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Westport Public Schools

Capital Improvement Plan (CIP) 5+ Year Forecast

March 2, 2022

Prepared by:

Colliers Project Leaders and the Westport Public Schools Administration

Accelerating success.

Capital Planning Overview

The WPS BOE has initiated an ambitious, but necessary, review and implementation of capital project improvements. Prior to the full renovation of Coleytown Middle School, the administration estimated the need for certain capital improvements, sometimes with the assistance of outside expertise.

Given the broad capital needs, a new approach was warranted.

Past practice in capital improvements

- minimal consideration for the capacity to perform capital projects.
- facilities were not evaluated holistically,
- projects not driven by a prioritization process (e.g. prioritizing thermal and moisture protection, mechanicals, etc.)
- ability to finance projects was primary driver
- capital investments de-prioritized in favor of educational investments

Pilot program with an external firm

- manage and plan capital improvements
- provide additional bandwidth without committing to permanent headcount
- access breadth and depth of full firm expertise and experience
- Dial up/down level of support as needed
  - capital
  - day to day operational, “on-demand”

OPM Relationship

Colliers Project Leaders is supporting WPS with a combination of capital program management and capital project management for larger projects, as well as providing "as needed" expertise for day to day operations.

	PROGRAM Management	PROJECT Management	Building Maintenance
LEAD:	**WPS & Colliers**	**Colliers**	**WPS Facilities Department**
RESPONSIBILITY:	-Capital forecast development Re-prioritize capital plan -Consult on project development, project needs, studies needed, etc. -Project sequencing based on optimizing comprehensive solutions, facilities department bandwidth, financing, and seasonal timing	-Orchestrate large / complex individual capital projects when separate project manager not required -Competitive bidding maximized for most projects -Serve in advisory role when working with project manager -Manage state reimbursements	-Maintain daily functions of buildings -Consultation on day to day operations when expertise or capacity is beyond current facilities team
FEE STRUCTURE & FUNDING:	Fee for Service 2021-22: COA ($50K) 2022-23: COA	Fee for Service (included in project costs)	Operating Budget

Capital Improvement Plan: 5+ Year Forecast

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Capital Forecast:

- an estimation and projection of future capital projects based on useful life, evaluations of systems, findings of studies/reports, etc.

Capital Projects:

- General Parameters:
  - singular projects, non-recurring in the immediate
  - beyond maintenance - capacity and/or capability
  - requires design documents

Capital Improvement Plan: 5+ Year Forecast

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WPS Capital Improvement Plan (CIP) Forecast:

- dynamic document
- listing of the capital projects, equipment, and major studies
- prioritization/ranking of projects
- cost estimates
- timetable for the construction/completion of the project
- project justification/rationale

Capital Improvement Plan: 5+ Year Forecast

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- **Antinozzi Report**
  - determine physical plant needs
  - “replace in kind” approach

- **Colliers Project Leaders (CPL)**
  - take holistic and practical approach
  - critical look at current capital forecast
    1. reprioritize (*note the number of projects pushed out beyond year 5*)
    2. add/delete projects
    3. propose holistic solutions, further study where appropriate
    4. develop dynamic forecast with:
       - built in escalators
       - soft costs
       - hyperlink to individual project descriptions/rationale/etc.
       - “public facing” feature

Capital Improvement Plan: 5+ Year Forecast

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- Site visits conducted by CPL on:
  - 1/26/22, 1/28/22, 1/31/22, 2/2/22, & 2/8/22
- Conducted visits of:
  - Saugatuck Elementary School
  - Kings Highway Elementary School
  - Greens Farms Elementary School
  - Coleytown Elementary School
  - Bedford Middle School
  - Staples High School
- Excluded Coleytown Middle School (renovated) and Long Lots (in process) from visits

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- **Focus of Visits:**
  - For Colliers team to familiarize themselves better with the schools
  - Assess the overall condition of each school and categorize into major categories of need
  - Ascertain any chronic or immediate concerns (symptoms) from the principals, head custodians, and maintenance personnel
- **Areas of focus during visits**
  - Building Envelope (roof, windows, doors, facades, trim, etc.)
  - Building Mechanical Systems (Adam Holzschuh, Project Manager:Commissioning and Energy Services team)
  - Destructive testing and in-depth investigations were **not** performed at this time

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General Assessments

- Overall, the Westport Public Schools facilities are in very good condition
- Well maintained by WPS staff
- With the exception of Long Lots and Coleytown ES, buildings are in generally good physical condition from a building envelope and interior conditions perspective
- Recommending further studies:
  - MEP (mechanical, electrical, & plumbing) in select buildings- develop options beyond “replace in kind”
    - BMS and SES
  - Envelope Studies:
    - Prioritize KHS, SES, SHS
    - followed by BMS and GFS

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4 Categorization Levels of Schools by Need:

- **Level 1** – Facility is in overall good condition, continue to maintain and monitor for any issues and address them as they arise
- **Level 2** – Facility is in overall fair to good condition, but some systems require further investigation and possibly capital improvements but does not require a holistic solution (e.g. renovation or replacement of facility)
- **Level 3** – Facility is in overall fair to poor condition but functioning; multiple systems are aged to the point of needing full replacement in 3 to 5 years; replacement of systems most likely requires a holistic solution to the facility
- **Level 4** – Facility is in fair to poor condition and experiencing complaints by occupants/users; multiple systems are aged and recommended to be replaced in 1 to 3 years; replacement of systems requires a holistic solution

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- **Level 1 Facilities**
  - Green Farms Elementary School
  - Coleytown Middle School (assumed given recent renovation)
- **Level 2 Facilities**
  - Saugatuck ES
  - Kings Highway ES
  - Bedford MS
  - Staples HS
- **Level 3 Facilities**
  - Coleytown ES
- **Level 4 Facilities**
  - Long Lots ES

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Reprioritization of Capital Forecast:

1. Thermal and Moisture Protection
2. Mechanicals
3. Exterior
4. Finishings

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Reprioritization of Capital Forecast:

1. **Thermal and Moisture Protection**
   - includes the materials/systems used to seal the outside of the building against:
     - moisture, thermal, and air penetration
   - inclusive of building envelope
     - windows, doors, openings, roof, surface foundation
2. **Mechanicals**
   - include all equipment used for space heating, cooling, ventilation, and hot water heating
   - add or remove heat, moisture, and air from facility
3. **Exterior**
   - masonry, asphalt (except where the town is advancing projects), railing systems, exterior painting (except when recommended beyond routine maintenance)
4. **Finishes**
   - millwork, cabinetry, bathroom partitions/stalls, select flooring projects, acoustic ceiling tiles, general food equipment

Capital Improvement Plan: 5+ Year Forecast

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- **Capital Improvement Plan Regularly Scheduled Updates**
  - **Annual review (perhaps October, unless capital schedule is revised)**
    - **interim updates (3X year?) at Committee level**
  - **Were projects funded?**
  - **Were projects completed?**
  - **Has a high priority capital project emerged?**
  - **Consider pushing out lower priority projects?**
  - **Is there capacity to proceed with scheduled projects?**

Capital Budget

	Remaining 2021-22	2022-23	2023-24		BEYOND 23-24
Key Capital Projects	- $785K CES Modulars (unfunded) -SES/SHS Roofs -Asphalt	-Emphasis on MEP and envelope studies -SHS Auditorium Stage Rigging Evaluation	-SHS Sport Flooring Design Funding -Various HVAC Upgrades -BMS Insulated Glass -KHS West Side Gym Entry	…	-Based on MEP and Envelope Studies -Prioritize thermal and moisture protection projects and mechanicals
Evaluations & Benchmarks		$530K *-2 MEP Evaluations (BMS, SES)* *-5 Envelope Benchmarks* *-Security or ADA Evaluation*	$80K *Security or ADA Evaluation*	…	As Needed
TOTAL	**$9,672,020**	**$1,813,467**	**$1,556,780**	…	
Individual Building Portfolio Solutions **-CES, LLS**	**$40K (Operating Budget)** **CES - Evaluation per OSCGR Criteria to determine renovation status eligibility**	**$150K** **LLS - Development of Options to Replace School**	**$50-70M+** **LLS/SSP - begin renovation/"replace as new" process**	…	**$50-70M** **CES - Renovate or "replace as new"**

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School by School Review of 5+ Year Capital Improvement Plan (CIP)

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Questions & Answers

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Thank you!

PROPERTY CONDITION ASSESSMENT

Long Lots Elementary School

PREPARED BY:
Colliers Project Leaders USA NE, LLC
12/16/21

PREPARED FOR:
Westport Public Schools,
Town of Westport CT.
Long Lots Elementary School

Table of Contents

DISCLAIMER

The scope of this conditions assessment did not test for mold.

Other hazardous materials that may be present in the building constructed in this timeframe may contain hazardous materials. This condition assessment does not include a study of hazardous materials.

I. Executive Summary

Colliers Project Leaders USA NE, LLC ("CPL") is pleased to present the Property Condition Assessment (PCA) for Westport Public Schools. The purpose of this PCA is to determine the current condition of Long Lots Elementary School and provide recommendations for repairs and upgrades.

Due to the age and condition of the building structure and interior systems, significant repairs and capital equipment replacement are recommended. Observations of the building enclosure and roof show the need for extensive repairs, most notably structural cracks of the chimney interior block in the gymnasium, lack of vapor barrier below the building structure, water infiltration of the building enclosure at the roof, curtain wall, exterior finish system, and portions of the brick exterior. In addition, many of the mechanical and electrical systems are nearing or at the end of their useful life. The boilers are original to the building, are inefficient relative to new models, and are experiencing costly repairs to maintain their operation. The chillers and other direct expansion cooling systems utilize R-22 refrigerant, a greenhouse gas which has been phased out of operation by legislation. Many of the remaining heating, ventilating, and air conditioning systems (HVAC) are antiquated, relatively inefficient designs which coupled with the envelope issues observed lead to increased energy consumption. Approximately half of the electrical infrastructure (breakers, panels, branch wiring, and end devices) and the fire alarm system should be replaced.

While a recent energy service performance contract (ESPC) identified and implemented low-payback measures, including some HVAC controls upgrades and interior lighting replacements, the short payback term precluded investment in higher payback capital equipment replacements. Facility staff appear to be diligent in routine maintenance, however the antiquated equipment, varied controls strategies, and compromised building enclosure require a comprehensive approach to truly improve the indoor conditions and reduce energy consumption.

Long Lots Elementary School, 13 Hyde Lane, Westport CT

Inspection Performed by: **Colliers Project Leaders**

Interviews and Document Review

The following people were present during the MEP & Building survey:

NAME	TITLE	REPRESENTING
Theodore Hunyadi	Director of Facilities & Securities	Westport Public Schools
William Gonzalez	Office Coordinator for Facilities	Westport Public Schools

Luigi Caputo	Technical Consultant	Environmental Systems Corporation
Adam Holzschuh	Senior Project Manager	Colliers Project Leaders / Mechanical Systems
Ravi Chavan	Project Manager	Colliers Project Leaders /Mechanical Systems
Terence Connolly	Associate Director	Colliers Project Leaders / Envelope Survey
George Barnes	Project Manager	Colliers Project Leaders /Envelope Survey
Andrew Kindya	Director	Colliers Project Leaders /Electrical Systems
Dan Maxwell	Facilities Staff – HVAC	Westport Public Schools
Tom Carr	Facilities Staff – Plumbing/Heating	Westport Public Schools
Calvin Terpstra	Facilities Staff – Electrical	Westport Public Schools
David Cavallaro	Facilities Staff - HVAC	Westport Public Schools

The following systems and documents were reviewed:

- 1: Building Management System and Controls Front End
- 2: Crawl Space & Tunnels Drawing
- 3: Mechanical spaces, equipment, and typical service areas

Property Profile

Location:	Long Lots Elementary School, 13 Hyde Lane, Westport CT
Area of Building:	108,881 Square Foot. 40,000 is unusable for academic program needs. The 40,000 s.f. would need to be re-configured to meet the needs.
Number of Stories:	Two
Occupancy Type:	K-12 school. School – Built as a Junior High School being used as an elementary school. Space in the building is reported to be not suitable for use as an elementary school.
Year Built:	Original 1953 with additions in 1962, 1973 and 1979. The 200 wings had a fire and was re-built.
Building Code:	Code upgrades performed in 1993
Exterior Walls:	Two main systems were observed on the building Brick masonry with a concrete masonry unit backup wall and External Finish System.

Exterior Windows:	Single pane window system and entrance doors. Operable metal frame windows with hopper windows that swing into the building.
Roof:	Modified Bitumen Roof with a failing cap sheet.

II. Property Overview

A. Property Summary

1) Architectural

Long Lots Elementary School is located on 13 Hyde Lane in Westport, CT. The school is a two-story structure with a main floor and a lower level. The original school was built in 1953 and received its first renovation in 1957. Two additions were completed to the North and South in 1962, with renovations in 1971 and another addition added in 1979. The facility received multiple improvements and Code upgrades during 1993. Most recently the facility underwent an energy savings performance contract (ESPC) project that included several controls and lighting upgrades. The current facility is approximately 108,881 SF.

The building houses approximately 42 classrooms and serves about 580 students per year. Various spaces in the building include a library, cafeteria, and auditorium. The outdoor areas consist of a courtyard, basketball court and playground.

The building uses electric energy purchased from Eversource and heating is provided by gas fuel purchased from Southern Connecticut Gas company.

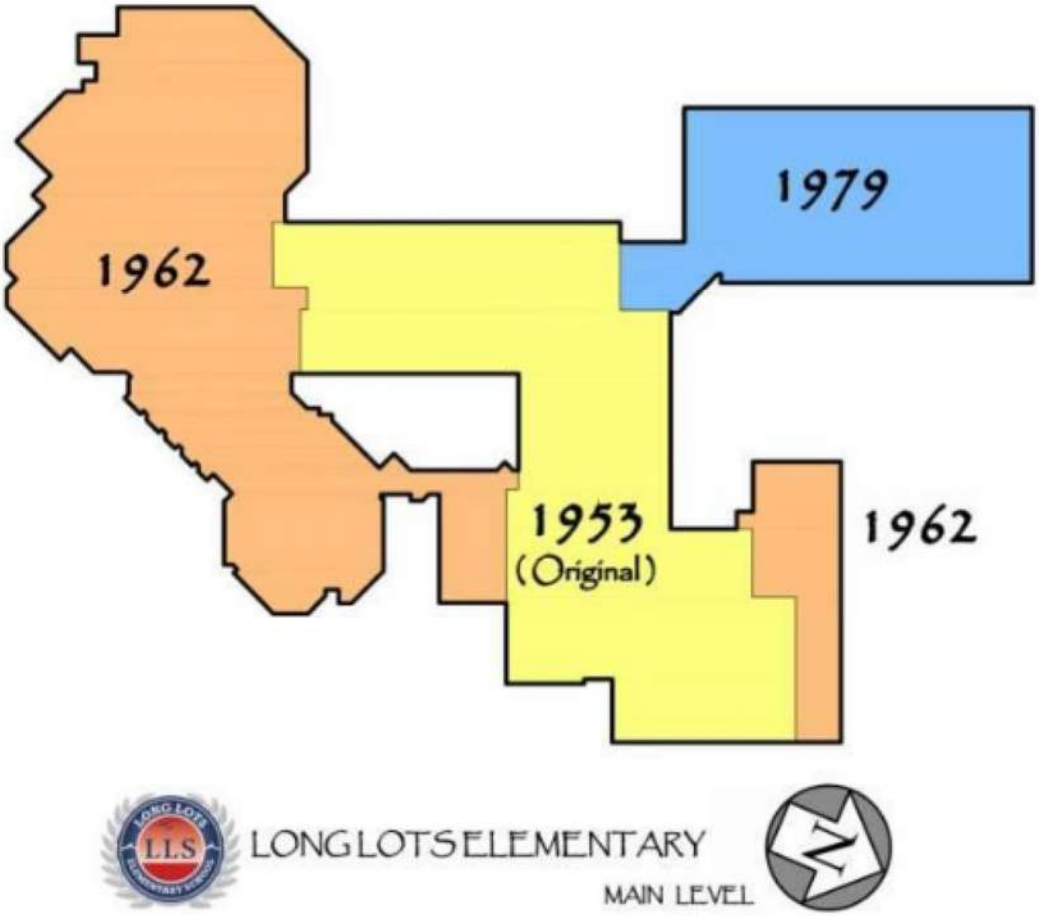


Figure 1: Site plan showing the building layout and construction dates

The Main floor consists of several classrooms, central office, auditorium, library, and gymnasium. The lower lever consists of classrooms located to the North and South of the building and the mechanical space in the older section of the building. The diagram below provides a layout of the building with approximate location of the different uses within the building.

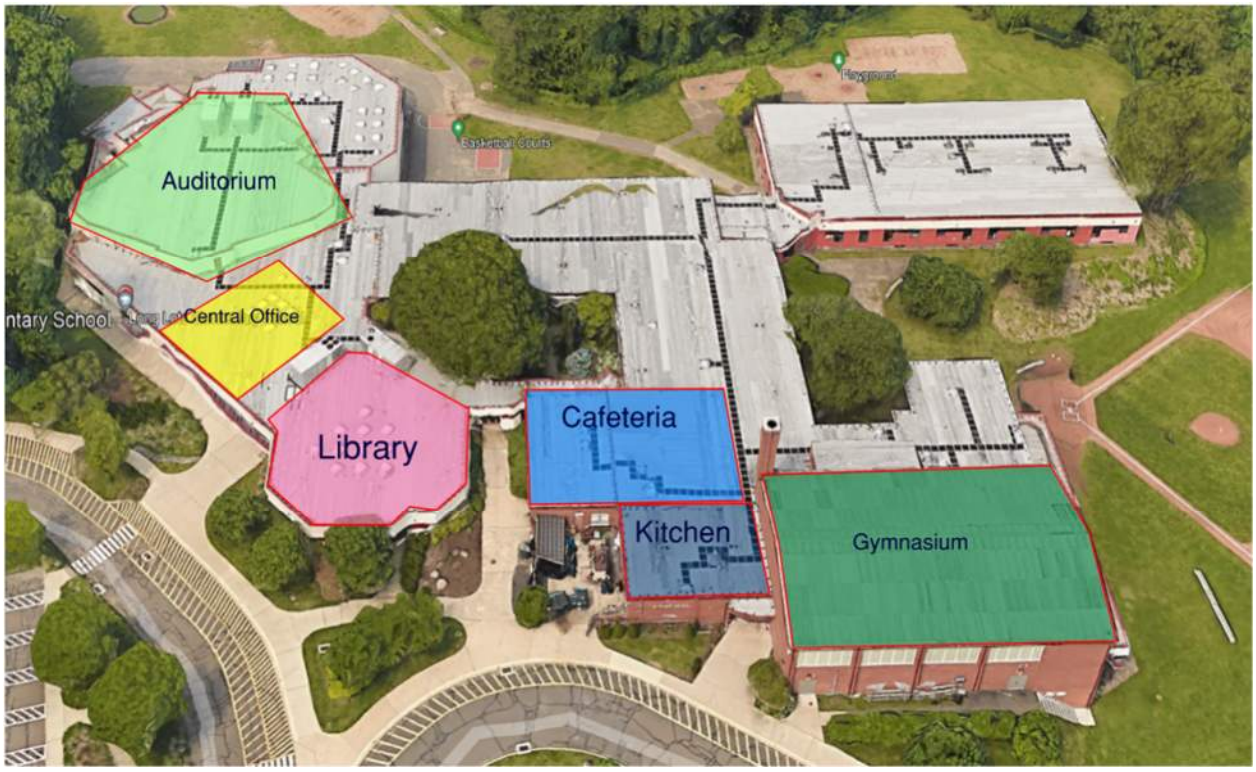


Figure 2: Site plan showing the building layout and space uses.

2) Mechanical

Boilers:

The building is heated by two (2) H.B Smith H.B. Smith Series 440-20 sectional CI dual fuel, steam boilers B-1 and B-2. Another third Weil-McLain steam boiler B-3 is abandoned in place due to problems related to installation and operation of the boiler. The boilers were manufactured in 1953 and are served by updated Power Flame burners. Although the burners are dual fuel the boilers now predominantly operate on natural gas. The boilers, condensate pump systems, fuel oil pumps and accessories are past their useful life and installation is aged. The steam piping is more than 60 years old.

The boilers feed heating steam to original building steam radiation system, gymnasium heating and ventilation unit, and kitchen make-up air unit. The building also houses two (2) steam to hot water heat exchangers that generate heating hot water for all roof top units and reheat coils, wing 200 unit ventilators and 4-pipe unit ventilators serving rooms 5, 6, 7, 101, 103 and 105.

Figure 3: Steam boilers original to the building (cr 1953).

