.10	559	623			
227.20	566	636			
227.30	572	649			
227.40	578	662			
227.50	923	676			
227.60	929	682			
227.70	936	689			
227.80	942	696			
227.90	949	703			
228.00	955	709			
228.10	962	716			
228.20	968 075	723			
228.30	975 081	730 736			
228.40	981	736			
228.50	988	743			

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## **Summary for Link 1L: Storm Sewer System**

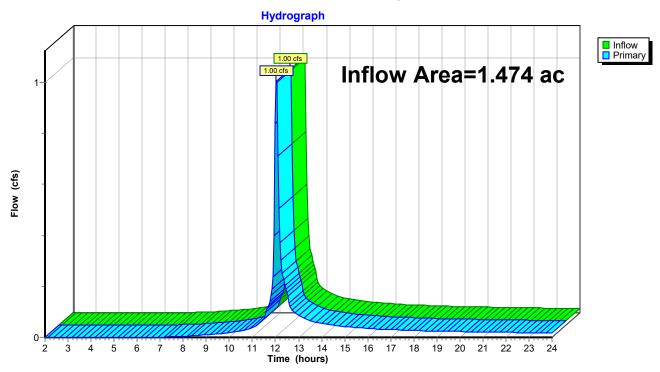
Inflow Area = 1.474 ac, 55.82% Impervious, Inflow Depth > 0.53" for 10-yr event

Inflow = 1.00 cfs @ 12.04 hrs, Volume= 0.065 af

Primary = 1.00 cfs @ 12.04 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs

## Link 1L: Storm Sewer System



2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

2022-0303-Post

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Time span=2.00-24.00 hrs, dt=0.05 hrs, 441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area #1 Runoff Area=23,450 sf 52.74% Impervious Runoff Depth>4.38"

Tc=6.0 min CN=84 Runoff=2.96 cfs 0.196 af

Subcatchment 2S: Drainage Area #2 Runoff Area=17,249 sf 88.99% Impervious Runoff Depth>5.60"

Tc=6.0 min CN=95 Runoff=2.58 cfs 0.185 af

Subcatchment 3S: Drainage Area #3 Runoff Area=10,711 sf 43.28% Impervious Runoff Depth>4.17"

Tc=6.0 min CN=82 Runoff=1.30 cfs 0.085 af

Subcatchment 4S: Drainage Area #4 Runoff Area=12,789 sf 27.23% Impervious Runoff Depth>3.65"

Tc=6.0 min CN=77 Runoff=1.37 cfs 0.089 af

Pond 1P: Bioswale #1 Peak Elev=228.67' Storage=1,955 cf Inflow=2.96 cfs 0.196 af

Discarded=0.88 cfs 0.197 af Primary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.197 af

Pond 2P: Infiltration System #1 Peak Elev=222.42' Storage=0.042 af Inflow=2.58 cfs 0.185 af

Discarded=0.40 cfs 0.185 af Primary=0.00 cfs 0.000 af Outflow=0.40 cfs 0.185 af

Pond 3P: Bioswale #2 Peak Elev=229.57' Storage=836 cf Inflow=1.30 cfs 0.085 af

Discarded=0.39 cfs 0.085 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.085 af

Link 1L: Storm Sewer System

Inflow=1.37 cfs 0.089 af
Primary=1.37 cfs 0.089 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.556 af Average Runoff Depth = 4.53" 44.18% Pervious = 0.651 ac 55.82% Impervious = 0.823 ac

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### Summary for Subcatchment 1S: Drainage Area #1

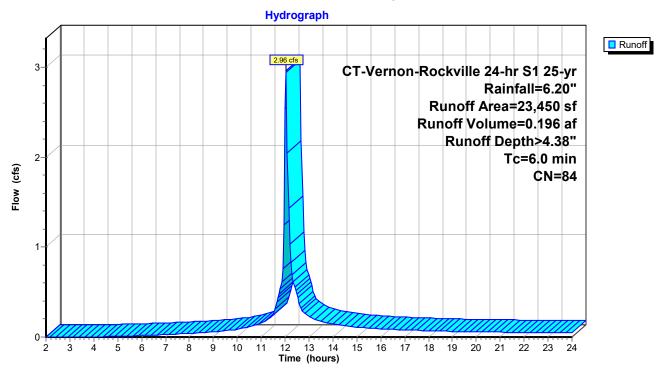
Runoff 2.96 cfs @ 12.04 hrs, Volume= 0.196 af, Depth> 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

	Area (sf)	CN	Description						
	11,083	69	50-75% Gra	ass cover, l	Fair, HSG B				
*	5,360	98	Paved park	Paved parking, HSG B					
	7,007	98	Unconnecte	Unconnected roofs, HSG B					
	23,450	84	Weighted A	Weighted Average					
	11,083		47.26% Pervious Area						
	12,367		52.74% Impervious Area						
	7,007		56.66% Unconnected						
	Tc Length	ı Slop	e Velocity	Capacity	Description				
(r	nin) (feet)	) (ft/f	t) (ft/sec)	(cfs)					
	6.0				Direct Entry, Direct Entry				

**Direct Entry, Direct Entry** 

# Subcatchment 1S: Drainage Area #1



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### Summary for Subcatchment 2S: Drainage Area #2

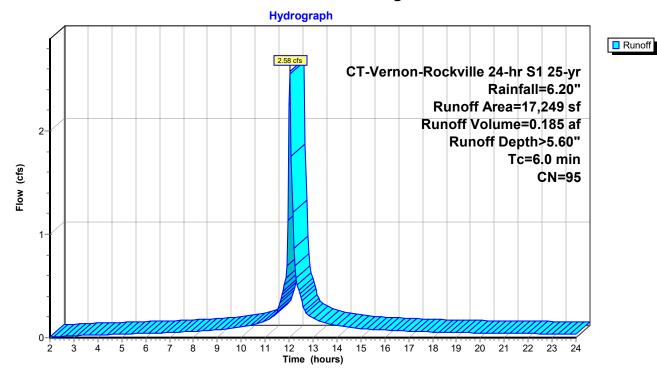
Runoff 2.58 cfs @ 12.04 hrs, Volume= 0.185 af, Depth> 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

A	rea (sf)	CN	Description		
	1,899	69	50-75% Gra	ass cover, l	Fair, HSG B
	15,350	98	Paved parking, HSG B		
	17,249	95	Weighted Average		
	1,899		11.01% Pervious Area		
	15,350		88.99% Impervious Area		
_				_	
Tc	Length	Slope	,	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0					Direct Entry, Direct Entry

**Direct Entry, Direct Entry** 

## Subcatchment 2S: Drainage Area #2



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### Summary for Subcatchment 3S: Drainage Area #3

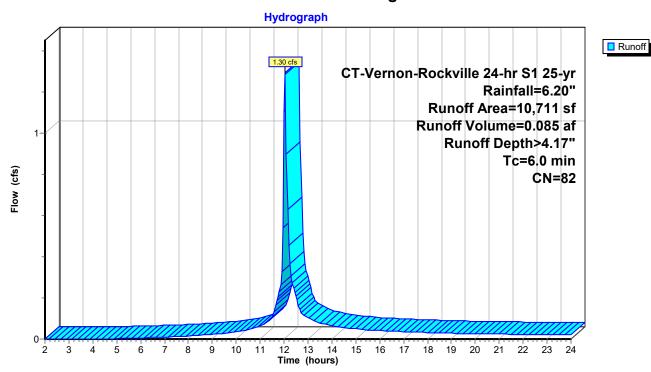
Runoff 1.30 cfs @ 12.04 hrs, Volume= 0.085 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

A	rea (sf)	CN	Description					
	6,075	69	50-75% Gra	ass cover, F	Fair, HSG B			
	1,643	98	Paved park	ing, HSG B	3			
	2,993	98	Unconnected roofs, HSG B					
	10,711	82	2 Weighted Average					
	6,075		56.72% Pervious Area					
	4,636		43.28% Impervious Area					
	2,993		64.56% Unconnected					
Tc	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
6.0					Direct Entry, Direct Entry			

**Direct Entry, Direct Entry** 

## Subcatchment 3S: Drainage Area #3



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### Summary for Subcatchment 4S: Drainage Area #4

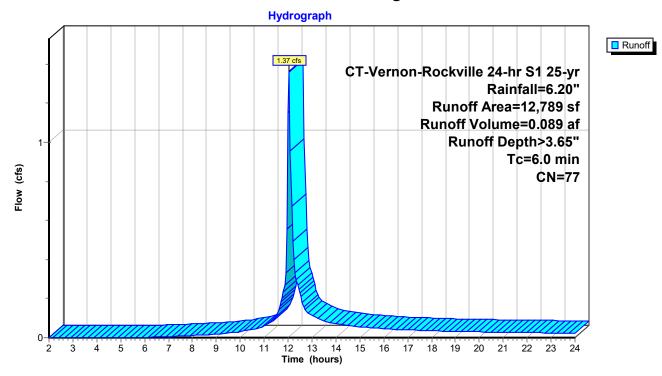
Runoff 1.37 cfs @ 12.04 hrs, Volume= 0.089 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 25-yr Rainfall=6.20"

Are	ea (sf)	CN I	Description		
	9,306	69	50-75% Gra	ass cover, F	Fair, HSG B
	3,483	98 I	Paved parking, HSG B		
1	12,789	77 \	Weighted A	verage	
	9,306	-	72.77% Pervious Area		
	3,483	2	27.23% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

**Direct Entry, Direct Entry** 

## Subcatchment 4S: Drainage Area #4



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## Summary for Pond 1P: Bioswale #1

0.538 ac, 52.74% Impervious, Inflow Depth > 4.38" for 25-yr event Inflow Area =

2.96 cfs @ 12.04 hrs, Volume= 0.88 cfs @ 12.24 hrs, Volume= Inflow 0.196 af

0.197 af, Atten= 70%, Lag= 11.9 min Outflow

Discarded = 0.88 cfs @ 12.24 hrs, Volume= 0.197 af Primary 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 228.67' @ 12.24 hrs Surf.Area= 2,531 sf Storage= 1,955 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 28.1 min ( 844.4 - 816.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	3,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	226.00'	282 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,408 cf Overall x 20.0% Voids
#3	222.00'	624 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,936 cf Overall - 377 cf Embedded = 1,559 cf x 40.0% Voids
#4	223.00'	377 cf	24.0" Round Pipe Storage Inside #3
			L= 120.0'

