Catherine Lillis Administrative Building

Building Conditions Assessment

50 East Street
New Milford, Connecticut 06776

Draft Report, October 6, 2023
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TABLE OF CONTENTS

SECTION I - EXECUTIVE SUMMARY

This report was prepared by Silver Petrucelli & Associates, Inc. (SPA) of Hamden, Connecticut, an architecture and engineering firm specializing in municipal programming, planning and design, feasibility analyses and building condition investigations.

Objective

Silver Petrucelli & Associates (SPA) was retained in the late summer 2023 by the Town of New Milford, New Milford Connecticut, to perform a comprehensive inspection/report reviewing the existing Catherine Lillis Administrative Building, located at 50 East Street, New Milford, CT which was constructed in 1931. The analysis included the site conditions, site parking lots, sidewalks, entry drives, exterior building envelope, interior building conditions, code analysis along with Mechanical, Plumbing, Fire Protection and Electrical components. Our efforts included visual observations from the ground (both outside the facility & inside the facility), visual observations from the roof and review of all existing documents made available to SPA.

Findings

Based on our observations, the site components and 31,000 s.f. building are generally in fair/poor condition. While the structure is solid along with the exterior masonry & windows, many of the other building elements need significant work due to deferred maintenance over the years or code compliance violations. The Mechanical, Electrical and Plumbing components are also past their useful life expectancy and will require significant renovations/restoration work.

Recommendations

SP&A is recommending to fully renovate the building correcting existing deficiencies including parking lot re-paving, sidewalk restoration, code compliance building & site issues, building envelope restoration, reconstructed cupola, New Slate roof, new finishes, doors, toilets, masonry repairs, etc. We also recommend a full removal and installation of new Mechanical, Plumbing, Fire Protection & Electrical systems throughout the 3-story facility. Further details and information can be found later in this report.

Opinion of probable Construction Costs:

To correct the existing code & construction deficiencies, SPA recommends that the Town of New Milford appropriate the following amount for the renovations/restorations to the Catherine Lillis Administrative Building:

Total 2023 Costs = $12,135,000

Aerial View of 50 East Street, New Milford, CT

SECTION II - PROCESS

The information contained in this report was gathered by S/P+A via field observations. On August 29, 2023, one Architect and 2 Engineers from SPA walked the site and the building, including all 3 floors plus the attic/cupola. These visual inspections along with photography taken as part of the site visit were invaluable and utilized as part of this study. The collected data was organized and appears in sections of this report in the form of written narratives and graphic images.

SECTION III - EXISTING CONSTRUCTION

Construction of the Catherine Lillis Administrative Building, located at 50 East Street, New Milford, CT was completed in 1931. The 3-story structure has a brick and concrete exterior with a slate shingled sloped hip roofs. A very prominent wood cupola sits centered on the building above the main entrance axis. The facility is approximately 31,000 sf total, according to Town records. The Facility served as the towns High School until a new High School was built more than 30 years later. The structure is listed on the State and National Registers of Historic Places as part of the new Milford Center Historic District. A unique element of the building is a stained-glass window on the north elevation. The window is entitled "American Literature" and depicts literary and historical figures. On the upper floor of the corridor is also a linear series of murals that depict the progress of American Civilization.

The Building Structure:

The Catherine Lillis Administrative Building is a type 3B construction which means that the exterior walls of the structure is constructed of non-combustible materials but the floor & roof structures are constructed of combustible materials. The Super structure of the facility consists of Concrete footings, foundations & concrete floor slabs on the first floor. We believe that steel columns and steel beams are utilized on the first-floor framing of the multipurpose room. The upper two floors are predominately constructed with load bearing terracotta block on the corridor walls (load bearing) with wood joists & wood substrates/flooring for the original classrooms. The roof is constructed of 2x12 wood rafters & wood decking. The exterior walls are constructed of 4" brick veneer & terracotta block backing. All existing walls are plaster, but many new walls were added (subdividing the original classrooms) which are constructed of 2x4 studs with ½" gypsum board. Tile floors & walls exist, predominately in the toilets and custodial closets. The original classrooms had 2.5" oak flooring but many of them have been covered or altered over the years with different materials including VCT, carpet, etc.

Typical floor joist construction bearing on perimeter masonry

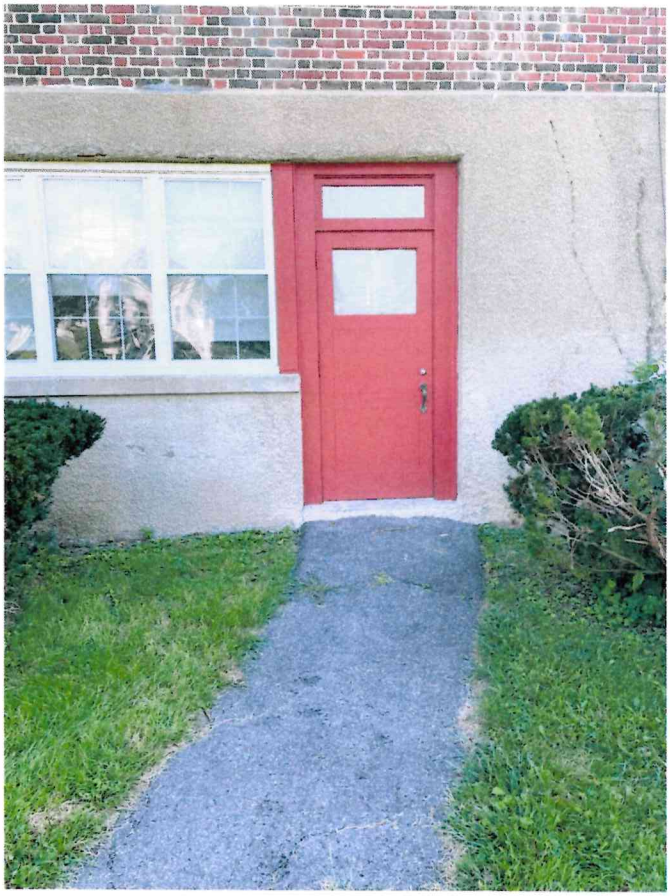
Attic roof construction – wood rafters & wood decking

SECTION IV – ARCHITECTURAL OBSERVATIONS

The Site:

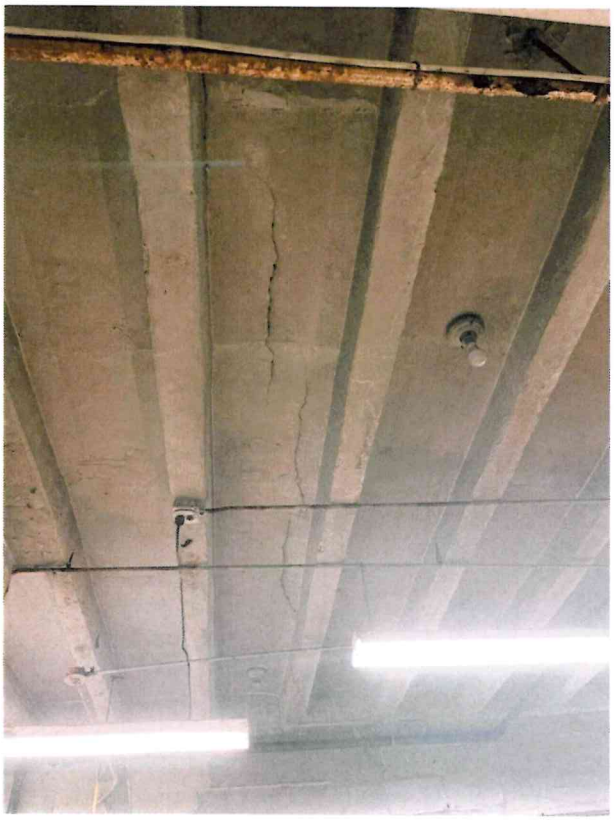
The Property located at 50 East Street is bound by East Street on West side, a restaurant (Oriental House) on the South Side, residences on the North side and woodlands on East side. The building structure is placed approximately in the middle of the parcel with a level grass lawn in the front (west side) along with a few mature trees. There are Bituminous concrete sidewalks connecting East Street with the building with secondary sidewalks that connect to the two ends of the building (north & south) along with smaller sidewalks connecting to various doors of the building. These bituminous sidewalks are all in poor condition. At the front door of the facility, there is a concrete stair with 4 risers that is in poor condition. There is also no code required handrails on this stair. On the South side of the building, there is also a 4-riser concrete stair that is equally in poor condition, with spalling concrete and exposed rebar. This stair also has no code compliant handrails. Concrete stairs with 3 risers also exist on the South-East side of the facility that are in poor condition without code complaint handrails. On the North side of the facility is also a 4-riser stair that is also in poor condition without code complaint handrails. On the North-East corner of the building, there is a concrete ramp that connects the North entry to the rear parking lot. This ramp has had recent work and is in fair condition. However, the handrail on this stair is not code compliant nor is the slope of the ramp code complaint. None of the primary entrance doors of the facility are ADA complaint due to the stair/risers at each location.

There is a bituminous concrete driveway on the North side of the property that connects East Street to the rear parking lot on the East side of the lot. This rear lot has striped parking for approximately 50 parking spaces. There is also a helicopter pad on the North-East side of the rear parking lot that serves the New Milford hospital, which is near the facility. The bituminous concrete on both this side driveway and rear lot are in poor condition.



The Building Structure:

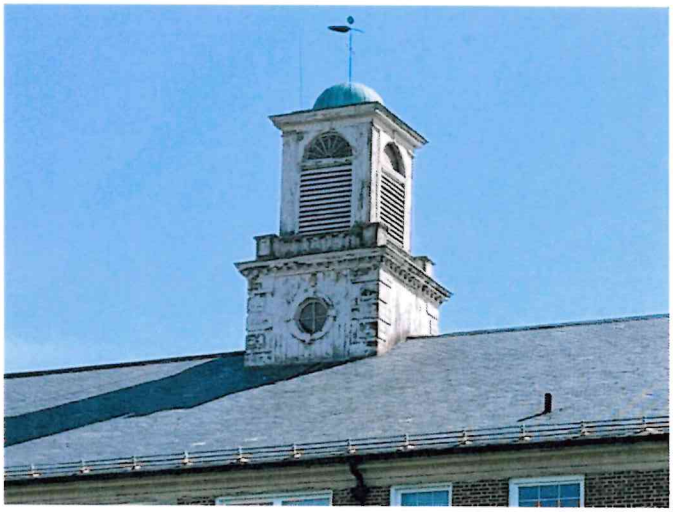
There were no signs of any significant structural deficiencies in any of the observed steel columns, terracotta load bearing interior or exterior walls, wood floor framing or wood roof framing. However, the floor over the boiler room is constructed with a one-way waffle slab. Between one of the T's showed a significant crack that would need further investigation. All other structural components appeared to be in good condition.



The Building Exterior:

The Catherine Lillis Administrative building is a 3 story Masonry building with Concrete stucco veneer on the first floor and brick veneer on the second & third floor. There are also limestone surrounds on the North, South and West entrances along with limestone quoins on the 4 corners of the building. Above the north and south entrances are large Palladian windows spanning between the second & third floor. These large windows are trimmed in white painted wood. At the roof line is a white painted wood fascia & soffit. There are also copper gutters and downspouts around the entire perimeter of the facility. The roof consists of slate shingles on a wood deck and there are snow guards on the 4 primary hip roof. Centered on the building is a large 1.5 story wood framed and wood trimmed cupola with wood windows facing all 4 directions along with a copper dome and weathervane.

Starting from the ground up, the first story veneer is predominately stucco and is in fair condition. This stucco is likely applied to the terracotta block backing that makes up the backing masonry of the facility. There were a few dozen significant cracks present in the stucco on all 4 faces of the building. The second and third floor exterior veneer is 4" brick in good condition. There are a few locations on each face of the building that show signs of settlement cracks. A small portion of the brick on all 4 faces will also need minor replacing/repointing. The limestone quoins, windowsill and entry surrounds are all in very good condition with minor repointing/repairs needed. The primary windows of the facility are vinyl double hung windows with insulated glass. These windows have many more serviceable years before replacement is needed. However, many of these windows were observed needing caulking/trim where they intersect with the existing masonry building. The North and south Palladian windows are in fair/poor condition and will need repair/components replaced and new painting. If these windows are not replaced, new glazing compound is strongly recommended. On the first floor, there are a variety of small wood windows and louvers that are in poor condition and will need to be replaced. The wood facia/soffit (at the gutter line) is in poor condition with portions showing significant rotting and will need significant repair consisting of replacement/restoration. The copper gutters and downspouts are older and are in fair/poor condition. The slate roof shingles are in poor condition on the sloped roofs and will need to be replaced soon. The large 1.5 story wood framed & sheathed cupola is in very poor condition and will likely need significant restoration/rebuilding and/or replacement. This also includes the 6-wood window, trim, copper dome and weathervane. There are a few small slate roofs on the east side of the facility that will also need replacement along with the wood fascia, soffits & copper flashings. There is also a small asphalt shingle roof on the east side of the facility that is in fair condition. 2 small flat roofs on the east side are EPDM membrane roofed and should be replaced. There is a large chain supporting canopy over the North entry stair door that appears to be in good condition. All perimeter doors are either aluminum or wood and all are in fair condition. However, they are not period correct for the facility and replacement should be considered. All perimeter wood trim needs stripping, priming and painting.