Figure 4: Steam to hot water HX in the boiler room

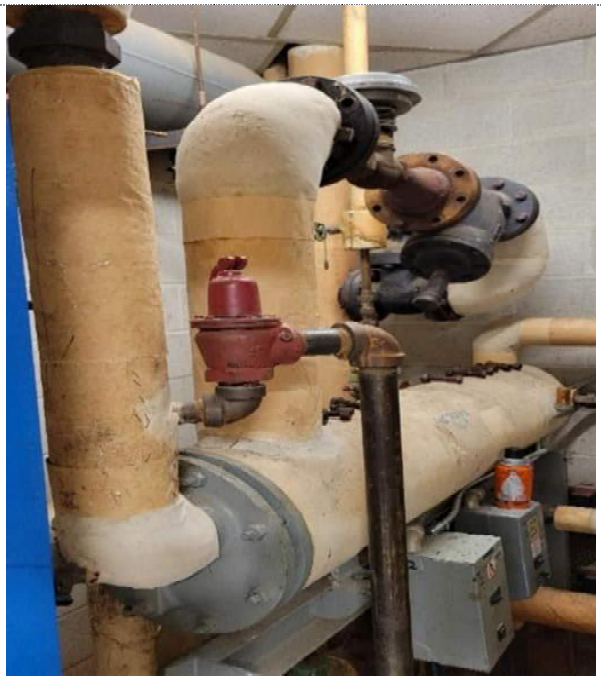


Figure 5: Steam to hot water HX for wing 200

Figure 6: Heating HW pumps in boiler room

Steam Radiation and Window AC Units

The original 1953 building is heated with steam radiation which are controlled via digital thermostats. The digital thermostats can be monitored and controlled by the BMS. The thermostats send digital signal to a controller that uses EP switches to control pneumatic valves serving the steam radiators.

The cooling is provided by window air conditioners which are 0.75 to 1.0 ton in capacity each. The air conditioners are enabled/disabled by the BMS.

Figure 7: Steam radiation and window AC unit in the original building

Roof Top Units (RTU)

The Auditorium is served by two custom made Seasons-4 manufactured roof top units RTU-MZ-1N & RTU-MZ-1S. These units are equipped with DX cooling and hot water heat. Each unit conisits of two (2), R-22 refrigerant compressors rated for 460V, 27.6 Amps (RLA). The RTU supply fan is equipped with variable frequency drive (VFD). The unit is designed as hot-deck/cold-deck unit with three zones. Recently the zone dampers have been converted to DDC and controlled and monitored via BMS. The fan motor has been replaced with VFD duty high effiiciency motor and equipped with a VFD.

The Main Office is served by Seasons 4 manufactured constant air volume unit RTU-MZ-2. The unit is equipped with DX cooling and hot water heat. The RTU conisits of two (2) stage cooling using R-22 refrigerant compressors rated for 460V, 27.6 Amps each. The unit is designed as hot-deck/cold-deck unit. The fan motor has been replaced with VFD duty high effiiciency motor and equipped with a VFD.

The Library is served by Seasons 4 manufactured constant air volume unit RTU-MZ-3. The unit is equipped with DX cooling and hot water heat. The RTU conisits of two (2) stage cooling using R-22 refrigerant compressors rated for 460V, 18.4 Amps each. The unit is designed as hot-deck/cold-deck unit with two zones. The zone dampers are pneumatic controlled and cannot be accesed by the BMS. The fan motor has been replaced with VFD duty high effiiciency motor and equipped with a VFD.

The Music Room is served by Trane manufactured constant air volume unit RTU. The unit is equipped with DX cooling. The name plate data for compressor rating was not available. It is reported that the unit is scheduled for replacement.

Heating & Ventilation Units (HV)

The gymnasium is served by two Carrier's AERO 39M heating and ventilation units. Each unit is equipped with two steam heating coils, supply fan VFD, modulating outside air, mixed air and relief air dampers and exhaust fan that operates during economizer mode operations.

Units Unit Ventilators (UV)

The 200 wing classrooms are served by 13 unit ventilators with air cooled condensers mounted on the roof of the building. The units are manufactured by Lennox and are approximately 3 ton each in capacity. The condensing units use now phased out R-22 refrigerant. The units are equipped with economizer dampers, occupancy sensor based temperature controls and CO_2 based ventilation control.

Figure 8: Unit ventilator with hot water heat and DX cooling original to the 200-Wing construction.

All of the unit ventilators for 200-wing have pneumatic control valves for heating hot water. The valves are controlled by electric thermostat using EP switches. The units can be controlled and monitored from the BMS.

Chillers

The building cooling is provided by two Trane manufactured air cooled chillers. These chillers are Intellipak series machines with older R-22 refrigerant and approximately 20 ton capacity each. There are two compressors per chiller and each compressor is rated for 460V, 17.2 Amps. One chiller was observed to be

operating to deliver 43.2°F chilled water temperature and the return water temperature was measured at 49.3°F when the outside dry bulb temperature (OAT) was 90.6°F. The chillers are designed to operate in a lead/lag control however only one chiller typically operates at a time. The constant volume chilled water pump and the chiller operates contineously whenever the OAT goes above 67°F.
These chillers are more than 20 years old and past their useful life.

4-Pipe Fan Coil Units

The South-West classrooms (room 5, 6, 7, 101, 103 and 105) are served by 4-pipe fan coil units with outdoor air damper for ventilation. The heating and cooling are provided by hot water and chilled water respectively.

Figure 9: Four-Pipe Fan Coil Unit.

Kitchen make-up air unit

The kitchen is served by a 100% outdoor air unit with pneumatic controls and steam heating coil. The unit serves the kitchen and café area. It is reported that the kitchen hood exhaust unit is not interlocked with the make-up unit.

Figure 10: Kitchen Make-up Air Unit above ceiling.

Figure 11: Kitchen exhaust hood.

All classrooms in the old section of the school use window air conditioners for cooling. Dehumidifiers are also observed to be used in all classroom spaces and some common areas throughout the school building.

The table below identifies different HVAC systems in the school including their service location, schedule, fan speed and their ventilation control.

Unit	Space serving	Demand Ventilation?	VFD controls	Damper min position	Occupied Mode Schedule M-F
HV-1	Gym	Yes	Yes	10%	6:30 am-9pm (M-Th); 6 am-9pm (F)
HV-2	Gym	Yes	Yes	10%	
RTU-MZ-1N	Auditorium	Yes	Yes	15%	5 am-9:30pm
RTU-MZ-1S	Auditorium	Yes	Yes	10%	5 am-9:30pm
RTU-MZ-2	Main Office	No	No		4 am-9:30pm
RTU-MZ-3	Library	Yes	Yes	10%	6:30 am-9:30pm
RTU	Music Room	No	No	N/A	5 am-9:30pm
13 Unit Ventilators	200 Wing	Yes	No	9%	5 am - 9pm
7 Fan Coil Units (4-pipe)	S West Classrooms level 1	Yes	No	9%	5 am - 9pm
Kitchen MAU	Kitchen and Cafe	100% OA	No	N/A	Manual

Domestic Hot Water

Domestic hot water (DHW) is generated by an AO Smith manufactured BTR-120 gas fired water heater. The heater has an input capacity of 120MBH and recovery rate of 120 gal/hr. The DHW is circulated by a Bell & Gossett recirculating pump. The DHW heater appears new and has a built year of 04/2019.

Figure 12: AO Smith 120MBH domestic hot water heater.

3) Building Envelope
   a) All six surfaces of the building have building enclosure issues. The roof, exterior walls, window and entrance door systems, the slab-on-grade, building foundation walls and site grading are all contributing to water and moisture infiltration and heat and conditioning loss through the building enclosure.

4) Electrical
   a) The electrical distribution serving the building consists of a variety of aged panels. Due to the varying age, some of the existing equipment is at the end of its useful life, some is approaching the end of its useful life and some of the existing equipment is in acceptable condition. Some of the older panels are Federal Pacific Electric (FPE) and should be replaced immediately due to known problems with the equipment.

      The age and condition of the distribution cables, branch wiring, disconnects, starters, end devices, etc. varies greatly. While some of the listed items are newer, many of the items are at the end of their useful life and should be replaced.

	
Figure 13: Newer Square D panel serving the 200 wing	Figure 14: Old FPE panel serving the 200 wing
	
Figure 15: Old FPE panel serving the kitchen area	Figure 16: Older General Electric switchboard serving 100 wing
	
Figure 17: Old FPE panel serving boiler room	Figure 18: Old FPE panel outside the boiler room

	
Figure 19: GE panel located in the electrical room	Figure 20: GE panel near the gym

b) Emergency Power

Emergency power is provided to the building from a new exterior mounted Cummins 125kW diesel generator. The generator, installed in 2021, has a sub-mounted fuel tank. The unit is in new condition and should not be scheduled for replacement for two decades if maintained properly.

The emergency generator is connected to a 400 amp 480 volt ASCO automatic transfer switch (ATS). The ATS is in new condition and should be relatively maintenance free for a number of years.

	
Figure 21: New 125kW Cummins emergency generator	Figure 22: New 400amp ASCO Automatic Transfer Switch

c) Fire Alarm

The installed fire alarm system is at least a decade old and should be scheduled for replacement within the next few years.

d) The building interior lighting was observed to be LED fixtures or LED retrofits.

Figure 23: Recessed LED fixtures in classrooms, library, and office spaces

Figure 24: Surface mount LED fixtures in kitchen

Figure 25: Exterior LED WallPak fixture

Figure 26: Can light fixtures by rear doorway canopy

All of the interior spaces were observed to have recessed or surface mount LED fixtures. Occupancy sensors were observed in classrooms. The hallway in the old section of the school appears to have LED lamps retrofitted in existing linear florescent fixtures.

The building exterior lighting was observed to be LED WallPak fixtures. Some of the interior and exterior canopy can light fixtures appeared to be older fixtures and may consist of incandescent or metal halide light bulbs. Several of the exterior light fixtures were observed to be operating during daytime. The exterior lighting is controlled by a timeclock.

III. Observations and Recommendations

A. Structural Frame and Building Envelope

Sr.#	Equipment / System	Observation Narrative	Recommendation
1	Building Structure	• Structural block cracks observed inside the gym at the Building Chimney	○ Have the cracks and chimney evaluated by a structural engineer. Possibly replace the chimney and or the interior blocks laminated over the chimney at the interior gym wall section adding a thermal break. Provide movement joint between the chimney and the interior block wall.
2	Building Structure	• Tunnel unexcavated with no vapor barrier.	○ Encapsulate soils with a vapor barrier.
3	Building Structure	• Surface water infiltration into the building.	○ Regrade building grounds and add yard drains.
4	Foundation and masonry repairs	• Correct flooding into building from the courtyard.	○ Excavate and install courtyard foundation waterproofing, insulation around the entire perimeter, footing drains and yard drains, revise grading.
5	Foundation and masonry repairs	• Tree concerns at foundation due to root and branch damage.	○ Remove trees within the drip edge overgrowing the roof line impacting the roof and potential root damage at the foundations.
6	Building Enclosure	• Outside air infiltration into the kitchen at the generator	○ Improve the building enclosure, window, and door systems in the around the generator and extend the generator exhaust system. Improve control of makeup air for the kitchen.
7	Building Enclosure	• The unit ventilators are allowing the infiltration and exfiltration of air through the building enclosure	○ Unit ventilators are recommended for replacement under MEP scope. It is recommended to patch the building enclosure at the removed units.
8	Building Enclosure	• Air infiltration from window air conditioners system	○ Window air conditioners will be removed under HVAC upgrades. These openings will need to be properly infilled.

Sr.#	Equipment / System	Observation Narrative	Recommendation
9	Skylight in Room 6	• The skylight system above room six has had many leaks and shows signs of many repairs	○ The skylight should be replaced with roofing.
10	Building Roof	• The roof has become brittle as the delaminating cap sheet blisters and has had many maintenance issues	○ Roof is recommended to be replaced in the next five years.
11	Building Roof	• Roof top unit gaskets and pans are leaking.	○ The RTU replacement is covered in the MEP portion. This estimate covers the curbs and associated roof work.
12	Building Roof	• Roof drain system and piping is in poor condition	○ Replace the entire roof drain piping system.
13	Window System	• The single pane curtainwall and window systems are leaking and have no seals	○ Kalwall panel system and windows are recommended to be replaced.
14	Exterior Wall Systems	• Exterior wall lacks air barrier and insulation. • EIFS Delamination	○ All the External Insulating Finish System needs to be removed and replaced. The masonry walls need to either be replaced or have a cavity wall created with an air barrier and insulation.
15	Exterior doors & Store front	• Wind driven rainwater infiltration is reported	○ The exterior doors and store front entrances need to be replaced due to water leakage, no seals, inefficiency, and lack of insulation.
16	Roof access Ladders	• The ladders on the roof are very loose at the anchor points	○ The wall needs to be opened to provide adequate blocking, patched, and properly anchor the ladders to the building.

B. Mechanical Systems

Sr.#	Equipment / System	Observation Narrative	Recommendation
17	Steam Boilers	• Boilers are 60 year old and beyond useful life. • One of the 3 boilers is abandoned in place due to design and operational issue. • Facility personnel note extensive repairs have been required to maintain the boilers operation.	○ Investigate replacing steam heating system with energy efficient alternative.
18	Steam and Condensate piping	• Steam and condensate piping is original to the construction (60 years). • Steam traps and devices are located in crawl spaces and tunnels from classroom 9 through gymnasium. These are not accessible for inspection and repairs.	○ Investigate replacing steam heating system with energy efficient alternative and eliminate steam system.
19	Heating piping insulation	• Insulation is missing or damaged in several locations of the heating system piping and devices. • No insulation is present on the steam to hot water heat exchanger in boiler plant.	○ Insulate heating system piping and devices.
20	Hot water pumps and heat exchanger	• The hot water pumps and heat exchanger are not available on the BMS. • Pump VFD speed control appears to be temperature based.	○ Add pumps and heat exchanger control valves to BMS. ○ Verify pump VFD control sequence and pump speed modulation. ○ Implement temperature reset based on building load and outdoor air temperature.

Sr.#	Equipment / System	Observation Narrative	Recommendation
21	RTU-MZ-1N, RTU-MZ-1S, RTU-MZ-2, RTU-MZ-3.	• RTUs were originally designed as constant volume hot-deck/ cold-deck units and 30+ year old. • RTU refrigerant is R-22 and phased out of production. • RTU fan motor VFD is programmed to operate as two speed (high/low) only.	○ RTU replacement to be considered as long-term plan. ○ Replace R-22 refrigerant with newer higher efficiency refrigerant such as R-134a or R410a. ○ Implement space temperature-based fan speed control.
22	AHU-1 & 2 (HV Units serving gymnasium)	• RTU fan motor VFD is programmed to operate as two speed (high/low) only. *Note: Heating is provided by two steam coils per unit.*	○ Implement space temperature-based fan speed control.
23	Unit Ventilators (Wing 200)	• Units are original to the building construction (30+ years) and past their useful life. • DX cooling is provided by R-22 refrigerant compressors.	○ Investigate replacing unit ventilators with energy efficient alternative.
24	Air Cooled Chillers	• Chillers are more than 25 years old and past their useful life. • Chiller refrigerant is R-22 and phased out of production. • Chilled water pumping is constant volume primary only and pump operates continuously when OA temperature is above setpoint.	○ Investigate replacing chillers with energy efficient alternative or heat pump chiller. ○ Investigate variable flow pumping design.
25	Exhaust Fan serving Room 9	• The exhaust fan serving Room 9 appears to have manual control and was observed to be continuously operating.	○ Implement digital controls to schedule exhaust fan serving room 9 based on occupancy and/or space temperature.
26	Kitchen Make-up Air Unit and Hood Exhaust Fans	• Kitchen Make-up air unit is pneumatically controlled and operates continuously during occupied time to provide 100% outside air.	○ Replace kitchen make-up and hood exhaust with variable speed unit. The new unit to be equipped with kitchen hood controls.

Sr.#	Equipment / System	Observation Narrative	Recommendation
		• Make-up unit is equipped with steam heating coil. • Kitchen hood exhaust fan is manually controlled and operates continuously during occupied time.	

C. Electrical Systems

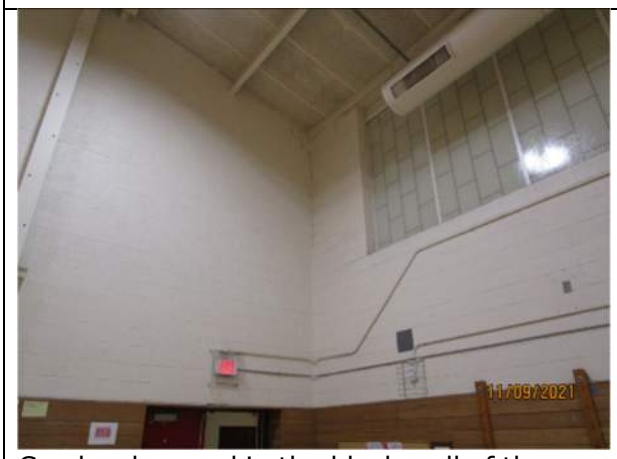
Sr.#	Equipment / System	Observation Narrative	Recommendation
27	Electrical Distribution	• Significant portions of the equipment are past useful life.	○ Replace ½ of the electrical distribution panels and associated feeders within the building.
28	Electrical Branch Wiring & End Devices	• Equipment is past useful life.	○ Replace ½ of the electrical branch wiring and end devices within the building.
29	Fire Alarm System	• Equipment is nearing the end of useful life.	○ Replace entire fire alarm system (panel, wiring, devices, etc.).
30	Exterior Lighting	• Equipment is nearing the end of useful life. • Equipment is inefficient.	○ Replace remainder of non-LED lighting fixtures (doorway canopy). ○ Investigate, repair, replace lighting controls on nonfunctioning exterior lighting controls.

IV. Building Envelope Survey Findings

Structural Failure at the building Chimney

Cracking in the gym masonry wall and heat transfer from the building chimney observed visually and in the thermal scan. These cracks are a major concern both from a structural perspective and a water infiltration concern. These cracks should be evaluated by a structural engineer.
It's not clear if the heat transfer from the chimney is from conduction or if the cracks visible in the gym wall continue into the chimney and this is a direct heat source from the chimney. There are no visible expansion joints at the common wall with the chimney. The building movement against the rigid chimney needs to be evaluated by a structural engineer.

View of the chimney at the gym adjacent to the Kalwall panels.

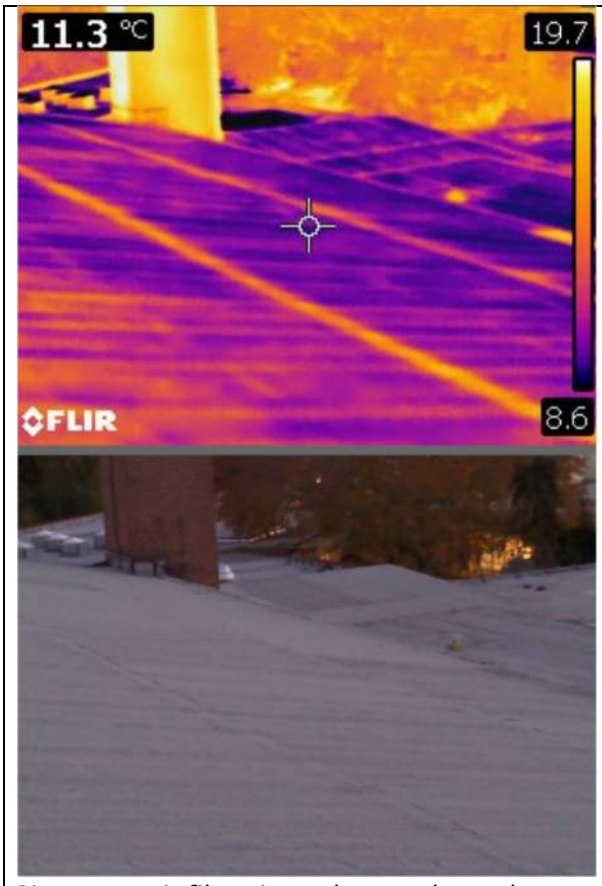
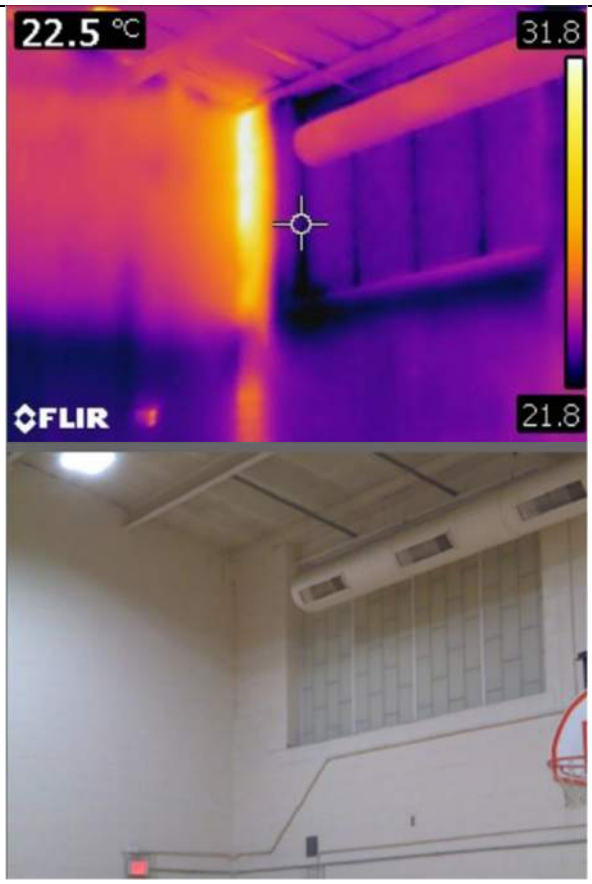


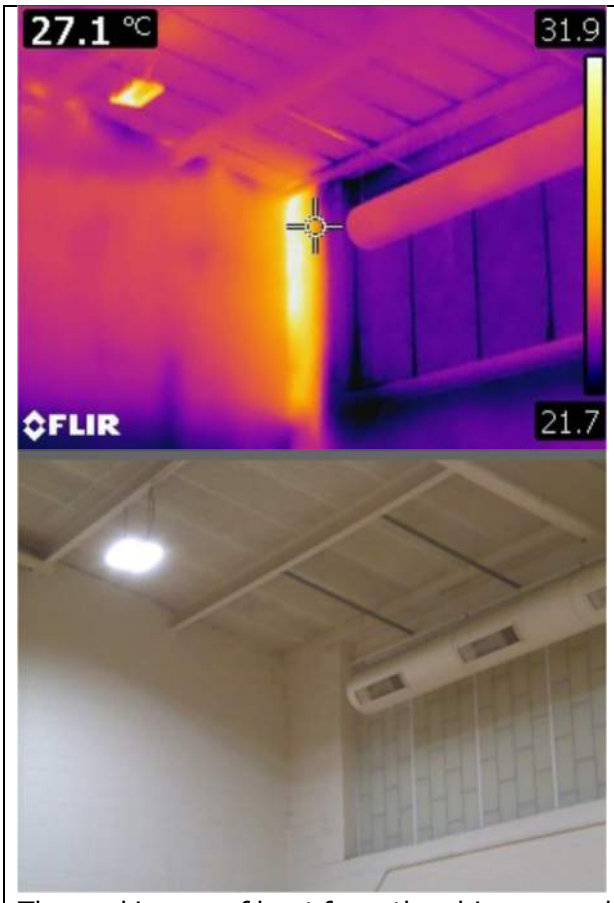
Cracks observed in the block wall of the gym at the common wall to the building chimney.

