

LYME-OLD LYME SCHOOLS

Regional School District #18

A Private School Experience



in a Public School Setting

PK-8 Building Committee Meeting

August 21, 2023

Committee Members Present: Steve Wilson, Chair; Mary Powell St. Louis, Vice-Chair; John Hartman; Sara Hrinak; Andrew Russell; Alan Sheiness; Cara Zimmermann; Darren Favello; Richard Conniff; Thomas Kelo

Administration Present: Ian Neviaser, Superintendent of Schools; Ronald Turner, Director of Facilities & Technology; Brian Howe, Assistant Director of Facilities; Mark Ambruso, Principal of Lyme-Old Lyme Middle School; Kelly Enoch, Principal of Mile Creek School; Allison Hine, Principal of Lyme Consolidated School; Noah Ventola, Assistant Principal of Lyme-Old Middle School

I. Call to Order

The meeting was called to order by Mary Powell St. Louis at 6:01 p.m.

II. Approval of Minutes of May 15, 2023 Meeting

MOTION: John Hartman made a motion, which was seconded by Sara Hrinak, to approve the minutes of the May 15, 2023 meeting.

VOTE: the committee voted unanimously in favor of the motion.

III. Architect and Construction Manager Updates

David Stein from Silver Petrucelli and Associates and representatives from CES Engineers and Downes Construction gave a detailed presentation to the committee which included site improvements to Center School, LOLMS, Lyme Consolidated School and Mile Creek School; security and code improvements; additions and alterations to Mile Creek School; HVAC improvements; and project budgets and schedules. A copy of their presentation is attached to these minutes for informational purposes.

IV. Discussion on the Proposed Conceptual Design for the Mile Creek School Addition

MOTION: Darren Favello made a motion, which was seconded by Andy Russell, to approve the six-room addition to Mile Creek School.

VOTE: the committee voted unanimously in favor of the motion.

V. Discussion on the Proposed MEP Options for the Four HVAC Projects

Discussion took place on moving forward with the proposed HVAC suggestions for each school.

Representatives from Downes Construction and CES Engineers agreed to prepare schematic designs and detailed budgeting for each system. There is a possibility of obtaining a grant for security as well as a grant for HVAC.

MOTION: Alan Sheiness made a motion, which was seconded by Sara Hrinak, to approve the schematic design on the proposals presented and to prepare an estimate of operating costs of the current system to the proposed electric systems.

VOTE: the committee voted unanimously in favor of the motion.

VI. Committee Discussion

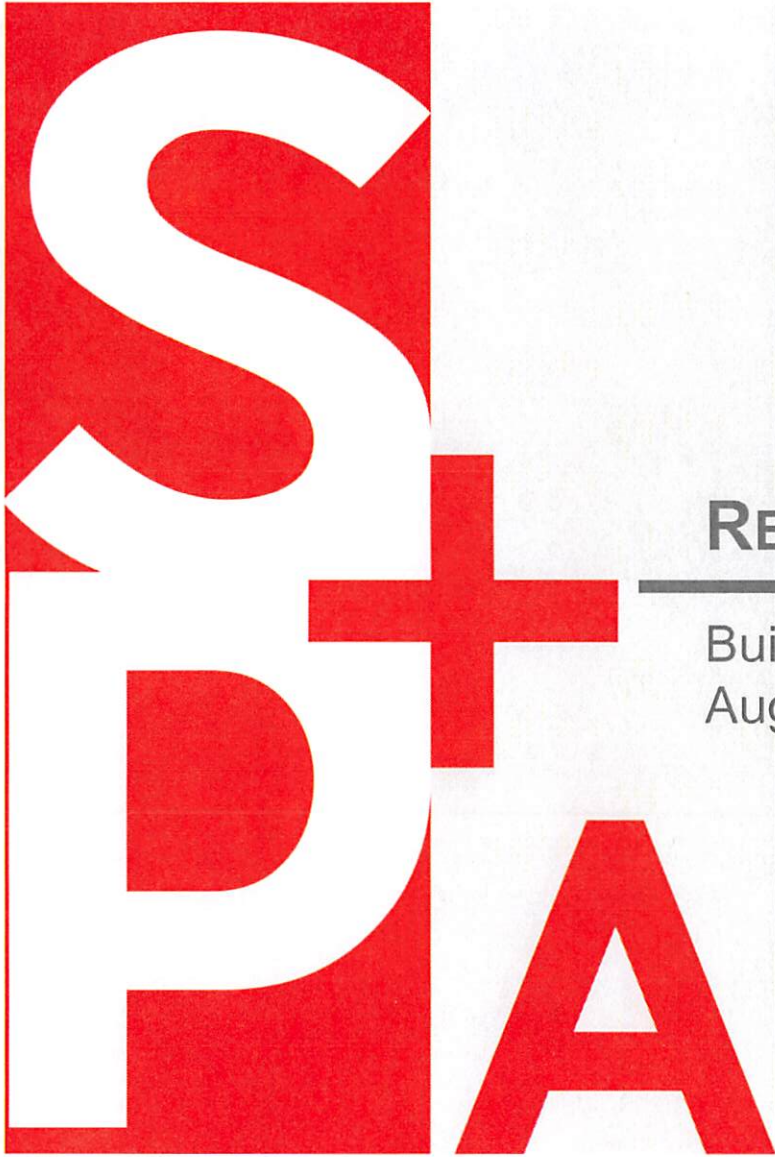
Committee discussion included the reasoning for the six room addition at Mile Creek School based on enrollment projections, maximum capacity, and an estimated four sections at each grade level.

This committee will continue to meet on the third Monday of each month.

VII. Adjournment

MOTION: The meeting was adjourned by Steve Wilson at 9:05 p.m. upon a motion by Alan Sheiness, which was seconded by Richard Conniff.

VOTE: the committee voted unanimously in favor of the motion.



REGION 18 SCHOOL RENOVATION PROJECTS

Building Committee Meeting 1
August 21, 2023



AGENDA

Project & Team Introduction

Site Improvements

- Center School
- Lyme/Old Lyme Middle School
- Lyme Consolidated School
- Mile Creek School

Security & Code Improvements

- Center School
- Lyme/Old Lyme Middle School
- Lyme Consolidated School
- Mile Creek School

Mile Creek School Addition & Alterations

HVAC Improvements

- Center School
- Lyme/Old Lyme Middle School
- Lyme Consolidated School
- Mile Creek School

Project Budgets & Schedules



REGION 18 SCHOOL RENOVATION PROJECTS

- **Center School**

37,000 sf

HVAC Upgrades

Security/Code Upgrades



- **Lyme/Old Lyme Middle School**

88,000 sf

HVAC Upgrades

Security/Code Upgrades



- **Lyme Consolidated School**

35,000 sf

HVAC Upgrades

Security/Code Upgrades



- **Mile Creek School**

67,000 sf

8,600 sf addition

HVAC Upgrades

Security/Code Upgrades



PROJECT TEAM INTRODUCTION

- **SP+A**
Architecture
MEP Engineering



David Stein, AIA
Principal in Charge



Dean Petrucelli, AIA
Design Principal
Project Director



Tanya Cutolo, AIA, LEED AP
Project Manager



Mat Begin
MEP Project Manager

- **Benesch**
Civil Engineering



Will Walter, PE, LEED AP
Senior Associate

- **CES**
MEP Engineering



Matt Couceiro
Project Manager



Waseem Khoury, PE
Senior Mechanical Engineer



Derek Bride, PE
Principal in Charge

- **Downes**
Construction Manager



Tom Romagnoli
Project Executive



Jeff Anderson
Preconstruction Manager



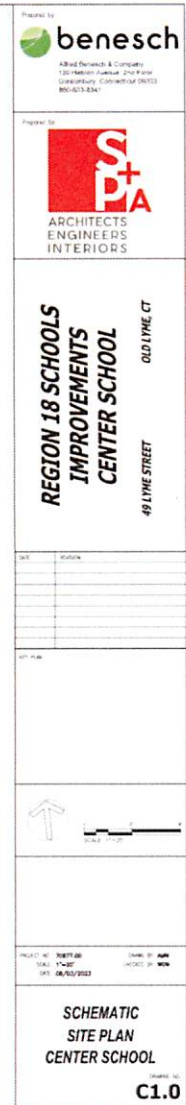
Ryan Patrick
Senior Estimator



SITE IMPROVEMENTS

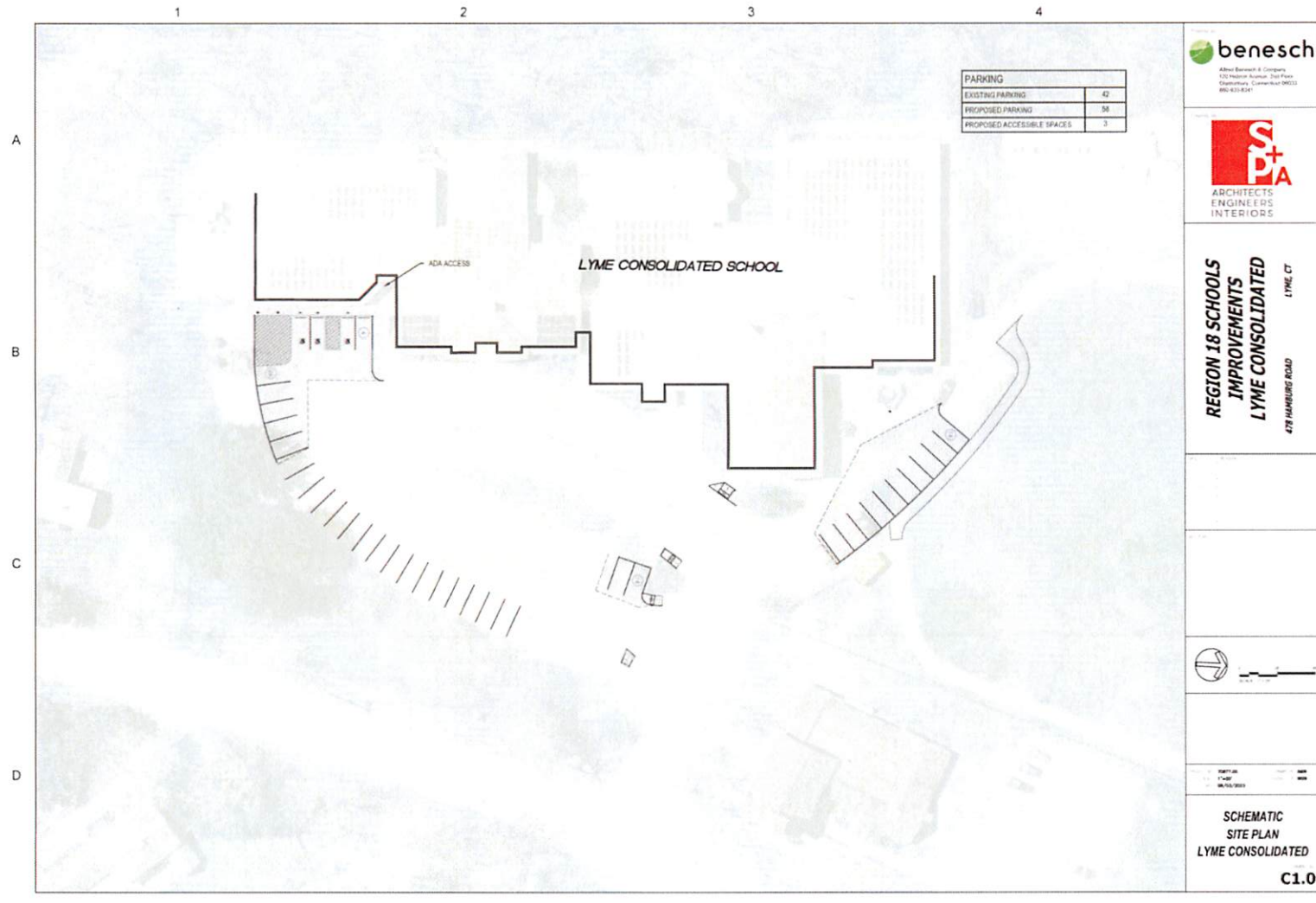
- Center School
- Lyme/Old Lyme Middle School
- Lyme Consolidated School
- Mile Creek School