The Building Interior (code & ADA issues):

The Facility was constructed in 1931 and is a traditional school design of that era. There are 2 main stairs connecting all 3 levels on the North and South end of the facility, which are at the ends of the center, double loaded corridor, on the 2nd and 3rd floor. On floors 2 & 3, there were originally 8 classrooms per floor along with boys & girl toilet rooms and some support space. What makes this building unique is the front center door (West side of building) which brings you into the building at a mid-level between floors 1 and 2. Immediately entering the main front entrance or the two side North & South entrances, you find yourself on a mid-stair landing, with a choice of either going up a half level to the floor above, or down a half level to the floor below. In other words, none of the 3 main entrances are directly connected to floors 1, 2 or 3. This configuration is no longer code complaint and will need to be addressed via the installation of a new 4-stop elevator that would need to connect to all 3 floor levels along with the front door mid-level. The first floor of the building, which is a story down from the front door mid-level, includes a large multi-purpose room, kitchen, boiler rooms, electrical rooms, abandoned storage rooms, abandoned toilet rooms, and other miscellaneous spaces. There are over a dozen rooms on various levels throughout this floor, and most are not feasible to make ADA accessible. At the 4 corners of the first floor are 4 classrooms, which are also not ADA accessible as they are 2-4 steps down, depending on the location. These 4 classrooms will be difficult to make ADA complaint and may want to remain "non-habitable" such as storage space. Off the main mid-level landing at the front door is also a pair of stairs that connect the main level mid landing to the lower-level multi-purpose room.

The 3 primary stairs, along with numerous secondary stairs, appear to be code compliant regarding their construction & dimensions. However, the handrail & guardrails on all stairs throughout the facility will need to be replaced with ADA and building code compliant rails, due to their design, height, and rail diameter. Most of the original doors throughout the facility are in fair to poor condition and we recommend their replacement. These doors also don't have the required hardware to meet Building Code compliance and ADA compliance. Also, many of the original classroom doors are in "pockets" that are too deep to meet ADA. These pockets will need to be rebuilt for any of these doors to meet ADA.

None of the facility toilets meet ADA regarding mounting height, type of fixtures, accessibility into the toilet rooms and the toilet room doors themselves, not being wide enough or meeting the push/pull code required clearance. These toilet rooms will all need to be demolished and rebuilt with code complaint equipment & access. The existing drinking fountains on each level are also not ADA complaint and will need to be replaced with new complaint ones.

Many other ancillary spaces throughout the facility like custodial closets, storage rooms, small private toilet rooms, the stage, the boiler room, the electrical room, etc are not ADA accessible. While some of these spaces will not need to be made accessible, spaces like the custodial closets will, which will require rebuilding the room, widening the door and installing new slop sinks/equipment in order to make them code complaint.

The Building Interior (general):

As mentioned above, the first floor of the Catherine Lillis Administration building is made up of a large multi-purpose room with glazed block walls on the bottom half and painted plaster on the upper half. The ceiling is made up of plaster "coffers" over the space and a stage is located on the East wall, approximately 3'-0" higher than the multipurpose floor. The Multipurpose floor appears to the original wood gymnasium floor and is in fair condition. The stage floor, which is also made of T&G hardwood, is buckling due to water infiltration and will need to be replaced. Below the stage is the main boiler room for the facility. On the West wall of the multipurpose room are 2 symmetrical stairs that head up to the main entrance mid-level landing. There is a kitchen at the south end of the multi-purpose room with tile floors/walls with plaster ceilings. The kitchen is in very poor condition with limited equipment, partially demolished walls and in general dis-repair. There are numerous rooms to the North of the multipurpose rooms on various levels. All these rooms are in poor condition with peeling paint, missing ceilings, lighting, floors etc. There appears to be an old dumbwaiter that connected various floors of the building adjacent to the boiler room door. At the north and south ends of the building are the main stairs/entrance to the facility. These steel stringer stairs connect all 3 levels of the facility. The flooring on these stairs, like the corridors on floors 2 & 3, is terrazzo and is in very good condition except for a few minor locations that will need repair. The handrail work required is mentioned above. The walls of these stairs, like the corridor's walls on floors 2&3 is glazed block and in very good condition. The large stained-glass window on the North stairs is likely the highlight of the building and is in remarkable condition considering its age. This window is part of the Palladian window that repeats itself on the South end (minus the stained glass). Both of these windows need new glazing/restoration.

The first floor, which was originally 8 classrooms and 2 toilets, has a terrazzo floor, glazed block & plaster walls, and a plaster ceiling. The block and plaster is in good serviceable condition. There is a large mural painted on the upper part of the East Corridor wall running almost the entire length of the facility depicting American Civilization. All efforts should be exercised to maintain this historic piece of artwork. The 8 classrooms on this level have either tile or vct flooring, plaster walls & plaster ceilings. While the plaster is in good condition, the flooring in all rooms is in poor condition and should be replaced. Various secondary non-load-bearing walls have been constructed with many of the classrooms and we would recommend removing them along with the secondary doors. All other doors are mentioned above. There are built-in metal lockers in the corridor walls that appear to be in fair condition and can remain. The boys' and girls' toilets on this level are in poor condition and the tile floor, tile walls, fixtures, partitions, and accessories should be removed and replaced. The custodial closet on this level is also tiled (floor & walls) and is in poor condition requiring replacement of finishes and a new mop sink/accessory.

The second floor, which was originally 8 classrooms and 2 toilets, has a terrazzo floor, glazed block & plaster walls, and a plaster ceiling. The block and plaster is in good serviceable condition. A few locations of plaster were noted as needing repair due to water infiltration. The 8 classrooms on this level have either tile or VCT flooring, plaster walls & plaster ceilings. While the plaster is in good condition, the flooring in all rooms is in poor condition and should be replaced. Various secondary non-load-bearing walls have been constructed with many of the classrooms and we would recommend removing them along with the secondary doors. All other doors are mentioned above. There are built-in wood lockers in the corridor walls that appear to be in fair condition and can remain. The boys' and girls' toilets on this level are in poor condition and the tile floor, tile walls, fixtures, partitions, and accessories should be removed and replaced. The custodial closet on this level is also tiled (floor & walls) and is in poor condition requiring replacement of finishes and a new mop sink/accessory. A wooden ladder in the upper custodial closet gains access to the attic.

The attic is mostly a wide-open space with structural wood framing throughout. This space has been used for storage over the years and it should all be removed from the attic. In the center of the attic is another vertical wood ladder that gains access to the roof mounted cupola. This cupola is wood framed with 6 windows. Its condition is mentioned above.

SECTION V – ARCHITECTURAL RECOMMENDATIONS

Proposed Site Improvements:

- Replace all exterior Bituminous concrete sidewalks.
- Replace all exterior Bituminous concrete parking lots & driveway.
- Replace all exterior concrete stairs at N, S & W entrances.
- Install code complaint handrails at all stairs/ramps.
- Install code complaint concrete ramp/handrails on N/E side of building.

Opinion of Probable Construction cost:
$600,000

Proposed Building Exterior Improvements:

- Repair all cracks in exterior stucco veneer (first story)
- Repair all cracks in exterior brick& stone veneer.
- Repoint/replace all failed brick & joinery.
- Caulk/trim & repair all exterior vinyl double hung windows.
- Repair/replace failed components on N & S Palladian windows.
- Reglaze and reset all glass on N&S Palladian windows.
- Replace all perimeter wood windows (small windows at first floor)
- Replace all perimeter wood louvers (small louvers at first floor)
- Repair/replace perimeter wood fascia & soffit to match existing in kind.
- Replace the existing slate roof with a new slate roof.
- Replace all existing copper roof flashing, gutters & downspouts.
- Rebuilt/repair & restore existing wood cupola including lovers & 6 windows to match in kind.
- Replace existing copper dome roof (over cupola) and weathervane.
- Replace the small East side roofs with new slate roofs.
- Replace East side EPDM roof in kind.
- Strip. Prime and paint all exterior wood trim, fascia, soffits, cupola, etc.
- Replace all exterior doors with ADA complaint hardware & in keeping with historic standards.