Building chimney at the roof intersection. No sign of water infiltration in the roof.

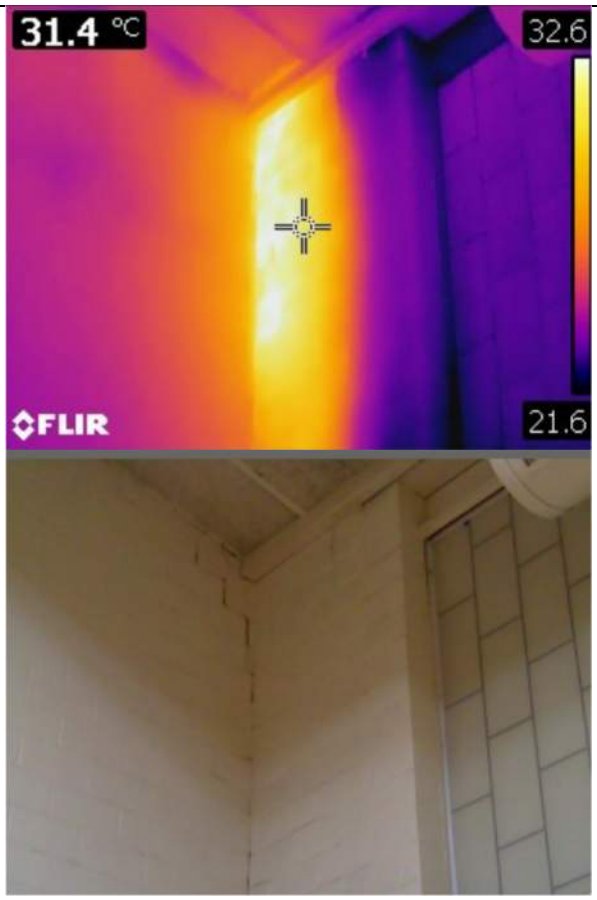

Cracks in the gym wall up to the roof level. Cracking in the masonry wall in the gym at the roof line.


Cracking continues to the opening.

	
No water infiltration observed at the roof flashing to the chimney.	The bright yellow colors show a significant amount of heat transfer seen in the common gym wall with the exterior chimney. A significant amount of heat loss is also seen at the Kalwall corners.



Thermal image of heat from the chimney and cracks in the common wall with the chimney.



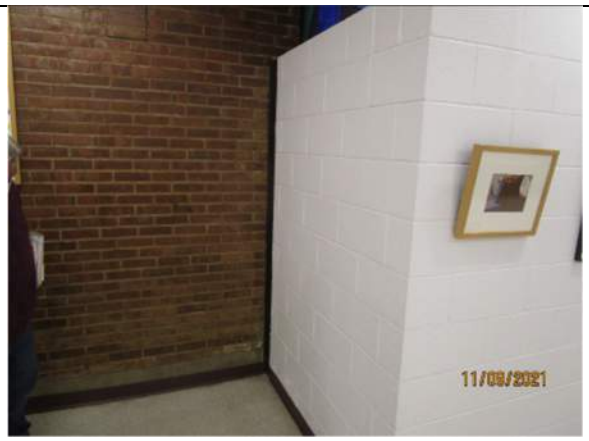
Thermal image of heat from the chimney and cracks in the common wall with the chimney.

Foundation Water Infiltration

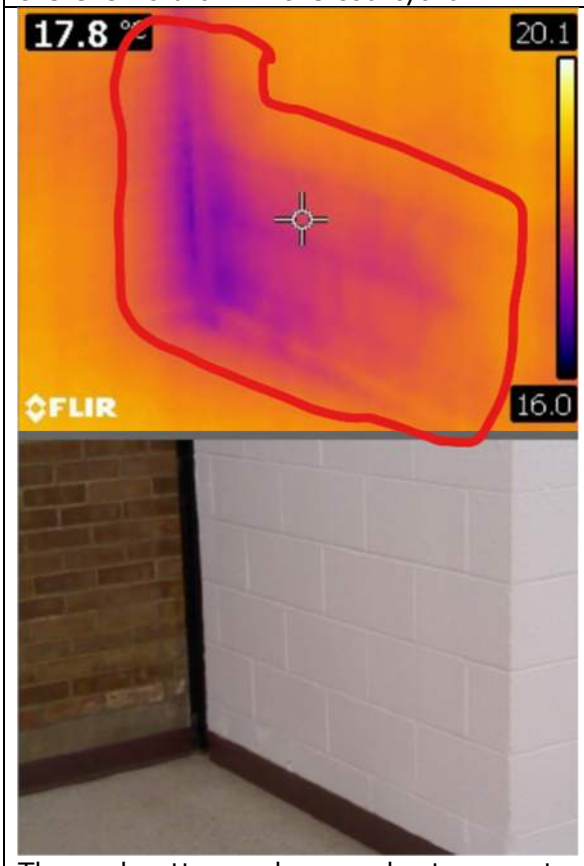
Lobby Flooding - A sump pump has been installed in the courtyard to try to reduce the amount of water in the area. The Courtyard foundation is causing moisture infiltration and flooding of the lobby area.

The lobby area has been flooded due to water infiltrating the building through the foundation wall from the courtyard.

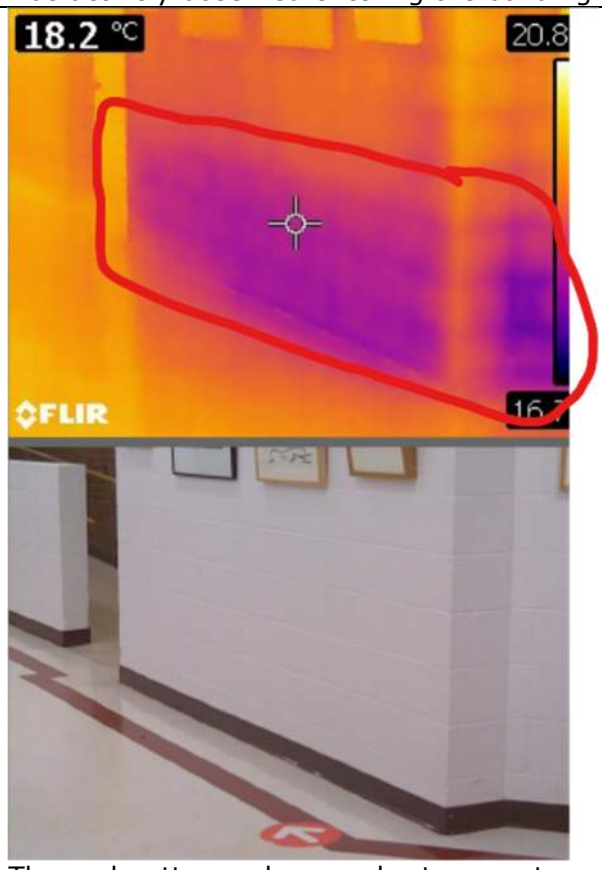
The sump pump discharges onto the roof as there is no drain in the courtyard.



This corner near the ramp is where the water was actively observed entering the building.



Thermal patterns show cooler temperatures at the foundation wall. This thermal pattern is consistent with missing foundation insulation, wet block, condensation. Efflorescence can be seen on the brick which is an indication of moisture in the masonry wall.



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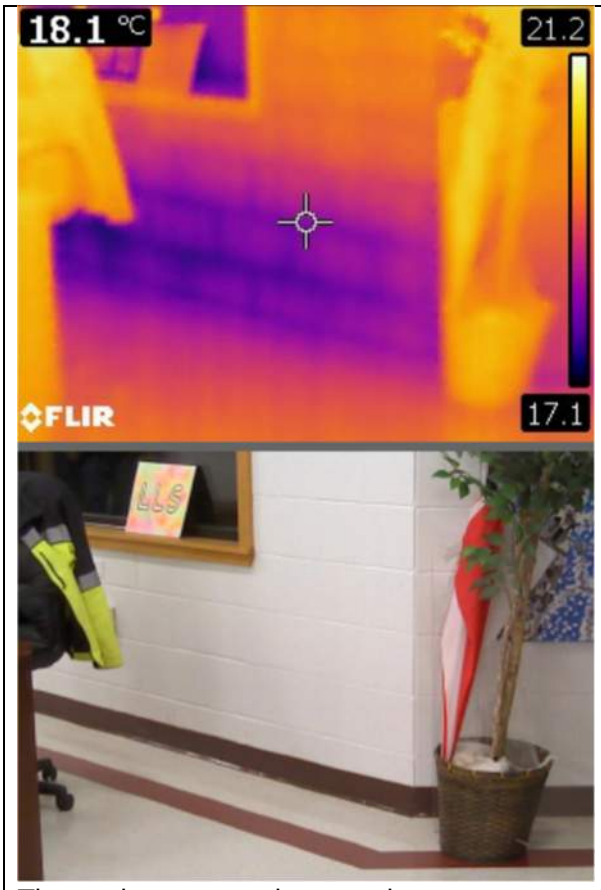	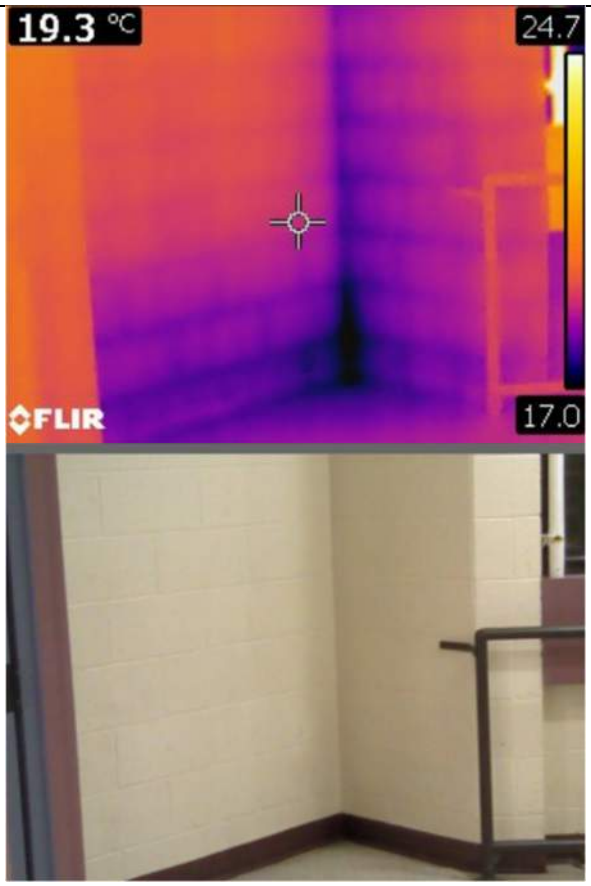
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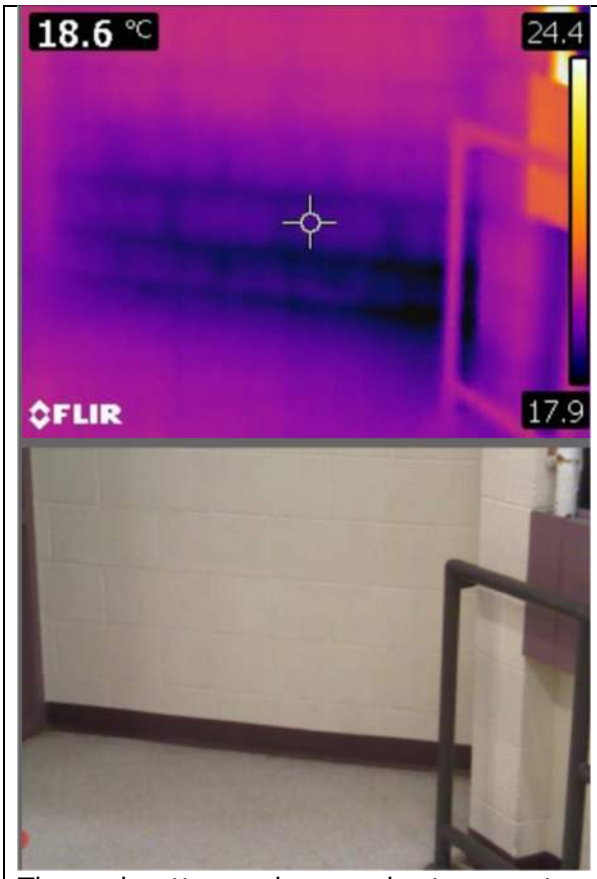


Thermal patterns show cooler temperatures at the foundation wall. This thermal pattern is consistent with missing foundation insulation, wet block, condensation.

The masonry wall extends below grade with no apparent foundation or waterproofing membrane.

Evidence of hydraulic water pressure against the below grade wall and water infiltration into the building.

Tunnel unexcavated soils with no vapor barrier

Estimated exposed dirt - Matt Mayer's from Langdon Associates mapped the tunnels. Langdon has prepared a report to indicate the exact extent of the exposed soils in the tunnels. Exposed soils emit water vapor in the tunnels and eventually the building.	 Access to room 19 with a door into the utility tunnels under the building.
Suspect insulation materials on pipes are deteriorating so the tunnels were not investigated.	 Soils with no vapor barrier allow moisture vapor from the ground into the building.
Observed the unexcavated soil condition through the room 9 hatch.	

Surface Water infiltration

Sandbags observed in place to prevent surface water from infiltration the building. Site grading changes will be needed to correct water infiltration plus the addition of area drains.	

Tree Concerns

Courtyard 24" beech tree canopy overlaps the building. This has the potential to cause multiple issues. The root system extends as far as the canopy of the tree and will impact the building foundation, the tree branches are in contact with the roof and will cause damage to the roof membrane and flashing, the leaves from the tree are collecting on the roof and will impact the function of the roof drains.	
Additional trees overgrow the roof line and should be removed to prevent roof and foundation damage.	

Outside air infiltration into the kitchen at the generator

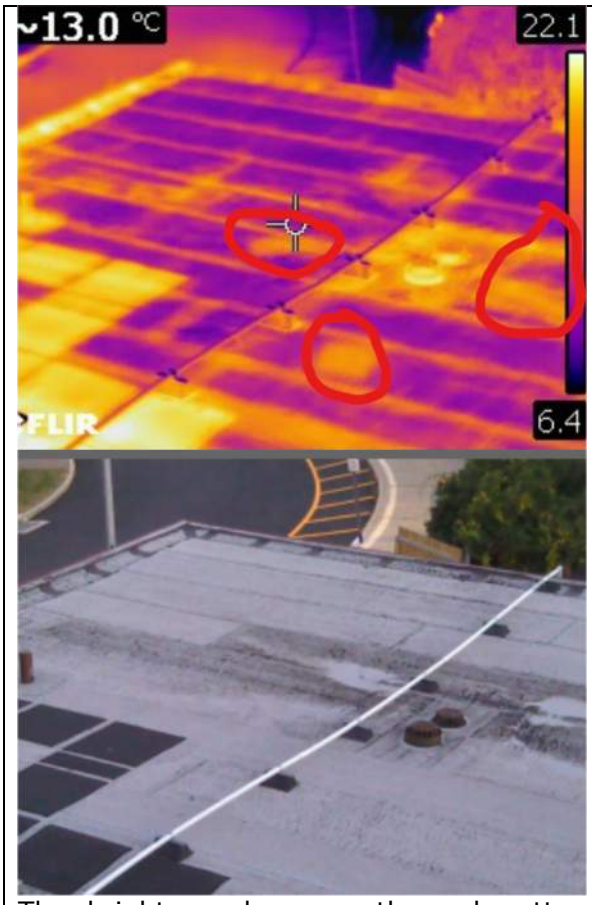
It was reported when the diesel generator is operating the diesel smell is evident in the kitchen. This is a sign of a failed building enclosure and improper balancing of the ventilating system allowing outside air to be pulled into the kitchen. It is reported that the kitchen exhaust hood has no control link between the cooking line hood and makeup air. The kitchen exhaust is likely causing negative air pressure in the kitchen and the poor building enclosure construction is likely allowing these fumes to be drawn into the building through the walls, windows, gaps around the doors and the window air conditioning unit.	
The generator exhaust stack should be extended and directed above the roof level. The windows, doors and exterior wall system should be replaced with an airtight building enclosure. A makeup air unit should be provided to correct the negative air balancing issue in the kitchen. Facilities reports that the generator belongs to the Town.	

Roofing

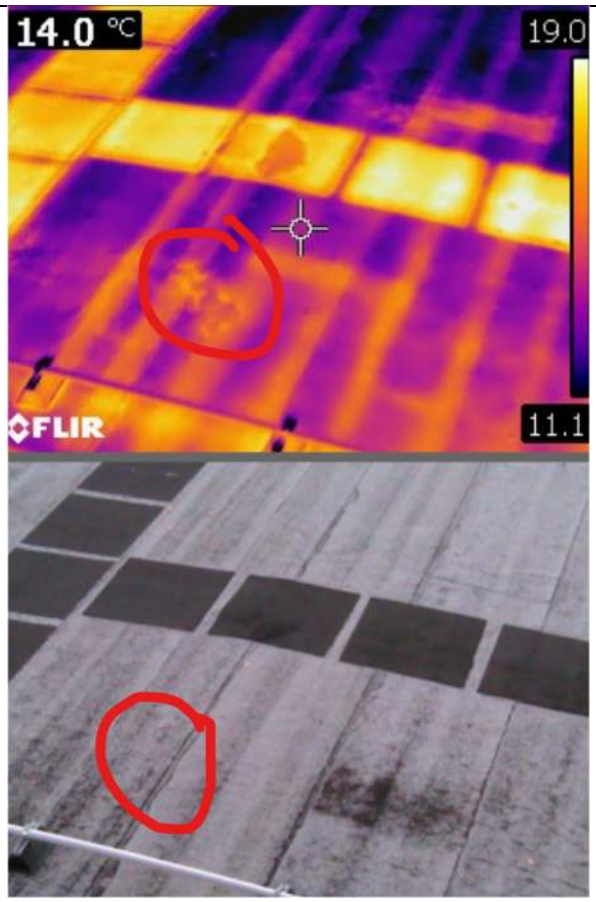
Offshore Roofing – Joe Kiss, PM - Contractor for Westport Johns Manville warranty engaged due to Separating and off gassing issues. 30 Points of blistering recorded. 10 points of blistering have moisture into the substrate but not apparent inside the building. The Johns Manville Roofing Report will provide greater detail for the roof condition.	

Roofing cap sheet is delaminated from the lower plies of roofing. The roof blisters are causing water infiltration to the lower plies of roofing both through cracks in the cap sheet and condensation building up in the blisters. The moisture trapped in the blisters will deteriorate the roof at an accelerated rate.	
Annual and semi-annual roof inspections are performed on Long Lots. The maintenance of the roof is evident. Leaks have been chased for years with new sealant observed at cracks, joints, pitch boxes and repairs.	
The roof is very fragile. The blister spots are easy to damage if walked on especially in the colder temperatures in addition the bitumen is getting cracked and brittle. The life expectancy of this roof is 10 – 20 years and it is showing signs of wear.	

This roof is not impact resistant to falling branches. As mentioned above some trees overhang this building and should be removed.	
Puddling will cause a modified bitumen roof to wear down faster. The building maintenance team is doing an excellent job of preventing puddling by keeping the roof drains clean. No leaf clogged roof drains were observed during the site visit despite leaves actively falling on the roof from overhang trees.	



The brighter colors are thermal patterns consistent with wet insulation below the roof membrane.