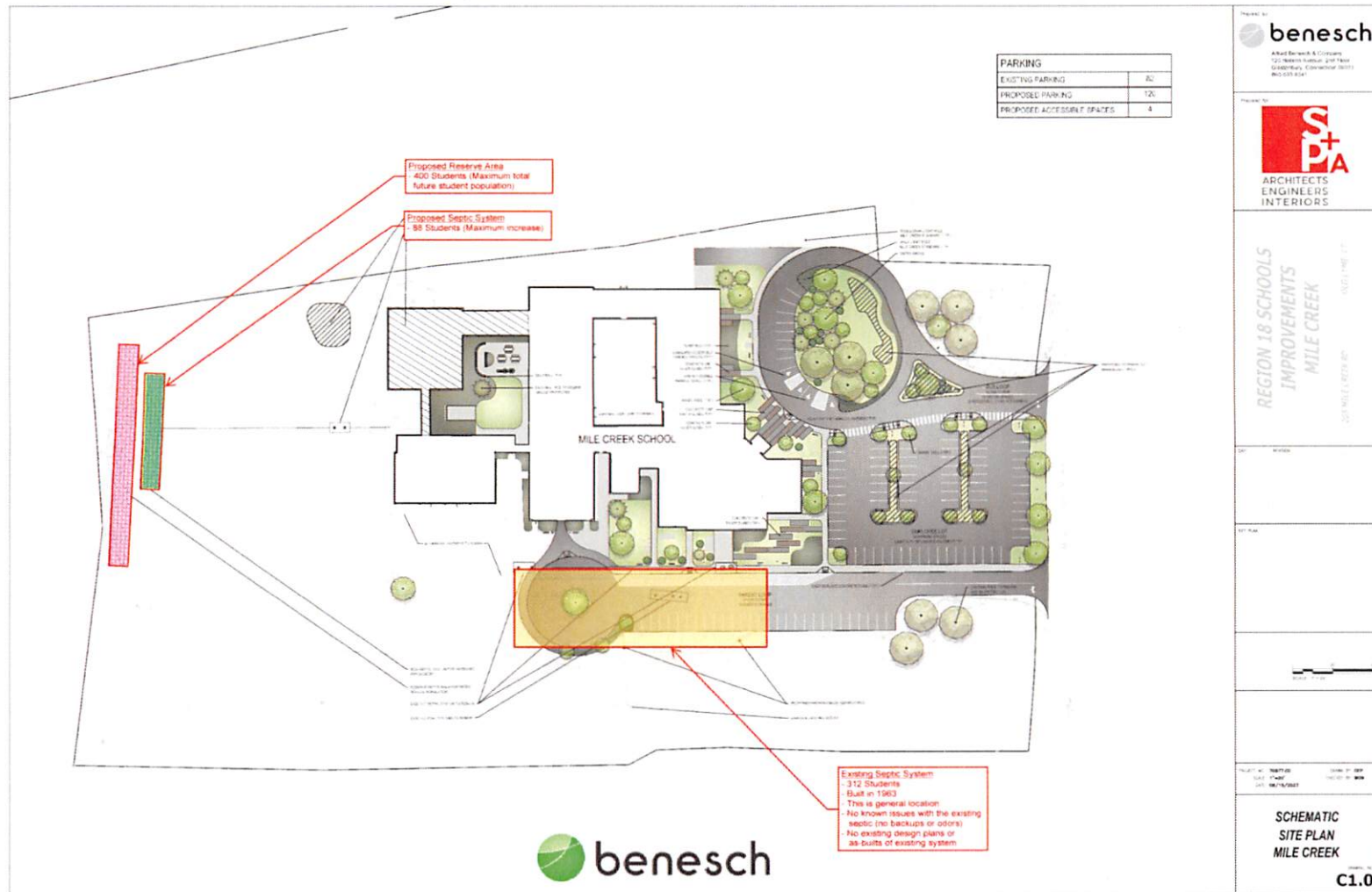
Site Improvements– Consolidated School



Existing Site Conditions– Mile Creek School



Site Improvements– Mile Creek School

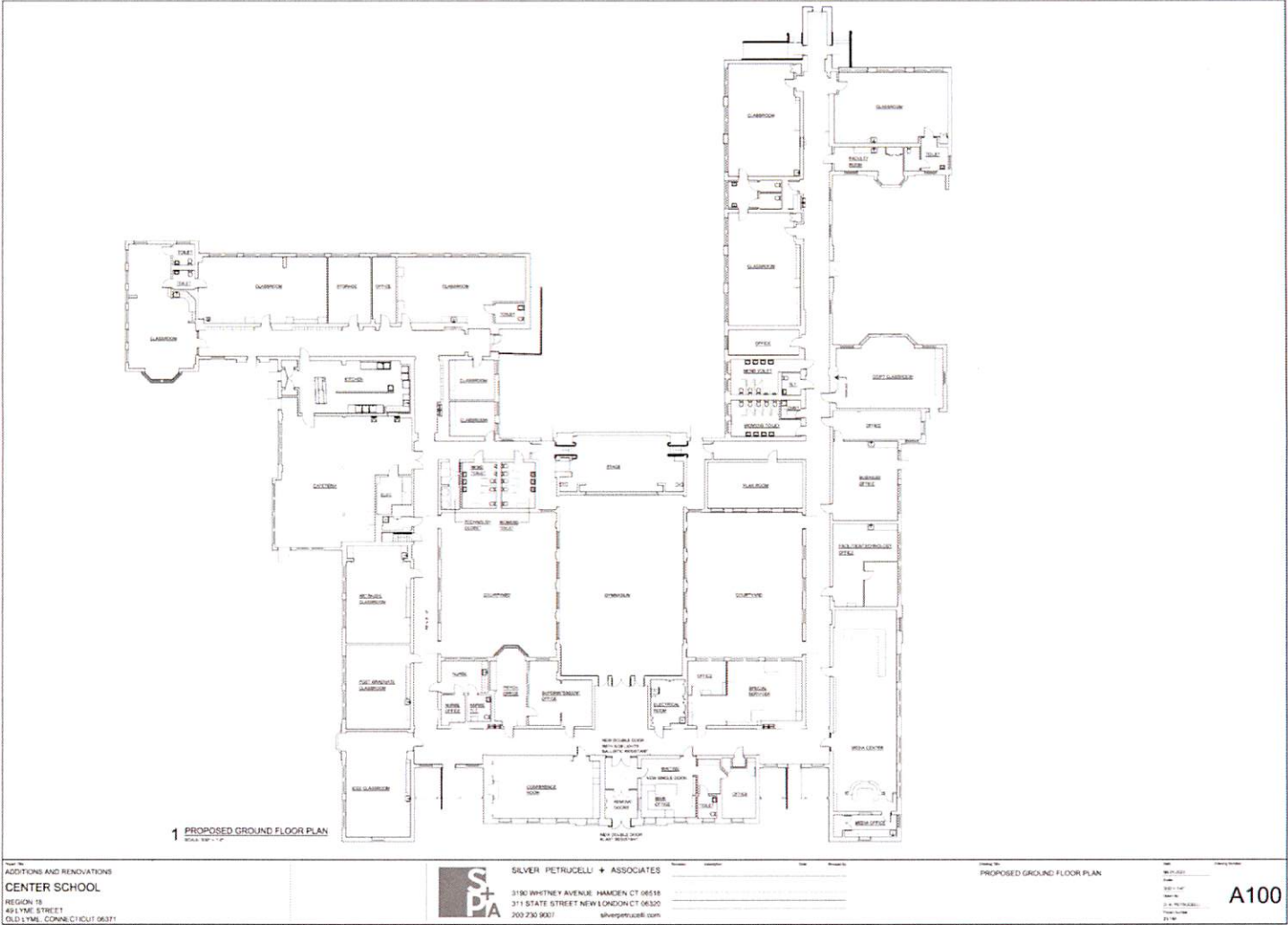


SECURITY & CODE IMPROVEMENTS

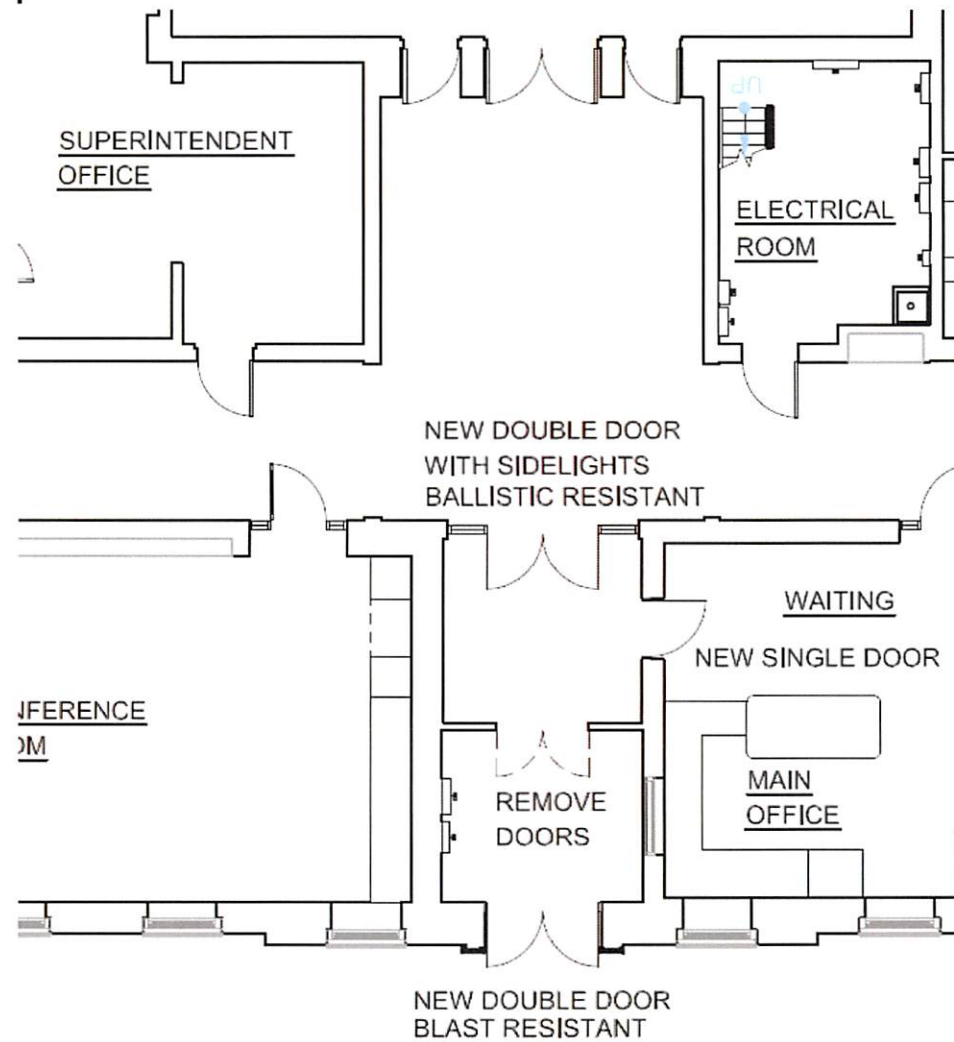
- Center School
- Lyme/Old Lyme Middle School
- Lyme Consolidated School
- Mile Creek School