Opinion of Probable Construction cost:
$2,462,500

Proposed Building Interior Improvements (code and ADA issues):

- Replace exterior egress doors with ADA complaint doors & hardware.
- Replace all stair railing/guard rails with ADA rails.
- Replace all toilet fixtures and accessories with ADA complaint fixtures.
- Replace all drinking fountains with ADA complaint fixtures.
- Replace all interior doors & hardware with ADA complaint doors/hardware.
- Rebuild/correct door pockets (into original classrooms) that are currently non-ADA complaint.
- Install new 4 stop elevator connecting floor 1, 2 & 3.
- Install interior lifts/ramps
- Correct all non- complaint Custodial closets/sink/hardware.

Opinion of Probable Construction Cost:
$1,932,500

Proposed Building Interior Improvements (general):

- Remove debris from abandoned rooms throughout facility (significant on the first floor)
- Replace floor finishes throughout facility on all 3 floors.
- Replace damaged hardwood floor (stage & original floors to the building)
- Install ceilings at various locations.
- Repair damaged terrazzo floors throughout facility
- Paint all plaster walls, ceiling & wood trim throughout facility.
- Replace all tile floors in toilet rooms & custodial closets.
- Replace all tile walls throughout all toilet rooms & custodial closets.
- Demolish all miscellaneous unnecessary (non-load bearing) walls/doors throughout facility (retain original walls)
- Patch & repair all damaged plaster walls & ceilings due to water infiltration.
- Remove all unused casework, sinks, counter, appliances, etc.
- Remove debris from the attic.
- Repair structural slab above boiler room

Opinion of Probable Construction Cost:
$1,335,000

SECTION VI - ENGINEERING OBSERVATION/RECOMMENDATIONS

MECHANICAL CONSIDERATIONS

General

All heating, ventilation and air conditioning systems will be new and designed in accordance with Connecticut's High Performance Building Regulation.

Existing Conditions

A central boiler plant located in the basement level mechanical room provides heating for the entire building. The existing steam boiler is an HB Smith Cast Iron sectional boiler with fuel oil Powerflame burners. The existing nameplate indicates the boiler is a 28A-10 series Smith boiler with a NET IBR Rating of 1,939,000 Btu/Hr. The boiler generates heat for the facility and distributes steam at 15 psi throughout the building. Steam is fed to equipment such as perimeter convection units, and baseboard radiation. With proper maintenance of the equipment, the life expectancy of the boiler is 30 years and the associated burner is approximately 20 years. Therefore, this equipment is beyond its life expectancy and in poor condition.

Flue gases are routed through breeching connected to a masonry chimney which terminates above the roof. The existing mechanical room does not contain provisions for combustion air for the boiler.

The piping distribution system throughout the building is original to the 1930 construction. Piping systems, with proper maintenance, can operate for 50 years. Therefore, the piping is beyond its serviceable life expectancy and should be replaced.

An existing underground fuel oil storage tank provides the fuel oil for the heating plant. Fuel oil piping is run under the rear parking lot from the tank into the building then routed through the basement level to the boiler. Oil appears to be recirculated between the tank and boiler via circulation pump. The fuel oil tank and associated underground fuel oil piping, Proteus tank monitoring system was replaced within the past 5 years.

Ventilation, or the provision for delivering fresh air to the building, has been provided predominantly via operable windows. A combination of mechanical exhaust, natural and mechanical ventilation has been provided throughout the facility as well. Before the use of mechanical ventilation, it was common practice to simply open the exterior windows. This is not a method that is currently recommended for several reasons. First, during the winter and summer months the windows are generally not opened which fails to meet the requirements of the code. Second, ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality has provisions for how far an exterior window must be from the furthermost interior wall.

Means for cooling have not been provided with the exception of one random wall mounted split system serving a former office.

Existing Temperature Control systems throughout the facility are stand alone, operated by pneumatic control and cannot be monitored or controlled through a central building management control system or internet. The systems should be considered to be beyond the end of their useful life but appear to be functioning properly and may be kept in service during the construction process. This type of control system is considered obsolete technology and replacement parts are not readily available.

Classroom areas of the original school are served by perimeter steam radiation, operable windows and two central exhaust

systems. Existing exhaust systems appear to be damaged and in poor condition. The associated exhaust fans located in the attic are non-operable, well beyond their serviceable life and should be replaced.

The Multi-purpose/Gymnasium is conditioned with heating only via steam radiators located below the windows on the eastern and western exterior walls. Ventilation is achieved naturally by transferring air from a grille located below the stage to an exterior louver. The existing ventilation means is not acceptable to the current code. The equipment is beyond its service life expectancy.

Toilet rooms and janitor closets are ventilated by independent exhaust fans. Make-up air to the spaces is provided by operable windows, transfer air louvers within doors and/or undercuts of doors. Perimeter steam radiation provides heating to these spaces.

The Kitchen area has two dedicated exhaust fans, one serving the kitchen hood and the other an abandoned dishwasher hood. There is no means of make-up air, and the space is heated via steam radiation.

Potential Proposed Systems

Heating Plant: The Central Heating Plant could potentially consist of natural gas fired high efficiency condensing boilers. Combustion air may be supplied directly to each boiler with a dedicated duct or it may be supplied to the boiler room by combustion air fans. The boilers will be vented outside either individually or into common venting. A microprocessor-based boiler controller will be provided to optimize boiler plant operation by sequencing boilers, pumps, and resetting supply water temperature based on outside air temperature. The boilers will have an automatic water treatment system. Hot water system will be piped in primary/secondary configuration. Each boiler will have a dedicated primary circulator. The secondary loop will be variable flow. Hot water distribution system will consist of either in-line centrifugal or end suction pumps to circulate hot water within the loop that serves the heating equipment and heating zones.

Automatic Temperature Controls/Energy Management System: A Direct Digital Control (DDC) type Energy Management System should be provided for the facility to meet the facilities' requirements. The system can be compatible with existing systems serving other town facilities if this is a desired feature. Compatibility with existing systems will be determined based on the owner's requirements. The controls will be based on BACnet controls.

Toilet/Janitor/Locker/Storage Room Exhaust: Each Toilet Room and Locker Room should be provided with exhaust as required by the Building Code. Energy Recovery Ventilators (ERVs) will be reviewed as an option for additional energy efficiency.