4,647 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	704	0	0	704
229.00	1,737	1,182	1,182	1,744
230.00	2,660	2,182	3,364	2,682
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
226.00	704	0	0	704
228.00	704	1,408	1,408	892
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
222.00	484	0	0	484
226.00	484	1,936	1,936	796

Device	Routing	Invert	Outlet Devices
#1	Discarded	222.00'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 214.00'
#2	Primary	224.40'	<b>12.0" Round Culvert</b> L= 115.0' Ke= 0.500
			Inlet / Outlet Invert= 224.40' / 222.85' S= 0.0135 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.79 sf
#3	Device 2	229.25'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600
			I imited to weir flow at low heads

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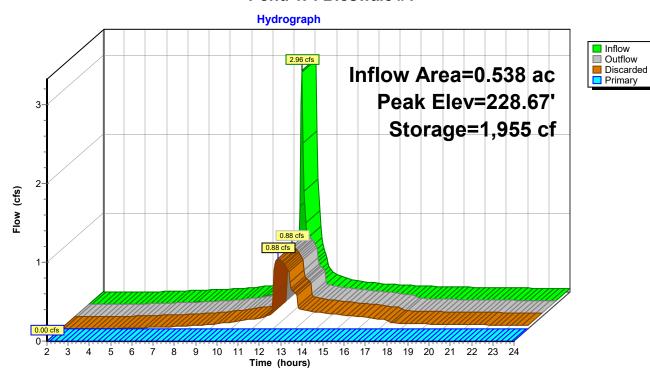
**Discarded OutFlow** Max=0.88 cfs @ 12.24 hrs HW=228.67' (Free Discharge) **1=Exfiltration** (Controls 0.88 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=222.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

3=Orifice/Grate (Controls 0.00 cfs)

#### Pond 1P: Bioswale #1



3,894

4,135

4,386

4,647

4,068

4,166

4,267

4,370

224.60

224.70

224.80

224.90

225.00

225.10

225.20

225.30

225.40

225.50

225.60

225.70

225.80

225.90

226.00

226.10 226.20

226.30

226.40

226.50

226.60

226.70

226.80

226.90

227.00

687

695

702

710

718

726

734

741

749

757

765

773

780

788

1,500

1,509

1,519

1,528

1,538

1,547

1,556

1,566

1,575

1,585

1,594

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Storage ubic-feet) 1,155 1,170 1,184
1,155 1,170
1,170
1,170
1 184
.,
1,198
1,212
1,226
1,240
1,254
1,268
1,282
1,357
1,440
1,532
1,633
1,744
1,866
1,998
2,142
2,297
2,464
2,642
2,829
3,024
3,227
3,440
3,662

697

728

757

783

807

826

846

865

884

904 923

943

962

981

1,001

1,015

1,029

1,043

1,057

1,071

1,085

1,099

1,113

1,127

1,141

229.70

229.80

229.90

230.00

Stage-Area-Storage for Pond 1P: Bioswale #1

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### Summary for Pond 2P: Infiltration System #1

Inflow Area = 0.934 ac, 68.10% Impervious, Inflow Depth > 2.37" for 25-yr event
Inflow = 2.58 cfs @ 12.04 hrs, Volume= 0.185 af
Outflow = 0.40 cfs @ 12.49 hrs, Volume= 0.185 af, Atten= 85%, Lag= 26.9 min
Discarded = 0.00 cfs @ 12.49 hrs, Volume= 0.185 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 222.42' @ 12.49 hrs Surf.Area= 0.023 ac Storage= 0.042 af

Plug-Flow detention time= 26.7 min calculated for 0.184 af (100% of inflow) Center-of-Mass det. time= 26.3 min (793.4 - 767.2)

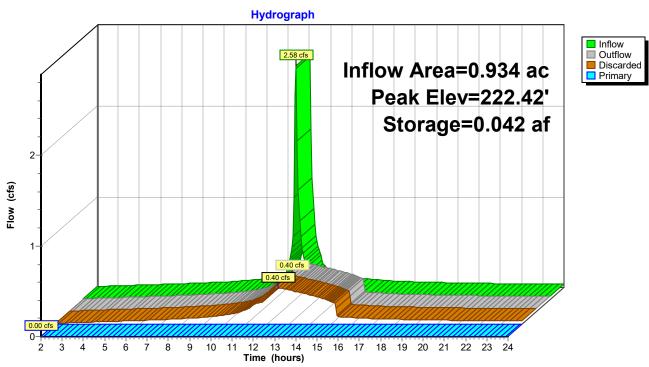
Volume	Invert	Avail.Storage	e Storage Description
#1	219.50'	0.030 a	f 12.00'W x 82.00'L x 5.00'H Prismatoid
#2	220.50'	0.039 a	0.113 af Overall - 0.039 af Embedded = 0.074 af x 40.0% Voids f <b>36.0" Round Pipe Storage</b> x 3 Inside #1 L= 80.0'
		0.069 a	f Total Available Storage
Device	Routing	Invert C	Outlet Devices
#1	Primary	222.70' <b>1</b>	<b>2.0" Round Culvert</b> L= 31.0' Ke= 0.500
	•	Ir	nlet / Outlet Invert= 222.70' / 219.30' S= 0.1097 '/' Cc= 0.900
		n	= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	219.50' <b>1</b>	0.000 in/hr Exfiltration over Wetted area
		C	Conductivity to Groundwater Elevation = 200.00'

**Discarded OutFlow** Max=0.40 cfs @ 12.49 hrs HW=222.41' (Free Discharge) **2=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=219.50' (Free Discharge)
—1=Culvert (Controls 0.00 cfs)

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# Pond 2P: Infiltration System #1



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# Stage-Area-Storage for Pond 2P: Infiltration System #1

<b>□</b> 14:	\A/ - 44I	04		\\\ - ++l	04
Elevation	Wetted	Storage	Elevation	Wetted	Storage
(feet)	(acres)	(acre-feet)	(feet)	(acres)	(acre-feet)
219.50	0.023	0.000	222.05	0.034	0.035
219.55	0.023	0.000	222.10	0.034	0.036
219.60	0.023	0.001	222.15	0.034	0.037
219.65	0.023	0.001	222.20	0.034	0.038
219.70	0.023	0.002	222.25	0.034	0.039
219.75	0.024	0.002	222.30	0.035	0.040
219.80	0.024	0.003	222.35	0.035	0.041
219.85	0.024	0.003	222.40	0.035	0.042
219.90	0.024	0.004	222.45	0.035	0.043
219.95	0.025	0.004	222.50	0.036	0.044
220.00	0.025	0.005	222.55	0.036	0.045
220.05	0.025	0.005	222.60	0.036	0.045
220.10	0.025	0.005	222.65	0.036	0.046
220.15	0.025	0.006	222.70	0.036	0.047
220.20	0.026	0.006	222.75	0.037	0.048
220.25	0.026	0.007	222.80	0.037	0.049
220.30	0.026	0.007	222.85	0.037	0.050
220.35	0.026	0.008	222.90	0.037	0.051
220.40	0.026	0.008	222.95	0.037	0.052
220.45	0.027	0.009	223.00	0.038	0.052
220.50	0.027	0.009	223.05	0.038	0.053
220.55	0.027	0.010	223.10	0.038	0.054
220.60	0.027	0.010	223.15	0.038	0.055
220.65	0.028	0.011	223.20	0.039	0.056
220.70	0.028	0.012	223.25	0.039	0.056
220.75	0.028	0.012	223.30	0.039	0.057
220.80	0.028	0.013	223.35	0.039	0.058
220.85	0.028	0.014	223.40	0.039	0.058
220.90	0.029	0.015	223.45	0.040	0.059
220.95	0.029	0.015	223.50	0.040	0.060
221.00	0.029	0.016	223.55	0.040	0.060
221.05	0.029	0.017	223.60	0.040	0.060
221.10	0.029	0.018	223.65	0.041	0.061
221.15	0.030	0.019	223.70	0.041	0.061
221.20	0.030	0.020	223.75	0.041	0.062
221.25	0.030	0.020	223.80	0.041	0.062
221.30	0.030	0.021	223.85	0.041	0.063
221.35	0.031	0.022	223.90	0.042	0.063
221.40	0.031	0.023	223.95	0.042	0.064
221.45	0.031	0.024	224.00	0.042	0.064
221.50	0.031	0.025	224.05	0.042	0.064
221.55	0.031	0.026	224.10	0.042	0.065
221.60	0.032	0.027	224.15	0.043	0.065
221.65	0.032	0.028	224.20	0.043	0.066
221.70	0.032	0.029	224.25	0.043	0.066
221.75	0.032	0.030	224.30	0.043	0.067
221.80	0.033	0.030	224.35	0.044	0.067
221.85	0.033	0.031	224.40	0.044	0.068
221.90	0.033	0.032	224.45	0.044	0.068
221.95	0.033	0.033	224.50	0.044	0.069
222.00	0.033	0.034			
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## Summary for Pond 3P: Bioswale #2

Inflow Area = 0.246 ac, 43.28% Impervious, Inflow Depth > 4.17" for 25-yr event

Inflow = 1.30 cfs @ 12.04 hrs, Volume= 0.085 af

Outflow = 0.39 cfs @ 12.24 hrs, Volume= 0.085 af, Atten= 70%, Lag= 11.8 min

Discarded = 0.39 cfs @ 12.24 hrs, Volume= 0.085 af Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 229.57' @ 12.24 hrs Surf.Area= 1,065 sf Storage= 836 cf

Plug-Flow detention time= 29.2 min calculated for 0.085 af (100% of inflow)

Center-of-Mass det. time= 28.4 min (851.7 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	229.50'	504 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	227.50'	135 cf	Custom Stage Data (Conic) Listed below (Recalc)
			676 cf Overall x 20.0% Voids
#3	223.50'	424 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,312 cf Overall - 251 cf Embedded = 1,061 cf x 40.0% Voids
#4	224.50'	251 cf	24.0" Round Pipe Storage Inside #3
			L= 80.0'