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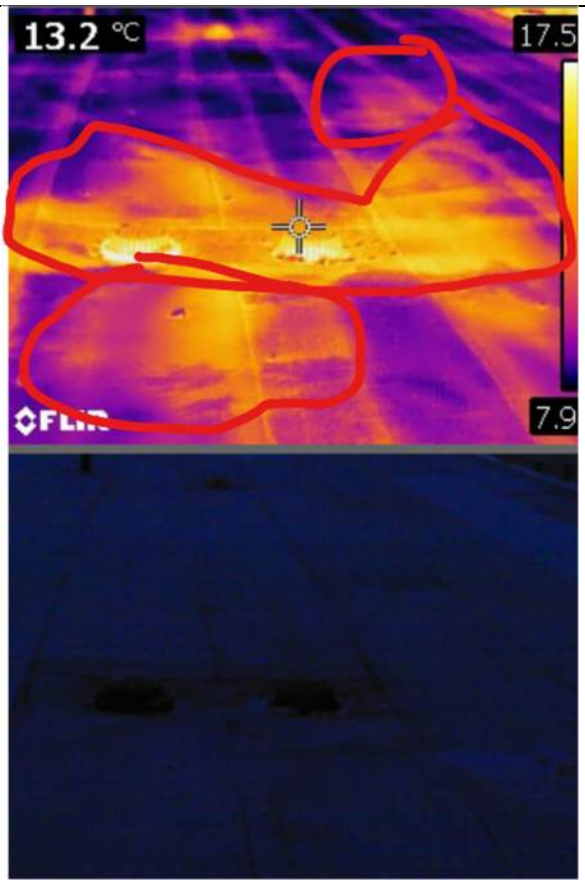

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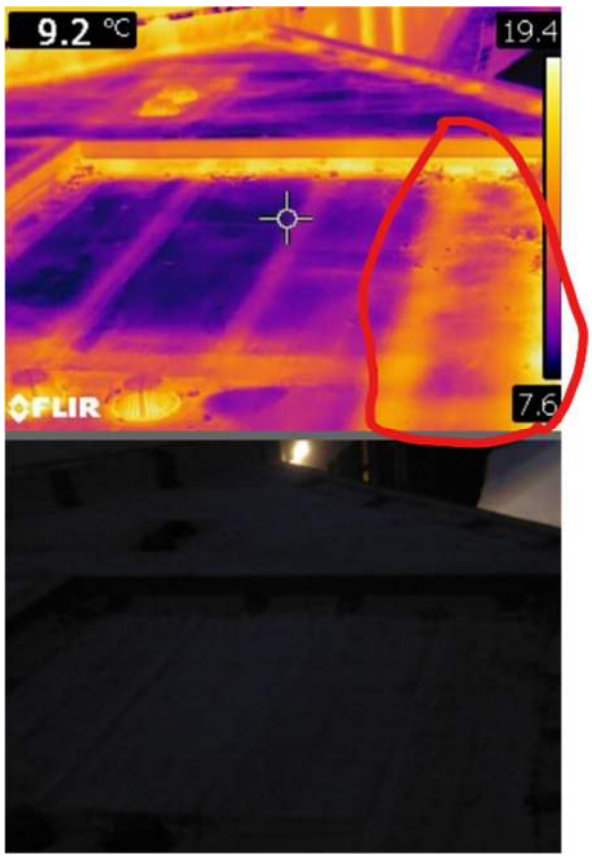

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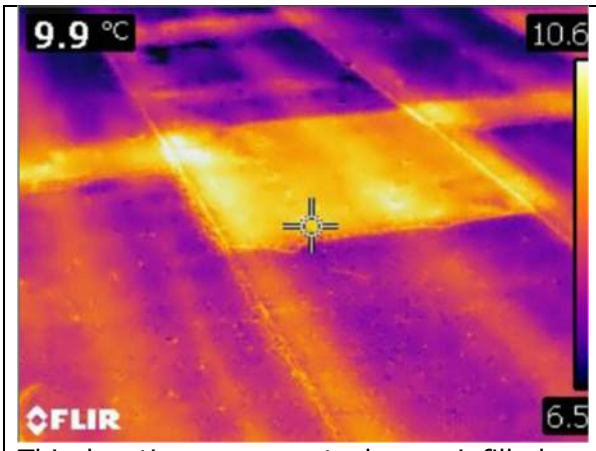
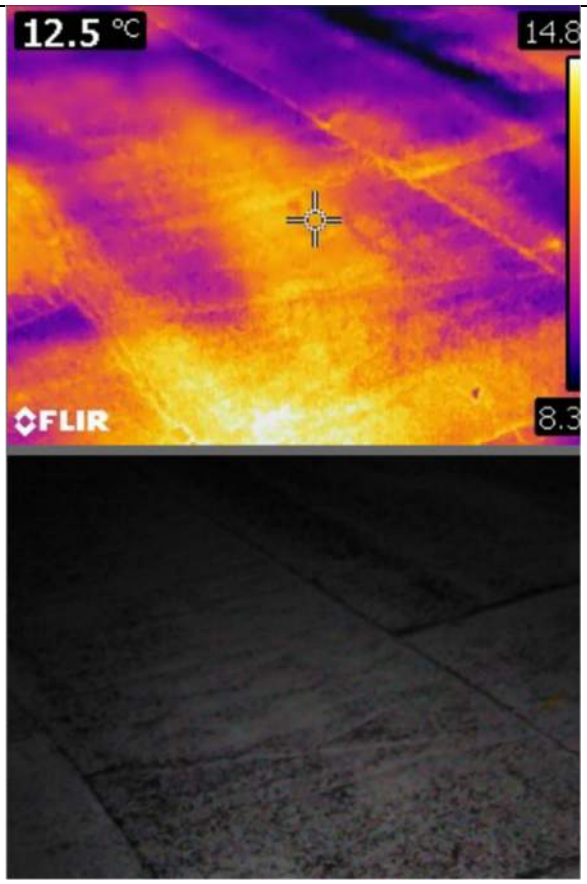


This location appears to be an infilled roof curb roofed over flush to the roof with no insulation.



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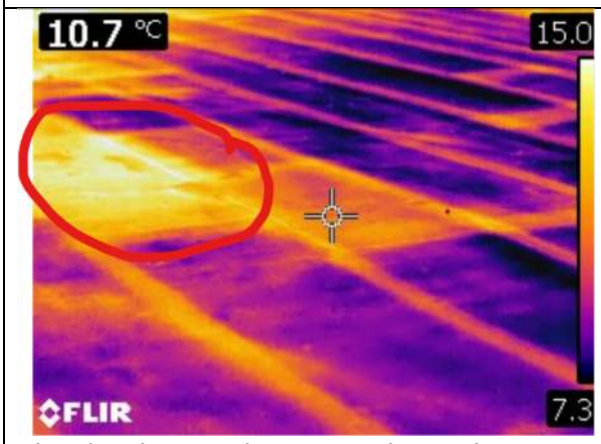

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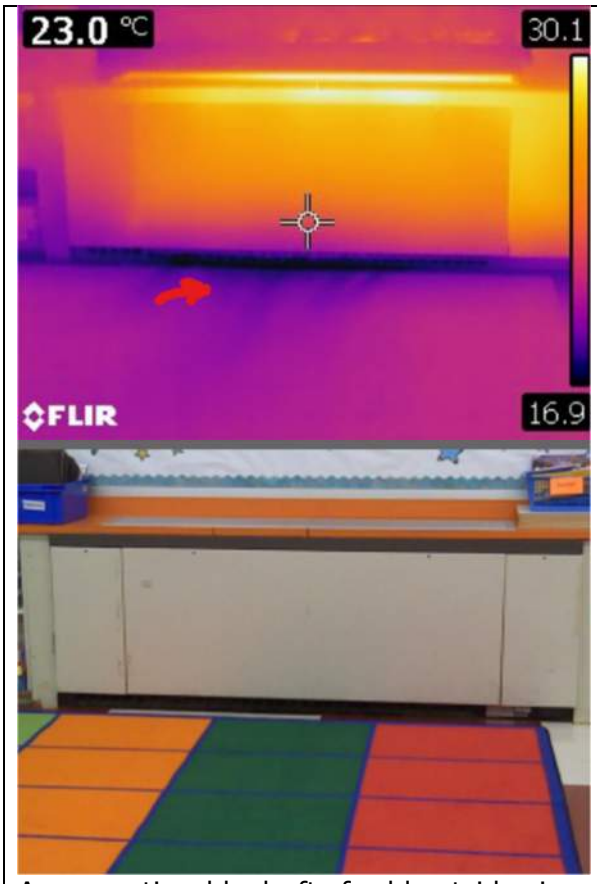
Unit Ventilators

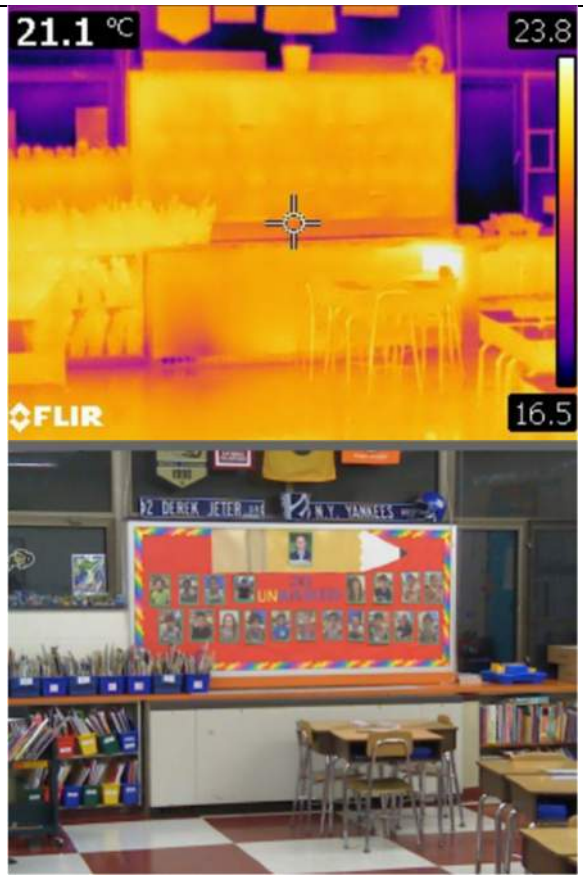
The unit ventilators have an internal screen that is not accessible. These units are completely clogged and have no way to efficiently service the unit.	
The openings and the clogged dampers allow moisture into the building – snow blows through the ventilators.	
Water observed withing the backside of the External Finish System that poured out of the wall assembly when the unit ventilator was removed. This is an indication that water is trapped behind the finish system reducing the effectiveness of the insulation and causing issues associated with water trapped in a wall system. This was in the 200-wing building.	

Unit ventilator in place at ground level. Cold air and surface water have an open pathway into the building.

Wide open-air gap at the unit ventilator into the building.



A very noticeable draft of cold outside air can be seen below the unit ventilator cabinet. The draft appears as the dark wispy fingers on the floor. The darker colors are the cooler temperatures, and the bright colors are the warmer temperatures.



Cold air seen at the base of the unit. A hot spot at the controls at the top right of the cabinet. A cold draft of outside air seen at the operable window to the right of the tack board. Drafts seen around the hopper window to the left of the tack board.

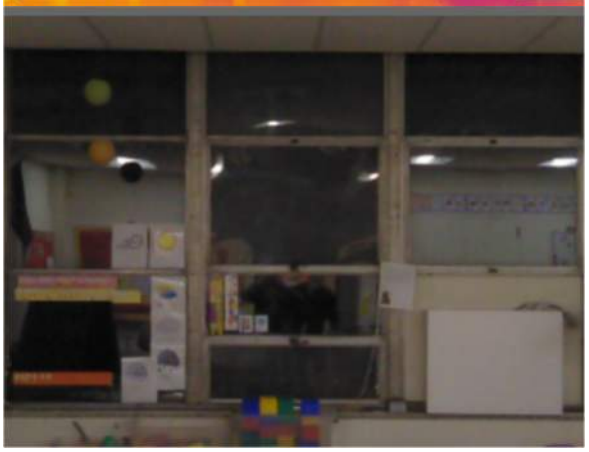
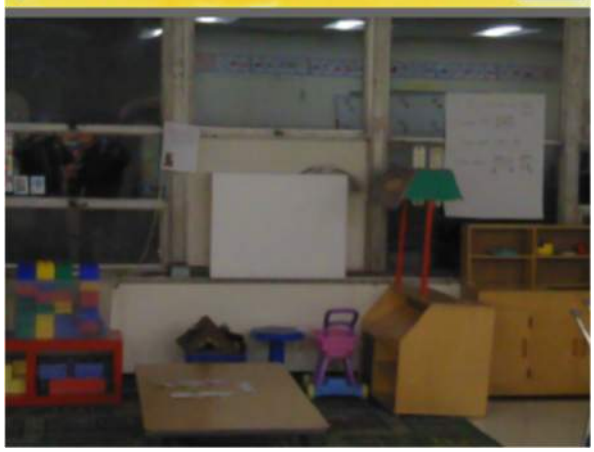
Skylight issues in Room 6

On-going issue with the skylights.
Water infiltration issue has been on-going, and several attempts have been made to mitigate the water leaks. Sealant has been applied to the skylight joints.
Solar heat gain issue – the skylight has been whited out to try to reduce the amount of solar heat gain in the space.

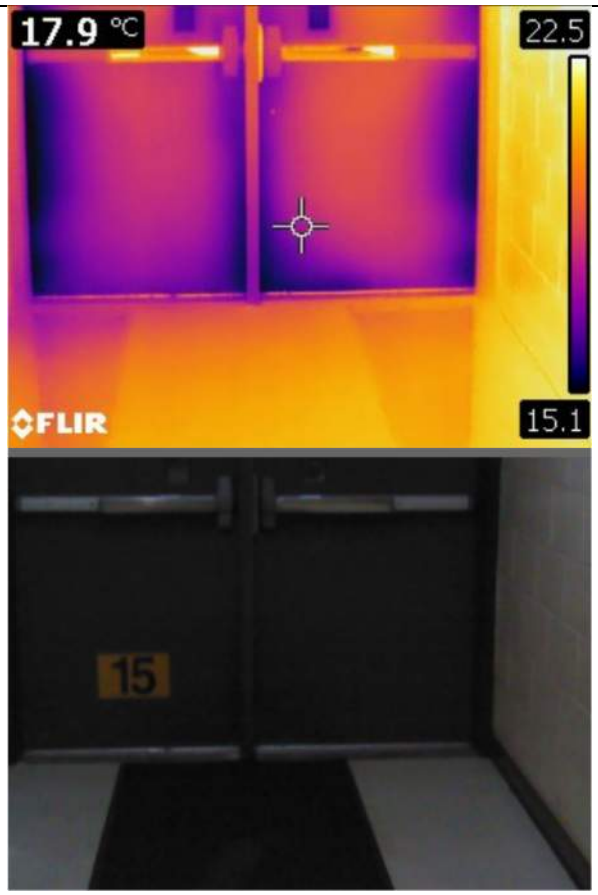
Sealants applied to the joints to try to stop the water leaks.

HVAC window units

Window units in approximately 15 classrooms that stay in the window system year-round.

Approximately half the building has window units. These are large 3-ton window units.	
  The whisps of black seen at the hopper window and around the air conditioner are cold air drafts into the building.	  The cold air draft around the air conditioner cover can be clearly seen by the dark colors around the unit.

The dark colors around the air conditioner cover are a thermal image of cold air entering the building. Duct tape is being used to try to mitigate this air infiltration.



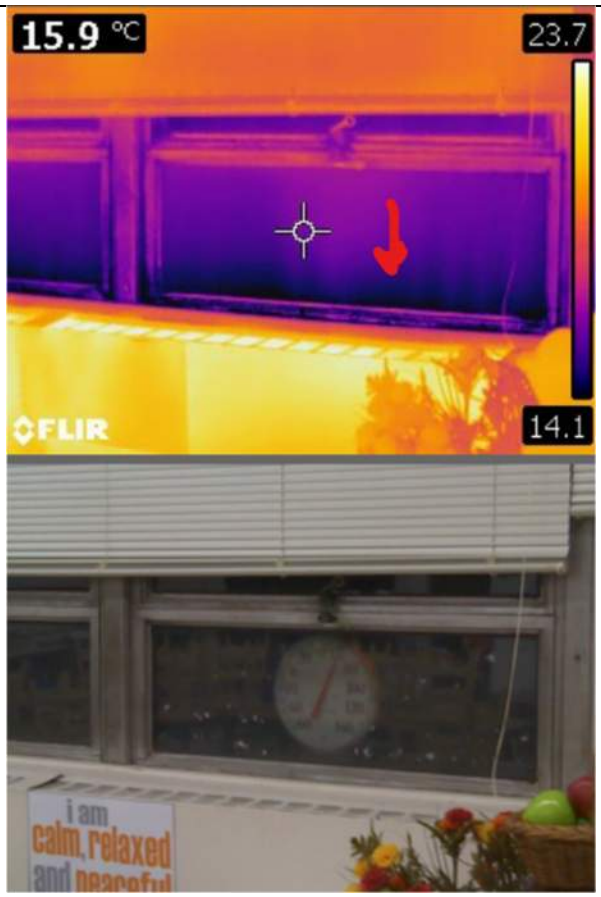
The dark wispy pattern around the perimeter of the entry doors is cold air drafts around the entire perimeter of the pair of doors.

Window System

Original single pane window system 1950's vintage.
The windows have had extensive caulking applied to try to address some of the water and air infiltration issues.

Single vents have been installed to try to ventilate the brick cavity space. This ventilation is not adequate. Convection is required to properly ventilate a cavity space with vents at the bottom and top of the wall.	
Kalwall System observed in the thermal scans to have air leakage at the perimeter and thermal bridging between the panels.	

The bright colors are the warm surfaces, and the dark wispy colors are the cold air infiltration drafts. Normally these surfaces would be a consistent color. There is a significant amount of thermal bridging heat loss through the window frames and significant air infiltration.



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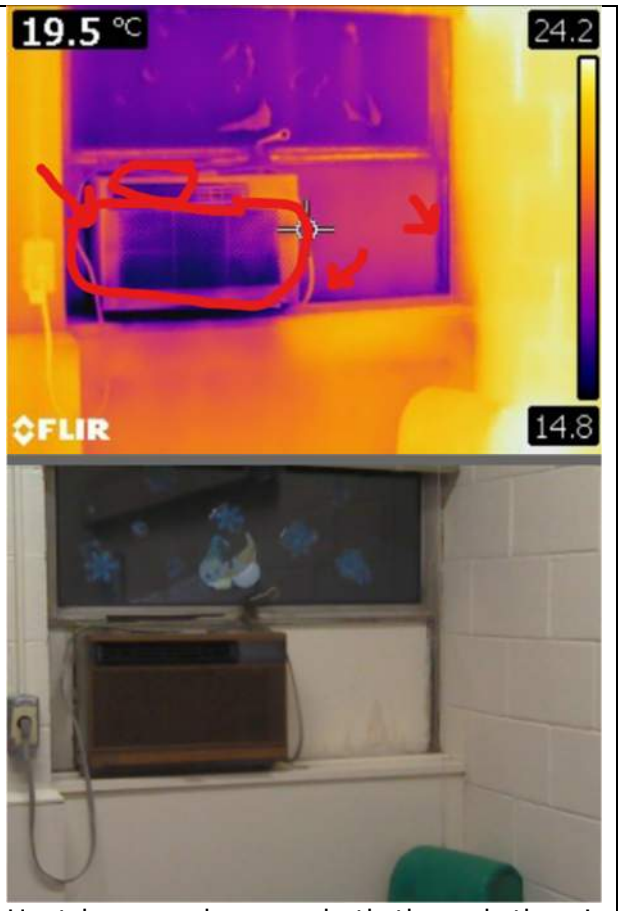
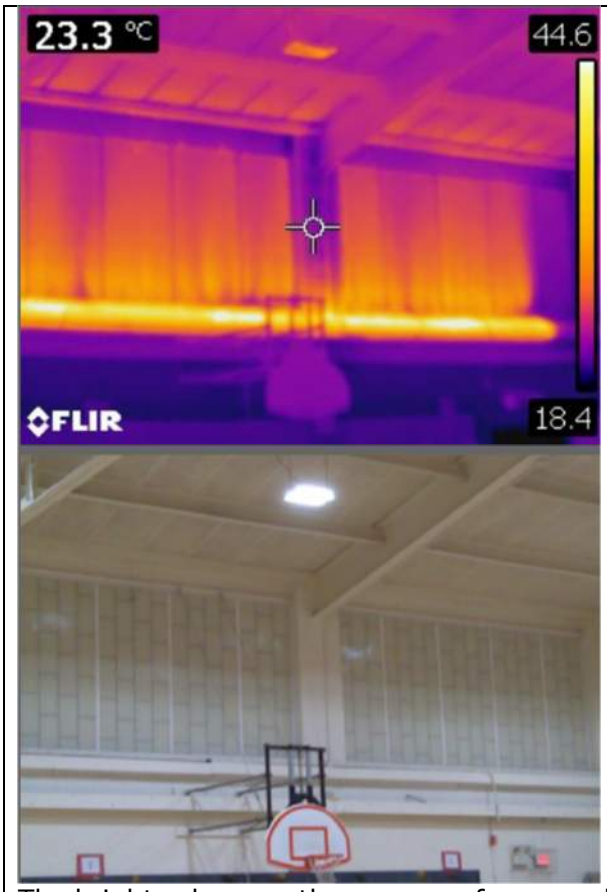
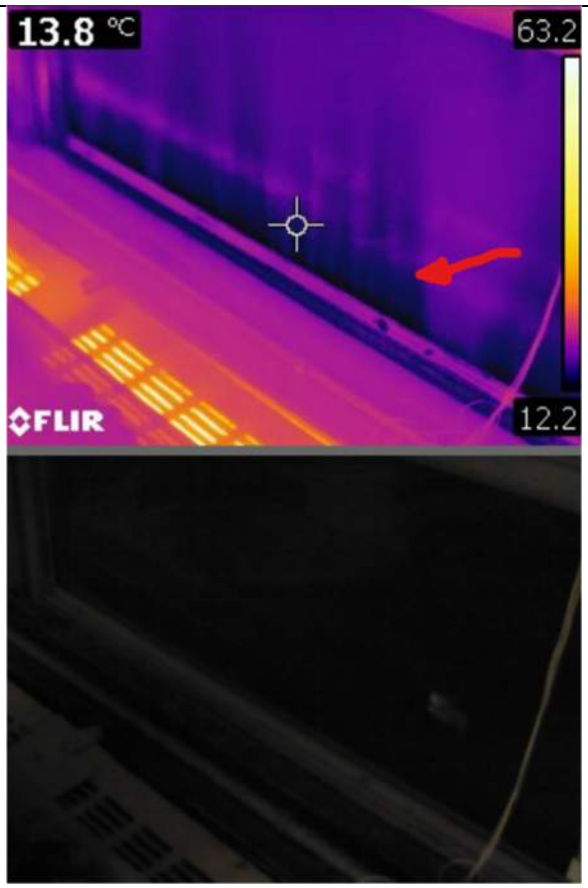


Heat loss can be seen both through the air conditioner and around the air conditioner.