Areas such as Offices, Conference Rooms, Teacher Lounge, Corridors, etc. should be served by a new state-of-the-art Variable Refrigerant Flow (VRF) system. The VRF system provides the benefit of free energy exchange while in simultaneous heating and cooling modes and without the need for seasonal equipment changeovers. When units operating along one exposure are in cooling mode, while the others across the hall on the opposite exposure are heating, or vice versa (both common scenarios in this specific building), the refrigerant streams effectively transfer energy from one another providing "free energy exchange". Therefore, the outdoor compressors operate at lower capacities resulting in a significant portion of the system's energy consumption being negated. They provide one of the most viable retrofit options available as well and potentially have the advantage of being much less disruptive during the upgrade of a building's HVAC infrastructure, requiring only additional circuiting for the added number of terminals and routing small-diameter flexible pipe sets above the ceilings. They are also highly maintenance friendly.

The VRF system consists of multiple "fan coil units", similar to the split ductless-indoor units which have become

commonplace, and which can be configured to be mounted in a myriad of configurations, such as:

- High-wall mounted
- Low-wall (floor) mounted
- Lay-in cassettes at the ceiling level
- Ceiling mounted
- Above the ceiling (concealed) with duct connections to diffusers serving the space

The benefit to this HVAC retrofit application is that there is no addition of ductwork, duct insulation, dampers, diffusers, registers and grilles (except for the aforementioned concealed units, thus minimizing space disruption. In addition, the flexible refrigerant piping and small electrical power and control circuits serving the fan coil units is more easily run through an existing space. The refrigerant piping is run from the fan coil unit to a branch-circuit controller/junction box serving a building zone, wherein all the free-energy exchange takes place. The branch-circuit controller then connects to an outdoor condensing unit, along with other branch-circuit connections, to reject or absorb heat as required. These outdoor units could easily be placed on grade or at rooftop level as applicable.

Ventilation will still need to be addressed. Specialized energy recovery units will distribute tempered, dehumidified, outside air to the building via a duct system.

Any new Server / Data areas will be served by split-ductless systems consisting of an indoor unit with integral Direct Expansion (DX) refrigerant cooling and an outdoor condensing unit equipped with low ambient cooling capability. The outdoor condensing unit will either be mounted on the roof or at grade.

Energy Conservation Measures

Various energy conservation measures should be employed in the mechanical systems to ensure that the building runs as efficiently as possible.

The boiler plant should consist of high efficient condensing type, with modulating burners so the boilers can more precisely meet heating demand and to minimize boiler cycling. This will also aid in extending the life of the boilers.

Demand controlled ventilation is a method of ensuring adequate ventilation for building occupants, while eliminating unnecessary ventilation and reducing energy consumption. The ventilation process requires a substantial amount of energy because outside air needs to be heated or cooled to acceptable levels. Energy is conserved by controlling ventilation rates based on the actual number of occupants based, indirectly, on the use of carbon dioxide (CO_2) as an indicator of occupant load. Concentrations of CO_2 are measured by a sensor located in the space or return air duct and the outside air dampers are modulated to maintain concentrations below an established baseline. This technique can be applied throughout the building and is especially effective in high occupancy spaces that are not continuously occupied. Demand Controlled Ventilation can be easily implemented by the addition of sensors and required programming when an Energy Management System is provided.

Outside air economizers should be employed on all air handling systems with a capacity of 4 tons and greater. If there is a demand for cooling within the building and the outside air temperature is less than the inside space temperature, the cooling system will be disabled and fresh air will be brought in and used to cool the space. This will be particularly useful for areas with high occupancy such as conference and meeting rooms, classrooms, high occupancy spaces, etc., where a load is generated by a large group of people and cooling is often required when it is cool outside and other spaces may require heating.

Variable frequency drives (VFD's) will be used on air handling units and pumps to minimize electrical demand. As demand increases, the heating or cooling system calls for more water flow. The VFD's will modulate the pump to provide greater flow. At times where there is minimal load the VFD's will modulate the pumps to minimum settings to reduce the electrical load on the building.

An Energy Management System (EMS) provides a building owner with the ability to monitor, control, and adjust all HVAC (along with plumbing and electrical if desired) systems from a central location. An operator workstation consisting of a personal computer and printer can be located in the building, and this station can be accessed remotely via the internet. The owner can set occupancy schedules, adjust set points, and monitor trouble/alarm conditions in an efficient manner with this tool. Features such as night setback, holiday scheduling and weekend scheduling will be included to allow the system to minimize energy expenditure during unoccupied periods. An alarm feature will be added which can remotely notify facilities staff of any pre-determined, alarm conditions.

Incentives, Grants, and other programs may be available to offset construction costs. They may be in the form of rebates for implementing certain energy conservation measures such as high efficiency air conditioning equipment and premium efficiency motors. In addition, other incentives may be available for high efficiency systems by participating in a utility companies comprehensive design program. The incentives offered are designed to offset some or all of the additional cost for higher efficiency systems. Possible funding sources will be investigated as part of the design process.

Energy Recovery can be accomplished through a variety of technologies, and for this project, the use of energy recovery ventilators and energy recovery wheels is anticipated. These devices capture a portion of energy from the exhaust air stream and add it to the supply air stream thus reducing the amount of energy input required.

Refrigerants used in air conditioning systems will be hydrofluorocarbons having low ozone depletion and global warming potentials. Equipment will most likely use HFC-410A or HFC-134a.

Premium Efficiency Motors will be utilized wherever their application is feasible and per the latest energy codes.

Applicable Codes

The proposed upgrades require that the building be brought up to full current code standards. It is expected that the State of Connecticut will adopt the following Codes on October 1, 2020 prior to the completion of the design documents. Therefore, our project will fall under the requirements of these following codes:

- Connecticut State Building Code (CSBC) with 2020 Connecticut Supplements
- 2018 International Building Code (IBC)
- 2018 International Mechanical Code (IMC)
- 2018 International Energy Conservation Code (IECC)
- 2020 NFPA 70 National Electric Code (NEC)

Opinion of Probable Construction Cost:

@ $75.00/SF x 31,000 SF = **$ 2,325,000**


Smith

PLUMBING CONSIDERATIONS

Existing General Conditions:

The facility is provided with a 50-gallon electric water heater manufactured by AO Smith, model ENS-50-110 which serves the buildings plumbing fixtures. The heater is in fair condition.
It is recommended to remove the existing electric water heater, pump, tank, valves, etc. as they are past their serviceable life expectancy and replace them with a new code compliant system.

Remove all existing hot and cold-water piping, insulation, and hangers as they do not comply with the latest IECC values and the lead (PB) content is unknown.

Remove all existing plumbing fixtures throughout the facility including all water closets, classroom sinks, urinals, lavatories, shower, mop sinks, and all kitchen fixtures as they are in poor condition. Provide new fixtures per the new architectural program. Provide new hot water, cold water, sanitary and vent services to new fixtures as indicated in the new architectural layout.

Potential Proposed Systems

Domestic water:

Scope: Provide a full-size reduced pressure backflow preventer to be incorporated on the building's water service. Domestic hot and cold-water distribution to plumbing fixtures and other points of connection as required by the program.

Freeze-proof exterior hydrants will be located around the building.

Water piped to plumbing fixtures, drinking fountains, lawn hydrants, and sinks. Hot water piped to plumbing fixtures and sinks.

Design Criteria: Pipe sizing in accordance with the International Plumbing Code based upon friction loss charts with a maximum of 6 feet per second velocity.