1,315 cf Total Available Storage

Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
229.50	338	0	0	338
230.00	916	302	302	918
230.20	1,110	202	504	1,113
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
227.50	338	0	0	338
229.50	338	676	676	468
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
223.50	328	0	0	328
227.50	328	1,312	1,312	585

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.50'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 209.00'
#2	Primary	230.10'	1.5' long x 4.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

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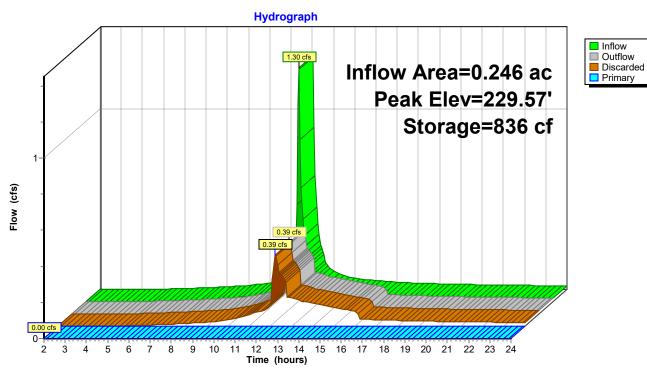
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**Discarded OutFlow** Max=0.39 cfs @ 12.24 hrs HW=229.56' (Free Discharge) 1=Exfiltration (Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=223.50' (Free Discharge) —2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Bioswale #2



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# Stage-Area-Storage for Pond 3P: Bioswale #2

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
223.50	328	0	228.60	994	750
223.60	334	13	228.70	1,001	757
223.70	341	26	228.80	1,008	763
223.80	347	39	228.90	1,014	770
223.90	354	52	229.00	1,021	777
224.00	360	66	229.10	1,027	784
224.10	367	79	229.20	1,034	791
224.20	373	92	229.30	1,040	797
224.30	379	105	229.40	1,047	804
224.40	386	118	229.50	1,391	811
224.50	392	131	229.60	1,484	849
224.60	399	147	229.70	1,589	897
224.70	405	165	229.80	1,705	957
224.80	411	185	229.90	1,832	1,028
224.90	418	205	230.00	1,971	1,113
225.00	424	226	230.10	2,066	1,209
225.10	431	248	230.20	2,166	1,315
225.20	437	270			
225.30	444	292			
225.40	450 450	315			
225.50 225.60	456 463	338			
	463 469	361 383			
225.70 225.80	476	406			
225.90	482	428			
226.00	489	449			
226.10	495	470			
226.20	501	491			
226.30	508	510			
226.40	514	528			
226.50	521	544			
226.60	527	558			
226.70	533	571			
226.80	540	584			
226.90	546	597			
227.00	553	610			
227.10	559	623			
227.20	566	636			
227.30	572	649			
227.40	578	662			
227.50	923	676			
227.60	929 936	682 689			
227.70 227.80	936 942	696			
227.90	942	703			
228.00	955	703 709			
228.10	962	716			
228.20	968	723			
228.30	975	730			
228.40	981	736			
228.50	988	743			

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### **Summary for Link 1L: Storm Sewer System**

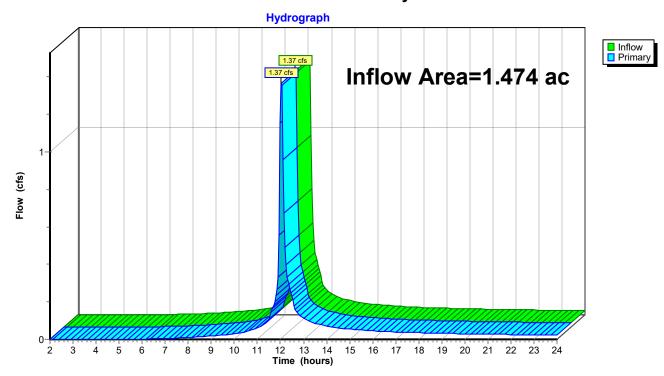
Inflow Area = 1.474 ac, 55.82% Impervious, Inflow Depth > 0.73" for 25-yr event

Inflow = 1.37 cfs @ 12.04 hrs, Volume= 0.089 af

Primary = 1.37 cfs @ 12.04 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs

### **Link 1L: Storm Sewer System**



2022-0303 273 Talcottville Rd Vernon CT CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

2022-0303-Post

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Time span=2.00-24.00 hrs, dt=0.05 hrs, 441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area #1 Runoff Area=23,450 sf 52.74% Impervious Runoff Depth>6.06"

Tc=6.0 min CN=84 Runoff=4.01 cfs 0.272 af

Subcatchment 2S: Drainage Area #2 Runoff Area=17,249 sf 88.99% Impervious Runoff Depth>7.34"

Tc=6.0 min CN=95 Runoff=3.31 cfs 0.242 af

Subcatchment 3S: Drainage Area #3 Runoff Area=10,711 sf 43.28% Impervious Runoff Depth>5.82"

Tc=6.0 min CN=82 Runoff=1.77 cfs 0.119 af

Subcatchment 4S: Drainage Area #4 Runoff Area=12,789 sf 27.23% Impervious Runoff Depth>5.24"

Tc=6.0 min CN=77 Runoff=1.93 cfs 0.128 af

Pond 1P: Bioswale #1 Peak Elev=229.22' Storage=2,865 cf Inflow=4.01 cfs 0.272 af

Discarded=1.05 cfs 0.272 af Primary=0.00 cfs 0.000 af Outflow=1.05 cfs 0.272 af

Pond 2P: Infiltration System #1 Peak Elev=223.04' Storage=0.053 af Inflow=3.31 cfs 0.242 af

Discarded=0.44 cfs 0.231 af Primary=0.47 cfs 0.011 af Outflow=0.91 cfs 0.242 af

Pond 3P: Bioswale #2 Peak Elev=230.07' Storage=1,175 cf Inflow=1.77 cfs 0.119 af

Discarded=0.54 cfs 0.119 af Primary=0.00 cfs 0.000 af Outflow=0.54 cfs 0.119 af

Link 1L: Storm Sewer System Inflow=1.93 cfs 0.140 af Primary=1.93 cfs 0.140 af

Total Runoff Area = 1.474 ac Runoff Volume = 0.762 af Average Runoff Depth = 6.20" 44.18% Pervious = 0.651 ac 55.82% Impervious = 0.823 ac

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## Summary for Subcatchment 1S: Drainage Area #1

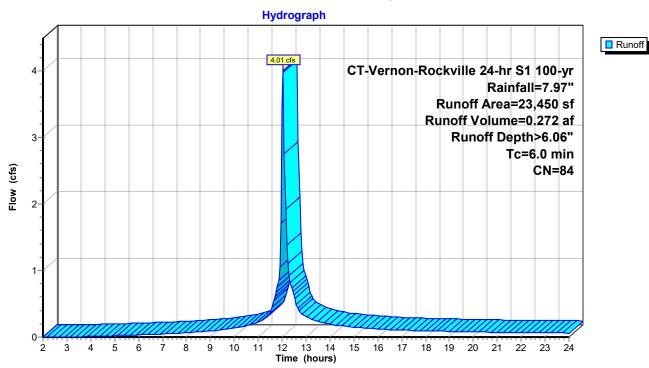
Runoff 4.01 cfs @ 12.04 hrs, Volume= 0.272 af, Depth> 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

	Area (sf)	CN	Description				
	11,083	69	50-75% Grass cover, Fair, HSG B				
*	5,360	98	Paved park	ing, HSG B	3		
	7,007	98	Unconnecte	Jnconnected roofs, HSG B			
,	23,450	84	Weighted A	verage			
	11,083		47.26% Pervious Area				
	12,367		52.74% Impervious Area				
	7,007		56.66% Un	connected			
	Tc Length	ı Slop	oe Velocity	Capacity	Description		
(	min) (feet)	) (ft/	ft) (ft/sec)	(cfs)			
	6.0				Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

# Subcatchment 1S: Drainage Area #1



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## Summary for Subcatchment 2S: Drainage Area #2

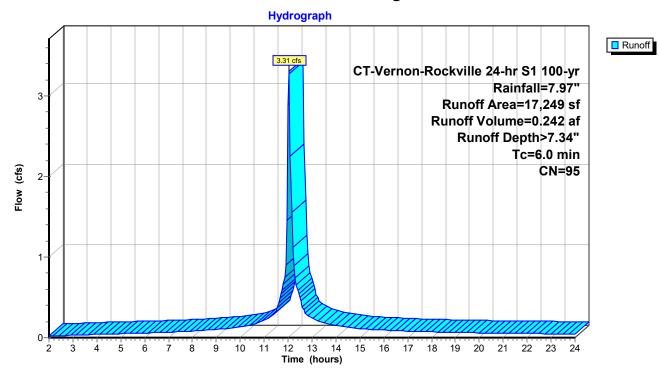
Runoff 3.31 cfs @ 12.04 hrs, Volume= 0.242 af, Depth> 7.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

A	rea (sf)	) CN Description				
	1,899	69 50-75% Grass cover, Fair, HSG B				
	15,350	98	Paved parking, HSG B			
	17,249	,249 95 Weighted Average				
	1,899 11.01% Pervious Area			vious Area		
	15,350 88.99% Impervious Are			pervious Ar	ea	
_				_		
Tc	Length	Slope	,	Capacity	Description	
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
6.0					Direct Entry, Direct Entry	

**Direct Entry, Direct Entry** 

# Subcatchment 2S: Drainage Area #2



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## Summary for Subcatchment 3S: Drainage Area #3