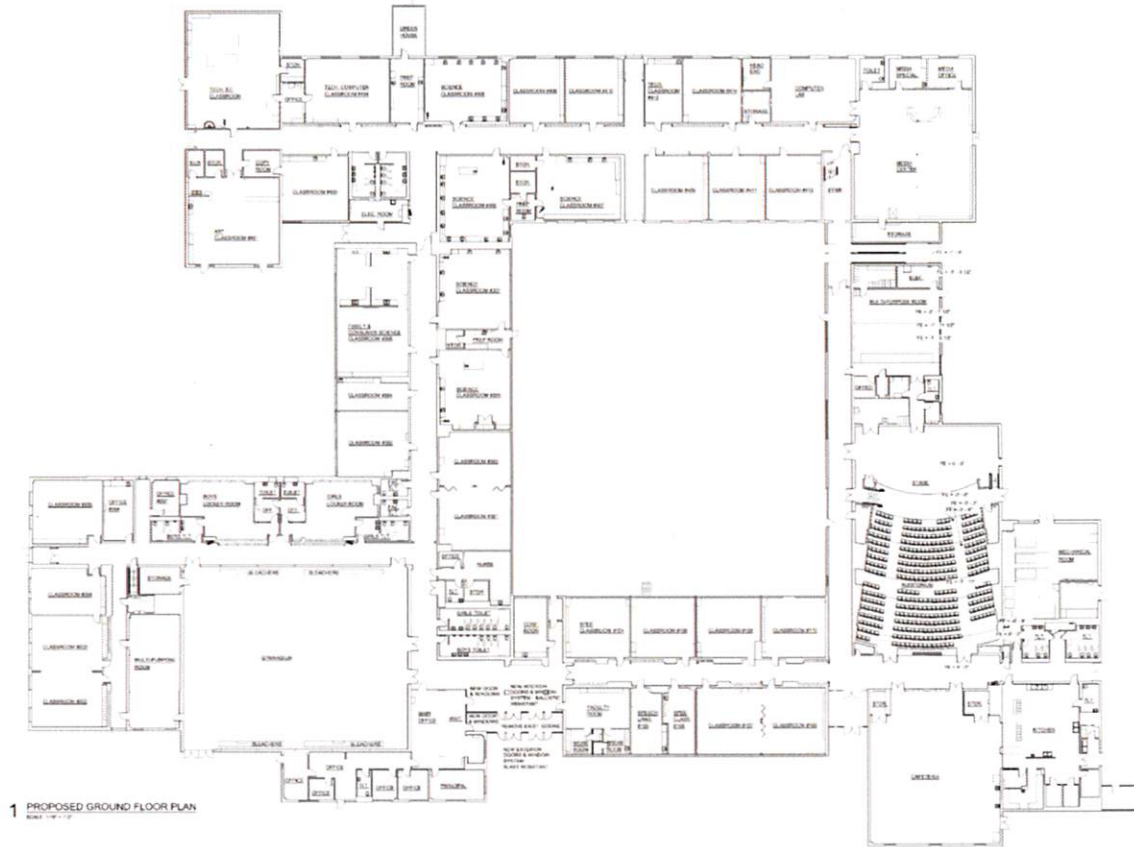
Security & Code Improvements – Center School



Security & Code Improvements – Center School



Security & Code Improvements – Lyme/Old Lyme Middle School



ADDITIONS AND RENOVATIONS
LYME-OLD LYME MIDDLE SCHOOL
REGION 18
53 LYME STREET
OLD LYME, CONNECTICUT 06371



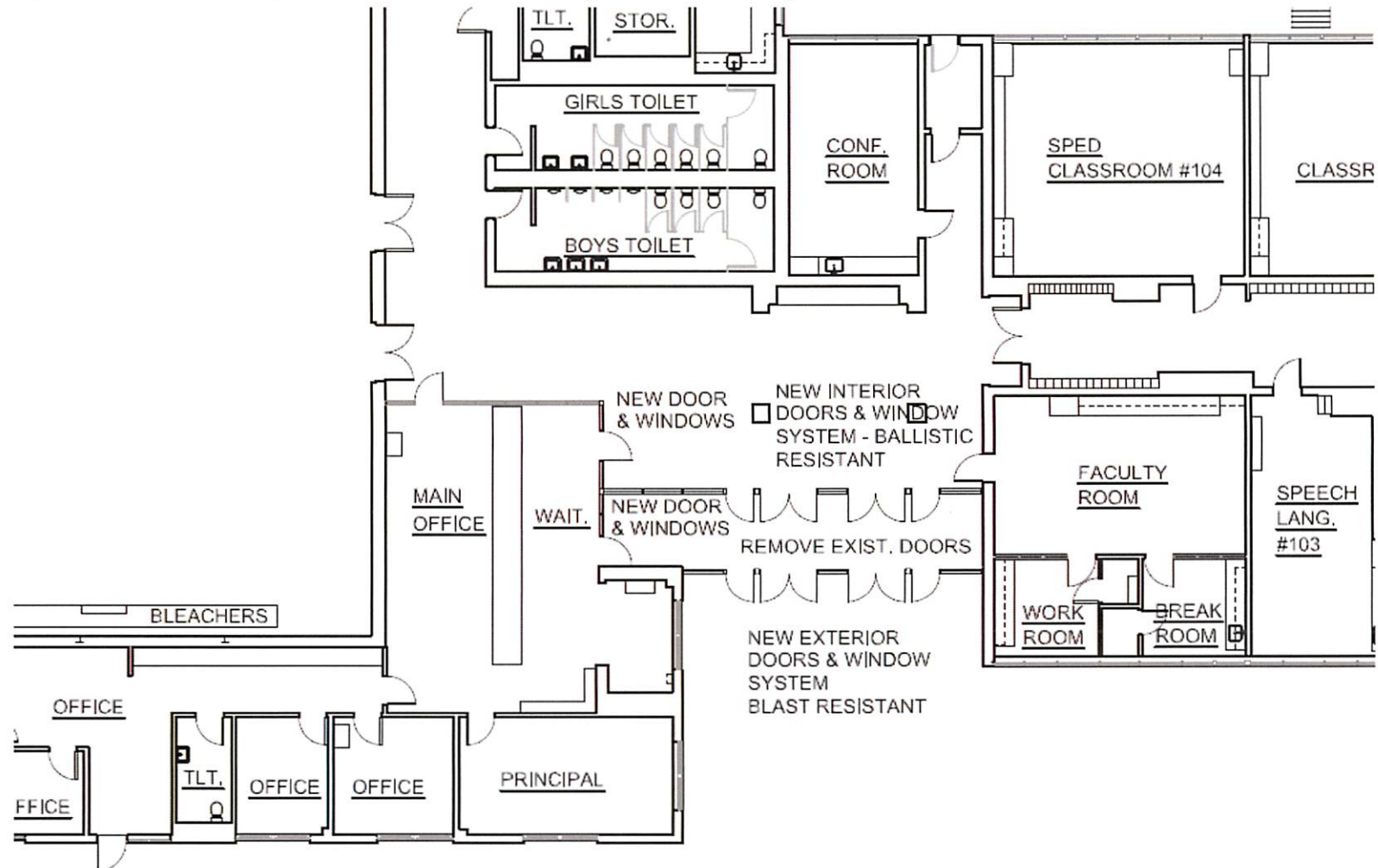
SILVER PETRUCELLI & ASSOCIATES
3180 WHITNEY AVENUE, HAMDEN CT 06418
311 STATE STREET NEW LONDON CT 06320
203 230 9007
silverpetrucelli.com

PROPOSED GROUND FLOOR PLAN

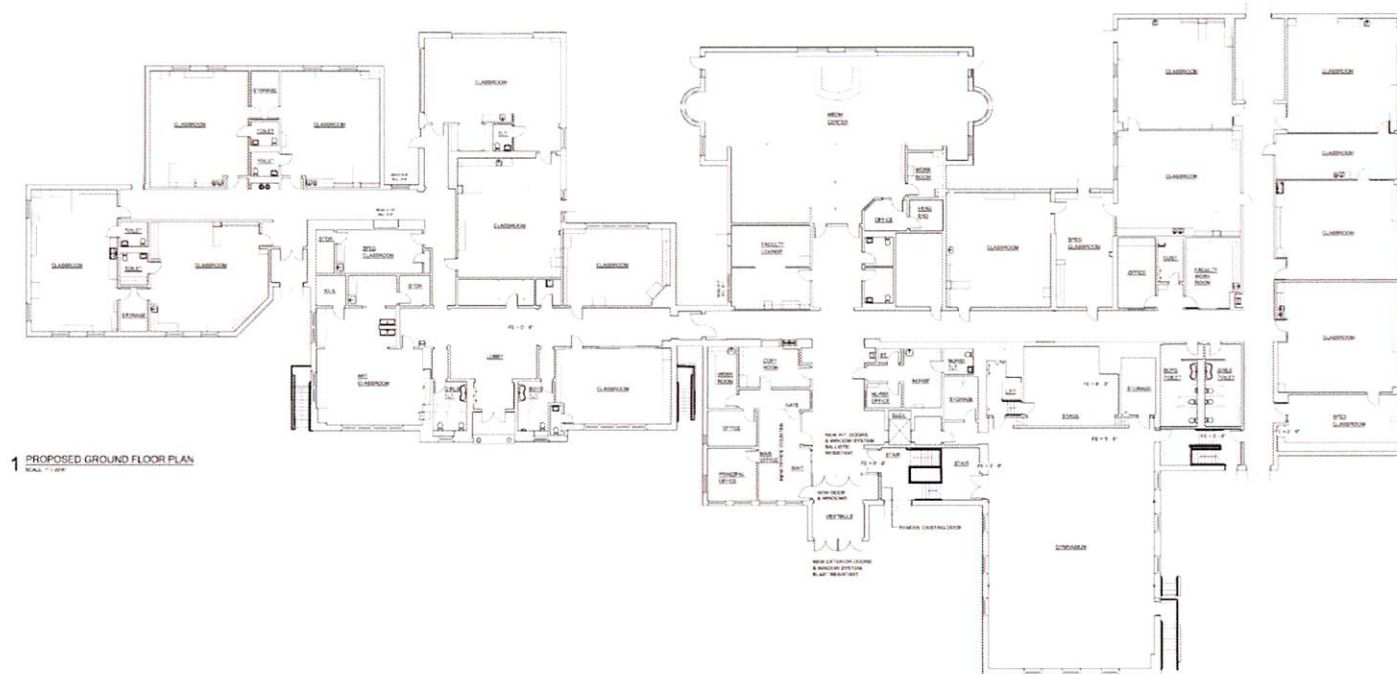
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Security & Code Improvements – Lyme/Old Lyme Middle School



Security & Code Improvements – Lyme Consolidated School



1 PROPOSED GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"



ADDITIONS AND RENOVATIONS
CONSOLIDATED SCHOOL
REGION 18
478 HAMBURG ROAD
LYME, CONNECTICUT 06371



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3190 WHITNEY AVENUE, RAMDEN CT 06318
311 STATE STREET NEW LONDON CT 06320
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silverpetrucci.com