Domestic Hot Water Generation

Hot Water

To allow for redundancy and serviceability, provide high efficient, condensing gas fired water heaters, modulating burners shall have 95% efficiency rating. Finalized size and capacity of the water heating plant will be refined as the design progresses.

Store domestic hot water at 140°F to reduce the growth of legionella. To eliminate potential scald hazards, provide a properly sized thermostatic mixing valve to deliver the required temperature per the following criteria:

- Master Mixer, all water heaters require external temperature controls via ASSE 1017 Thermostatic mixing valve to reduce hot water from 140°F to 120°F.
- Hand washing lavatories (bathroom groups) require Tempered water via ASSE 1070 Thermostatic mixing valve to provide 105°F – 110°F water.
- Emergency Fixtures (eye wash & showers) require Tepid water via ASSE 1071 Thermostatic mixing valve to provide 70°F - 90°F water.

Provide all required, piping, fittings, hangers etc. and all system components shall be lead free. Provide di-electric fittings on all piping components of dissimilar material to avoid galvanic corrosion. Properly ground all electrical equipment where it interfaces with the plumbing system (i.e. pumps, controls, water heater, etc.). To avoid condensation of water piping, insulate all systems accordingly.

Provide new category IV compliant CPVC intake & exhaust piping with vertical concentric vent termination kit routed thru the existing chimney. *(Note: existing chimney system not rated Category IV applications.)*

Instantaneous Electric:

Water heaters serving bathroom group lavatories should be thermostatically controlled electric instantaneous point of use with integrated ASSE 1070 mixing valve. Provide one unit per three lavatories, rated at 55°F temperature rise @ 1 gpm . Equipment shall conform to all applicable A.S.M.E. Standards and approved by the National Sanitation Foundation, and in compliance with ASHRAE 90 (latest edition).

Tank Type Electric:

Water heaters serving janitor closet mop sinks shall be electric tank type with 20-gallon storage capacity. Heater shall be listed by Underwriters Laboratories and meets the thermal efficiency and standby loss requirements of the U.S. Department of Energy and current edition of ASHRAE/IESNA 90.1. Heater shall have 150 psi working pressure and be equipped with extruded high-density anode rod. CSA Certified and ASME rated T&P Relief valve is factory-installed. Each element shall be controlled by an individually mounted thermostat and high-temperature cutoff switch. The outer jacket shall be a baked enamel finish and provided with a full-size control compartment for performance of service and maintenance through a hinged front panel and shall enclose the tank with foam insulation.

Building Sanitary Drainage

The condition of underslab building sanitary piping mains will need to be further evaluated. It is likely that original mains are viable and can be retained, but if there are any issues discovered upon inspection, the underslab piping shall require replacement.

All new below-slab sanitary drainage shall be cast iron service weight hub and spigot pipe and fittings. Transition couplings and no-hub pipe shall not be installed below slab or in any buried conditions in contact with earth. Use of PVC schedule 40 solid wall pipe and PVC DWV fitting system is to be considered because of the anticipated construction cost savings. Alternates are subject to owner approval prior to substitution.

All above ground sanitary drainage should be cast iron service weight no-hub pipe and fittings. Piping 4" and smaller shall be 4-band super duty "Husky SD4000" clamps. All piping in plenum installations shall be UL listed for this application. Use of PVC schedule 40 solid wall pipe and PVC DWV fitting system with insulation (within sound sensitive areas "Soundfab" shall be provided) is to be considered because of the anticipated construction cost savings. Alternates are subject to owner

approval prior to substitution.

Cleanouts shall be located at minimum intervals of 50 feet for piping 4" and smaller and 100 feet for piping 6" and larger. Cleanouts shall be located at the base of each waste or soil stack. Cleanouts shall be installed at each change of direction greater than 45 degrees.

Gravity discharge to the building sewer is not possible in the lower level for mechanical room floor drains, therefore an ejector pump system will be provided. This system will include all controls, valves, and force main piping as required to provide necessary drainage connected back to the building gravity sewer main. System shall be fully vented and with vent termination to atmosphere.

Building Storm Drainage

The condition of underslab building storm piping mains will need to be further evaluated. It is likely that original mains are viable and can be retained, but if there are any issues discovered upon inspection, the underslab piping shall require replacement. Storm piping above slab is expected to remain and be reused.

New roof drainage, including secondary drainage on flat rooves where required, shall be provided. All secondary or overflow drainage shall discharge to grade per code. All interior storm drainage piping, including drain bodies, are to be insulated.

Any new below slab storm drainage shall be cast iron service weight hub and spigot pipe and fittings. Transition couplings and no-hub pipe shall not be installed below slab or in any buried conditions in contact with earth. Use of PVC schedule 40 solid wall pipe and PVC DWV fitting system is to be considered because of the anticipated construction cost savings. Alternates are subject to owner approval prior to substitution.

The HVAC system shall incorporate a plenum ceiling return system. All piping in the return air ceiling plenums shall be UL listed for this application and will comply with ASTM E84 with flame spread index of 25 or less, and smoke developed index of 50 or less.

Any new above ground storm drainage shall be cast iron service weight no-hub pipe and fittings. Piping 4" and smaller shall be 4-band super duty "Husky SD4000" clamps. Piping 6" and larger shall be 6-band super duty "Husky SD4000" clamps. All piping in plenum installations shall be UL listed for this application. Use of PVC schedule 40 solid wall pipe and PVC DWV fitting system with insulation (within sound sensitive areas "Soundfab" shall be provided) is to be considered because of the anticipated construction cost savings. Alternates are subject to owner approval prior to substitution.

Cleanouts shall be located at minimum intervals of 50 feet for piping 4" and smaller and 100 feet for piping 6" and larger. Cleanouts shall be located at the base of each stack. Cleanouts shall be installed at each change of direction greater than 45 degrees.

Fixtures

New low flow fixtures shall be provided, waterclosets shall have 1.6 gallon per flush (gpf), Urinals at .125 gpf, and hand washing lavatories at 0.5 gallons per minute.

Water closets, urinals and lavatories will be fabricated of vitreous china. Water closets and urinals will be wall-hung with floor-mounted carriers, and will utilize manual flush valves. Lavatories will also be wall-hung with floor-mounted carriers,

and will utilize dual handle faucets.

Bi-level water coolers with bottle fillers will be distributed throughout the building.

Plumbing fixtures are to be ADA compliant and installed as such as required. All heights and mounting distances shall be coordinated with architect.

All newly renovated public hand washing lavatories shall meet the International Energy Conservation Code requirements for Efficient Heated Water Supply Piping by incorporating a hot water recirculation loop routed within two feet of each fixture. Self-actuating thermostatic balancing valves shall be incorporated to control flow rates to each circuit.

Pipe Insulation

Insulation shall be Plenum rated and applied to hot & cold water, interior roof drainage piping and condensate lines. Interior, above ground piping insulation shall be mineral fiber with an all service jacket and self-sealing lap. Interior, above ground pipe fitting insulation shall be molded, pre-formed mineral fiber with a PVC jacket.