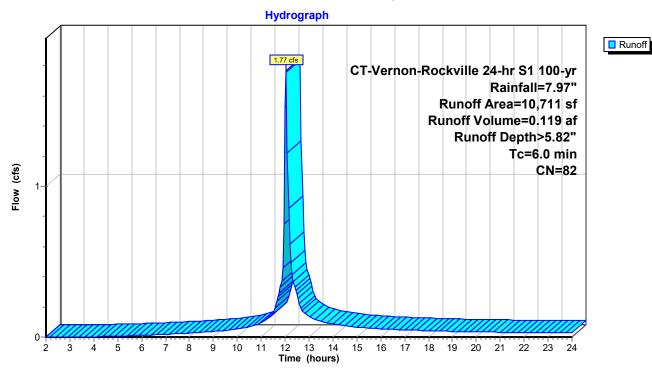
Runoff 1.77 cfs @ 12.04 hrs, Volume= 0.119 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

Aı	rea (sf)	CN	CN Description				
	6,075	69	50-75% Gra	ass cover, F	Fair, HSG B		
	1,643	98	Paved parking, HSG B				
	2,993	98	98 Unconnected roofs, HSG B				
	10,711	82	Weighted A	verage			
	6,075		56.72% Pervious Area				
	4,636		43.28% Imp	pervious Ar	rea		
	2,993		64.56% Un	connected			
Тс	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
6.0					Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

# Subcatchment 3S: Drainage Area #3



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# Summary for Subcatchment 4S: Drainage Area #4

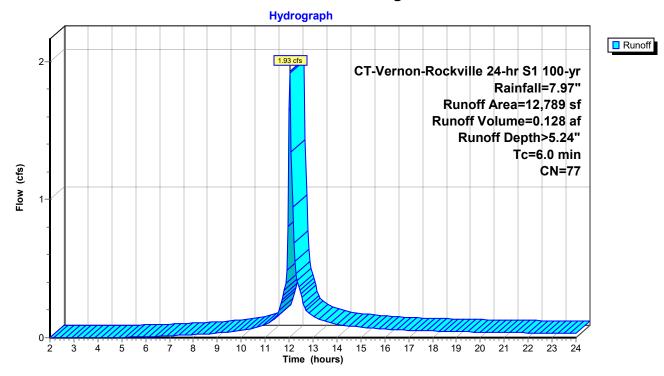
Runoff 1.93 cfs @ 12.04 hrs, Volume= 0.128 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs CT-Vernon-Rockville 24-hr S1 100-yr Rainfall=7.97"

A	rea (sf)	CN Description					
	9,306	69	50-75% Grass cover, Fair, HSG B				
	3,483	98	Paved parking, HSG B				
	12,789	77 Weighted Average					
	9,306		72.77% Pervious Area				
	3,483		27.23% Impervious Area				
-		01		0 "			
Tc	Length	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)			
6.0					Direct Entry, Direct Entry		

**Direct Entry, Direct Entry** 

# Subcatchment 4S: Drainage Area #4



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# Summary for Pond 1P: Bioswale #1

0.538 ac, 52.74% Impervious, Inflow Depth > 6.06" for 100-yr event Inflow Area =

Inflow 0.272 af

4.01 cfs @ 12.04 hrs, Volume= 1.05 cfs @ 12.27 hrs, Volume= 0.272 af, Atten= 74%, Lag= 13.6 min Outflow

Discarded = 1.05 cfs @ 12.27 hrs, Volume= 0.272 af Primary 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 229.22' @ 12.27 hrs Surf.Area= 3,111 sf Storage= 2,865 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 31.8 min (836.7 - 804.8)

<u>Volume</u>	Invert	Avail.Storage	Storage Description
#1	228.00'	3,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	226.00'	282 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,408 cf Overall x 20.0% Voids
#3	222.00'	624 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,936 cf Overall - 377 cf Embedded = 1,559 cf x 40.0% Voids
#4	223.00'	377 cf	24.0" Round Pipe Storage Inside #3
			L= 120.0'

4,647 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	704	0	0	704
229.00	1,737	1,182	1,182	1,744
230.00	2,660	2,182	3,364	2,682
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
226.00	704	0	0	704
228.00	704	1,408	1,408	892
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
222.00	484	0	0	484
226.00	484	1,936	1,936	796

Device	Routing	Invert	Outlet Devices
#1	Discarded	222.00'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 214.00'
#2	Primary	224.40'	<b>12.0" Round Culvert</b> L= 115.0' Ke= 0.500
			Inlet / Outlet Invert= 224.40' / 222.85' S= 0.0135 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.79 sf
#3	Device 2	229.25'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600
			I imited to weir flow at low heads

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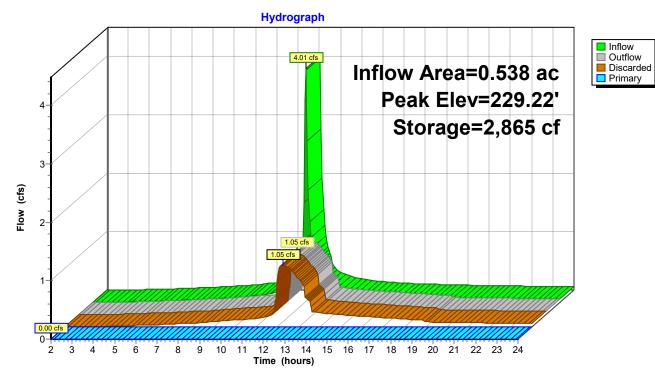
**Discarded OutFlow** Max=1.05 cfs @ 12.27 hrs HW=229.22' (Free Discharge) **1=Exfiltration** (Controls 1.05 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=222.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

3=Orifice/Grate (Controls 0.00 cfs)

## Pond 1P: Bioswale #1



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# Stage-Area-Storage for Pond 1P: Bioswale #1

Elevation (feet)         Wetted (sq-ft)         Storage (cubic-feet)         Elevation (feet)         Wetted (sq-ft)         Storage (cubic-feet)           222.00         484         0         227.10         1,603         1,155           222.10         492         19         227.20         1,613         1,170           222.20         500         39         227.30         1,622         1,184           222.30         507         58         227.40         1,632         1,198           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268           222.90         554         174         228.00         2,392         1,282
222.00         484         0         227.10         1,603         1,155           222.10         492         19         227.20         1,613         1,170           222.20         500         39         227.30         1,622         1,184           222.30         507         58         227.40         1,632         1,198           222.40         515         77         227.50         1,641         1,212           222.50         523         97         227.60         1,650         1,226           222.60         531         116         227.70         1,660         1,240           222.70         539         136         227.80         1,669         1,254           222.80         546         155         227.90         1,679         1,268
222.10     492     19     227.20     1,613     1,170       222.20     500     39     227.30     1,622     1,184       222.30     507     58     227.40     1,632     1,198       222.40     515     77     227.50     1,641     1,212       222.50     523     97     227.60     1,650     1,226       222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.20     500     39     227.30     1,622     1,184       222.30     507     58     227.40     1,632     1,198       222.40     515     77     227.50     1,641     1,212       222.50     523     97     227.60     1,650     1,226       222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.30     507     58     227.40     1,632     1,198       222.40     515     77     227.50     1,641     1,212       222.50     523     97     227.60     1,650     1,226       222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.40     515     77     227.50     1,641     1,212       222.50     523     97     227.60     1,650     1,226       222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.50     523     97     227.60     1,650     1,226       222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.60     531     116     227.70     1,660     1,240       222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222.70     539     136     227.80     1,669     1,254       222.80     546     155     227.90     1,679     1,268
222 90 554 174 228 00 2 392 1 282
223.00 562 194 228.10 2,475 1,357
223.10 570 217 228.20 2,563 1,440
223.20 578 244 228.30 2,656 1,532
223.30 585 273 228.40 2,753 1,633
223.40 593 303 228.50 2,854 1,744
223.50 601 335 228.60 2,961 1,866
223.60 609 367 228.70 3,072 1,998
223.70 617 400 228.80 3,187 2,142
223.80 624 433 228.90 3,307 2,297
223.90 632 467 229.00 3,432 2,464 224.00 640 500 229.10 3,517 2,642
224.00 640 500 229.10 3,517 2,642 224.10 648 534 229.20 3,604 2,829
224.10 646 534 229.20 3,004 2,828 224.20 656 568 229.30 3,693 3,024
224.20 636 306 229.30 3,093 3,024 224.30 663 601 229.40 3,783 3,227
224.40 671 634 229.50 3,876 3,440
224.50 679 666 229.60 3,971 3,662
224.60 687 697 229.70 4,068 3,894
224.70 695 728 229.80 4,166 4,135
224.80 702 757 229.90 4,267 4,386
224.90 710 783 230.00 <b>4,370 4,647</b>
225.00 718 807
225.10 726 826
225.20 734 846
225.30 741 865
225.40 749 884
225.50 757 904
225.60 765 923
225.70 773 943
225.80 780 962
225.90 788 981 226.00 1,500 1,001
226.00 1,500 1,001 226.10 1,509 1,015
226.20 1,519 1,029
226.30 1,528 1,043
226.40 1,538 1,057
226.50 1,547 1,071
226.60 1,556 1,085
226.70 1,566 1,099
226.80 1,575 1,113
226.90 1,585 1,127
227.00 1,594 1,141

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## Summary for Pond 2P: Infiltration System #1

Inflow Area = 0.934 ac, 68.10% Impervious, Inflow Depth > 3.11" for 100-yr event
Inflow = 3.31 cfs @ 12.04 hrs, Volume= 0.242 af
Outflow = 0.91 cfs @ 12.26 hrs, Volume= 0.242 af, Atten= 73%, Lag= 13.0 min
Discarded = 0.47 cfs @ 12.26 hrs, Volume= 0.231 af
Primary = 0.47 cfs @ 12.26 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 223.04' @ 12.26 hrs Surf.Area= 0.023 ac Storage= 0.053 af

Plug-Flow detention time= 29.3 min calculated for 0.242 af (100% of inflow) Center-of-Mass det. time= 29.1 min (790.5 - 761.4)