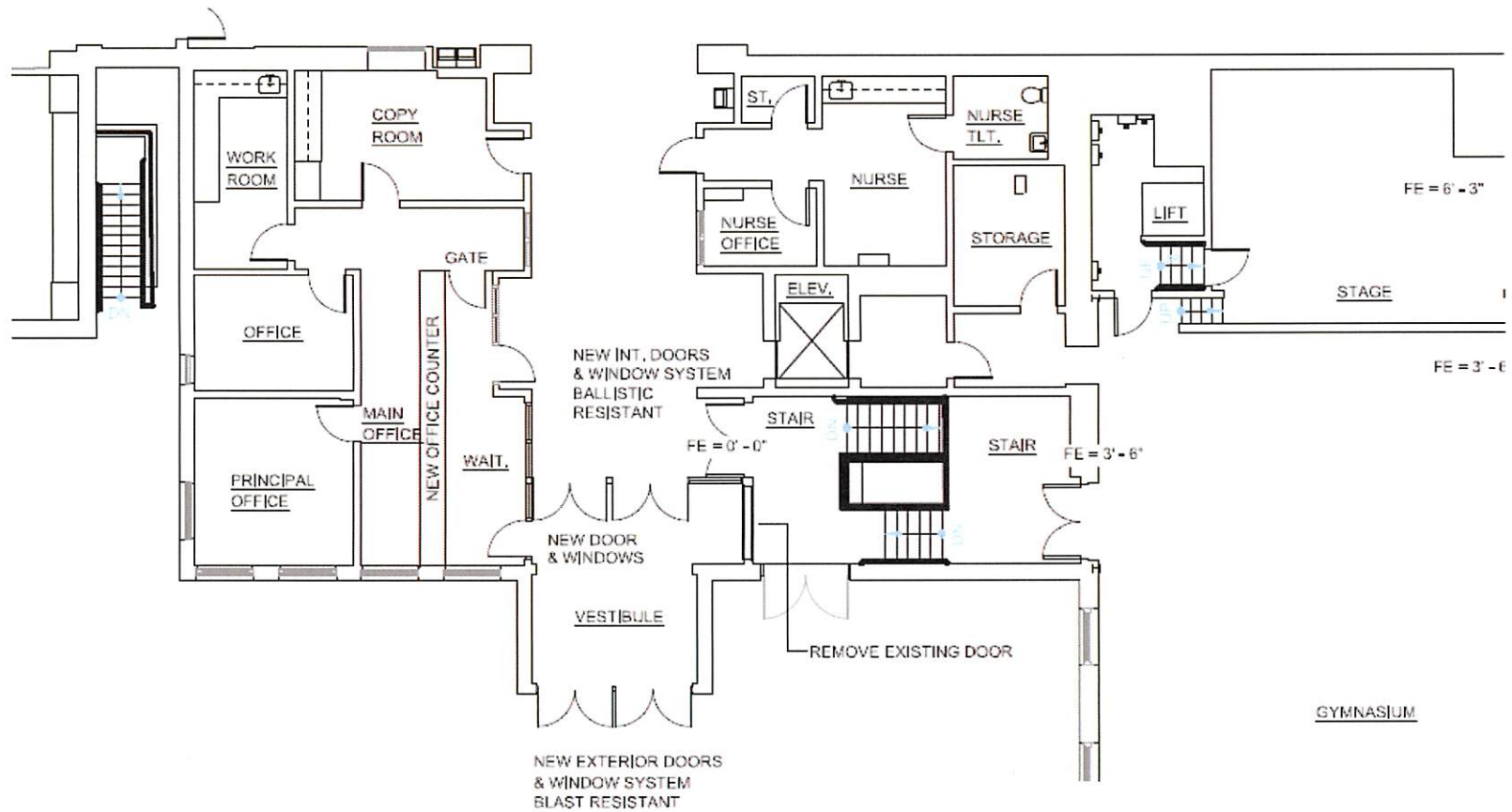
PROPOSED GROUND FLOOR PLAN

DATE: 08-11-2017
BY: [Signature]
CHECKED: [Signature]
DESIGNED: [Signature]
SCALE: 1/8" = 1'-0"

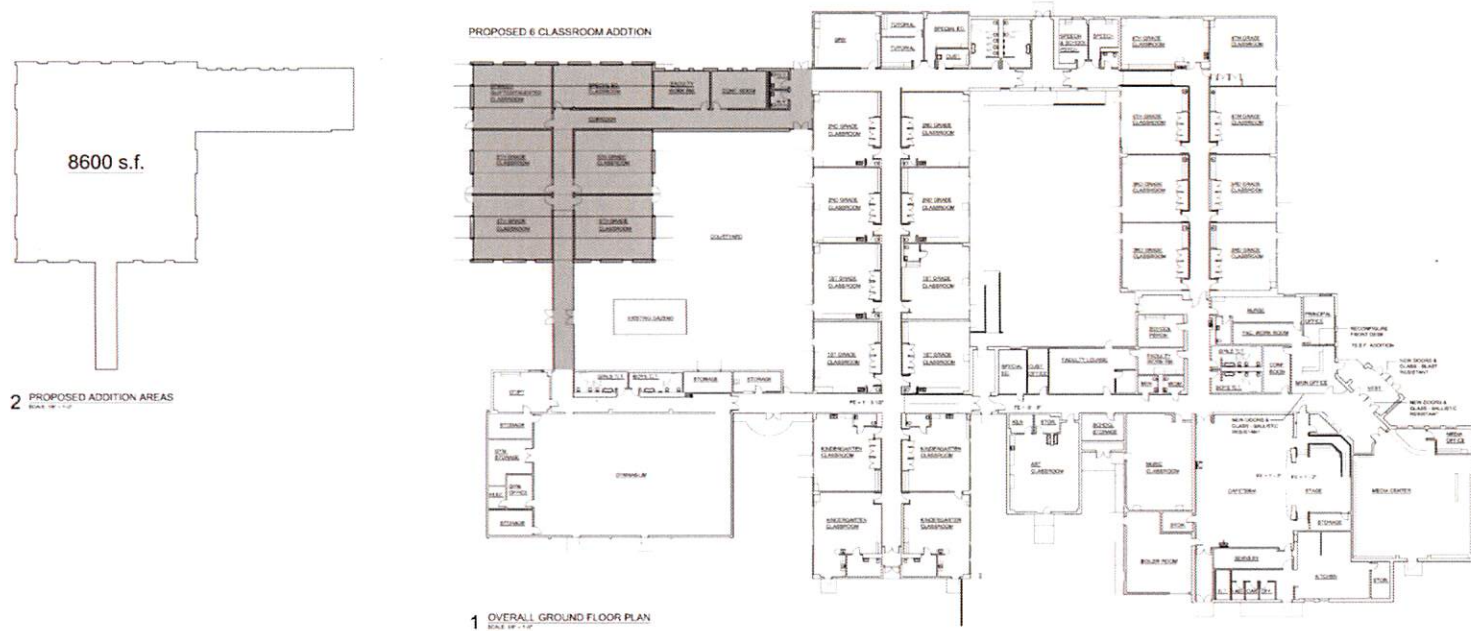
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Security & Code Improvements – Lyme Consolidated School



Security & Code Improvements – Mile Creek School



ADDITIONS AND ALTERATIONS
MILE CREEK ELEMENTARY SCHOOL
 REGION 18
 255 MILE CREEK ROAD
 OLD LYME, CONNECTICUT 06371



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 3190 WHITNEY AVENUE, HAMDEN CT 06518
 311 STATE STREET NEW LONDON CT 06320
 203 230 9007
 silverpetrucci.com

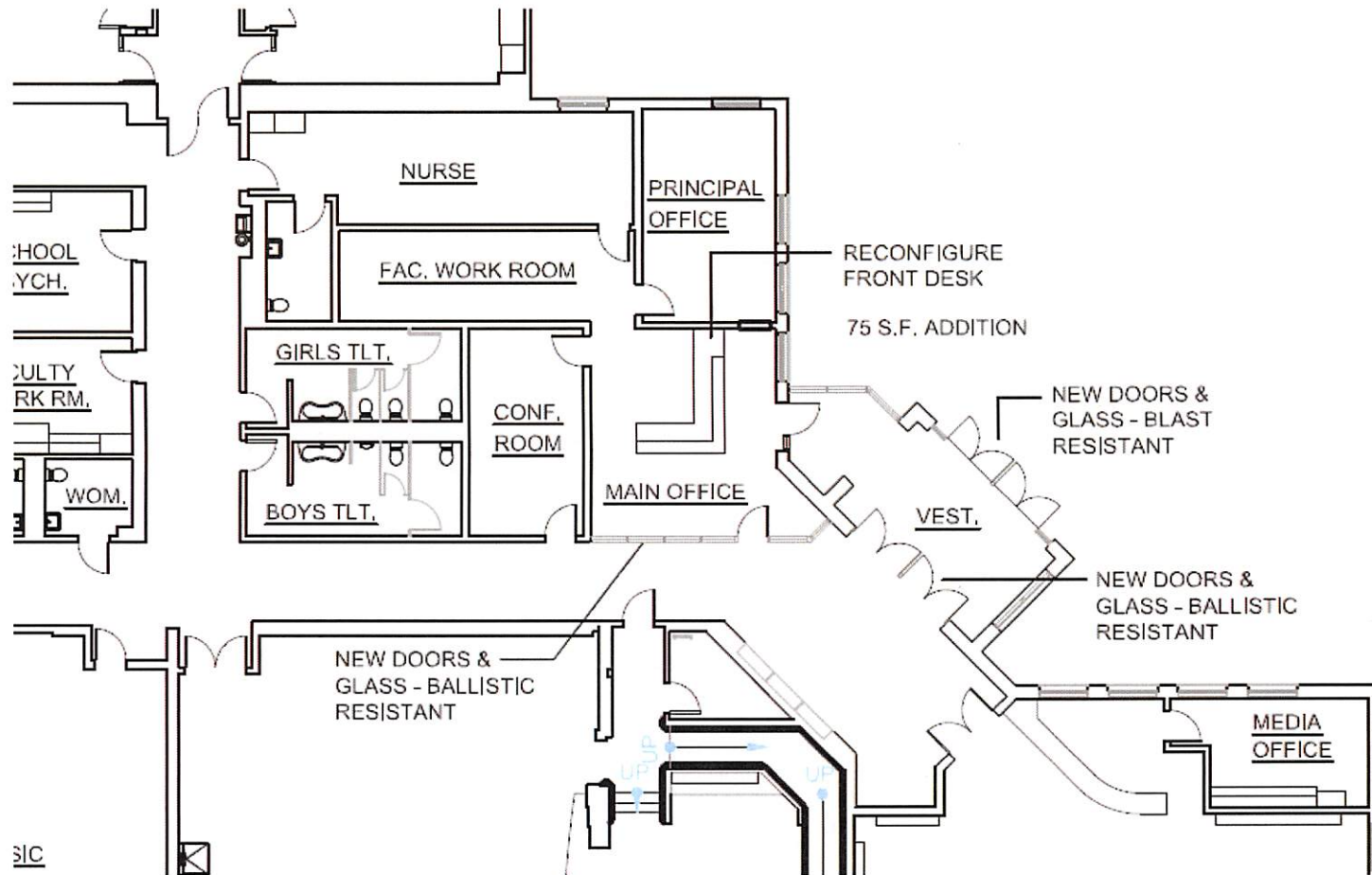
Overall Title
 OVERALL FLOOR PLAN

DATE
 08/11/2011
 SCALE
 1/4" = 1'-0"
 PROJECT NO.
 11-01-00000001
 DRAWING NO.
 01-001

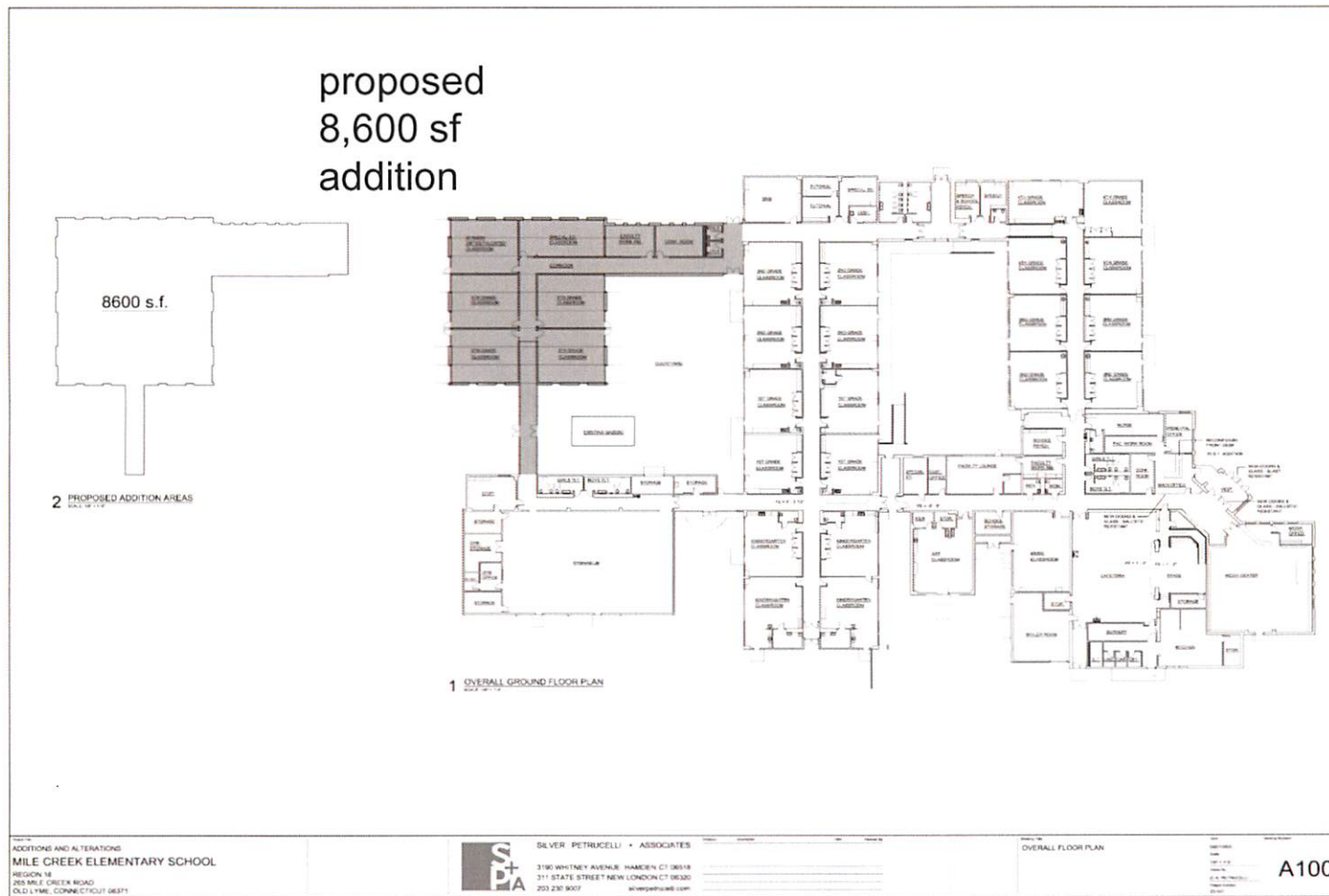
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Security & Code Improvements – Mile Creek School