The bright colors are the warm surfaces, and the dark wispy colors are the cold air infiltration drafts. The Kalwall system is showing significant air infiltration.



The bright colors are the warm surfaces, and the dark wispy colors are the cold air infiltration drafts. Normally these surfaces would be a consistent color. There is a significant amount of thermal bridging heat loss through the window frames and significant air infiltration.

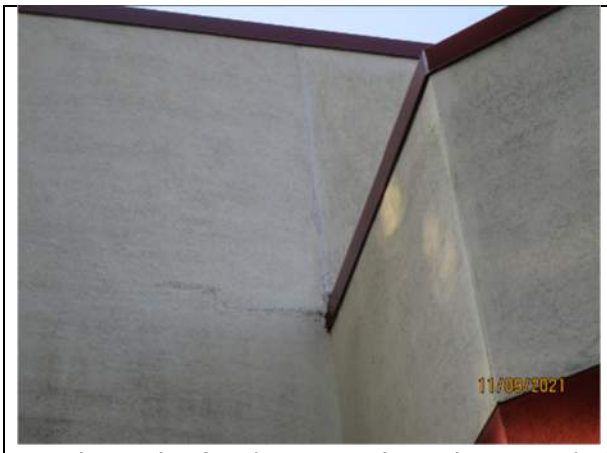
Air infiltration seen at the sill and jamb of the operable window.

A draft can be seen flowing down from the window shade. Cold air is seen from the window side.

Exterior Wall Systems

Brick – efflorescence on the brick surface is a sign of water infiltration from above. This may be coming from the roof level.

	 Extensive sealant has been applied to the door lintel. The water infiltration is likely coming from the brick wall cavity from a source higher on the wall or at the roof flashing.
External Finish Systems	
 Entry soffit does not have any venting resulting in likely condensation building up in the ceiling cavity. The moisture shows signs of suspect materials on the ceiling surface.	 Organics appear to be growing on the surface of the finish system. Water being trapped behind the system has been observed at the unit ventilators and the base of the fished system walls.
	



Cracks in the finish system have been sealed to try to prevent water infiltration.

Vent into finish system soffit.

View inside the finish system soffit reveals that the gypsum sheathing on the exterior wall has no vapor barrier allowing drafts of outside air into the building.

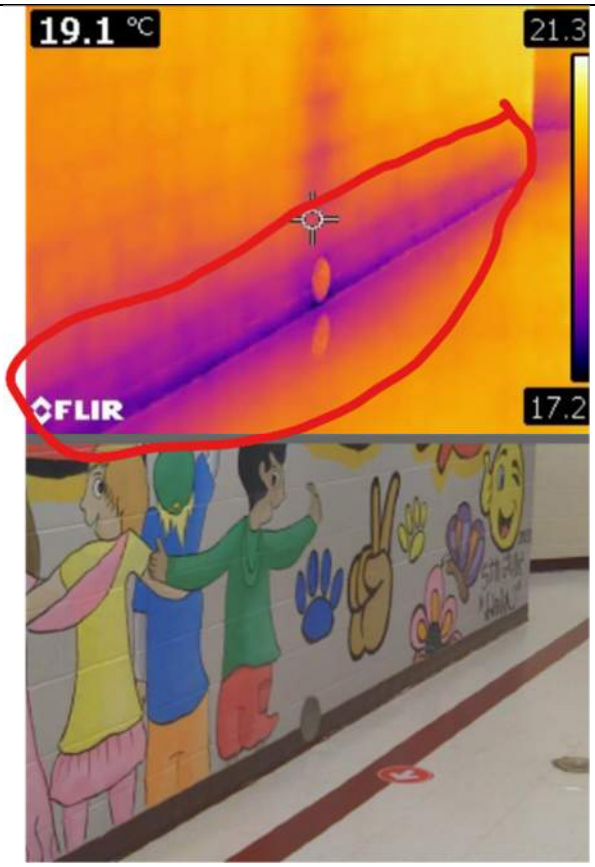
All the base trim and control joints appear to have expansion damage from water exfiltrating the system and expanding when leaving the system.

Ice damage at base trim and control joint.

Little to no ventilation in the soffits.

Insulation in the exterior walls is not properly installed. The vapor barrier should be overlapped and sealed from each section of insulation. Without the continuous vapor barrier airflow is free to infiltrate and exfiltrate the building.

A damp patch on a wall is usually much cooler that the surrounding surface and when moisture-laden air meets a colder surface, it causes condensation. Several areas with thermal images with a temperature variation that are consistent with condensation have been identified. Condensation damp areas can lead to microbial growth. If condensation is not delt with it will go on to cause mold growth.



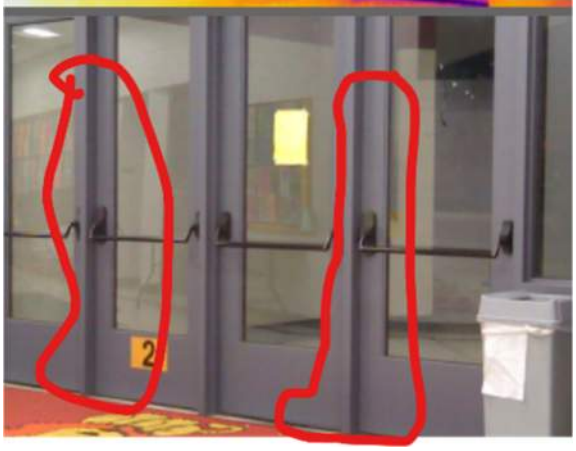
The foundation has no thermal break between the exterior foundation and the floor slab inside of the building causing a cold spot on the walls and floor that can lead to condensation.

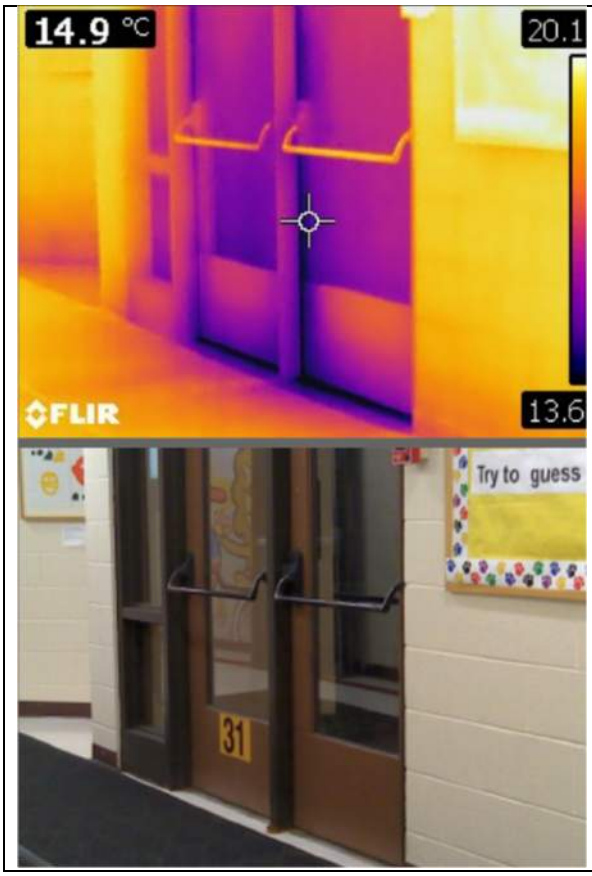
 Cold thermal bridge at the exterior walls.	 Interior walls thermal pattern as an example of a wall to floor slab with no thermal bridge to the exterior.

Roof Top Units

The rooftop units have been reported to have corroded pans that have rusted through and caused leaks into the building. The housing itself does not leak but the internal collection pans for condensation have failed. The RTU pans have been re-gasketed and caused extensive water infiltration into the auditorium. This resulted in a major project to mitigate the mold caused by this water infiltration into the auditorium.	

Wind Driven Rain Issues

Wind driven rain issues have been reported at the main entrance, storefront door areas, library entrance, rooftop man door access above the auditorium at the threshold. Snow has also been reported blowing through the gaps around the doors.	
 Visible gaps in the weather stripping at the doors observed.	 Deteriorated exterior walls systems observed.
  Thermal image consistent with air infiltration observed around all the entry doors.	  Thermal image consistent with air infiltration observed around all the entry doors.



Pitch box issues

Water infiltration was reported at the supply and return lines at the roof top units. This infiltration has been corrected.	 Pitch box at the guardrail has been refreshed.

Roof drain piping issue reported

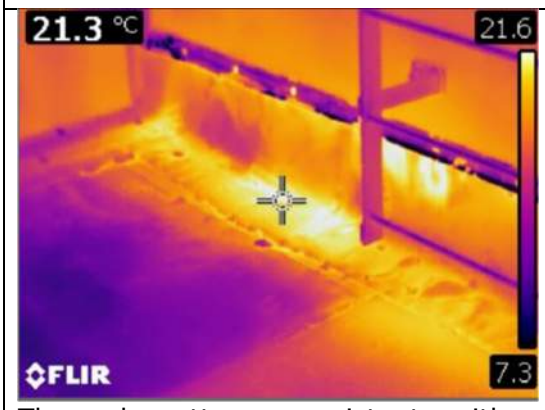
A roof drain body and piping that had been replaced was observed in the office. There was a hole in the pipe indicating that the roof drain system has exceeded its lifespan.	

Roof access Ladders – Anchors to the building

The access ladders on the roof levels have failed anchoring systems. The anchors have pulled out of the building and as a result the ladders are very loose. This is causing a potential water infiltration issue at both ladders.	

Roof ladder pulling away from the building causing the sealant around the anchors to tear allowing water into the wall.

Thermal pattern consistent with water infiltration at the roof ladder possibly caused by the movement of the ladder due to the loose anchors.



Thermal pattern consistent with water infiltration at the roof ladder possibly caused by the movement of the ladder due to the loose anchors.

V. HVAC Commissioning and Testing

The building HVAC systems consist of multiple types of roof top units, air handling units and unit ventilators. All major mechanical equipment is controlled by Environmental Systems Corporation (ESC) building management system (BMS) via direct digital controls (DDC).

A detailed testing of the various devices and sensors enabling the HVAC system to implement automatic temperature control (ATC) was conducted and the observations and deficiencies are provided in the sections below.

General Observations

1. HV units are located on the bulkhead above the gymnasium.
2. The chiller and the constant volume chilled water pump operates continuously when the OA temp goes above 67°F. Only one chiller runs at a time, and the chillers are rotated every 168 hours (approximately 1 week).
3. All units' filters are MERV 8 and have been replaced on 04/21. RTU MZ-2 filters were observed to be dirty, and stalled water was observed at the base of the unit.

RTU-MZ-2 filters

4. The RTU and HV units were running in 100% return air and OA dampers fully closed.
5. During the pandemic the units were running in occupied mode 24/7; however, since the government approval the units have been switched back to follow occupancy based programmed schedules.
6. All Exhaust Fans are controlled by Tork-time clocks. The BMS monitors ON/OFF status of the fans. The Tork time clock serving the West wing was observed to be faulty and is recommended for replacement. All of the Exhaust Fans serving the West wing were observed to be Off.
7. The RTU for the music room was observed to be not operating. The music room HVAC system is operated by pneumatic controls and the status is monitored by the BMS. Space temperature in the music room was measured to be 78°F and the

pneumatic thermostat setpoint was not visible. It is reported that the facilities are working on replacing the unit.

8. The fan coil unit's outdoor air (OA) dampers are located outside the classrooms a couple of inches above the ground level.

OA grills on the outside wall for fan coil unit ventilation.

9. The OA dampers of the RTU and HV are located away from exhaust fans.

OA louvers on the exterior of wall of the building as observed from the roof.

Operations & Maintenance Practices/Tasks:

Starting July of 2021, facilities staff and ESC have been working on evaluating and fixing issues with the units on site including properly locating sensors, replacing missing sensors, providing proper size and type of filters, and checking the operation of the units. The observation and findings of these tests are included under section five 'Functional Testing' of this report.

Sequence of Operations:

RTU-MZ-1N, MZ-1S, MZ-2 and MZ-3

Cooling Mode

Whenever the space temperature rises above the space temperature setpoint the cooling mode on the RTU will be enabled.

If the unit is operating in Occupied Mode, then Fan VFD turns ON at maximum fan speed and 1 (first stage) Compressor turns ON.

After 5 minute delay if the space temperature stays above setpoint then the stage two (2^{nd}) compressor turns ON.

If space temperature drops below space setpoint+1.5°F for 5 minutes, then the 2^{nd} compressor turns OFF.

If the cold deck temperature drops below cold deck setpoint, then the Fan VFD turns down to minimum fan speed.

If space setpoint is satisfied, then the first stage (1^{st}) compressor turns OFF after 5 minute delay and the fan stays operating at minimum fan speed.

Cold deck and hot deck dampers modulate based on space temperature (pneumatic controls)

Ventilation Control

Outside air dampers stay closed during normal operation. If space CO_2 increases above CO_2 setpoint, then OA damper modulates Open, Return damper modulates closed and supply Fan VFD modulates fan speed to maximum.

Economizer mode: (Applicable to the main office RTU only)

No economizer setpoint set up for RTU-MZ-1N, MZ-1S and MZ-3

When OA temperature is below Economizer setpoint, OA damper modulates open to 100%, Return air damper modulates closed to 0%.

Unoccupied mode:

The RTU fan remains OFF during scheduled unoccupied mode and the space temperature setpoint is reset to maintain unoccupied heating and cooling setpoints.

If space temperature increases above the unit's unoccupied cooling setpoint then the RTU turns ON to maintain unoccupied cooling setpoint. Similarly, if space

temperature drops below the unit's unoccupied heating setpoint then the RTU turns ON to maintain unoccupied heating setpoint.

HV Units (Serving Gymnasium)

Summer mode:

During summer mode operations the supply fan is operating at minimum fan speed. Unit's return air damper is 100% open.

Ventilation Control

When space CO_2 increases above CO_2 setpoint, the OA damper modulates open, the relief air damper also modulates open, and the return air damper modulates close. The fan speed is set to maximum fan speed.

When CO_2 setpoint is satisfied, the OA damper modulates closed after a delay. The relief air damper modulates closed, and the return air damper modulates Open. Fan Speed modulates to its low speed setpoint.

Unit Ventilators (UV) with DX Cooling:

Cooling mode:

Whenever the space temperature rises above the space temperature setpoint the cooling mode (DX cooling) on the unit ventilators will be enabled.

Occupied Mode:

During occupied mode the fan operates continuously, and the condenser turns ON.

If the space occupancy sensor detects motion, the unit will work to maintain occupied setpoints, else the unit will maintain standby setpoint.

Ventilation Control

If space CO_2 increases above CO_2 setpoint, then OA damper modulates Open and the Return air damper modulates closed.

Economizer mode:

When OA temperature is below Economizer setpoint, OA damper modulates open to 100%, Return air damper modulates closed to 0%.

If OA temperature at any one of the units is much lower than economizer setpoint, then OA temperature is set as global OA temperature.

Units Ventilators (UV) – 4 pipe system:

Cooling mode:

Whenever the space temperature rises above the space temperature setpoint the cooling mode on the UVs will be enabled and chilled water vale will modulate open.

Heating mode:

Whenever the space temperature drops below the space temperature setpoint the heating mode on the UVs will be enabled and hot water vale will modulate open.

Occupied Mode:

During occupied mode the fan operates continuously. If the space occupancy sensor detects motion, the unit will work to maintain occupied setpoints, else the unit will maintain standby setpoint.

Ventilation Control

If space CO_2 increases above CO_2 setpoint, then OA damper modulates Open and the Return air damper modulates closed.

Economizer mode:

When OA temperature is below Economizer setpoint, OA damper modulates open to 100%, Return air damper modulates closed to 0%.

If OA temperature at any one of the units is much lower than economizer setpoint, then OA temperature is set as global OA temperature.

VI. Functional Testing

The table below provides the functional test results for the HVAC equipment

Westport Public Schools										
Long Lots Elementary School HVAC Testing										
Date:	August 2021'									
			Testing Modes							
Equipment ID	Area / Service	Test Date	Occupied Mode	VFD Fan Speed Modulation	Cooling Mode	Heating Mode	Economizer Mode	CO2 Ventilation Mode	Unoccupied Mode	Observations / Comments
HV-1	Gym	8/24/2021	Pass	2- speed VFD setup	N/A	Deferred seasonal test	N/A	Pass	N/A	Outside air dampers were 100% closed
HV-2	Gym	8/24/2021	Pass	2- speed VFD setup	N/A	Deferred seasonal test	N/A	Pass	N/A	Outside air dampers were 100% closed
RTU-MZ-1N	Auditorium	8/24/2021	Pass	2- speed VFD setup	Pass	Deferred seasonal test	Fail - Not set-up	Pass	Pass	Outside air dampers were 100% closed
RTU-MZ-1S	Auditorium	8/24/2021	Pass	2- speed VFD setup	Pass	Deferred seasonal test	Fail - Not set-up	Pass	Pass	Outside air dampers were 100% closed
RTU-MZ-2	Main Office	8/24/2021	Pass	2- speed VFD setup	Pass	Deferred seasonal test	Pass	Pass	Pass	Outside air dampers were 100% closed. Unit MZ-2 filters were dirty, and stalled water was observed at the base of the unit.
RTU-MZ-3	Library	8/24/2021	Pass	2- speed VFD setup	Pass	Deferred seasonal test	Fail - Not set-up	Pass	Pass	Outside air dampers were 100% closed
RTU	Music Room	8/24/2021	Unit was off - Manually enabled	N/A	Fail	Deferred seasonal test	Fail	Fail	Fail	Facilities is working on replacing the unit

Functional Testing of RTUs and HV Units

Westport Public Schools								
Long Lots Elementary School HVAC Testing								
Date:		August 2021'						
Equipment ID	Date Teste	Area / Service	Supply Air Temperature	Space Temperature Sensor	Mixed Air Temperature	Outside Air Damp	Freeze Stat Operation	Comments / Observations / Issues
UV-5	7/7/2021	Wing 200 - Room 207	Pass	Calibrated - Pass	Fail - Sensor needs replacement	Pass	Pass	Found bad set of contacts on controller for fan status and moved it. Tested ok.
UV-14	7/7/2021	Wing 200 - Room 208	Pass	Pass	Pass	Pass	Pass	Found bad current sensor and replaced. Verified ok. HVAC occ sensor not working. Light occ sensor not working.
UV-13	7/7/2021	Wing 200 - Room 209	Pass	Pass	Pass	Pass	Pass	
UV-4	7/7/2021	Wing 200 - Room 206	Pass	n/a	n/a	n/a	Pass	Changed the outside air damper actuator. Also changed bad blower motor. Both now working correctly. Also replaced the controller that had a bad room sensor input.
UV-11	7/29/2021	Wing 200 - Room 212	Fail - Needs to be replaced	Pass	Pass	Pass	Pass	Needs new filters.
UV-2	7/29/2021	Wing 200 - Room 204	Pass	Pass	Pass	n/a	Replaced	Auto reset low limit stat, should add a manual reset freeze stat (N/C) 8/20/21. Replaced freeze stat with manual reset
UV-1	7/29/2021	Wing 200 - Room 203	Pass	Pass	Pass	Pass	Pass	Need 8x28 size filter. Found unit is tied into refrigeration lines of room 212. The controllers are configured that if the units do not see fan status in a/c mode the dx cooling will stay on and the units will ice up. In heat mode if we lose fan status the outdoor air dampers stay open, which could freeze the coil. Recommendation: (1) Clean all condenser coils then verify refrigerant charges in systems. (2) Reprogram all the controllers to disable the dx in summer if no fan status and close the OA dampers in winter mode if no fan status.
UV	7/29/2021	Room 101	n/a	Pass	n/a	Pass - linkage corrected	Pass - controller status not correct	Chilled water valve and Hot water Valve were tested and operation verified. Need to change controller to obtain correct unit status.
UV	7/29/2021	Room 103	n/a	Calibrated - Pass	n/a	Corrected - Pass	Pass - controller status not correct	Chilled water valve and Hot water Valve were tested and operation verified. Need to change controller to obtain correct unit status.
UV	7/29/2021	Last unit in communication line.	n/a	Pass	n/a	Pass	Pass - controller status not correct	Chilled water valve and Hot water Valve were tested and operation verified. Need to change controller to obtain correct unit status.
Kit Make-up Air	8/20/2021	Kitchen	n/a	n/a	n/a	Pass	Works, however needs EP switch to open heating valve	Heating actuator tested ok
General Note	8/20/2021	200 Wing						Cleaned all the condensers on the roof that serve the 200 wing
Auditorium RTU North	8/20/2021	Auditorium	Pass	Calibrated - Pass	Pass	Pass	Pass	
UV-6	8/20/2021	Wing 200 - Room 210	Fail - Needs to be replaced	Pass	Pass	Pass	Pass	
UV-3	8/20/2021	Wing 200 - Room 205	Pass	Pass	n/a	8/20/21-Actuator replaced and tested	Pass	Current sensor installed and checked. Needs new fan speed transformer. Blower runs when it should not be running.
UV-12	7/16/2021	Wing 200 - Room 211	n/a	Replaced	n/a	n/a	n/a	7/16/21: Replaced bad temperature sensor
UV-10	7/29/2021	Wing 200 - Room 202	Pass	Pass	Pass	n/a	Pass	
UV-9	7/29/2021	Wing 200 - Room 201	Fail - Needs to be replaced	Pass	Pass	8/20/21- Replaced and tested ok	n/a	Updated graphics to remove CO2 sensor and match to actual equipment.
UV-8	7/29/2021	Wing 200 - Room 200	Pass	Pass	Pass	n/a	Pass	Updated graphics to remove CO2 sensor and match to actual equipment. Need to check refrigerant charge.
UV-8 Notes	7/29/2021	Wing 200 - Room 200						No filter installed, need 8x28 size filter. Unit tied to refrigeration lines of room 212. 8/20/21- Window A/C replaced.