Hangers and Supports

All pipe hangers and supports shall be hot dipped galvanized. Threaded rod (min 3/8" diameter) and hardware shall be stainless steel. All fasteners into concrete shall be mechanical wedge type anchors, the use of powder actuated, or gas fastening is not allowed. All hangers and supports shall be capable of screw adjustment after piping is erected. Hangers in contact with copper or brass shall be dielectric, compatible with copper and brass alloy or provided with felt sleeve.

Contractor is responsible to provide additional supports for piping and equipment when deck is not capable of support.

New Natural Gas Fuel Service

Currently natural gas is not on site based on available information. Further development and coordination of programming with the Gas company is required to determine that the proposed natural gas service can be provided.

Confirm if Natural Gas supply of sufficient pressure is available in the street at the project address to serve the facilities loads, which are expected to include Domestic Water Heater, space-heating Boilers, and other HVAC equipment.

Routing and installation of new service piping through public areas and roads shall be performed by the Gas Company. A determination shall be made by the Gas Company regarding approved location of: the new gas meter assembly, requirements for potential easements, proposed routing on customer's property between the new service tap (at the property line) and new gas meter assembly, associated costs, etc. Coordinate requirements with other site utilities and existing services.

Contractor shall provide and install a new fuel gas system piped within the building connected to a new gas meter assembly which will serve domestic water heating and HVAC equipment. Install piping and equipment in accordance with Southern Connecticut Gas utility requirements, International and State of Connecticut Fuel Gas Code and NFPA 54.

Provide UL listed Gas service valves, for fuel gas service, including Exterior Emergency gas shut-off valve equipped with

sign: "EMERGENCY GAS SHUT-OFF VALVE". Gas pressure regulating valves to be pilot controlled, and actuated.

Propane (alternate):

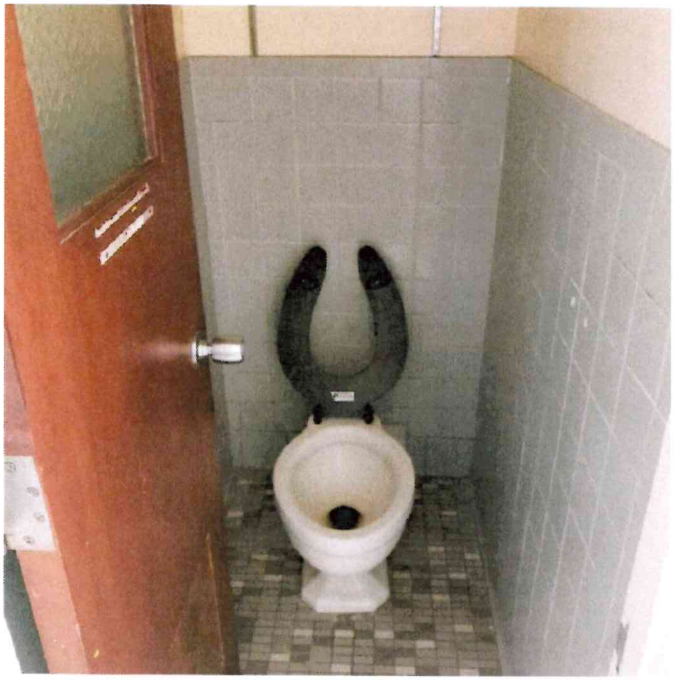
Propane serves some fossil fuel-fired equipment.

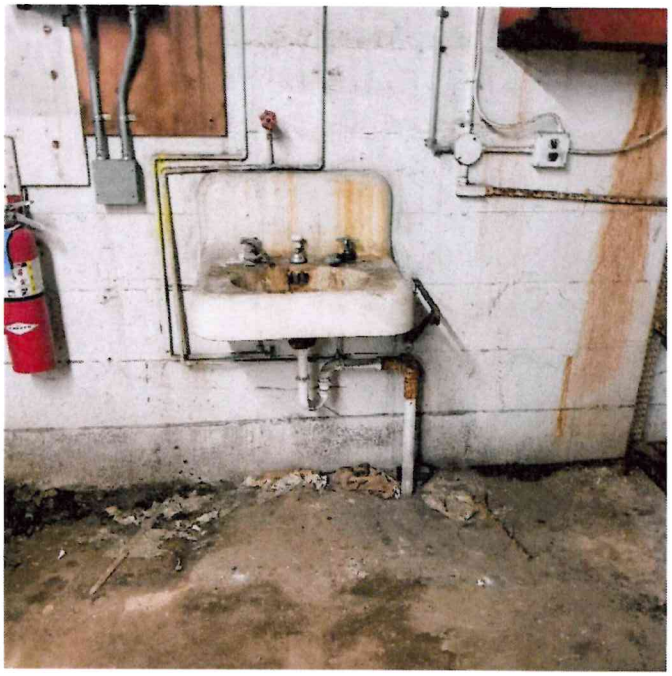
For liquid propane fuel supply, an above- or below-ground liquid propane tank is required, located with code-required clearances from possible future building lines, buildings, fresh air intakes, and sources of ignition. Tank storage pressure will be regulated building supply pressure of 14" w.c. to 2 psi. Appliance regulators will be installed at each propane-fired item to regulate pressure further to the middle of the item's inlet supply pressure range.

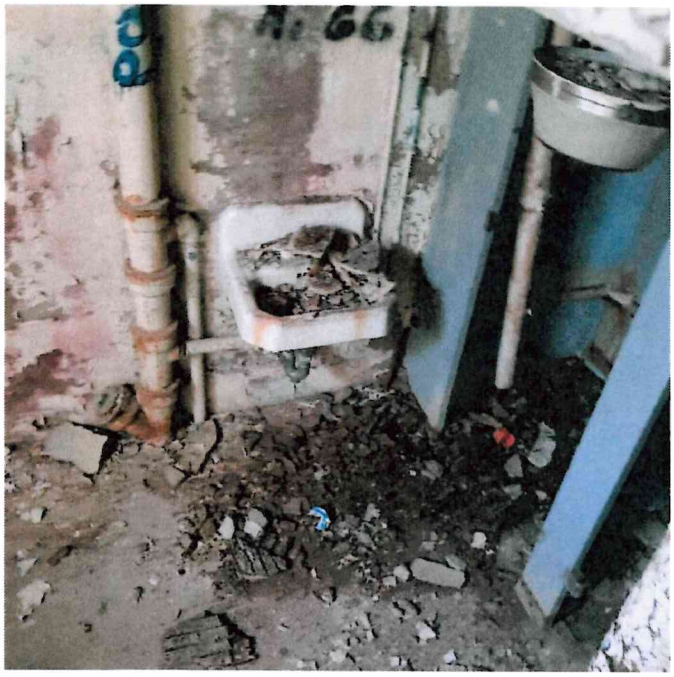
Propane piping underground shall be CSA-Listed polyethylene (PE) with metallic tracer wire installed atop the pipe. Propane above grade and inside the building shall be ASTM A53 Schedule 40 black steel with threaded fittings. Metallic pipe exposed to weather shall be painted for corrosion protection.