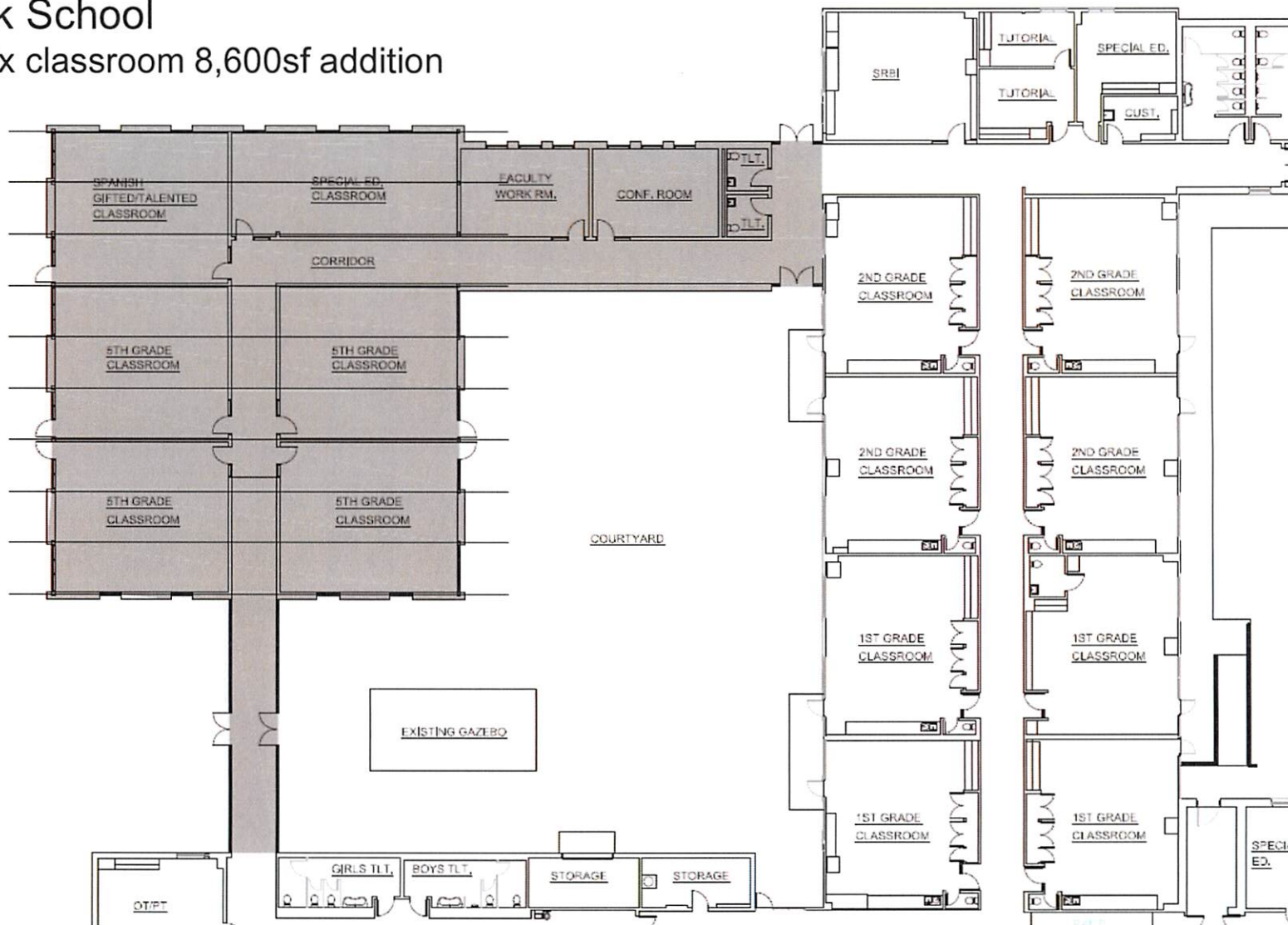


MILE CREEK SCHOOL ADDITION & ALTERATIONS



Mile Creek School

Proposed six classroom 8,600sf addition



Mile Creek School Addition & Alterations



Mile Creek School Addition & Alterations



Mile Creek School Addition & Alterations



Mile Creek School Addition & Alterations



Mile Creek School Addition & Alterations



Mile Creek School Addition & Alterations



HVAC IMPROVEMENTS

- Lyme/Old Lyme Middle School
- Center School
- Lyme Consolidated School
- Mile Creek School



HVAC Breathes Life Into Education



It has been
PROVEN

- Improve student and teacher performance
- Increase test scores
- Reduce airborne transmission of infection.

In one study, students in classrooms with higher outdoor air ventilation rates scored 14 to 15 percent higher on standardized test scores than children in classrooms with lower outdoor air ventilation rates.

1Shaughnessy, R.J., et al. 2006. A preliminary study on the association between ventilation rates in classrooms and student performance. Indoor Air 16(6): 465-468.



A Greener Horizon for Sustainable Living



Cleaner Environment: No emissions, better air quality.



Public Health: Improved indoor air quality, community well-being.



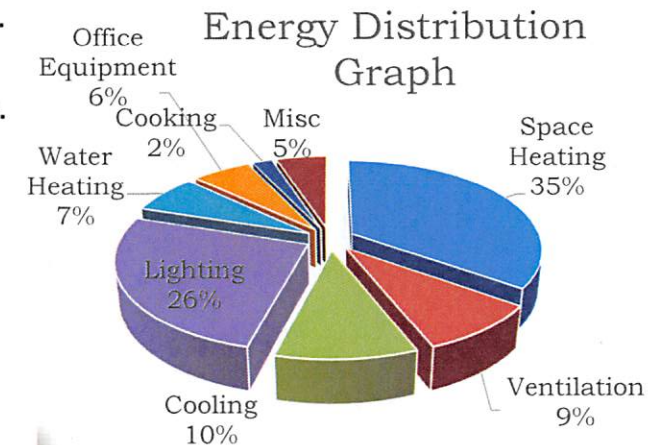
Leadership Impact: Set an example and inspire positive change.



Technological Progress: Engineers drive innovation.



Future-Ready: Adapt to evolving energy landscapes



Choosing the Perfect HVAC Symphony



Size Matters: Pick a system that fits your space.



Efficiency Stars: Look for high-efficiency ratings.



Fuel Options: Decide on the energy source – electricity, gas, or other alternatives.



Air Quality Allies: Opt for good air filtration and humidity control systems.



Smart Choices: Simple and advanced BMS controller.



Noise Levels: Quieter systems lead to a more peaceful environment.



Maintenance Friendliness: Regular maintenance is crucial.



Budget and Longevity: Balance upfront costs with long-term savings. A more efficient system might have a higher initial cost but can lead to substantial savings over time.



Upgrades for all Schools



All Options

- ✓ **Install a new advanced Building Management System (BMS)**
- ❑ Replace the Boiler System with High-Efficiency System.
- ❑ Perimeter Heating
- ❑ Heat Pump Rooftop/DOAS units



BMS - Controller Upgrade

Building Management Systems (BMS) are the silent heroes shaping modern schools. They ensure a seamless blend of comfort, efficiency, and safety, creating an optimal environment for learning and growth.

- ❑ Optimum Start/Stop
- ❑ Dirty Filters
- ❑ Demand Ventilation
- ❑ Monitor



Upgrades for all Schools



All Options

- ☐ Install a new advanced Building Management System (BMS)
- ✓ **Replace the Boiler System with High-Efficiency System**
- ☐ Perimeter Heating
- ☐ Heat Pump Rooftop/DOAS units

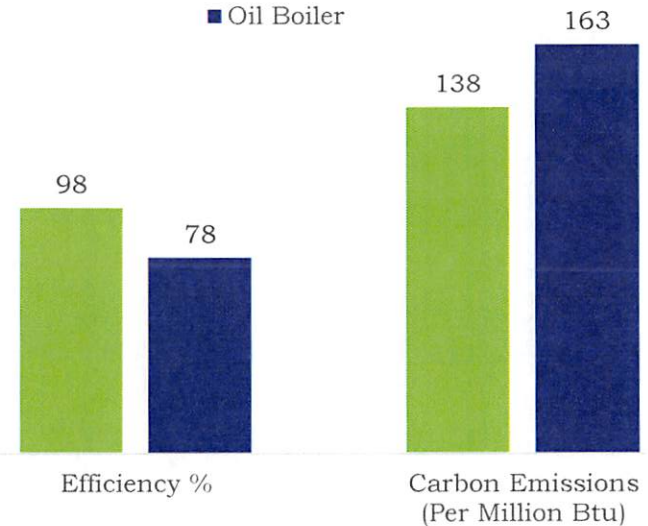


Unlocking Efficiency: The Shift from Oil to Propane Condensing Boilers

The upgrade from conventional oil boilers to condensing boilers signifies a strategic leap in energy technology. Condensing boilers harness latent heat from exhaust gases, achieving efficiency levels unattainable with traditional systems. This transition optimizes fuel utilization, slashes emissions, and aligns with progressive energy standards.

Boiler Comparison

- Condensing Propane Boiler
- Oil Boiler



Upgrades for all Schools



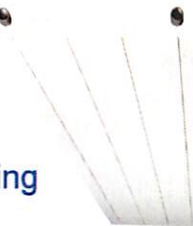
All Options

- ☐ Install a new advanced Building Management System (BMS)
- ☐ Replace the Boiler System with High-Efficiency System
- ✓ **Perimeter Heating**
- ☐ Heat Pump Rooftop/DOAS units

- ☐ **Thermal Comfort:** Older buildings often have cold exterior walls and windows. Perimeter heating mitigates this issue and enhances overall thermal comfort for occupants.
- ☐ **Condensation Prevention:** Cold surfaces within the building envelope can lead to condensation.
- ☐ **Reduced Temperature Stratification:** Perimeter heating helps minimize this effect by maintaining more uniform temperature levels throughout the room.