Functional Testing of Unit Ventilators serving Wing 200

VII. Commissioning Issues Log

Commissioning Issues Log

Updated: 8/25/2021

Issues Open 13

Issue Status

"OP" or Open indicates a resolution has not been agreed upon.
"CL" or Closed indicates that the resolution was verified to be incorporated.
"IP" or In Process indicates resolution agreed upon, but not completed and confirmed.
"CL+" indicates resolution complete awaiting verification. (date entered in Action col)
"CL-" indicates Closed (with date), but will be shown for one more printing.
"IP+" indicates IP, but needs additional discussion.

Issue Num	Status	Equipment	Dates Entry	Issue Details and Impacts (list equip tag and zone)	Response or Action by Contractor, A/E, CxP or Owner (give date and initials)	By
1	OP	AHU/HV	8/25/2021	BMS outside air RH reading innacurately (100%).		
2	OP	RTU-MZ-2	8/25/2021	Observed standing water at the economizer/filter compartment of the RTU. Condensate not draining properly		
3	OP	RTU-MZ-2	8/25/2021	No alert on the BMS for condensate overflow		
4	OP	RTU-MZ-1N,S	8/25/2021	Facilities observed condensate not properly draining in both units. The filter compartment of MZ-1N looked damp		
5	OP	RTU-MZ-1,3	8/25/2021	VFDs were installed in 3 units, however the control sequencing in the BMS is set up so the units run at either min or max speed. The min and max speeds were taken from a previous energy saving study.		
6	OP	OA dampers	8/25/2021	Unsure if snowline was considered when the OA dampers (induction and HV units) locations were chosen		
7	OP	RTU-Music room	8/25/2021	RTU observed off. Facility staff turned down the thermostat in the music room but the unit was unable to cool down the room.		
8	OP	BMS	8/25/2021	The BMS only shows the signals/command to the HVAC units but it isnt set up to monitor the operation of compressors, or dampers.		
9	OP	Exhaust fans	8/25/2021	Exhaust fans at the 200 Wing were observed off. Tork timer faulty needs to be replaced		
10	OP	Exhaust fans	8/25/2021	Exhaust fans operation can be monitored in the BMS but there were no alarms set up that notified the 200 wing fans stopped running		
11	OP	RTU-MZ-2	8/25/2021	Filters observed dirty. Need to be replaced		
12	OP	Induction Units	8/25/2021	Area by the return intake observed dirty, needs to be cleaned regularly		
13	OP	Chillers	8/25/2021	Broken pressure gauges		
14						
15						
16						
17						
18						

Table 1: Commissioning Issues Log

VIII. Limiting Conditions

The observations described in this report are valid on the dates of the investigation under the conditions noted in the report. We prepared this report for the exclusive use of Westport Public Schools (hereinafter "Client") and their successors and assignees. CPL does not intend any other individuals or party to rely upon the report without our express written consent. If another individual or party relies on the report, they shall indemnify and hold CPL harmless for any damages, losses, or expenses they may incur as a result to its use.

The report is limited to the visual observations made during our inspection. We did not remove surface materials, conduct any destructive or invasive testing, move furnishings or equipment, or undertake any digging or excavation. Accordingly, we cannot comment on the condition of systems that we could not see, such as buried structures and utilities, nor are we responsible for condition(s) that could not be seen or were not within the scope of our services at the time of inspection. We did not undertake to completely assess the stability of the buildings or the underlying foundation soil since this effort would require excavation and destructive testing. Likewise, this is not a seismic assessment.

We do not render an opinion on uninspected portions of the facility.

We did not perform any computations or other engineering analysis as part of this evaluation, nor did we conduct a comprehensive code compliance investigation. The report is not to be considered a warranty of compliance investigation. The report is not to be considered a warranty of condition, and no warranty is implied. Any photographs are an integral part of this report and must be included in any review.

If cost estimates are presented, they are estimates only. The estimates are based on our general knowledge of building systems and the contracting/construction industry. When appropriate, we have relied on standard sources to develop cost estimates. However, items for which we have developed cost estimates (e.g., structural repairs), no standard guide for developing such estimates exists.

We have performed no design work as part of the study, nor have we obtained competitive quotations or estimates from contractors as this also is beyond the scope of the project. The actual cost to remedy deficiencies and deferred maintenance items that we have identified may vary significantly from estimates and competitive quotations from contactors.

IX. Disclaimer

It is agreed and understood that this report is for the exclusive use of the Client and is not to be reproduced or copied.

While CPL has agreed to take reasonable steps to evaluate the building and its systems, the Client acknowledges and agrees that CPL shall have no liability or responsibility whatsoever arising out of or with respect to the commission of, utilization of or reliance upon the contents of this report by the Client including without limitation for any injury or death to any person, loss or damage to any property, loss of profits or business interruption, indirect or consequential damages, or for any other costs, losses or damages whatsoever or kind suffered by the Client. Without limiting or affecting the generality or interpretation of the foregoing, CPL shall not be liable or responsible for its failure to identify the existence of any of the following or issues arising therefrom:

1. Existence of an environmental hazard or condition, including, but not limited to, oil and petroleum products, toxic, reactive combustible, corrosive contaminants, wildfire, geologic or flood, except for evidence of environmental hazards visually identifiable without utilizing intrusive or chemical testing procedures;
2. Existence of conditions related to animals, rodents, insects, wood-destroying insects, organisms, mold or mildew;
3. Geotechnical, engineering, structural, architectural, geological, hydrological, land surveying or soils-related examinations;
4. Factors related to any systems, structures or components of the facility including but not limited to: efficiency, durability, costs to operate, fair market value, marketability, quality or advisability of purchase;
5. Systems, structures or components of the facility which are not permanently installed;
6. Compliance with installation guidelines, manufacturers' specifications, building codes, ordinances, regulations, covenants or other restrictions, including local interpretations thereof;
7. Some components of the property may be inaccessible for examination or concealed from view. Examples would include mechanical equipment suspended from or concealed by high ceilings, or access restricted by adjacent improvements;
8. As-built construction plans and operation and maintenance records may not be available or accurately reflect existing conditions at the time of review; and
9. Some system components or latent problems may be completely hidden from view in the facility.

X. CPL Inspection Team:

Adam Holzschuh, Sr. Project Manager

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Terence Connolly, Associate Director

Ravi Chavan, Project Manager

George Barnes, Project Manager

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Colliers
Project Leaders

June 1, 2022

Mr. Thomas Scarice
Superintendent
Westport Public Schools
110 Myrtle Avenue
Westport, CT 06880

Subject: ***Long Lots Elementary School Replacement Recommendations and Considerations***

Dear Mr. Scarice:

Contained in this letter is Colliers Project Leaders early recommendations for the Long Lots Elementary School as well a draft schedule and draft high-low budget ranges for a proposed new school. These recommendations take into account many different factors as outlined below.

Based on our experience in multiple districts managing both renovation projects as well as new construction projects, as well as many factors of the existing building and site, Colliers recommendation to the district is to replace the existing facility with a new elementary school. We do so based on the specific criteria listed below.

- As noted in our letter to you dated January 13, 2022, the building envelope (walls, roofs, and slabs) and mechanical systems are severely compromised and past their useful life. Please refer to that letter for further details.
- The existing building layout was originally designed to serve as a middle school and has had multiple additions over its life span. As noted by the QA+M letter dated May 31, 2022, the existing footprint of the building is not programmatically appropriate for an elementary school.
- The existing site, based on preliminary test-fits developed by QA+M, indicates that we can construct a new 108,000 gross square foot school concurrently while the existing school remains in operation. Please note that operations of the school will most likely need to be modified to accommodate construction. We would recommend the use of a construction manager to facilitate proper phasing of the construction.
- Renovation of the facility is feasible however we suspect the renovations would be extensive in nature. We also suspect, based on our experience on past projects, that we would encounter many unforeseen conditions and conditions that are not in compliance with today's construction standards. These conditions would lead to numerous additional costs during construction that we cannot forecast until the building is being partially demolished.
- Renovation of schools, especially elementary schools, have a significant impact on the school operations. Occupied renovations require multiple phases, multiple moves, significant disruption and the need for both construction personnel and school occupants to be in the building at the same time, which is not ideal for elementary schools.

- Occupied renovations will take longer due to the multiple phases and the need to find swing space within the building. We estimate that that a renovation project could take between 6 and 12 months longer than a new construction project. General conditions for the construction manager typically range from $60k to $80k per month. That's a total of $720k to $960k in additional general conditions costs alone.
- Abatement of hazardous materials in elementary schools while being occupied is very restricted by the Department of Public Health. Typically, abatement cannot occur while students are in the building for obvious safety reasons. In addition, we've found that this places additional stress and concern onto the parents, administration and teachers.
- With respect to constructing a new school, they can be programmatically designed to meet the educational needs of the district as well as be constructed to meet the space needs of the school.
- New schools allow the district to consider all the available building systems being used in schools today to allow not only maximum comfort but also maximum efficiency. Renovation of existing buildings typically restrict the type of systems that can be installed within the existing structure of the building thus limiting the districts choices for systems.
- New schools also allow the district to incorporate all the school safety requirements as needed without being limited by the physical structure and geometry of the building. Vehicular and pedestrian access can also be designed appropriately as well as the playground and other site amenities.
- Typically, with a renovation project, parts of the existing building remain but are not necessarily desirable in a like-new school. Construction of a new school eliminates this undesirable aspect.

Draft Project Budget for a New School

Enclosed for your consideration is a draft budget for construction of a new elementary school that would house grades K-5 as well as the Stepping Stones program. Please note that our draft budget estimates the size of the building based on the enrollment projections, but the final budget will be based upon the approved educational specification yet to be completed.

The low draft budget is approximately $80M and the high draft budget is $102M. The proposed size of the building ranges from 101,000 gross square feet to 108,000 gross square feet. We have assigned a range of $400 per square foot to $450 per square foot for the building only. Please note these values are based on bids received for a comparable new elementary school this past November. The budget includes the abatement and demolition of the existing school but this should be discussed further given considerations to future swing space for Coleytown Elementary School.

A major factor in budgeting projects presently is escalation. We are currently utilizing an eight percent escalation factor carried through the mid-point of construction which is fourth quarter of 2025. This value alone represents $15.6M on the low budget and $20M on the high budget. We have collaborated with some of the construction management firms in the state to confirm the escalation value. Unfortunately, we cannot predict if this will come back down to the rates we've been using over the recent years (4%).

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The draft budgets are total project budgets and also include FF&E (Furniture, Fixtures, and Equipment), Fees and Expenses (e.g., architect fees, hazmat consultant fees, owner's rep fees, commissioning agent, legal, permits, testing, moving fees, etc.) and owner's contingency. Please note we have not included financing costs for bonding of the project as we typically request those from the town financing department for inclusion in the budget.

Assuming a grant funding will be provided by the state, we estimate the district share to range from $73M to $93M. This assumes a 11.07% reimbursement rate (2022 rates), 5 % ineligible costs for the project, and a space standard reduction of approximately 85%. This reduction is an estimated reduction of the reimbursement rate based on the anticipated size of the building compared to the statutory space standard calculation. Such a reduction would reduce the reimbursement rate to 9.43%. This is subject to the final audit by the state.

Project Schedule

Enclosed for your consideration is a draft project schedule. Due to the long duration of the project, we anticipate that with a funding approval in spring of 2023, that the schools can be designed, constructed and occupied by fall of 2026. This assumes a 15-month design phase starting in July 2023 and a 15-month building period followed by miscellaneous site work to follow.

In the draft macro-schedule, we have outlined some of the major components of the pre-grant application and pre-funding approval process. Please note that this process is subject to change but based on our experience with multiple projects, this schedule appears to be fairly reasonable and achievable. It assumes a grant application would be submitted by June 30, 2023.

Next Steps

In order to meet the enclosed schedule, we recommend continuing the due diligence phase of the project with the preparation of preliminary geotechnical studies, a Phase 1 Environmental Site Assessment (required for the grant application), and development of educational specifications.

Should you have any questions regarding this letter and the attachments, please do not hesitate to call me directly.

Sincerely,

Colliers
Project Leaders

Charles E. Warrington, Jr., P.E.
Director, Project Management

Attachment – High Low Draft Budgets dated June 1, 2022, Draft Macro-Schedule dated June 1, 2022
cc: Mr. Elio Longo, Chief Financial Officer

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Colliers
Project Leaders

January 13, 2022

Mr. Thomas Scarice
Superintendent
Westport Public Schools
110 Myrtle Avenue
Westport, CT 06880

Subject: ***Long Lots Elementary School***
Budget Analysis and Recommendations

Dear Mr. Scarice:

This letter serves as supplemental information to Colliers Project Leaders report dated December 16, 2021, that provides detailed documentation of the building envelope, mechanical, and electrical and systems as well as site observations adjacent to the building contributing to water infiltration into the building. Contained in this letter are our recommendations for the Long Lots facility based on our observations but also taking into consideration studies performed by Langan during the summer of 2021, and the 2019 Antinozzi Associates Master Plan Facility Study.

The Long Lots Elementary School is an aging facility originally constructed in 1953 with additions in 1962 and 1979. As documented in both Colliers and Antinozzi reports, most of the systems in the building are past their useful life with many of them dating back to the original construction of the building. Two of the major building systems are in poor condition as documented by Colliers. The building envelope and the mechanical/electrical systems.

These two major systems are primarily responsible for maintaining the indoor environmental conditions of the building. In very simple terms, they are responsible for keeping the building dry and warm (or cool.) These systems, especially in new buildings, compliment and support each other in this function. If one of these systems fails, it will typically cause the other to work harder or possibly become ineffective in its intended use. However, both systems are failing and in our professional opinion beyond their useful life where full replacement of the systems should be considered.

Based on our review of Antinozzi's Capital Implementation Plan contained within their report, we generally do not take any exceptions at this time. However, based on our reading of the reports and the proposed values of construction, we recommend that planning and design funding be provided to perform more comprehensive investigations and review of their findings. We recommend this as our understanding of their scope of work was based purely on visual observations of the physical conditions. Below are our recommendations for specific divisions of work.

HVAC Systems (Division 23): The HVAC system improvements comprise $28.7 million of the total $96 million in proposed improvements by Antinozzi. We recommend that the HVAC system improvements be reviewed in a holistic manner versus on an individual component basis. Simply replacing units on a one-to-one basis without reviewing the systems as a collective whole may lead to a less effective and/or efficient system. Many of the current systems are original systems that do not possess current design methodologies and technologies.

Finishes (Division 9): The proposed finishes comprise $13.3 million of the $96 million in proposed improvements. Most of the proposed finish projects consist of either ceiling tile replacement or flooring replacements. There are some painting recommendation and a few other finish recommendations, but the vast majority lie between ceiling tiles and flooring.

Based on our review of their report and our experience with older buildings, we find that many of the areas being recommended for replacement are associated purely with aesthetics. There will certainly be areas in need of repair such as floor cracking, tile delamination or other failures but we recommend these areas be addressed on a case-by-case basis when presenting a safety hazard. The recommendation to replace large areas of ceilings or flooring based purely on age or aesthetics should be weighed against other proposed work and balanced against the available funding.

Exterior Improvements (Division 32): These improvements comprise $15.1 million. Most of these costs are repaving of lots and driveways. This information is being provided due to the large percentage of the total costs.

The total cost of the HVAC, Finishes, Exterior Improvements, and Thermal and Moisture Protection (Division 7, mostly roofs) make up 82% of the total costs proposed by Antinozzi.

Six other divisions comprise 14% ($13.5M) of the $96 million in proposed improvements. These are masonry, woods and plastics (cabinets primarily), openings (doors and windows), specialties (mostly

Mechanical and Electrical Systems

As reported by Colliers, the mechanical and electrical systems are nearing their end of life and recommended to be replaced. Our assumption is that they would be replaced in full with current technology and systems and not replaced in kind. In doing so there are many factors to consider when contemplating such a project in an occupied school of this age. Some of these factors include but are not limited to:

- Construction phasing in an occupied school
- Removal of ceiling and wall systems necessary to install the systems and replacement thereof
- Unforeseen conditions
- Hazardous materials abatement
- Above ceiling clearances
- Project Costs
- Reimbursement

Installation of these systems throughout a building that is fully occupied will require extensive phasing, coordination and ultimate disruption to the school operations. In addition, the duration of the project would be extended due to the limited amount of area a contractor may take at one time or restrictions to work during summer breaks, holidays or even second shift.

Mechanical and electrical systems are installed above ceilings and through walls. To install them in these concealed spaces, the finished ceilings and walls must be removed to allow access to the space above or behind such a wall. The ceilings contain lighting fixtures, emergency devices and other systems that require removal and ultimate replacement. In our experience, these systems are typically replaced with new systems and not the old systems that were removed. Walls and their finishes will need to be replaced with new materials also.

When working in buildings of the 50s and 60s era, there are always hidden conditions within a building that are unforeseeable. The possibilities are endless but must be accounted for when budgeting for such a project.

The likelihood of hazardous materials being present above ceilings and behind walls is very likely as well as hazardous materials that were used in the original construction of these systems. Old boilers may contain asbestos linings. Pipes were typically wrapped with insulation containing asbestos. Some

walls may contain vermiculite that is a suspected carcinogen as well. Abatement of these materials will need to be accounted for.

New mechanical systems always consist of supply and return ductwork that allow the proper exchange of air to the building. The ductwork must be able to fit between the finished ceiling and the roof deck. Older building sometimes has limited ceiling space to allow such installation.

Probably the most important factor is the cost of replacing these systems. Just the systems alone not including the aforementioned factors of phasing, unforeseen conditions and possibly hazardous materials abatement will cost in in the millions of dollars. To provide a rough order of magnitude, Colliers recently received bids for a new elementary school in Connecticut where trade bids for electrical, HVAC, and other required trades for the building were submitted. Excellent bid coverage was provided for this project thus we feel confident in the values.

The successful HVAC and building controls bid were $51.30 per square foot for a building approximately 103,000 square feet which is similar to Long Lots. The successful electrical contractor bid (not including security, audio visual, telecommunications or fire alarm trades) was $35.59 per square foot. Applying these square foot costs to the 109,000 gross square feet of building at Long Lots equates to $5,591,700 for HVAC and $3,879,310 for electrical. In total, the equal $9,471,010 which is for the trade costs alone not including, demolition of conditions, general conditions which are estimated to be 15% of the trade costs as well as a recommended owner's contingency for unforeseen conditions.

Building Envelope Replacement

As described in our assessment, the building envelope consists of the roof; the vertical surfaces consisting of walls, doors, window, and louvers; and the building slab and foundation. The only component of the building envelope that is in fair condition is the roof. Having been replaced in 2008, the roof warranty expires in 2028 thus there is an additional 6-years of warranty remaining and if maintained correctly could last longer. However, thermal imaging indicates wet insulation in select areas of the roof.

The exterior walls, windows, and doors of the building have been documented to be in poor condition and likely responsible for air and moisture intrusion into the building. Most of the window systems are original single-pane and some double-pane construction that we have documented allow air infiltration via the use of thermal imaging. The skylights in the art room are leaking and are

recommended to be replaced with solid roofing. Most of the doors are rusted and show water leakage, lack of seals or lack of insulation. In general, the entire vertical envelope is ineffective and inefficient.