Volume	Invert	Avail.Storag	ge Storage Description			
#1	219.50'	0.030 a	af 12.00'W x 82.00'L x 5.00'H Prismatoid			
			0.113 af Overall - 0.039 af Embedded = 0.074 af x 40.0% Voids			
#2	220.50'	0.039 a	af <b>36.0" Round Pipe Storage</b> x 3 Inside #1			
			L= 80.0'			
		0.069 a	af Total Available Storage			
			•			
Device	Routing	Invert	Outlet Devices			
#1	Primary	222.70'	<b>12.0" Round Culvert</b> L= 31.0' Ke= 0.500			
	,		Inlet / Outlet Invert= 222.70' / 219.30' S= 0.1097 '/' Cc= 0.900			
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf			
#2	Discarded					
<i>'''</i>	D.CCCI GOG		Conductivity to Groundwater Elevation = 200.00'			
			Conductivity to Croandwater Elevation – 200.00			

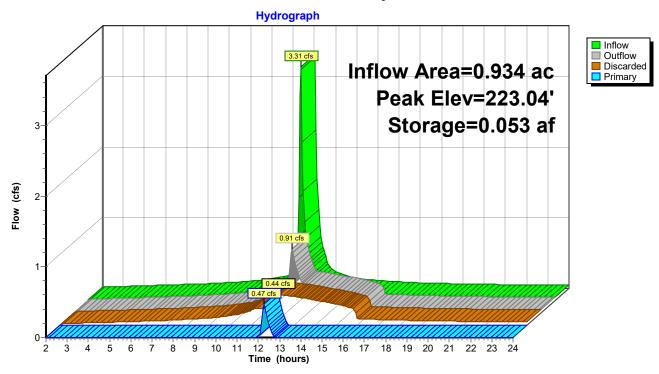
**Discarded OutFlow** Max=0.44 cfs @ 12.26 hrs HW=223.04' (Free Discharge) **2=Exfiltration** (Controls 0.44 cfs)

Primary OutFlow Max=0.46 cfs @ 12.26 hrs HW=223.04' (Free Discharge) 1=Culvert (Inlet Controls 0.46 cfs @ 1.98 fps)

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# Pond 2P: Infiltration System #1



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# Stage-Area-Storage for Pond 2P: Infiltration System #1

Elevation (sers) (acres)         (acres)         (acre-feet)         (eet)         (acres)         (acre-feet)           219.50         0.023         0.000         222.05         0.034         0.035           219.55         0.023         0.000         222.10         0.034         0.036           219.65         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.001         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.45         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.041           219.95         0.025         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.75	- ·	147 (1 1	0.1	l =,	187 (/ 1	01
219.50						
219.55         0.023         0.0001         222.10         0.034         0.036           219.60         0.023         0.001         222.15         0.034         0.038           219.70         0.023         0.002         222.25         0.034         0.038           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.50         0.036         0.042           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.047           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         <						
219.60         0.023         0.001         222.15         0.034         0.037           219.65         0.023         0.001         222.20         0.034         0.039           219.75         0.024         0.002         222.35         0.035         0.040           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.044           220.00         0.025         0.004         222.55         0.036         0.044           220.01         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.044           220.15         0.025         0.005         222.55         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.046           220.15         0.026         0.007         222.85         0.037         0.049           220.20         0.026         0.007         222.85         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.65         0.023         0.001         222.20         0.034         0.038           219.75         0.024         0.002         222.25         0.034         0.039           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.46         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.005         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.16         0.026         0.006         222.75         0.037         0.049           220.25         0.026         0.007         222.80         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.70         0.023         0.002         222.25         0.034         0.039           219.80         0.024         0.002         222.35         0.035         0.041           219.85         0.024         0.003         222.45         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.045           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.75         0.024         0.002         222.35         0.035         0.041           219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.004         222.45         0.035         0.042           219.95         0.025         0.004         222.55         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.05         0.025         0.005         222.66         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.045           220.15         0.025         0.006         222.77         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.048           220.35         0.026         0.007         222.85         0.037         0.051           220.40         0.026         0.008         222.95         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.80         0.024         0.003         222.35         0.035         0.041           219.85         0.024         0.003         222.40         0.035         0.042           219.95         0.025         0.004         222.45         0.035         0.043           219.95         0.025         0.005         222.55         0.036         0.044           220.05         0.025         0.005         222.56         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.045           220.10         0.025         0.006         222.70         0.036         0.046           220.10         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.050           220.35         0.026         0.008         222.95         0.037         0.051           220.40         0.027         0.009         223.00         0.037 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.85         0.024         0.003         222.40         0.035         0.042           219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.66         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.99         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.90         0.024         0.004         222.45         0.035         0.043           219.95         0.025         0.004         222.50         0.036         0.044           220.05         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.049           220.30         0.026         0.008         222.95         0.037         0.052           220.35         0.026         0.008         222.95         0.037         0.052           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
219.95         0.025         0.004         222.50         0.036         0.044           220.06         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.052           220.40         0.026         0.008         222.90         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.15         0.038         0.052           220.50         0.027         0.010         223.15         0.038 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.00         0.025         0.005         222.55         0.036         0.045           220.10         0.025         0.005         222.60         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.45         0.027         0.009         223.05         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038 <t< td=""><td>219.90</td><td></td><td></td><td></td><td>0.035</td><td></td></t<>	219.90				0.035	
220.05         0.025         0.005         222.60         0.036         0.045           220.15         0.025         0.006         222.65         0.036         0.046           220.15         0.025         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.052           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.053           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.60         0.027         0.010         223.15         0.038 <t< td=""><td>219.95</td><td>0.025</td><td>0.004</td><td>222.50</td><td>0.036</td><td>0.044</td></t<>	219.95	0.025	0.004	222.50	0.036	0.044
220.10         0.025         0.006         222.65         0.036         0.046           220.15         0.026         0.006         222.70         0.036         0.047           220.20         0.026         0.007         222.80         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.059           220.35         0.026         0.008         222.90         0.037         0.050           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039 <t< td=""><td>220.00</td><td>0.025</td><td>0.005</td><td>222.55</td><td>0.036</td><td>0.045</td></t<>	220.00	0.025	0.005	222.55	0.036	0.045
220.15         0.025         0.006         222.75         0.036         0.047           220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.051           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039 <t< td=""><td>220.05</td><td>0.025</td><td>0.005</td><td>222.60</td><td>0.036</td><td>0.045</td></t<>	220.05	0.025	0.005	222.60	0.036	0.045
220.20         0.026         0.006         222.75         0.037         0.048           220.25         0.026         0.007         222.80         0.037         0.050           220.30         0.026         0.007         222.85         0.037         0.051           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.65         0.028         0.011         223.15         0.038         0.054           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039 <t< td=""><td>220.10</td><td>0.025</td><td>0.005</td><td>222.65</td><td>0.036</td><td>0.046</td></t<>	220.10	0.025	0.005	222.65	0.036	0.046
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.15</td><td>0.025</td><td>0.006</td><td>222.70</td><td>0.036</td><td>0.047</td></t<>	220.15	0.025	0.006	222.70	0.036	0.047
220.25         0.026         0.007         222.80         0.037         0.049           220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.011         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td>220.20</td><td>0.026</td><td>0.006</td><td>222.75</td><td>0.037</td><td>0.048</td></t<>	220.20	0.026	0.006	222.75	0.037	0.048
220.30         0.026         0.007         222.85         0.037         0.050           220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.010         223.10         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.25         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.45         0.040 <t< td=""><td></td><td></td><td>0.007</td><td>222.80</td><td>0.037</td><td>0.049</td></t<>			0.007	222.80	0.037	0.049
220.35         0.026         0.008         222.90         0.037         0.051           220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.10         0.038         0.053           220.55         0.027         0.010         223.15         0.038         0.054           220.60         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.013         223.35         0.039         0.058           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.95         0.029         0.015         223.45         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.40         0.026         0.008         222.95         0.037         0.052           220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.99         0.029         0.015         223.45         0.040         0.060           221.00         0.029         0.016         223.55         0.040 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.45         0.027         0.009         223.00         0.038         0.052           220.50         0.027         0.009         223.05         0.038         0.053           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.50         0.027         0.009         223.05         0.038         0.053           220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.058           220.95         0.029         0.015         223.55         0.040         0.059           221.00         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.55         0.027         0.010         223.10         0.038         0.054           220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.35         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.10         0.029         0.017         223.60         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.60         0.027         0.010         223.15         0.038         0.055           220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.65         0.028         0.011         223.20         0.039         0.056           220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.55         0.040         0.060           221.15         0.030         0.019         223.70         0.041         0.061           221.15         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.70         0.028         0.012         223.25         0.039         0.056           220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.75         0.028         0.012         223.30         0.039         0.057           220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.016         223.55         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.80         0.041 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.80         0.028         0.013         223.35         0.039         0.058           220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.85         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.062           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.85         0.028         0.014         223.40         0.039         0.058           220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.90         0.042         0.063           221.45         0.031         0.023         223.95         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.90         0.029         0.015         223.45         0.040         0.059           220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.85         0.041         0.063           221.40         0.031         0.022         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.05         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
220.95         0.029         0.015         223.50         0.040         0.060           221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.00         0.029         0.016         223.55         0.040         0.060           221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.024         224.00         0.042         0.064           221.45         0.031         0.025         224.05         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.05         0.029         0.017         223.60         0.040         0.060           221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.063           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.50         0.031         0.025         224.00         0.042         0.064           221.55         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.10         0.029         0.018         223.65         0.041         0.061           221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.15         0.030         0.019         223.70         0.041         0.061           221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.030         224.30         0.043 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.20         0.030         0.020         223.75         0.041         0.062           221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.80         0.033         0.030         224.35         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.25         0.030         0.020         223.80         0.041         0.062           221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.031         224.40         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
221.30         0.030         0.021         223.85         0.041         0.063           221.35         0.031         0.022         223.90         0.042         0.063           221.40         0.031         0.023         223.95         0.042         0.064           221.45         0.031         0.024         224.00         0.042         0.064           221.50         0.031         0.025         224.05         0.042         0.064           221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.033         224.45         0.044 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
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221.55         0.031         0.026         224.10         0.042         0.065           221.60         0.032         0.027         224.15         0.043         0.065           221.65         0.032         0.028         224.20         0.043         0.066           221.70         0.032         0.029         224.25         0.043         0.066           221.75         0.032         0.030         224.30         0.043         0.067           221.80         0.033         0.030         224.35         0.044         0.067           221.85         0.033         0.031         224.40         0.044         0.068           221.90         0.033         0.032         224.45         0.044         0.068           221.95         0.033         0.033         224.50 <b>0.044 0.069</b>						
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221.70       0.032       0.029       224.25       0.043       0.066         221.75       0.032       0.030       224.30       0.043       0.067         221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.75     0.032     0.030     224.30     0.043     0.067       221.80     0.033     0.030     224.35     0.044     0.067       221.85     0.033     0.031     224.40     0.044     0.068       221.90     0.033     0.032     224.45     0.044     0.068       221.95     0.033     0.033     224.50 <b>0.044 0.069</b>						
221.80       0.033       0.030       224.35       0.044       0.067         221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.85       0.033       0.031       224.40       0.044       0.068         221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.90       0.033       0.032       224.45       0.044       0.068         221.95       0.033       0.033       224.50 <b>0.044 0.069</b>						
221.95 0.033 0.033 224.50 <b>0.044 0.069</b>				-		
222.00 0.033 0.034				224.50	0.044	0.069
	222.00	0.033	0.034			