Finned Tub Radiator



Radiant Ceiling Panels



Upgrades for all Schools

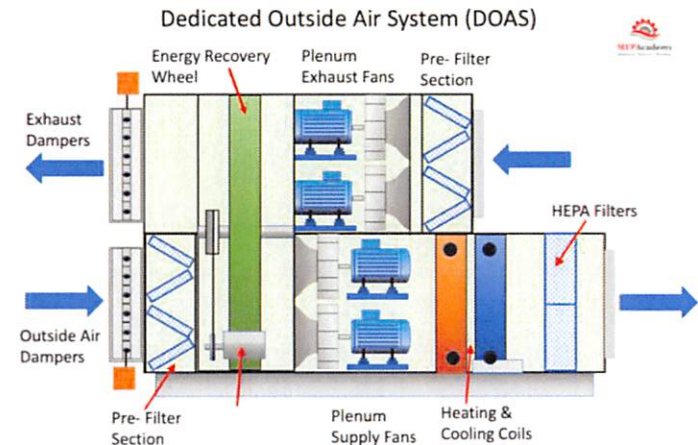
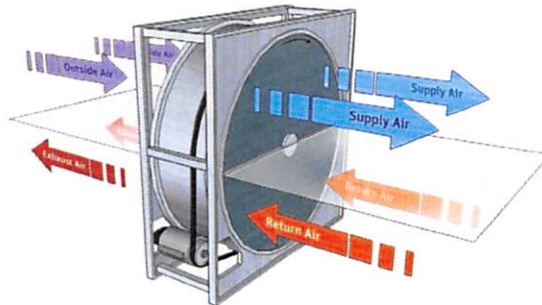


All Options

- ☐ Install a new advanced Building Management System (BMS)
- ☐ Replace the Boiler System with High-Efficiency System.
- ☐ Perimeter Heating
- ✓ **Heat Pump Rooftop/DOAS units**

How it
WORKS

A heat pump rooftop unit operates as both a heater and air conditioner. It extracts heat from outdoor air to warm indoor spaces in winter and reverses the process for cooling in summer. This dual-functionality provides year-round comfort with a single system, making it efficient and space-saving.



Heat Pump Rooftop Units

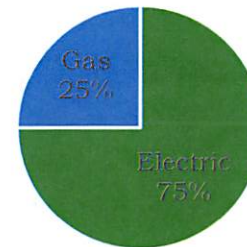


All Options

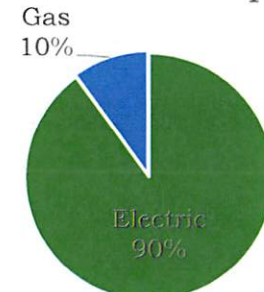
- ☐ Install a new advanced Building Management System (BMS)
- ☐ Replace the Boiler System with High-Efficiency System.
- ☐ Perimeter Heating
- ✓ **Heat Pump Rooftop/DOAS units**

- ☐ The Heat Pump rooftop unit powered by electricity will be responsible for cooling and heating the building.
- ☐ However, in the heating mode, the heat pumps won't be able to generate heat when the ambient temperature falls below 15°F.
- ☐ Weather data from the National Renewable Energy Laboratory for Lyme Old Lyme shows that the temperature would be below 15°F for less than 2% of the heating season.
- ☐ In such situations, gas-fired condensing boilers will take over and provide heating to the building.

VAV system
Electric VS Propane



VRF System
Electric VS Propane



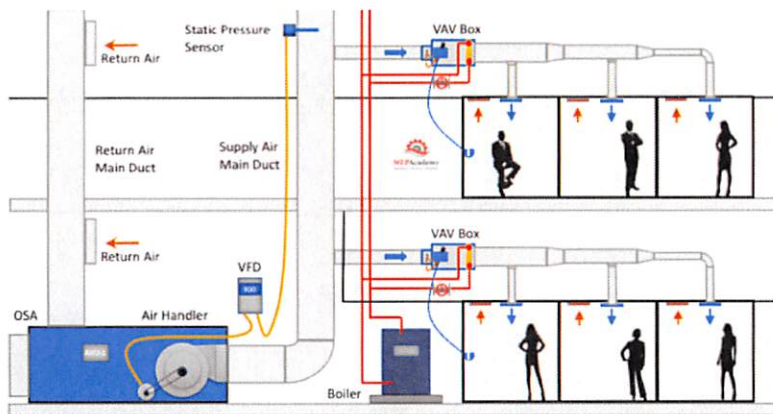
VAV System

How it WORKS



■ 75%
Electric

A Variable Air Volume (VAV) system adjusts airflow into different areas based on their temperature needs. Sensors detect changes, and dampers modulate air supply accordingly. This dynamic control ensures comfort and energy efficiency, adapting to varying conditions within a building.



- ☐ Low initial Cost
- ☐ Minimum Maintenance
- ☐ Simple to Control
- ☐ Minimum Noise level
- ☐ Individual Zone Control
- ☐ Minimum impact on the existing system at the MS



- ☐ Mixed air ventilation system
- ☐ Slightly lower efficiency than the VRF system

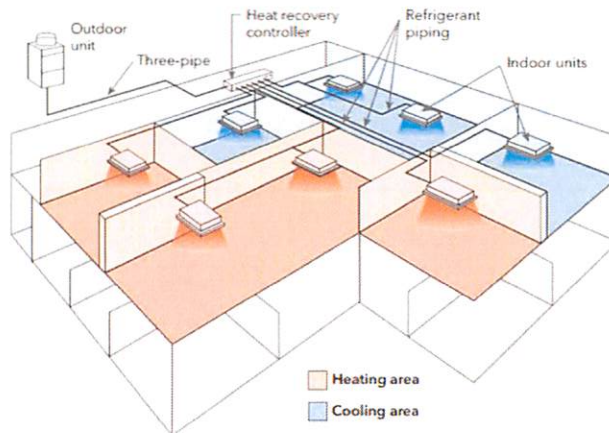
VRF System

How it WORKS



■ 90%
Electric

A Heat Recovery Variable Refrigerant Flow (VRF) system captures heat from areas that need cooling and transfers it to spaces requiring heating. Refrigerant circulates between indoor and outdoor units, simultaneously ensuring energy-efficient temperature control in various zones.



- ❑ Very efficient system.
- ❑ A dedicated outdoor air unit guarantees better indoor air quality.
- ❑ Individual Zone Control.



- ❑ Additionally required demolition work.
- ❑ Higher cost than VAV system
- ❑ Requires more maintenance than a VAV system.



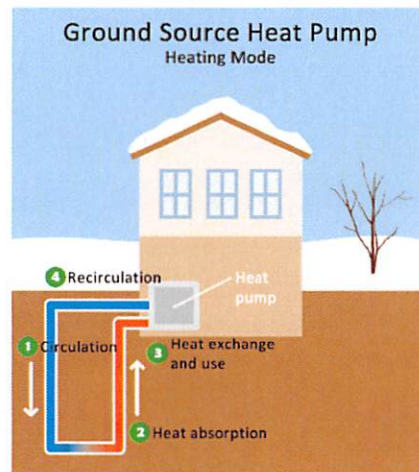
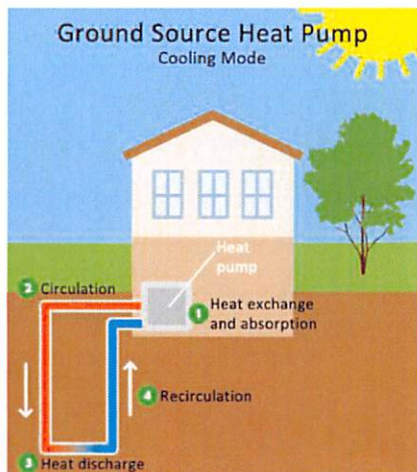
VRF - Geo System

How it WORKS



■ 90%
Electric

VRF - Geo system combines VRF technology with the Earth's consistent temperature underground. The VRF system uses this geothermal energy to provide heating or cooling, creating an eco-friendly, energy-efficient climate control solution for buildings.



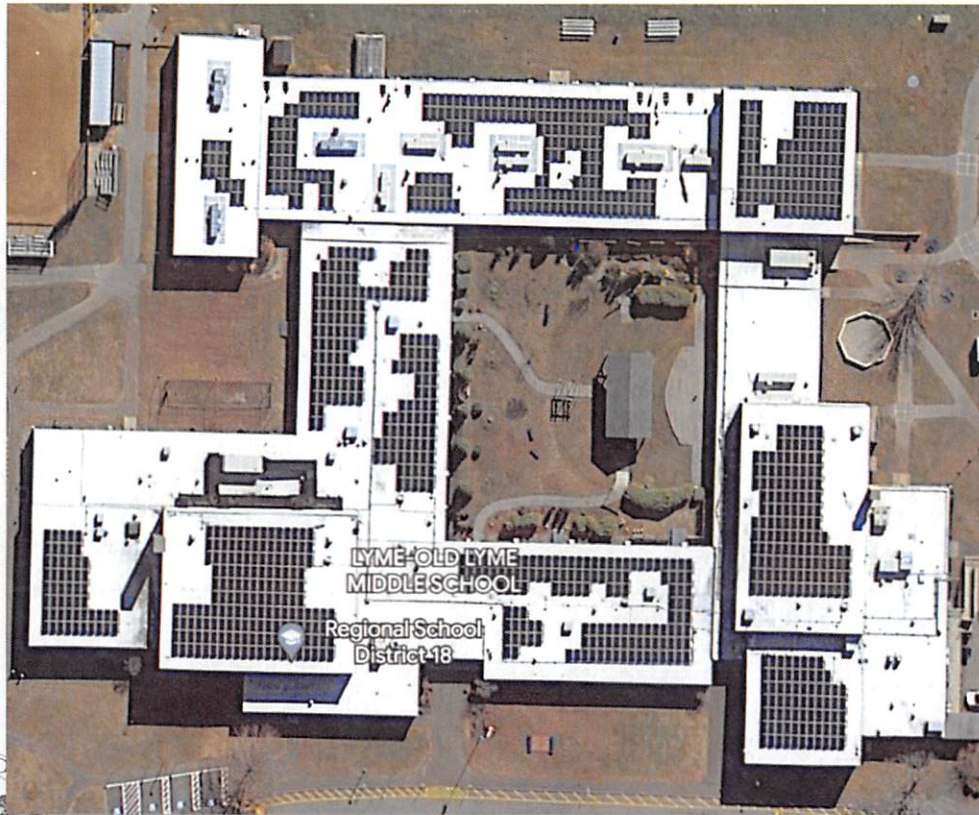
- ❑ Incredibly efficient system.
- ❑ A dedicated outdoor air unit guarantees better indoor air quality.
- ❑ Individual Zone Control



- ❑ Additionally, required demolition work, and site work.
- ❑ Significantly Higher cost.
- ❑ Required larger mechanical room.
- ❑ Requires more maintenance than a VAV system.



Lyme Old Lyme Middle School



88,000 SF



275 Students



Lyme Old Lyme Middle School



All Options

- ✓ Install a new advanced Building Management System (BMS)
- ✓ Replace the Boiler System with High-Efficiency System.
- ✓ Perimeter Heating
- ✓ Heat Pump Rooftop/DOAS units



Option #1 VAV System

- ❑ New heat pump high-efficiency rooftop unit with energy recovery wheels
- ❑ Clean and disinfect existing ductwork.
- ❑ Replace existing VAV boxes with New ones.
- ❑ Easiest to implement based on existing conditions at the MS



Option #2 VRF System

- ❑ New heat pump high-efficiency dedicated outdoor unit with energy wheel
- ❑ Remove most of the existing ductwork. Clean and disinfect the remaining.
- ❑ Install VRF system with air source condensing unit.