Finally, there are basement and crawl spaces without vapor barriers on the bottom side of the building that prevent moisture intrusion from the ground. Interior walls that are below the exterior ground surface display evidence of moisture penetrating through the foundation also. This condition leads to interior condensation.

In summary, the entire building envelope is considered compromised and in need of replacement. This includes the roof, exterior walls, windows, door and louvers. Like the mechanical and electrical systems, we assume that the systems would utilize current systems installed in today's systems. Many of the same factors noted for the mechanical and electrical system project would need to be considered for the building envelope.

With respect to costs, we received an estimate from the construction manager for the same project noted earlier that provided an estimate of the exterior walls, window and doors for the project. (Note: bids received for the project are not submitted by building system thus we cannot reference the bids for this analysis). The construction manager estimated these systems to be $5,659,065 for the new school 103,296 gross square feet in size. This equates to $54.78 per square foot. Applying this to the Long Lots building area equates to approximately $5,971,558 in 2021 dollars. This is based on an estimate but is likely to be higher as bids for this specific project came in over budget by about 7%. Conservatively, we'll assume the lower estimated amount for this discussion. The estimated cost above does not include hazardous materials abatement (if applicable), demolition of existing conditions, general conditions or owner's contingency.

Should the roof be replaced, the estimated cost to do so is 80,458 s.f. of roof multiplied by $20.22 per square foot (bid received for Saugatuck Elementary School in 2021) equals $1,626,860 in 2021 dollars.

The building envelope, not including improvements for the exposed ground conditions under the building, are roughly $7.6M plus any additional cost for hazardous materials abatement, demolition of existing conditions, general conditions or owner's contingency.

We estimate the minimum cost to replace these systems to be roughly $22 million for the entire building. ($9.5M + $7.6M multiplied by 15% for general conditions then multiplied by 10% for owner contingency).

Colliers

Project Leaders

In consideration of the mechanical, electrical, and building envelope systems combined with the recent indoor environmental challenges studied by Langan as well as the age of the building and its interior conditions, we recommend that Westport Public Schools consider executing a holistic review of building and potential options for either renovating or replacing the facility in full. Should the district concur with this recommendation, we would also recommend postponing execution of any recommendations in Antinozzi's report unless it presents a health or safety hazard.

In closing, we thank you for the opportunity to assist the district with the evaluation of the Long Lots Elementary School. Should you have any questions regarding this letter or our December 16, 2021, report, please do not hesitate to reach out to me or my team members who prepared that report.

Sincerely,

Charles E. Warrington, Jr., P.E.
Director, Project Management

cc: Mr. Elio Long, Chief Financial Officer
Mr. Theodore Hunyadi, Director of Facilities

PROJECT BUDGET

Westport Public Schools

Long Lots Elementary School Replacement

DRAFT BUDGET FOR NEW LONG LOTS (WITH STEPPING STONES)

Date: **June 1, 2022**

		PROPOSED BUDGET (HIGH RANGE)	PROPOSED BUDGET (LOW RANGE)
8-Year High Enrollment		682	682
$(000) except $/GSF			
New Construction of K-5 Program, GSF		87,300	80,025
Stepping Stones, GSF (Based on Space Summary)		20,721	20,721
Total GSF		108,020	100,745
New Construction $/GSF - Current		$ 450.00	$ 400.00
Stepping Stone $/GSF - Current		$ 450.00	$ 400.00
New Construction $/GSF - Escalated		$ 516.20	$ 458.90
Stepping Stones, $/GSF - Escalated		$ 516.20	$ 458.90
Total Construction w/ site $/GSF		$ 87.81	$ 73.78
Total Project $/GSF		$ 836.05	$ 705.66
I.	**Building Construction**		
A.	New Building Construction	$ 39,284.8	$ 32,009.9
B.	Stepping Stones Construction	$ 9,324.3	$ 8,288.3
C.	Other Construction	$ -	$ -
	Total Building Construction	48,609.1	40,298.2
II.	**Related Construction**		
A.	Sitework		
1	Earthwork / Site Prep	12,152.3	8,059.6
2	Exterior Improvements		
a.	Paving - Asphalt / Concrete / Other	w/ Site prep	w/ Site prep
b.	Sidewalks / Paths	w/ Site prep	w/ Site prep
c.	Wetlands Mitigation	w/ Site prep	w/ Site prep
d.	Landscape & Planting	w/ Site prep	w/ Site prep
e.	Athletic / Recreational Surfaces	w/ Site prep	w/ Site prep
f.	Fencing / Gates	w/ Site prep	w/ Site prep
g.	Retaining Walls	w/ Site prep	w/ Site prep
h.	Misc Site Improvements	w/ Site prep	w/ Site prep
B.	Site Utility Systems		
1	Water & Wells	w/ Site prep	w/ Site prep
a.	Fire Protection	w/ Site prep	w/ Site prep
2	Sanitary Sewage	w/ Site prep	w/ Site prep
3	Storm Drainage	w/ Site prep	w/ Site prep
4	Gas	w/ Site prep	w/ Site prep
5	Steam	w/ Site prep	w/ Site prep
6	Chilled Water	w/ Site prep	w/ Site prep
7	Electric	w/ Site prep	w/ Site prep
8	Data & Communications	w/ Site prep	w/ Site prep
9	Site Lighting	w/ Site prep	w/ Site prep
	Total Site Construction	12,152.3	8,059.6
C.	Building Demolition	2,700.0	2,160.0
D.	Hazardous Materials Removal	w/ Bldg Demo	w/ Bldg Demo
E.	Sustainable Elements		
1	Solar Panels / PV Array	Assume PPA	Assume PPA
2	Wind Power Generation	-	-
3	Geothermal Wells	1,000.0	-
4	Rain Garden	-	-
5	Waste Water Treatment Plants	City Sewer	City Sewer
F.	GC / CM Mark-ups	w/ construction	w/ construction
	Total Related Construction	15,852.3	10,219.6
	Subtotal Construction - Current $	64,461.4	50,517.8
III.	**Escalation - Mid-point Construction (4th Qtr 2025)**	9,484.9	7,433.2
	Total Construction - Escalated	$ 73,946.3	$ 57,951.0
IV.	**Furniture, Fixtures & Equipment (FF&E)**		
A.	Loose Furnishings	1,227.6	1,091.2
B.	Playgrounds (Assume 3 total)	850.0	700.0
C.	Data / Telecomm Equipment	1,227.6	1,023.0
1.	Cabling / Wall Jack / Devices	w/ construction	w/ construction
D.	Audio/Visual Equipment	w/ Data	w/ Data
E.	Security Equipment	w/ construction	w/ construction
1.	Cabling / Wall Jack / Devices	w/ construction	w/ construction
F.	Specialty Signage	100.0	50.0
	Total FF & E	$ 3,405.2	$ 2,864.2

PROJECT BUDGET

Westport Public Schools

Long Lots Elementary School Replacement

DRAFT BUDGET FOR NEW LONG LOTS (WITH STEPPING STONES)

Date: **June 1, 2022**

		PROPOSED BUDGET (HIGH RANGE)	PROPOSED BUDGET (LOW RANGE)
8-Year High Enrollment		682	682
$(000) except $/GSF			
V.	**Fees and Expenses**		
A.	Fees		
1	Existing Conditions & Space Program	-	-
2	Architect	5,027.8	3,953.0
a	Civil Engineering	w/ architect	w/ architect
b	Landscape Architect	w/ architect	w/ architect
c	Structural Engineering	w/ architect	w/ architect
d	MEP/FP Engineering	w/ architect	w/ architect
e	Interior / Furniture Designer	w/ architect	w/ architect
f	Lighting Consultant	w/ architect	w/ architect
g	Acoustical Consultant	w/ architect	w/ architect
h	Signage Consultant	w/ architect	w/ architect
i	LEED Designer	w/ architect	w/ architect
j	Referendum Services	w/ architect	w/ architect
k	Code Consultant	w/ architect	w/ architect
l	Designer's Cost Estimator	w/ architect	w/ architect
3	Special Consultants		
a	Haz. Mat. Consultant	200.0	150.0
b	Audio / Visual	w/ architect	w/ architect
c	Technology / Security Systems Design	w/ architect	w/ architect
d	Geo-Tech Engineering	w/ architect	w/ architect
e	Traffic Engineer	w/ architect	w/ architect
f	Ecologist / Soil Sample	50.0	35.0
g	Peer Reviews	35.0	25.0
h	Green Building Consultant	w/ architect	w/ architect
i	Storm Water Monitoring	50.0	50.0
4	Project Management	850.0	700.0
5	Building Commissioning	115.0	100.0
6	Owner's Cost Estimator	w/ CM	w/ CM
7	CM Preconstruction Fee	175.0	150.0
8	Owner's Legal Fees	50.0	50.0
9	Site Survey	w/ architect	w/ architect
10	Utility Assessment	50.0	40.0
	Sub-total Fees	**6,602.8**	**5,253.0**
B.	Expenses		
1	Owner's Insurance	110.9	86.9
2	Permits	25.0	25.0
a.	Building	w/ Construction	w/ Construction
b.	Town / Site	-	-
3	Printing	15.0	15.0
4	Construction Utilities Use	w/ Construction	w/ Construction
5	Site Borings	w/ architect	w/ architect
6	Materials Testing	150.0	125.0
7	Special Inspections	25.0	20.0
8	Consultant Reimbursables	40.0	25.0
9	Moving / Relocation	100.0	75.0
10	Temporary Space / Operations	25.0	25.0
11	Advertising	20.0	20.0
12	Physical Plant Expenses	20.0	20.0
13	Misc. Expenses	15.0	26.0
14	Financing Costs / Bond Origination	TBD	TBD
15	Site Acquisition	NA	NA
a.	Real Estate Fees	-	-
b.	Closing Costs	-	-
	Sub-total Expenses	**545.9**	**462.9**
	Total Fees and Expenses	**7,148.7**	**5,715.9**
V.	**Contingency**		
A.	Construction	**3,697.3**	**2,897.6**
B.	Owner's Project	**2,112.5**	**1,663.3**
	Total Contingency	**5,809.8**	**4,560.9**
	Total Project	**$ 90,310.0**	**$ 71,092.0**
	Construction Cost vs. Total Project Cost	**82%**	**82%**
	Soft Cost vs. Total Project Cost	**18%**	**18%**

PROJECT BUDGET

Westport Public Schools

Long Lots Elementary School Replacement

DRAFT BUDGET FOR NEW LONG LOTS (WITH STEPPING STONES)

Date: **June 1, 2022**

		PROPOSED BUDGET (HIGH RANGE)	PROPOSED BUDGET (LOW RANGE)
8-Year High Enrollment		682	682
$(000) except $/GSF			
New Construction of K-5 Program, GSF		87,300	80,025
Stepping Stones, GSF (Based on Space Summary)		20,721	20,721
Total GSF		108,020	100,745
New Construction $/GSF - Current		$ 450.00	$ 400.00
Stepping Stone $/GSF - Current		$ 450.00	$ 400.00
New Construction $/GSF - Escalated		$ 589.10	$ 523.70
Stepping Stones, $/GSF - Escalated		$ 589.10	$ 523.70
Total Construction w/ site $/GSF		$ 184.47	$ 155.01
Total Project $/GSF		$ 946.55	$ 798.52
I.	**Building Construction**		
A.	New Building Construction	$ 39,284.8	$ 32,009.9
B.	Stepping Stones Construction	$ 9,324.3	$ 8,288.3
C.	Other Construction	$ -	$ -
	Total Building Construction	48,609.1	40,298.2
II.	**Related Construction**		
A.	Sitework		
1	Earthwork / Site Prep	12,152.3	8,059.6
2	Exterior Improvements		
a.	Paving - Asphalt / Concrete / Other	w/ Site prep	w/ Site prep
b.	Sidewalks / Paths	w/ Site prep	w/ Site prep
c.	Wetlands Mitigation	w/ Site prep	w/ Site prep
d.	Landscape & Planting	w/ Site prep	w/ Site prep
e.	Athletic / Recreational Surfaces	w/ Site prep	w/ Site prep
f.	Fencing / Gates	w/ Site prep	w/ Site prep
g.	Retaining Walls	w/ Site prep	w/ Site prep
h.	Misc Site Improvements	w/ Site prep	w/ Site prep
B.	Site Utility Systems		
1	Water & Wells	w/ Site prep	w/ Site prep
a.	Fire Protection	w/ Site prep	w/ Site prep
2	Sanitary Sewage	w/ Site prep	w/ Site prep
3	Storm Drainage	w/ Site prep	w/ Site prep
4	Gas	w/ Site prep	w/ Site prep
5	Steam	w/ Site prep	w/ Site prep
6	Chilled Water	w/ Site prep	w/ Site prep
7	Electric	w/ Site prep	w/ Site prep
8	Data & Communications	w/ Site prep	w/ Site prep
9	Site Lighting	w/ Site prep	w/ Site prep
	Total Site Construction	12,152.3	8,059.6
C.	Building Demolition	2,700.0	2,160.0
D.	Hazardous Materials Removal	w/ Bldg Demo	w/ Bldg Demo
E.	Sustainable Elements		
1	Solar Panels / PV Array	Assume PPA	Assume PPA
2	Wind Power Generation	-	-
3	Geothermal Wells	1,000.0	-
4	Rain Garden	-	-
5	Waste Water Treatment Plants	City Sewer	City Sewer
F.	GC / CM Mark-ups	w/ construction	w/ construction
	Total Related Construction	15,852.3	10,219.6
	Subtotal Construction - Current $	64,461.4	50,517.8
III.	**Escalation - Mid-point Construction (4th Qtr 2025)**	19,927.0	15,616.6
	Total Construction - Escalated	$ 84,388.4	$ 66,134.4
IV.	**Furniture, Fixtures & Equipment (FF&E)**		
A.	Loose Furnishings	1,227.6	1,091.2
B.	Playgrounds (Assume 3 total)	850.0	700.0
C.	Data / Telecomm Equipment	1,227.6	1,023.0
1.	Cabling / Wall Jack / Devices	w/ construction	w/ construction
D.	Audio/Visual Equipment	w/ Data	w/ Data
E.	Security Equipment	w/ construction	w/ construction
1.	Cabling / Wall Jack / Devices	w/ construction	w/ construction
F.	Specialty Signage	100.0	50.0
	Total FF & E	$ 3,405.2	$ 2,864.2

PROJECT BUDGET

Westport Public Schools

Long Lots Elementary School Replacement

DRAFT BUDGET FOR NEW LONG LOTS (WITH STEPPING STONES)

Date: **June 1, 2022**

		PROPOSED BUDGET (HIGH RANGE)	PROPOSED BUDGET (LOW RANGE)
8-Year High Enrollment		682	682
$(000) except $/GSF			
V.	**Fees and Expenses**		
A.	Fees		
1	Existing Conditions & Space Program	-	-
2	Architect	5,706.6	4,484.9
a	Civil Engineering	w/ architect	w/ architect
b	Landscape Architect	w/ architect	w/ architect
c	Structural Engineering	w/ architect	w/ architect
d	MEP/FP Engineering	w/ architect	w/ architect
e	Interior / Furniture Designer	w/ architect	w/ architect
f	Lighting Consultant	w/ architect	w/ architect
g	Acoustical Consultant	w/ architect	w/ architect
h	Signage Consultant	w/ architect	w/ architect
i	LEED Designer	w/ architect	w/ architect
j	Referendum Services	w/ architect	w/ architect
k	Code Consultant	w/ architect	w/ architect
l	Designer's Cost Estimator	w/ architect	w/ architect
3	Special Consultants		
a	Haz. Mat. Consultant	200.0	150.0
b	Audio / Visual	w/ architect	w/ architect
c	Technology / Security Systems Design	w/ architect	w/ architect
d	Geo-Tech Engineering	w/ architect	w/ architect
e	Traffic Engineer	w/ architect	w/ architect
f	Ecologist / Soil Sample	50.0	35.0
g	Peer Reviews	35.0	25.0
h	Green Building Consultant	w/ architect	w/ architect
i	Storm Water Monitoring	50.0	50.0
4	Project Management	850.0	700.0
5	Building Commissioning	115.0	100.0
6	Owner's Cost Estimator	w/ CM	w/ CM
7	CM Preconstruction Fee	175.0	150.0
8	Owner's Legal Fees	50.0	50.0
9	Site Survey	w/ architect	w/ architect
10	Utility Assessment	50.0	40.0
	Sub-total Fees	7,281.6	5,784.9
B.	Expenses		
1	Owner's Insurance	126.6	99.2
2	Permits	25.0	25.0
a.	Building	w/ Construction	w/ Construction
b.	Town / Site	-	-
3	Printing	15.0	15.0
4	Construction Utilities Use	w/ Construction	w/ Construction
5	Site Borings	w/ architect	w/ architect
6	Materials Testing	150.0	125.0
7	Special Inspections	25.0	20.0
8	Consultant Reimbursables	40.0	25.0
9	Moving / Relocation	100.0	75.0
10	Temporary Space / Operations	25.0	25.0
11	Advertising	20.0	20.0
12	Physical Plant Expenses	20.0	20.0
13	Misc. Expenses	15.0	26.0
14	Financing Costs / Bond Origination	TBD	TBD
15	Site Acquisition	NA	NA
a.	Real Estate Fees	-	-
b.	Closing Costs	-	-
	Sub-total Expenses	561.6	475.2
	Total Fees and Expenses	7,843.2	6,260.1
V.	**Contingency**		
A.	Construction	4,219.4	3,306.7
B.	Owner's Project	2,390.9	1,881.5
	Total Contingency	6,610.3	5,188.2
	Total Project	$ 102,247.1	$ 80,446.9
	Construction Cost vs. Total Project Cost	83%	82%
	Soft Cost vs. Total Project Cost	17%	18%

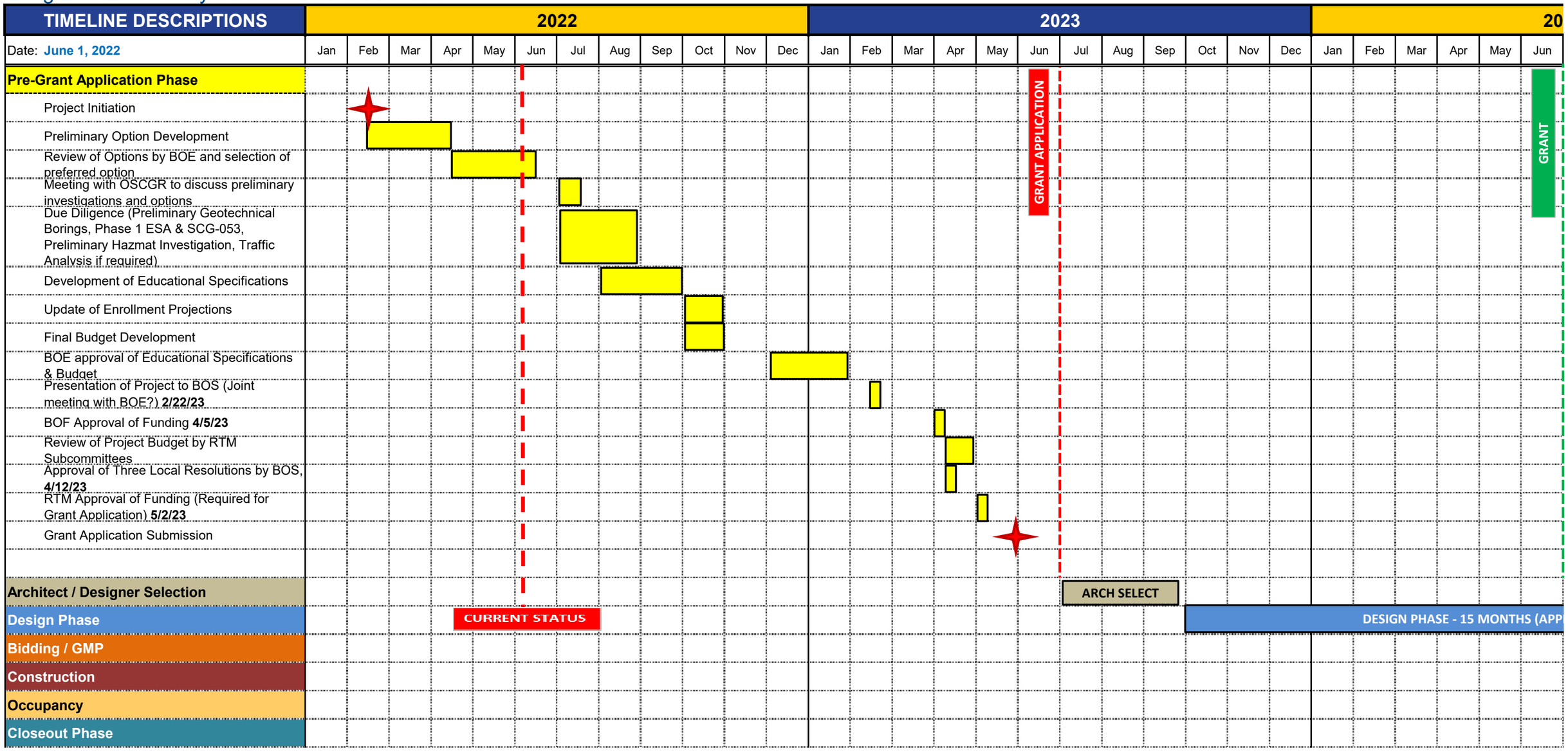
PROJECT SCHEDULE

DRAFT ONLY

Colliers INTERNATIONAL
PROJECT LEADERS

Westport Public Schools

Long Lots Elementary School - Macro Schedule



PROJECT SCHEDULE

DRAFT ONLY

Westport Public Schools

Long Lots Elementary School - M

TIMELINE DESCRIPTIONS	24						2025												2026											
Date: **June 1, 2022**	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pre-Grant Application Phase																														
Project Initiation																														
Preliminary Option Development																														
Review of Options by BOE and selection of preferred option																														
Meeting with OSCGR to discuss preliminary investigations and options																														
Due Diligence (Preliminary Geotechnical Borings, Phase 1 ESA & SCG-053, Preliminary Hazmat Investigation, Traffic Analysis if required)																														
Development of Educational Specifications																														
Update of Enrollment Projections																														
Final Budget Development																														
BOE approval of Educational Specifications & Budget																														
Presentation of Project to BOS (Joint meeting with BOE?) **2/22/23**																														
BOF Approval of Funding **4/5/23**																														
Review of Project Budget by RTM Subcommittees																														
Approval of Three Local Resolutions by BOS, **4/12/23**																														
RTM Approval of Funding (Required for Grant Application) **5/2/23**																														
Grant Application Submission																														
Architect / Designer Selection																														
Design Phase	ROXIMATE)																													
Bidding / GMP							BIDDING																							
Construction																			CONSTRUCTION - SUBSTANTIAL COMPLETION (15 MONTHS)											
Occupancy																														
Closeout Phase																														

PRESENTATION OF DRAFT TEST FITS
for LONG LOTS ELEMENTARY SCHOOL SITE
-
Westport BOE Meeting
5/16/2022

GRAPHIC SCALE

80 40 0 80

SCALE IN FEET

Revisions

LRC GROUP

- Land Planning
- Civil Engineering
- Environmental Services
- Land Surveying
- Landscape Architecture

160 West Street, Suite E
Cromwell, CT 06416
Tel: 860.635.2877

85 Civic Center Plaza, Suite 204
Poughkeepsie NY 12601
Tel: 845.243.2880

1 International Blvd, Suite 400
Mahwah, NJ 07495
Tel: 908.603.5730

www.lrcconsult.com

LRC Engineering & Surveying, DPC
LRC Engineering & Surveying, LLC
LRC Environmental Services, Inc.