Prepared by Freeman Companies

Printed 6/28/2022

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# Summary for Pond 3P: Bioswale #2

Inflow Area = 0.246 ac, 43.28% Impervious, Inflow Depth > 5.82" for 100-yr event

Inflow = 1.77 cfs @ 12.04 hrs, Volume= 0.119 af

Outflow = 0.54 cfs @ 12.23 hrs, Volume= 0.119 af, Atten= 70%, Lag= 11.6 min

Discarded = 0.54 cfs @ 12.23 hrs, Volume= 0.119 af Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs / 5 Peak Elev= 230.07' @ 12.23 hrs Surf.Area= 1,644 sf Storage= 1,175 cf

Plug-Flow detention time= 28.8 min calculated for 0.119 af (100% of inflow)

Center-of-Mass det. time= 28.5 min (839.9 - 811.3)

Volume	Invert	Avail.Storage	Storage Description
#1	229.50'	504 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	227.50'	135 cf	Custom Stage Data (Conic) Listed below (Recalc)
			676 cf Overall x 20.0% Voids
#3	223.50'	424 cf	Custom Stage Data (Conic) Listed below (Recalc)
			1,312 cf Overall - 251 cf Embedded = 1,061 cf x 40.0% Voids
#4	224.50'	251 cf	24.0" Round Pipe Storage Inside #3
			L= 80.0'

1,315 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
229.50	338	0	0	338
230.00	916	302	302	918
230.20	1,110	202	504	1,113
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft <u>)</u>
227.50	338	0	0	338
229.50	338	676	676	468
Elevation	Surf.Area	Inc.Store	Cum.Store	Wet.Area
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	(sq-ft)
223.50	328	0	0	328
227.50	328	1,312	1,312	585

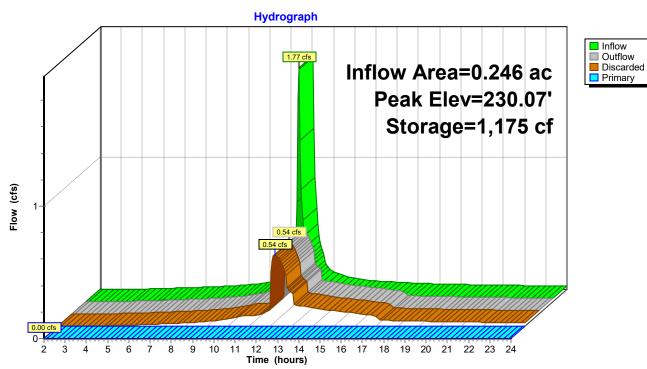
Device	Routing	Invert	Outlet Devices
#1	Discarded	223.50'	10.000 in/hr Exfiltration over Wetted area
			Conductivity to Groundwater Elevation = 209.00'
#2	Primary	230.10'	1.5' long x 4.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

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**Discarded OutFlow** Max=0.54 cfs @ 12.23 hrs HW=230.06' (Free Discharge) 1=Exfiltration (Controls 0.54 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=223.50' (Free Discharge) —2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Bioswale #2



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# Stage-Area-Storage for Pond 3P: Bioswale #2

		•	J		
Elevation	Wetted	Storage	Elevation	Wetted	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
223.50	328	0	228.60	994	750
223.60	334	13	228.70	1,001	757
223.70	341	26	228.80	1,008	763
223.80	347	39	228.90	1,014	770
223.90	354	52	229.00	1,021	777
224.00	360	66	229.10	1,027	784
224.10	367	79	229.20	1,034	791
224.20	373	92	229.30	1,040	797
224.30	379	105	229.40	1,047	804
224.40	386	118	229.50	1,391	811
224.50	392	131	229.60	1,484	849
224.60	399	147	229.70	1,589	897
224.70	405	165	229.80	1,705	957
224.80	411	185	229.90	1,832	1,028
224.90	418	205	230.00	1,971	1,113
225.00	424	226	230.10	2,066	1,209
225.10	431	248	230.20	2,166	1,315
225.20	437	270			
225.30	444	292			
225.40	450	315			
225.50	456	338			
225.60	463	361			
225.70	469 476	383			
225.80	476 482	406			
225.90	489	428 449			
226.00 226.10	495	470			
226.20	501	491			
226.30	508	510			
226.40	514	528			
226.50	521	544			
226.60	527	558			
226.70	533	571			
226.80	540	584			
226.90	546	597			
227.00	553	610			
227.10	559	623			
227.20	566	636			
227.30	572	649			
227.40	578	662			
227.50	923	676			
227.60	929	682			
227.70	936	689			
227.80	942	696			
227.90	949	703			
228.00	955	709			
228.10	962	716			
228.20	968	723			
228.30	975	730 736			
228.40	981	736			
228.50	988	743			

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## **Summary for Link 1L: Storm Sewer System**

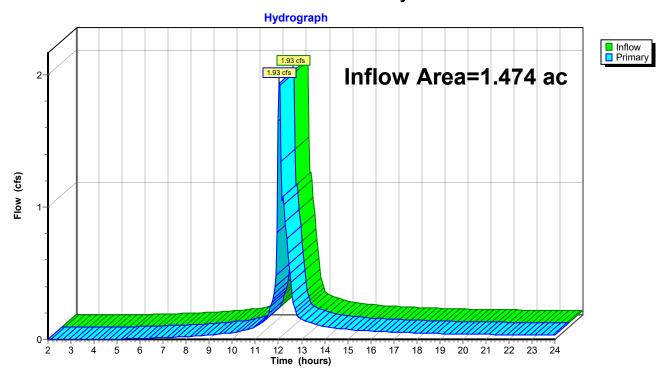
Inflow Area = 1.474 ac, 55.82% Impervious, Inflow Depth > 1.14" for 100-yr event

Inflow = 1.93 cfs @ 12.04 hrs, Volume= 0.140 af

Primary = 1.93 cfs @ 12.04 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-24.00 hrs, dt= 0.05 hrs

# **Link 1L: Storm Sewer System**



#### Water Quality Volume (WQV) Worksheet

Project: Kindercare Learning Center Designed: NVG Date: 6/29/2022 Address: 273 Talcotville Rd (CT Rt 83), Vernon CT JNL Date: 6/29/2022 Checked: 1. Impervious cover area 0.823 ac 2. Site area 1.474 ac 3. Percent impervious cover, I (Impervious Area/Site Area) 55.820 4. Volumetric runoff coefficient, R = 0.05 + 0.009(I) 0.552 5. WQV = (1"\*R\*A)/12 0.068 ac-ft 2953 cu-ft or

#### Conclusion

Prior to Discharge, Stormwater Management Systems Retains 0.140 ac ft > WQV of 0.068 ac

Bioswale #1: overflow grate @ elevation=229.25' retains 0.065 ac-ft (2829 cu-ft)
Bioswale #2: overflow weir @ elevation=230.1' retains 0.028 ac-ft (1209 cu-ft)
Infiltration Systems: 12" HDPE outlet @ inv=222.70' retains 0.047 ac-ft (2047 cu-ft)

INSTRUCTIONS: Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table

- 2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
- 3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
- 4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
- 5. Total TSS Removal = Sum All Values in Column D

**TSS Removal Calculation** 

Location: Design Point: Existing Detention Pond

	Α	В	С	D	E
		TSS Removal	Starting TSS	Amount	Remaining
	BMP <sup>1</sup>	Rate <sup>1</sup>	Load*	Removed (B*C)	Load (C-D)
	Bioswales/ Rain Gardens	0.90	1.00	0.90	0.10
eet	Hooded Outlets in Catch Basins	0.25	0.10	0.03	0.08
Worksheet	Infiltration System	0.80	0.08	0.06	0.02
>					
) )					

Total TSS Removal = 99%

Project: Kindercare Learning Center FC#2022-0303
Prepared By: NVG
Date: 6/29/2022

<sup>\*</sup>Equals remaining load from previous BMP (E) which enters the BMP

# 6/30/2022

# Kindercare Learning Facility

#### Date:

## Project:

Conformance with the following criteria shall be initialed in the spaces provided below by a Connecticut Registered Professional Engineer, Land Surveyor, or Certified Soils Scientist as appropriate. If conditions cannot be met comments addressing each item should be provided by the applicant in the space provided below. Comments will be reviewed with Town Staff at the scheduled Development Staff Meeting and documented.