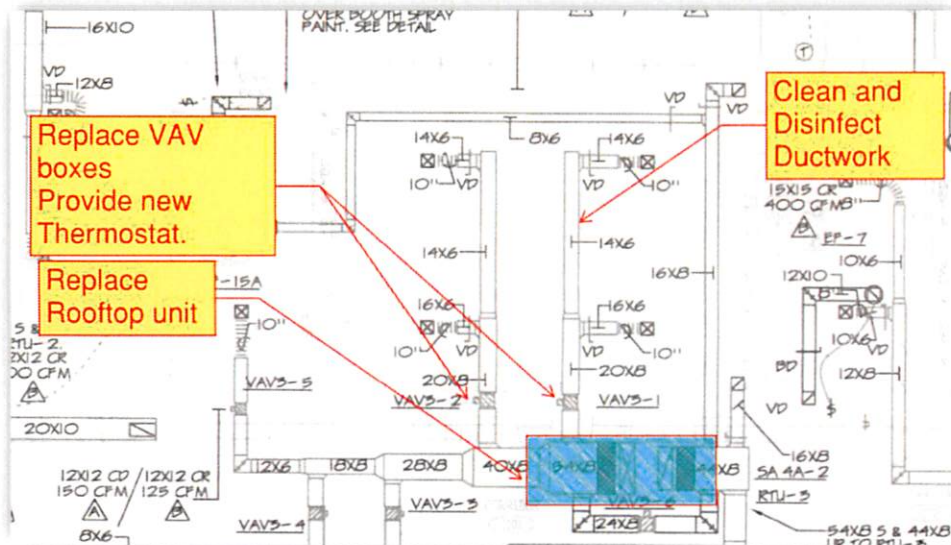


Option #3 VRF – Geo System

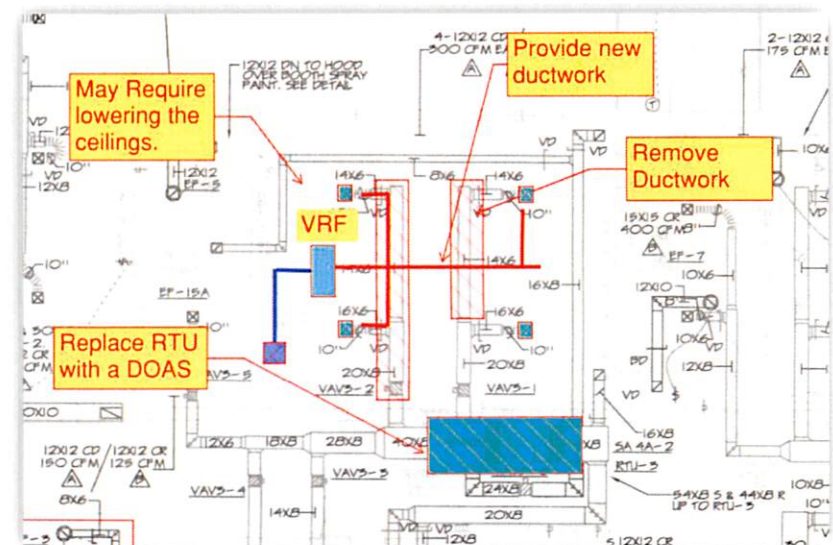
- ❑ New heat pump high-efficiency dedicated outdoor unit with energy wheel
- ❑ Remove most of the existing ductwork. Clean and disinfect the remaining.
- ❑ Install VRF system with Geothermal water source condensing unit.
- ❑ Drill geothermal wells on site and pipe to pumps within mechanical room



Middle School HVAC Recommendations



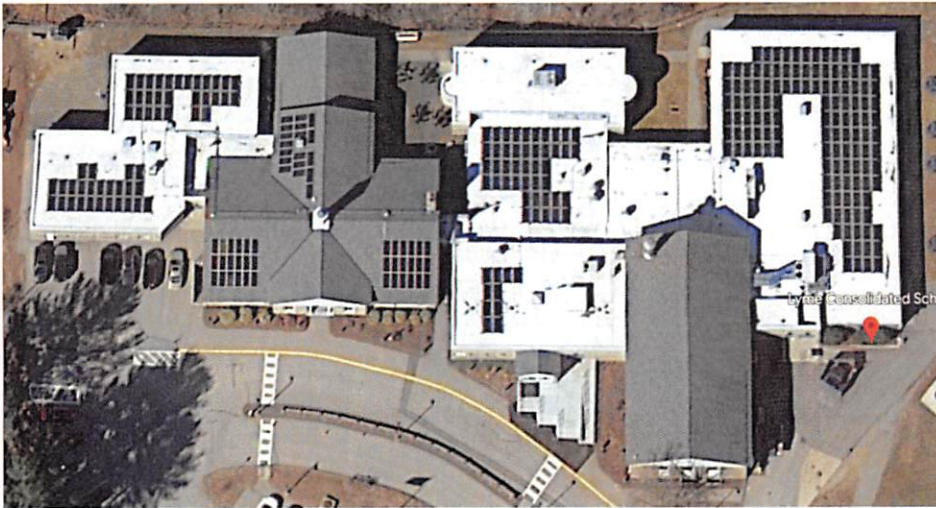
Option # 1 (Recommended)
VAV System



Option # 2 & 3
VRF - DOAS System



Lyme Consolidated & Center Schools



35,000 SF



210 Students



37,000 SF



95 Students



Center and Consolidated Schools



All Options

- ✓ Install a new advanced Building Management System (BMS)
- ✓ Replace the Boiler System with High-Efficiency System.
- ✓ Perimeter Heating
- ✓ Heat Pump Rooftop/DOAS units



Option #1 VAV System

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Option #3 VRF – Geo System

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- ❑ Install VRF system with Geothermal water source condensing unit.
- ❑ Drill geothermal wells on site and pipe to pumps within mechanical room



Consolidated School HVAC Recommendations



4 WAY FLOW UNDER CEILING

FXUQ

18

24

30

36

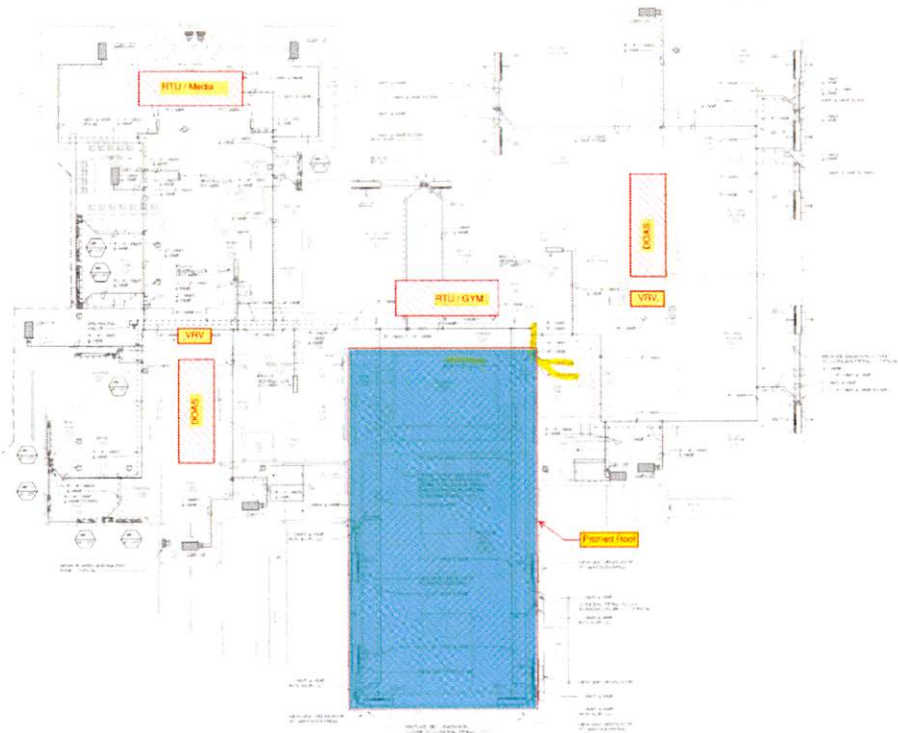
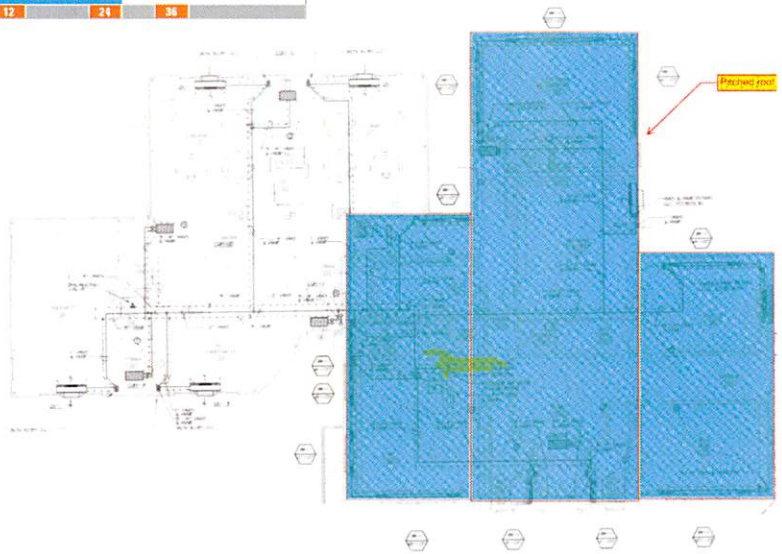
1 WAY FLOW UNDER CEILING

FXHQ

12

24

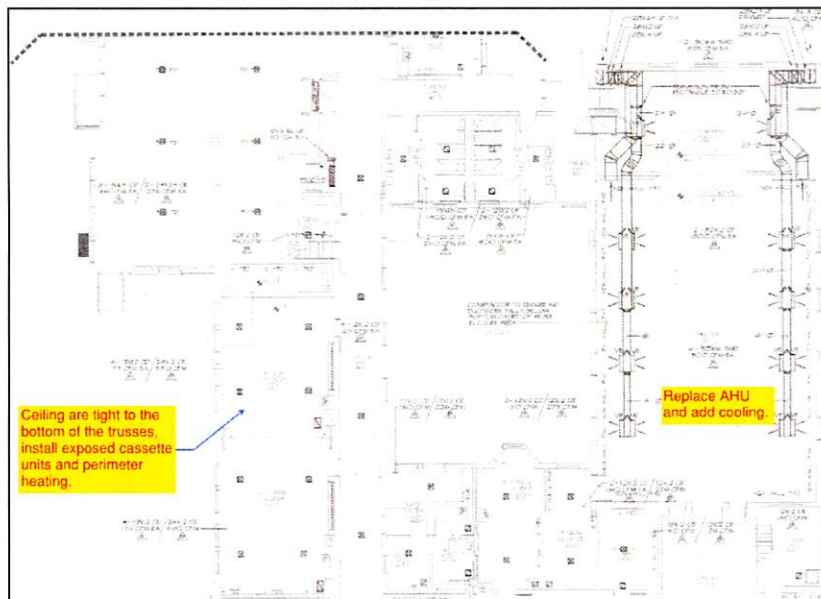
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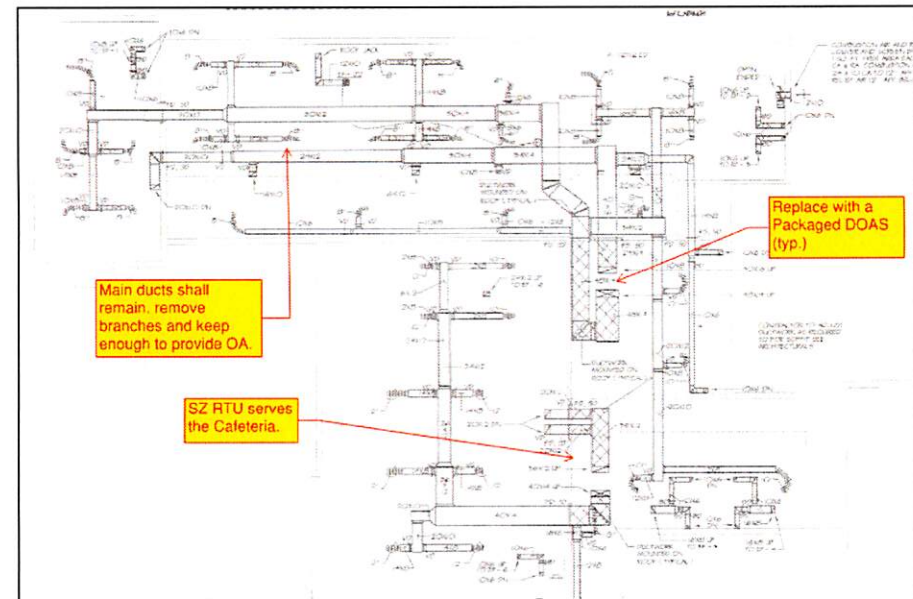
VRF System
Floor Plan