EXISTING SITE CONDITIONS AERIAL

LONG LOTS ELEMENTARY SCHOOL

13 HYDE LANE
TOWN OF WESTPORT
FAIRFIELD COUNTY, CONNECTICUT

Design/Calcs	CAD File	BASE MAP.dwg	Sheet No.	
Drawn	Project No.	22–2904		C1.1
Checked	Date	04/20/22		
Approved	Scale	1"=80'		

GRAPHIC SCALE

80 40 0 80

SCALE IN FEET

Revisions

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EXISTING SITE CONDITIONS

LONG LOTS ELEMENTARY SCHOOL

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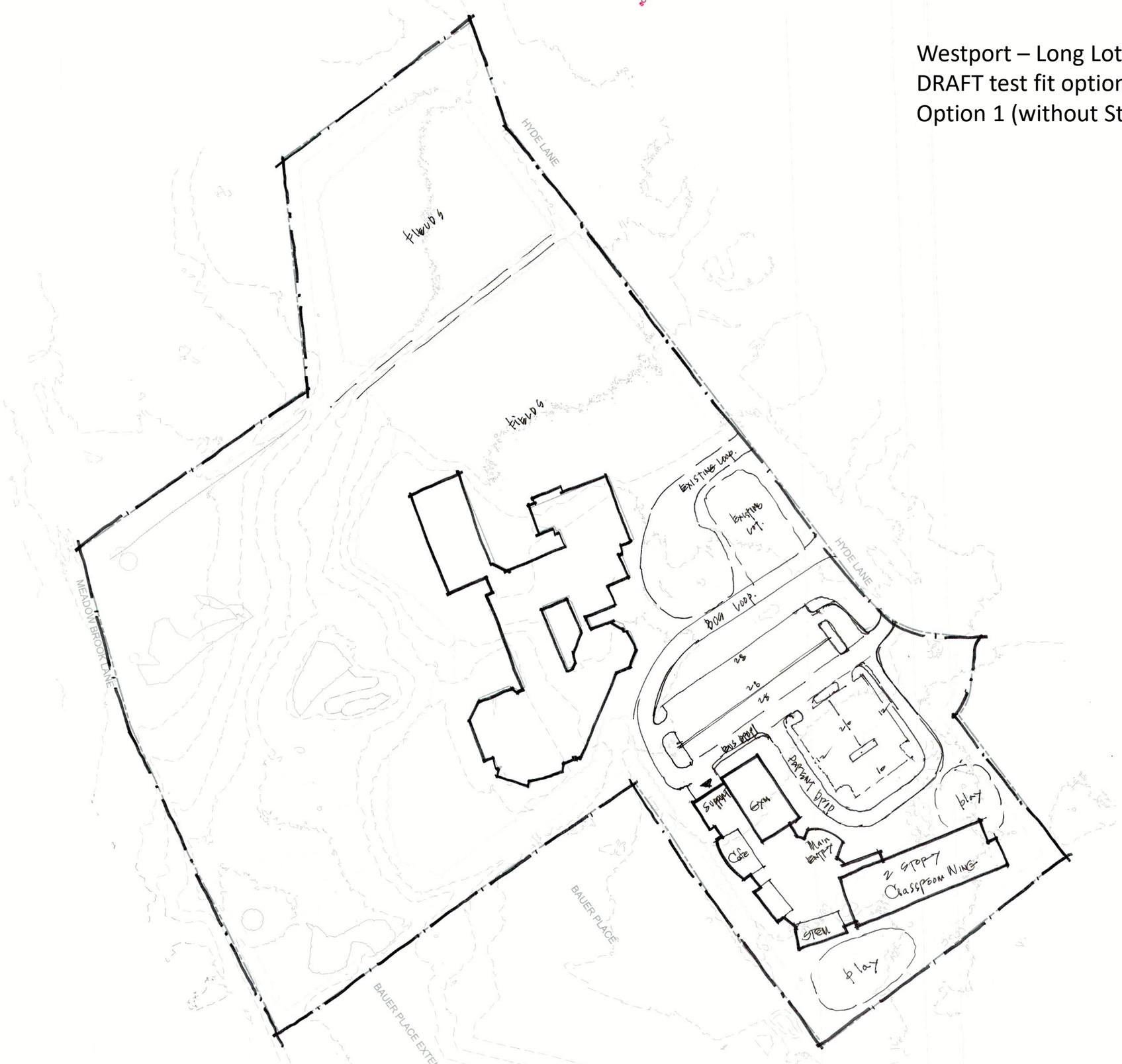
TOWN OF WESTPORT
FAIRFIELD COUNTY, CONNECTICUT

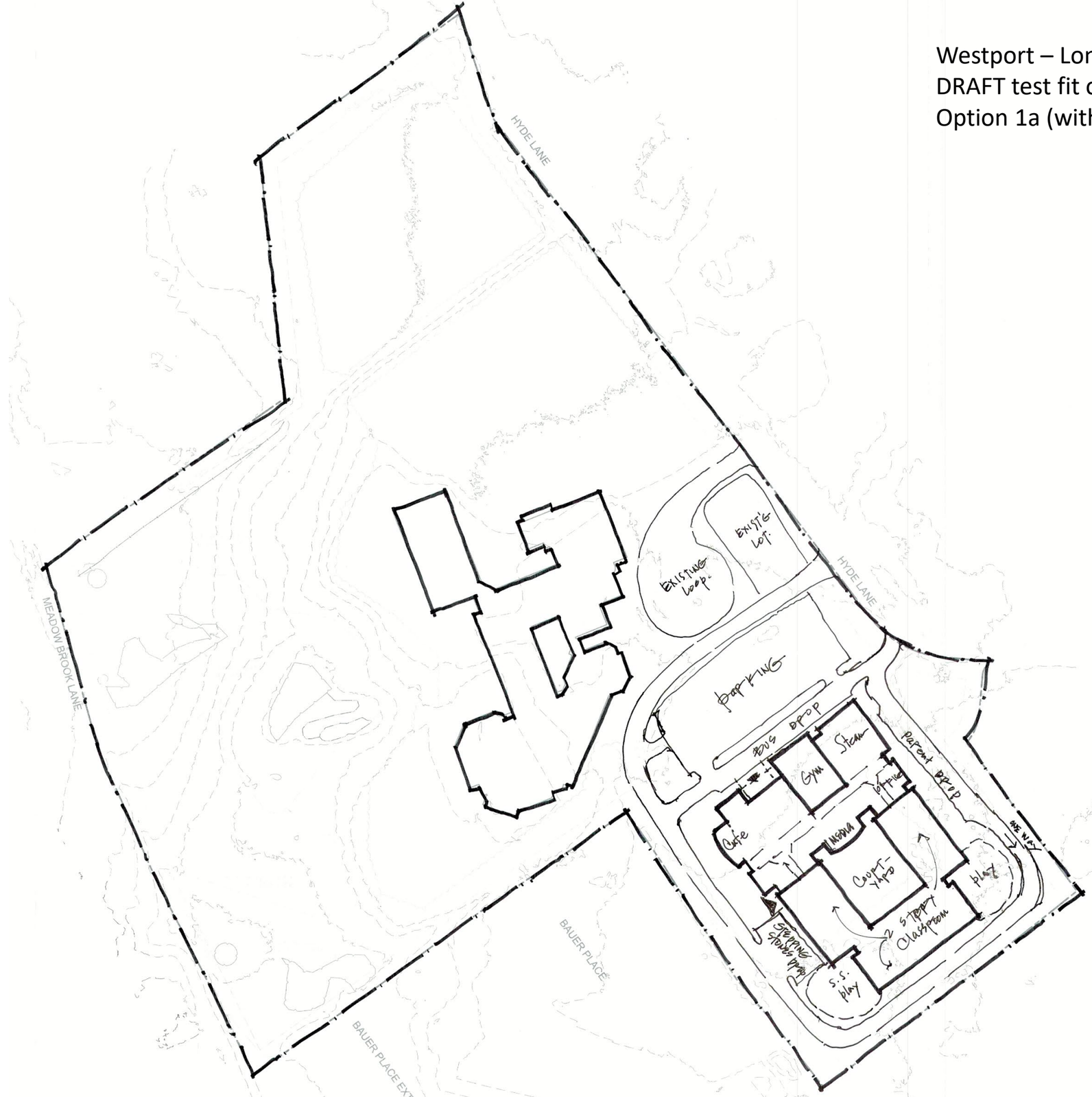
Design/Calcs	CAD File	BASE MAP.dwg	Sheet No.
Drawn	Project No.	22-2904	C1.0
Checked	Date	04/20/22	
Approved	Scale	1"=80'	

Z:\JOBS\2022 Jobs\22-2904 Q4+M Westport Elementary\DWG\BASE MAP.dwg 4/20/2022 11:56 AM Dwolf

Westport – Long Lots Elementary School
DRAFT test fit options - 5/5/2022
Option 1 (without Stepping Stones)

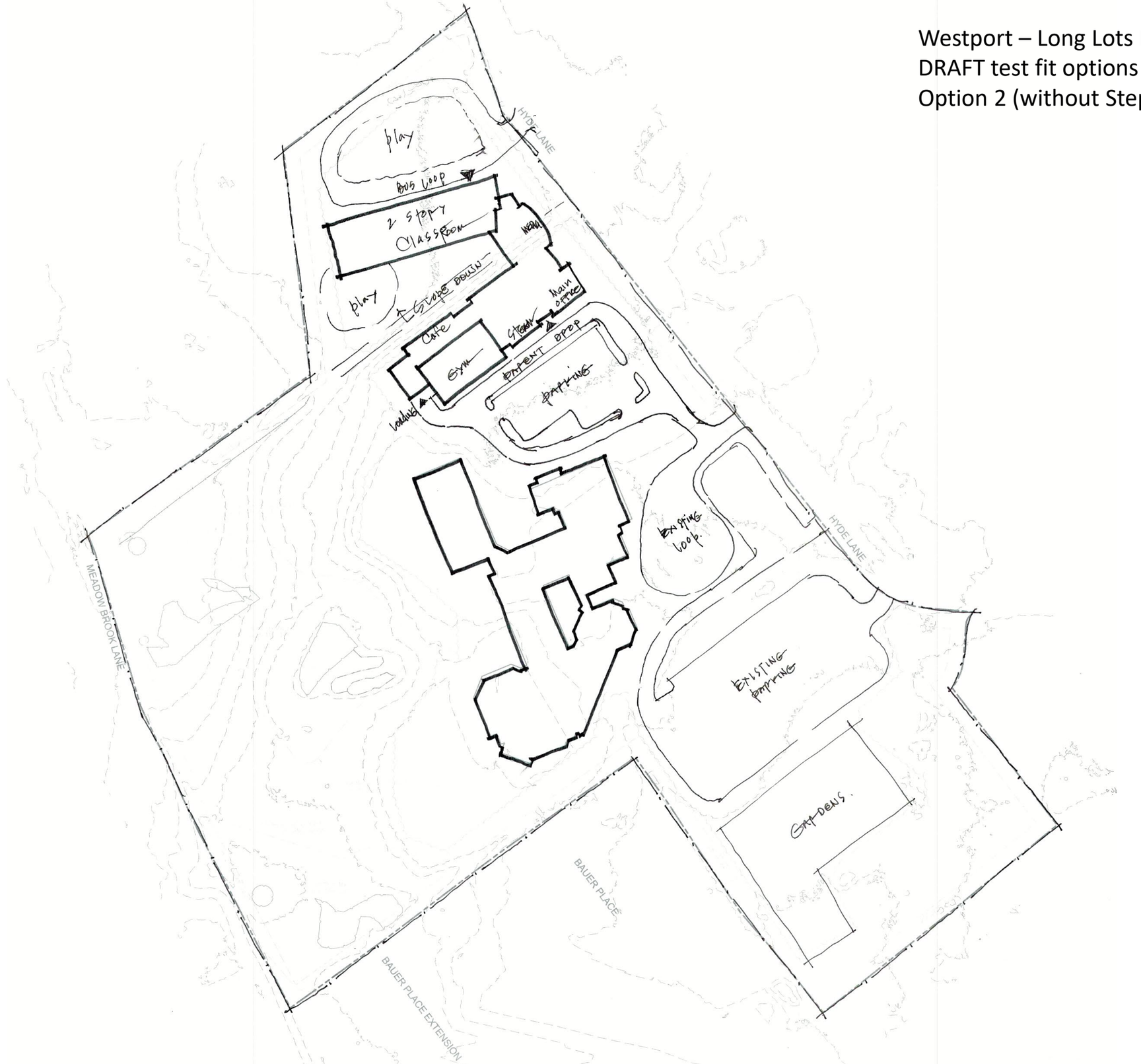


Westport – Long Lots Elementary School
DRAFT test fit options - 5/5/2022
Option 1a (with Stepping Stones)



QA+M architecture

Westport – Long Lots Elementary School
DRAFT test fit options - 5/5/2022
Option 2 (without Stepping Stones)

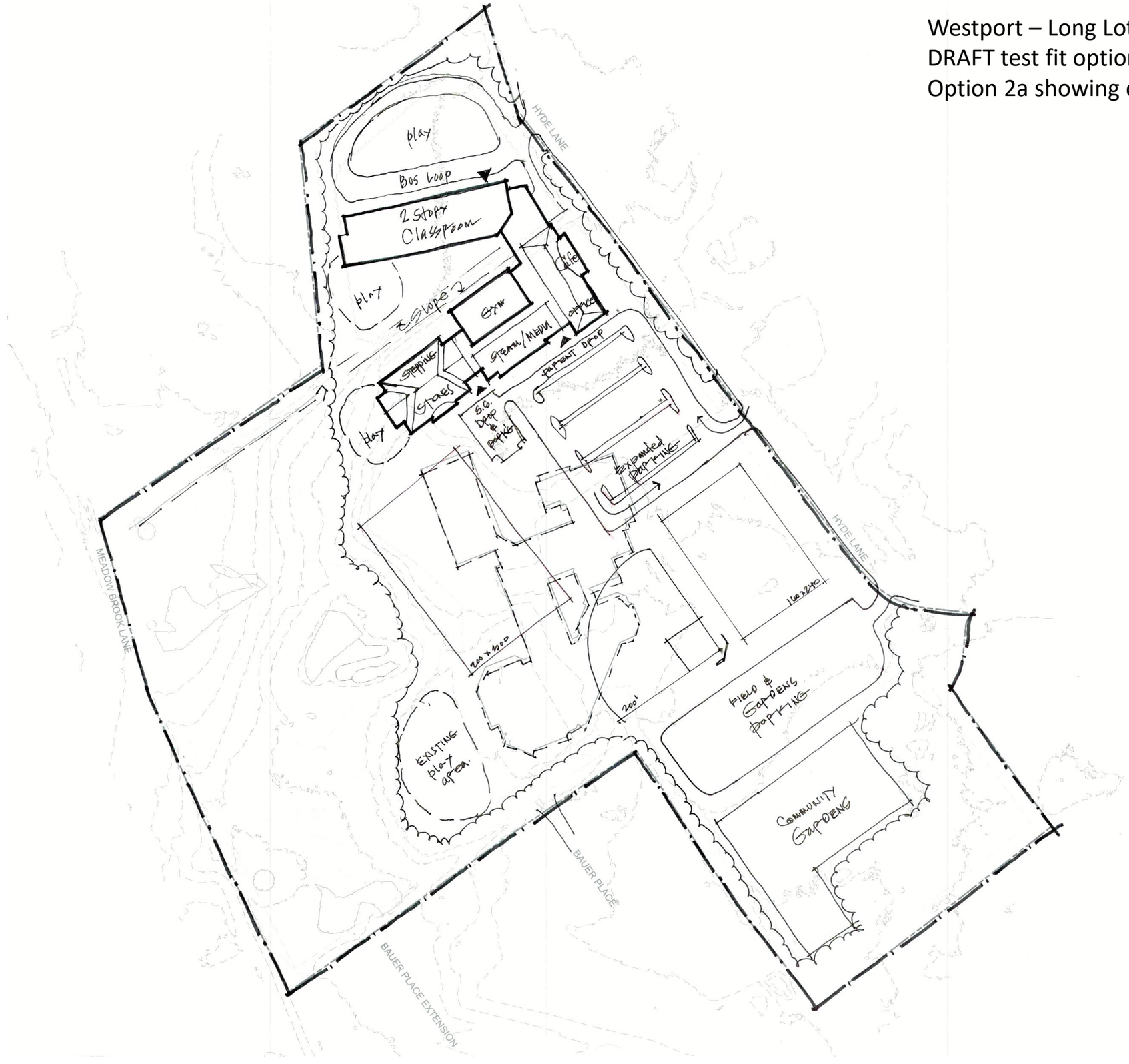


QA+M architecture

Westport – Long Lots Elementary School
DRAFT test fit options - 5/5/2022
Option 2a (with Stepping Stones)

QA+M architecture

Westport – Long Lots Elementary School
DRAFT test fit options - 5/5/2022
Option 2a showing completed site potential



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June 1, 2022

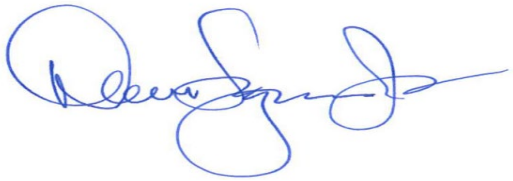
Mr. Thomas Scarice
Superintendent of Schools
Westport, Connecticut

Re: Long Lots Elementary School and Coleytown Elementary School– assessment of viability for Renovate Like New status.

Mr. Scarice,
As you requested, I have toured both Long Lots Elementary School and Coleytown Elementary School. Based on these walk throughs, and with the information provided to me (existing Long Lots assessments and Coleytown floor plans), I offer my professional opinion for each school as follows:
Concerning Long Lots Elementary School, it is my professional opinion that a Renovate Like New project would not be cost effective or practical compared to constructing a new facility on the existing site. There are numerous envelop deficiencies that have been noted in previous reports (and are very clear visually), mechanical systems are beyond their current life expectancy and the existing construction would make replacement with modern, efficient systems very difficult. As the building was originally designed as a middle school, portions of the existing area are not programmatically appropriate for an Elementary school. Also, knowing there is the potential that the existing building continue to be used as swing space for future projects, it would be my recommendation that a new Elementary School be constructed. Attempting to Renovate and brings the facility to like new condition would require a long construction process with multiple phases, and this will not necessarily provide a facility that is as efficient (cost wise or from a programmatic standpoint) as a new facility.

Concerning Coleytown, having only performed a walk through/visual inspection and not having any assessment reports to review, I do feel this facility has more potential for as a Renovate like New project. While the available site of Coleytown is smaller than at Long Lots, knowing the student population is intended to remain at a similar level to current and that during a renovation project the school can be moved off site, additions and full renovations would provide a more effective way to update the facility to be more efficient and effective programmatically. This assessment of Coleytown was made with limited information, so I would recommend further analysis of the existing systems and structure take place before making a final decision regarding a Renovate like new process for Coleytown.

Sincerely,



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