Item	Description	Verified	Comments
1	An Existing Conditions Plan is provided documenting sensitive natural resources including but not limited to existing wetlands (as designated by a Certified Soils Scientist in Connecticut), streams, ponds, vernal pools, flood zones, stream channel encroachment lines, soil types and infiltration rates, wells, tree lines, property boundaries, and other items that may be requested by the Town.	JNL	Please see the survey titled "ALTA/NSPS LAND TITLE SURVEY" dated 4/22/2022 by Freeman Companies for more information.  No Wetlands were delineated onsite as can be seen on the Official Inland Wetlands Redesignation Map for Vernon, CT.  The soil types can be seen as per the NRCS Web Soil Survey included in the Stormwater Management Report by Freeman Companies dated 6/29/2022.
2	Utilizing the Existing Conditions Plan as a guide, development has been located to maximize preservation of contiguous natural sensitive areas.	JNL	All proposed work is outside of the 100' Wetland Review Area associated with the Hockanum River Wetlands.
3	Proposed site developments for residential or two family dwellings on more than one individual parcel, all commercial, industrial, and retail developments have been guided by the applicable requirements of the Town's Low Impact Development Stormwater Quality Manual and the Connecticut Storm Water Quality Manual.	JNL	The proposed project is guided by and meets all applicable requirements of the Town's Low Impact Development Stormwater Quality Manual and the Connecticut Stormwater Quality Manual.
4	Bioretention Basins or Rain Gardens have been incorporated within yards, median strips, culde-sacs islands, and parking lot islands.	JNL	Bioretention basins and rain gardens have been implemented to collect storm water runoff from both pervious and impervious surfaces to promote water quality and groundwater recharge.

Date: 6/30/2022

# Project: Kindercare Learning Facility

Conformance with the following criteria shall be initialed in the spaces provided below by a Connecticut Registered Professional Engineer, Land Surveyor, or Certified Soils Scientist as appropriate. If conditions cannot be met comments addressing each item should be provided below. Comments will be reviewed with Town Staff at the scheduled development staff meeting and documented.

Item	Description	Verified	Comments	
5	Dry Wells have been incorporated into the design to control roof and pavement runoff.  Permeable (Porous) Pavement has been incorporated into areas of low traffic, parking lots, residential and light commercial use driveways, walkways, bike paths, etc.  Natural areas including woodlands, regulated wetland areas, naturally vegetated areas have been preserved/ and or replicated to the maximum extent practical.		Subsurface infiltration systems have been incorporated with this project to collect roof and pavement runoff promoting water quality and groundwater recharge.	
6			Stormwater runoff from impervious surfaces (parking lot, walkways, roof) of the proposed project has been designed to be captured and treated by the proposed stormwater management system.	
7			Erosion controls measures were delineated to ensure no negative downstream impacts. Existing tree and shrub line limits have been preserved to the maximum extent practicable.	
8	Post Development stormwater runoff is at or less than the predevelopment runoff.	JNL	Post development stormwater runoff is less than pre development runoff. Please see the Stormwater Management Report by Freeman Companies dated 6/29/2022 for more information.	
9	Stormwater infiltration has been provided by the use of underground storage units, devices, and/or infiltration swales/trenches.	JNL	Stormwater infiltration has been provided for by use of subsurface storage units below the parking lot and each bioretention basin/rain garden.	
10	Level spreaders/vegetation have been provided at storm drainage outfalls to enhance water quality and mitigate erosion.	JNL	Rip rap aprons have been used where overland drainage outfalls are anticipated to enhance water quality and mitigate erosion.	

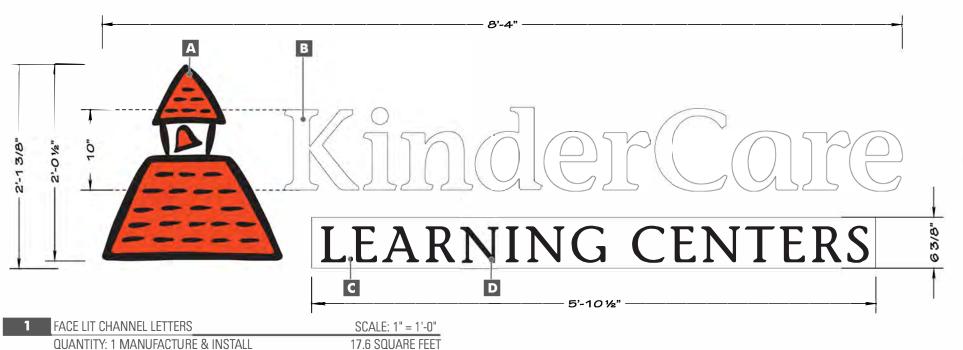
Date: 6/30/2022

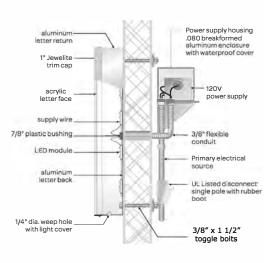
# Project: Kindercare Learning Facility

Conformance with the following criteria shall be initialed in the spaces provided below by a Connecticut Registered Professional Engineer, Land Surveyor, or Certified Soils Scientist as appropriate. If conditions cannot be met comments addressing each item should be provided below. Comments will be reviewed with Town Staff at the scheduled development staff meeting and documented.

Item	Description	Verified	Comments
11	On-Site retention/detention facilities have been provided to address water quality and storm water runoff.	JNL	On-site bioretention basins/rain gardens and an infiltration system have been provided to address water quality and stormwater runoff.
12	Rain Barrels, cisterns, and/or other rainwater harvesting techniques to reuse rainwater for irrigation and other non-potable uses are incorporated into the design.	JNL	Stormwater runoff is designed to be directed towards biorention basins/rain gardens irrigating plantings inside bioretention basins/rain gardens.
13	An Erosion and Sedimentation Control Plan conforming to the Standards of the Connecticut Guidelines for Soil Erosion and Sediment Control is included in the design.	JNL	C1.02 titled E&S Plan conforms to the Standards of Connecticut Guidelines for Soil Erosion and Sediment Control.
14	A yearly maintenance plan of all components of best management practices associated with storm water management has been provided.	JNL	Please see the Stormwater Management Report by Freeman Companies dated 6/29/2022 for a maintenance plan for the proposed project.
15	Impervious area percentages for pre and post development have been provided.	JNL	Please see the Stormwater Management Report by Freeman Companies dated 6/29/2022 for a detailed depiction of impervious percentages for pre and post development conditions.
16	When conflicts exist between the Town's Low Impact Development Stormwater Quality Manual and the Connecticut Storm Water Quality Manual the State Manual shall govern.	JNL	The Town's Low Impact Development Stormwater Quality Manual and the Connecticut Stormwater Quality Manual were followed for this project and no conflicts between the two occurred.

# **West Elevation**





1.2 DETAIL VIEW

FABRICATION SPECIFICATIONS A PAN CHANNEL WHITE LED CLEAR LEXAN FACE DIGITAL PRINT TRIM CAP 3/4" BLACK 5" DEEP BLACK B PAN CHANNEL TYPE FRONT LIT WHITE LED LIGHTING WHITE ACRYLIC TRIM CAP 3/4" BLACK RETURN COLOR 5" DEEP BLACK CABINET PAINT COLOR MP# N202 WHITE 1/2" ACRYLIC BLACK PERF (FIRST SURFACE) D PUSH THRU TYPE DIFFUSER (SECOND SURFACE)

**MOUNTING: FLUSH MOUNTED WITH REMOTE RACEWAY** 

ART SUPERIMPOSED ON PHOTO - SHOWN AT APPROXIMATE RELATIVE SCALE







sales@meyersignco.com www.meyersignco.com phone: 503 620 - 8200 fax: 503 620 - 7074 PROJECT: KCLC - Proto-k

ACCT. MGR:

SHOP MGR:

S C A L E:

DESIGNER:

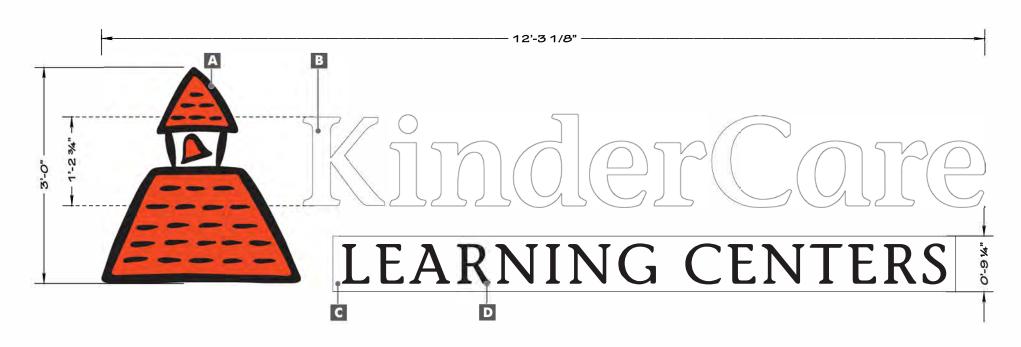
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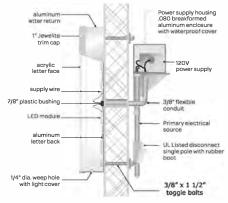
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	REVISION #			REVISION #			
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CUSTOMER APPROVAL:	LANDLORD APPROVAL:
DATE:	DATE:

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# **South Elevation**





FABRICATION SPECIFICATIONS A PAN CHANNEL FRONT LIT LIGHTING WHITE LED CLEAR LEXAN FACE VINYL DIGITAL PRINT TRIM CAP 3/4" BLACK 5" DEEP BLACK B PAN CHANNEL TYPE FRONT LIT WHITE LED LIGHTING WHITE ACRYLIC TRIM CAP 3/4" BLACK RETURN COLOR 5" DEEP BLACK **CI** CABINET WHITE LED PAINT COLOR MP# N202 WHITE 1/2" ACRYLIC BLACK PERF (FIRST SURFACE) D PUSH THRU TYPE DIFFUSER (SECOND SURFACE)

**MOUNTING: FLUSH MOUNTED WITH REMOTE RACEWAY** 

FACE LIT CHANNEL LETTERS

QUANTITY: 1 MANUFACTURE & INSTALL

SCALE: 3/4" = 1'-0" 37.7 SQUARE FEET 3.2 DETAIL VIEW





sales@meyersignco.com www.meyersignco.com phone: 503 620 - 8200 fax: 503 620 - 7074 PROJECT: KCLC

ACCT. MGR:

ADDRESS: SHOP MGR:

S C A L E:

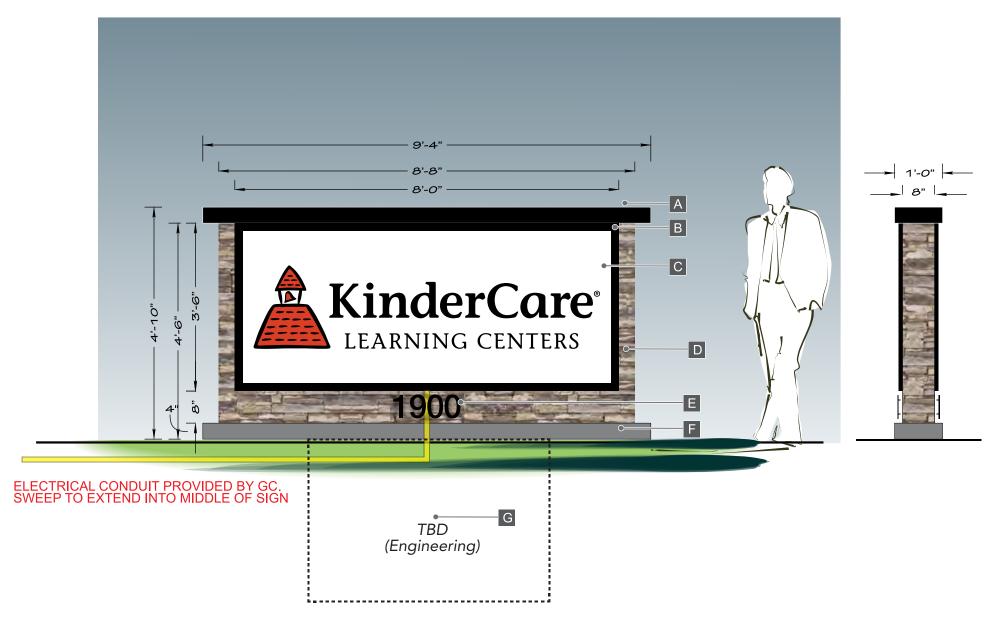
DESIGNER: D A T E: 06.13.19

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CUSTOMER APPROVAL:	LANDLORD APPROVAL:
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D/F INTERNALLY ILLUMINATED MONUMENT DISPLAY SCALE: ½" = 1'-0"

QUANTITY: 1 MANUFACTURE & INSTALL



COLOR	KEY				
PAINT	MATCH 3630-143				
VINYL	3M 3630-143 POPPY RED				
PAINT	BLACK				
VINYL	3M 3630-22 BLACK				
NOTE: UNILESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY, PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS					





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PROJECT: \_\_\_\_\_\_ ACCT. MGR: \_\_\_\_\_\_ ADDRESS: \_\_\_\_\_ SHOP MGR: \_\_\_\_\_ S C A L E : \_\_\_\_\_ DESIGNER: \_\_\_\_\_ D A T E : \_\_\_\_\_

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CUSTOMER APPROVAL:	LANDLORD APPROVAL:
DATE:	DATE:

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# TOWN OF VERNON

55 West Main St., VERNON, CT 06066-3291 (860) 870-3640 sgately@vernon-ct.gov

#### **MEMORANDUM**

TO: Planning & Zoning Commission

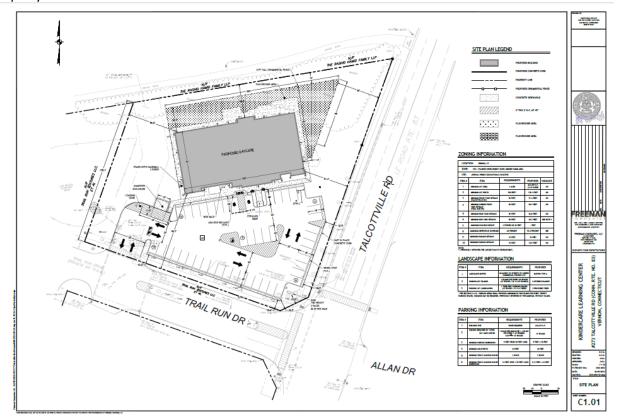
FROM: Shaun Gately, Town Planner

SUBJECT: PZ 2022-12, 273 Talcottville Rd. Site Plan & Special Permit for Kinder

DATE: July 13, 2022

#### **REQUEST**

**PZ-2022-12, 273 Talcottvile Rd.** An Application of Larissa A. Addison, Esq. for a Site Plan and Special Permit to change an approved Site Plan from commercial use to a proposed Early Educational Facility at 273 Talcottville Rd. (Tax Map 03, Block 04, Parcel 9C). The Special Permit modification requested includes Section 14.1.1.1 (Plan of Development (POD) and Sec. 4.24.4.3.10 (education facility). The property is zoned PDZ Gerber Farm Area District.





**Site Location** 

#### **SUMMARY**

The Applicant proposes to construct an approximately 9900 sq. ft. early education facility, at 273 Talcottville Rd. Access to the site will utilize the existing driveway entrance/exit to 2 Trail Run (Trail Run apartments). This out parcel was originally approved as part of a comprehensive sit plan approval which included the Trail Run Apartments, to contain a 9,400 sq ft retail pad. However, inside the PDZ-Gerber Farm zone all uses require a special permit, therefor the applicant needs to resubmit this application for review. The applicant has submitted, an application, a site plan set, drainage plan, LID Checklist, traffic statement, and architectural elevations, all included in the agenda packet.



#### **CURRENT REVIEW**

<u>Traffic Authority:</u> Chief Kelly reviewed the site plan and found it consistent with the previous site plan approval that was endorsed by the Traffic Authority on 2-11-16. All stipulations of that approval have already been installed as part of the Trail Run development.

<u>Design Review Commission:</u> The advisory Design Review Commission will review the application on July 19, 2022, and will provide comments at the public hearing on 7-21-22.

#### **STAFF REVIEWS:**

<u>Town Engineer:</u> The Town Engineer has reviewed the plans and found the plans acceptable. His comments are attached separately.

<u>Fire Marshall:</u> The Fire Marshal has no comments or objections to this plan. He has worked with their design staff on specifications for fire apparatus for the last several months and they meet all requirements.

Wetlands Agent: The wetlands agent has reviewed the application and has no comment.

<u>Police Chief:</u> The Police Chiefs comments were submitted separately with the Traffic Control Authority's response and found the plan to be adequate.

Zoning Enforcement: The ZEO has reviewed the plans and concurs that all previous special permits still apply, leaving only the special permit for Education Facility left to obtain.

<u>Health Department:</u> The North Central District Health Department (NCDHD) has reviewed the Daycare plans and will review and comment as part of the Building permit process.

Town Planner Summary: The Gerber Farm Zone allows for a large variety of uses by special permit that are consistent with the Plan of Conservation and Development. This site has previously been reviewed as part of a comprehensive development plan to include 4 commercial pad sites with frontage on Rte. 83. As part of that original approval several road improvements were made to accommodate the commercial activity which includes a road widening on Rte. 83, a full access driveway with a traffic control signal, dedicated pedestrian signals, and restricted right in- right out secondary driveway. This alternative use of an early childhood education facility and modification to one of the retail pads is consistent with the overall development plan and the intent of the Gerber Farm Zone. The applicant's proposed plan of development meets the town of Vernon's site plan requirements under section 14. They are utilizing an existing curb cuts which serve multiple parcels in accordance with Sections 12.5 (access management) of our zoning regulations.

In order to approve a special permit, the Commission must find that the applicant meets the general special permit criteria of Section 17.3.1, specifically:

- 17.3.1.1 It shall not create a hazardous condition relative to public health and safety
- 17.3.1.2 It shall be compatible with neighboring uses;
- 17.3.1.3 It shall not create a nuisance;
- 17.3.1.4 It shall not hinder the future sound development of the community;

- 17.3.1.5 It shall conform to all applicable sections of this ordinance;
- 17.3.1.6 N/A
- 17.3.1.7 N/A
- 17.3.1.8 The Commission may at its discretion require the submission of a Site Plan for approval as outlined in Section 14 of this ordinance.

In my judgment the Commission could make the finding that the protective provisions of section 17.3.1 have been met, provided the following conditions are met with no stipulations.

### **Gately, Shaun**

From: Kelley, John

**Sent:** Wednesday, July 13, 2022 1:09 PM

**To:** Gately, Shaun

**Subject:** Proposed Day Care 273 Talcottville Road

Follow Up Flag: Follow up Flag Status: Flagged

#### Shaun,

I reviewed the original plans for the Trail Run development that were presented to the Vernon Traffic Authority on February 11, 2016. The proposed project was approved by the Traffic Authority with the stipulations that pedestrian signalization be installed at Allan Drive and there be a pull over for school buses. Additionally, it was stipulated that raised, mountable curbing be utilized at the right turn southern exit to the complex. All stipulations have been met by the developer. The original proposal had retail space in place of the proposed daycare. After reviewing the original approval and considering the proposed change, I do not believe the change will create undue burden on the surrounding area or exceed the capacity of Trail Run Drive or Route 83.

John Kelley Chief of Police Vernon Police Department 725 Hartford Turnpike Vernon, CT 06066 jkelley@vernon-ct.gov (860)872-9126

### **Gately, Shaun**

**From:** Smith, David

**Sent:** Thursday, July 14, 2022 11:50 AM

**To:** Gately, Shaun

**Subject:** Engineering Review - Day Care proposal 273 Talcottville Road

I have reviewed the Application for a Day Care Facility located at 273 Talcottville Road. The drainage calculations indicate that there will be no adverse offsite impacts due to the construction of the building and the parking lot. Consistent with our LID regulations, the developer has proposed a recharge system for stormwater which we maintain the runoff characteristics in the pre-development condition. Robust Sediment and Erosion Control measures are provided, and if installed and maintained will minimize any migration of soil particles during the construction phase.

The plan as presented seems well conceived and is buildable with a minimum of impact to the adjacent activity and traffic on Route 83. I recommend that prior to the start of construction, a pre-construction meeting be conducted to meet the development team, understand key concerns and review the project schedule.

There is an Access Easement in favor of the property north of this facility. To be a functional emergency access path, grading and improvements by others will be required. This may impact the grading and drainage patterns; and curb location near the dumpster enclosure, as shown on the current plan, when and if the access improvements are made. This comment is provided merely to restate the obvious, both parties will need to be mindful of their activities in relation to the other.