Center School HVAC Recommendations



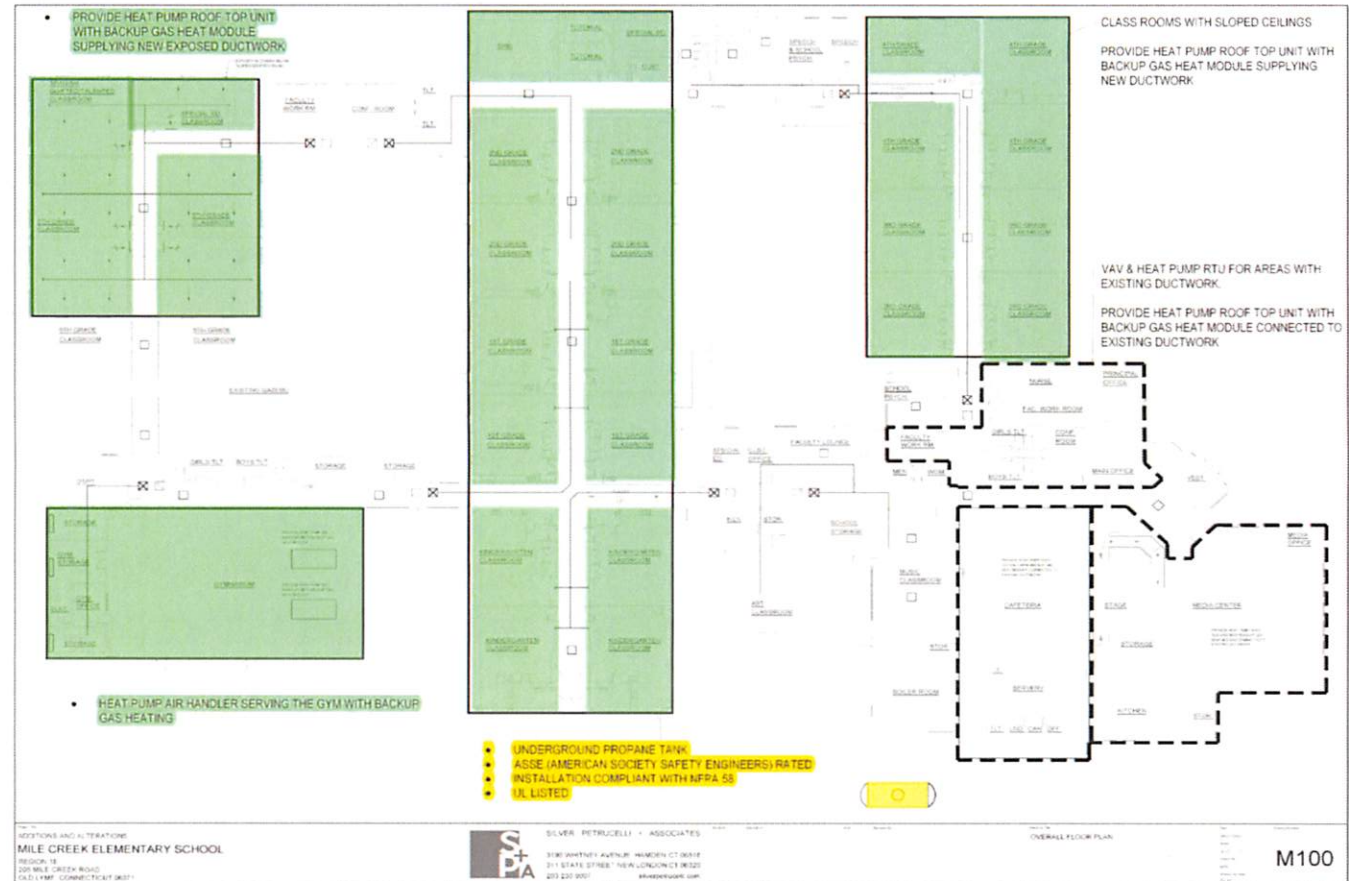
VRF System Floor Plan



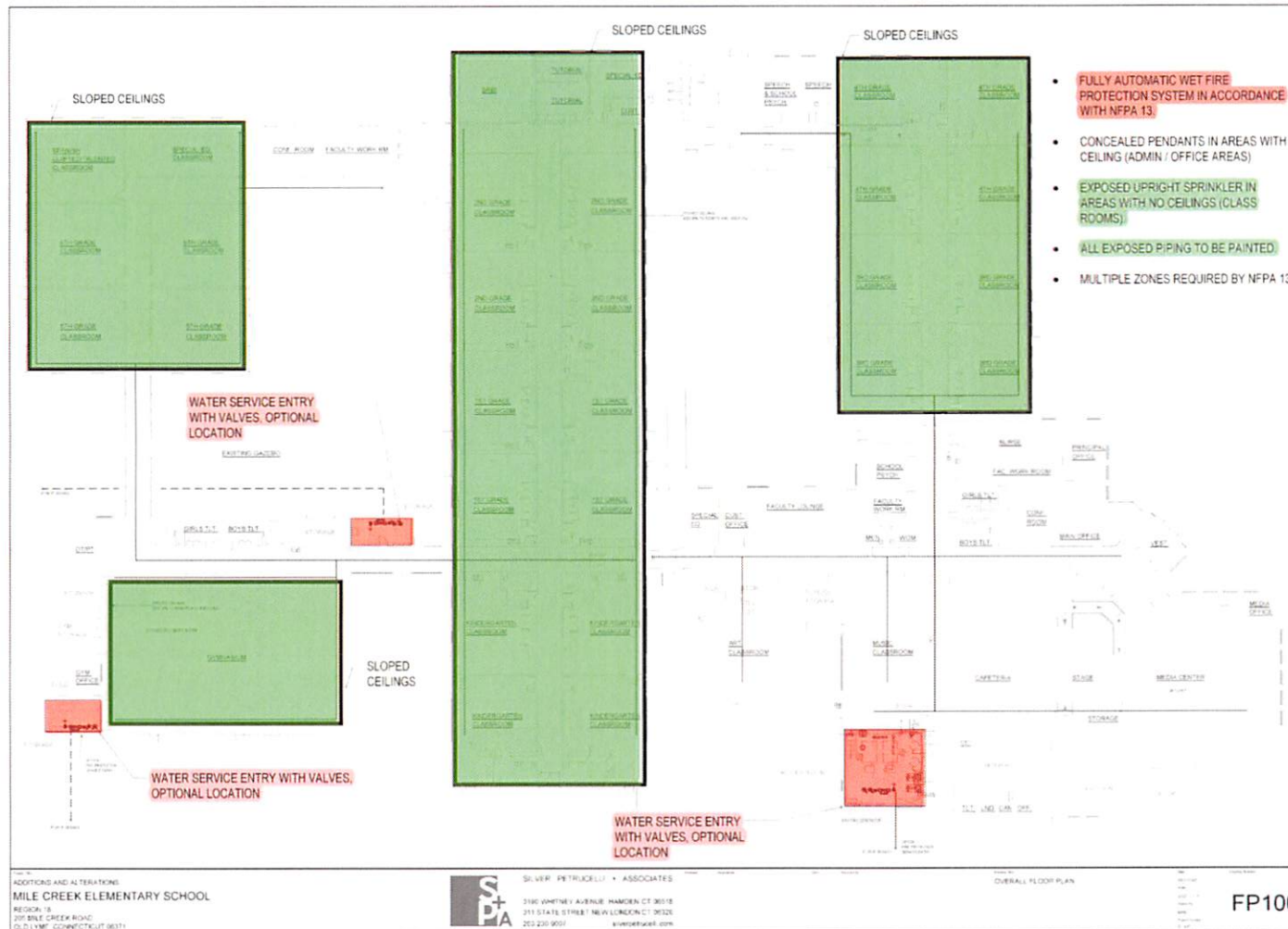
VRF System Attic Level



MILE CREEK SCHOOL – HVAC RECOMMENDATIONS



MILE CREEK SCHOOL – PROPOSED FIRE PROTECTION SYSTEM



SILVER, PETRUCCI & ASSOCIATES
3180 WHITNEY AVENUE, HARTFORD, CT 06118
211 STATE STREET, NEW LONDON, CT 06320
203-225-9007 www.petrucci.com



MILE CREEK SCHOOL – PROPOSED ELECTRICAL UPGRADES



- A new electrical service rated for 1,600A, 480/277V - 3 Phase will be provided and coordinated with the corresponding utility.
- New Switchgear and additional electrical panels rated for 480/277V - 3 Phase will be provided to suit the existing building and additional HVAC equipment.
- Existing switchgear rated for 1,600A, 208/120V - 3 Phase will be fed from new switchgear via stepdown-transformer.



RENOVATE AS NEW
MILE CREEK SCHOOL
205 MILE CREEK ROAD
OLD LYME, CONNECTICUT 06371



SILVER, PETRUCELLI + ASSOCIATES
3106 WINTNEY AVENUE, HAMDEN CT 06430
311 STATE STREET NEW LONDON CT 06320
203 233 9037 www.silverpetrucci.com

ELECTRICAL DISTRIBUTION PLAN

E4



HVAC System Comparison



Function	VAV System	VRF System	VRF System w/Geothermal
System Type and Configuration	Heat pump RTU, VAV boxes, and perimeter heating	Air source heat recovery VRF system, DOAS w/energy wheel, and perimeter heating	Geothermal source heat recovery VRF system, DOAS w/energy wheel, and perimeter heating
Heating and cooling Mechanism	75% Electric 25% Propane	90% Electric 10% Propane	90% Electric 10% Propane
Zoning and Individual Control:	Full Control	Full Control	Full Control
Energy Efficiency	Good	Very Good	Best
Installation and Space Requirement	For the Middle school it will replace the existing system no need for any added space	Need to analyze the roof for the added VRF condensing units and the packaged DOAS	Need a geothermal field and large mechanical room for the condensing units and pumps
Ductwork Requirement	Minimum	New ductwork to support the ducted units	New ductwork to support the ducted units
Indoor Air Quality	Very Good	Very Good	Very Good



HVAC System Comparison



Function	VAV System	VRF System	VRF System w/Geothermal
Maintenance and Service	Minimum, replace RTUs filters	Replace DOAS filters and clean/replace filter for each indoor unit.	Replace DOAS filters and clean/replace filter for each indoor unit.
System Reliability	Best	Very good	Very good
Noise level	Best	Very good with ducted units Less with cassette units	Very good with ducted units Less with cassette units
Control	Simple	Complex	Complex
Cost	Less than VRF System	More than VAV System	2 to 3 times the cost of a conventional VRF System



HVAC Budget Update



Region 18 Schools

Lyme / Old Lyme

HVAC Systems - VAV vs VRF Analysis

Date: 08/21/2023

Description	%	Mile Creek	Center School	Lyme Consolidated	Middle School	Totals
Base Budget VAV System (includes indirect costs)		5.4M	2.5M	3.0M	6.2M	17.1M
Additional Actual Escalation 2023	3.4%	\$175K	\$80K	\$100K	\$200K	\$555K
Escalation 2024	7%	\$390K	\$180K	\$220K	\$450K	1.2M
Total Revised Base Budget		6.0M	2.8M	3.3M	6.9M	19M
Upgrade to VRF System		NA	\$840K	\$515K	NA	1.4M
Total Budget Impact		\$600K	1.1M	\$815K	\$646K	3.2M



Our Goal



Maintenance

Friendly type of service



Budget

Balance upfront costs with long-term saving



Size

Pick a system that fits your space



Efficiency

Look for high-efficiency ratings



PROJECT BUDGETS & SCHEDULES

- Project Budgets

- HVAC Improvements

- Center School
 - Lyme/Old Lyme Middle School
 - Lyme Consolidated School

- Mile Creek School Addition & Alterations

- Project Schedule



Project Budgets



Center School #118-004 HVAC

Total Project Budget **\$7,389,531**

- Hard Cost \$6,497,050
- Soft Cost \$ 892,481
- Reimbursement \$2,718,608.45

Lyme-Old Lyme Middle School #118-004 HVAC

Total Project Budget **\$16,961,681**

- Hard Cost \$14,902,534
- Soft Cost \$ 2,059,147
- Reimbursement \$6,240,202.44

Lyme Consolidated #118-004 HVAC

Total Project Budget **\$8,292,760**

- Hard Cost \$7,281,329
- Soft Cost \$1,011,431
- Reimbursement \$3,050,906.40



Project Budgets



Mile Creek School – Addition and Alteration

23DASY218040EA0623

Total Project Budget \$24,911,028

- Hard Cost \$21,278,104
- Soft Cost \$ 3,632,924
- State Reimbursement \$9,075,088



[illegible]

QUESTIONS & DISCUSSION

- Next Steps