Opinion of Probable Construction Cost:

@ $32.26/SF x 31,000 SF = **$ 1,000,000**







FIRE PROTECTION CONSIDERATIONS:

General

The existing building is not sprinkled. The entire building will likely need to be sprinklered as part of this project. All materials and system components and their installation shall comply with the State Building Code with 2020 Connecticut Supplements, The State of Connecticut Fire Prevention Code (including the 2018 Amendments), all referenced standards and the Owner's insurance carrier. Presently, NFPA 13 – 2015 is referenced by the State Building and State Fire Prevention Codes.

Construction phasing has yet to be determined and may affect the schematic design and cost estimate accordingly.

Existing Conditions

The building is currently not sprinkled.

Potential Proposed Systems

Fire Service

The new sprinkler system shall cover the entire 31,000 s.f. facility. Specific installation requirements will be coordinated with local water authority requirements and the contractor will provide hydraulic calculations based on the results of a flow test involving local site fire hydrants. A fire pump should not be required, because sufficient pressure exists in the water utility's system to supply the hydraulic requirements of the building fire suppression systems, but a flow test will need to be performed to verify this at a later date.

If there exists any small, isolated areas subject to freezing which are adjacent to heated areas, they shall be protected by dry sprinkler assemblies fed from wet systems in adjacent heated areas. The attic, however, will likely be protected with a dry sprinkler assembly due to limited insulation currently in the attic.

Sprinkler Systems

A new distribution system shall be provided throughout the existing facility. Concealed pendent sprinkler heads shall be provided in areas with finished ceilings and exposed upright sprinklers shall be provided in unfinished areas. The color/finish of all exposed sprinkler piping, heads, and appurtenances shall be coordinated with the Interior Designer and piping shall be routed in order to minimize exposed piping. Routing shall be coordinated with all disciplines prior to installation. Areas subject to mechanical damage such as mechanical rooms and the gymnasium shall have sprinkler head guards. All sprinkler heads shall be the quick response type.

The need to provide protection below or within canopies and overhangs will be reviewed with the fire marshal and will be based on the type of construction that is selected.

Additional drain valves, including galvanized pipe and fittings as necessary to completely drain the system to the exterior shall be provided. Inspector's Test Stations per NFPA shall be provided as necessary.

Design Criteria

Compliance with State and Local Codes, Owner's insurance carrier, and NFPA Standards will be required. Systems to be hydraulically calculated based upon the following information as required by NFPA 13.

- General Areas: Wet Pipe, Light Hazard

  Density - 0.10 GPM/SF over the most remote 1,500 SF area with 100 GPM added for hose streams. Sprinkler heads rated at 165° spaced at 225 SF per head (maximum with smooth ceiling) with protection of all combustible concealed spaces.

- Mechanical & Electrical Equipment Rooms: Ordinary Hazard Group 1

  Density - 0.15 GPM/SF over the most remote 1,500 SF area with 250 GPM added for hose streams. Sprinkler heads rated at 165° spaced at 130 SF per head (maximum).

- Storage Rooms, Stage, Janitor's Closets: Ordinary Hazard Group 2

  Density - 0.20 GPM/SF over the most remote 1,500 SF area with 250 GPM added for hose streams. Sprinkler heads rated at 165° spaced at 100 - 130 SF per head (maximum). Storage shall not exceed ten feet in height.

- Building fire protection water supply requirement shall be whichever of the following building demands is greater:

  - Most stringent standpipe system demand
  - Most stringent sprinkler system demand with accompanying inside/outside hose allowances.

Piping Materials

Exterior Piping

Piping shall be equal to U.S. Pipe and Foundry ductile iron class 52 (ANSI) A21.51 (AWWA C151) with push-on rubber gasketed joints and rodding as required. Fittings shall be ductile iron class 250 (ANSI) A21.10 and A21.11 mechanical joint type. Contractor shall use a combination of mechanical joint retainer glands, thrust blocks, tie-rods and pipe clamps, at each fitting. The type of pipe, soil conditions and available space shall determine the proper anchoring method. All ductile iron pipe and fittings shall be cement lined on interior in accordance with ANSI A 21.4 and AWWA C104 and coated on exterior, along with rods and clamps, with coal tar enamel.

Interior Piping

Wet Pipe System

Schedule 40 black steel pipe and threaded fittings. For use with 2" and smaller.

Schedule 10 black steel pipe and roll-grooved fittings. For use with pipe 2-1/2" and larger.

Valves

Sprinkler Room Piping

All piping shall be in accordance with NFPA 13. OS&Y, ball, butterfly and check valves shall be 175 PSI flanged valves. OS&Y and butterfly valves shall be equipped with tamper switches.

Wet Pipe System

2" and Smaller: OS&Y, butterfly, check and ball valves shall be threaded 175 PSI valves with unions installed for serviceability.

2-1/2" and Larger: OS&Y, butterfly, check and ball valves shall be grooved 175 PSI valves.

Hangers and Supports

All pipe hangers and supports shall be hot dipped galvanized. Threaded rod (min 3/8" diameter) and hardware shall be stainless steel. All fasteners into concrete shall be mechanical wedge type anchors, the use of powder actuated, or gas fastening is not allowed. All hangers and supports shall be capable of screw adjustment after piping is erected. Hangers in contact with copper or brass shall be dielectric, compatible with copper and brass alloy or provided with felt sleeve.

Equipment

Sprinkler Heads

UL listed and/or FM approved automatic type, of proper temperature range, with installation meeting the conditions of listing and approval. Deflectors shall be marked to indicate proper installation position.

Upright and sidewall sprinkler heads in service areas, and areas not exposed to public view shall be bronze with glass bulb.

Upright and sidewall sprinkler heads in areas exposed to public view shall be bright chrome plated bronze with glass bulb.

Concealed sprinkler heads will be bronze with a frangible glass bulb and the ceiling plate will match the ceiling color.

Head guards are required for heads in areas subject to mechanical damage, such as mechanical rooms, gymnasiums, etc.

Spare sprinkler heads will be provided for each type/rating and at least one sprinkler head wrench with suitable openings will be provided. A minimum of (1) sprinkler head for every 100 of each type will be provided and will be stored in a baked enameled steel cabinet with adequate size to contain spare heads and wrenches. The cabinet will be located in the Water Service Room.

Opinion of Probable Construction Cost:

@ $20.00/SF x 31,000 SF = **$ 620,000**

ELECTRICAL CONSIDERATIONS

Existing Conditions

The building is powered by a 400 amp, 120/208 volt, 3-phase service fed from a pole on East Street. The service runs underground to an exterior 400 amp main circuit breaker and in-line utility meter on the south side of the building. These materials appear to have been recently installed and are in excellent condition. New service conductors run from the meter to a 400 amp fused main disconnect switch within the building. This switch, and the main distribution panel next to it, are well past the end of their useful life and do not have code-compliant clearance in front of them. Sub-panels are located in several locations throughout the building. These vary in condition from fair to obsolete. Several pieces of equipment are no longer serviceable and some instances of old "cloth insulation" wiring were witnessed which can be a safety concern. Electrical devices are located in reasonable quantity throughout the building but these are likely not fully compatible with a future intended use. Some of the previously mentioned cloth insulation may also be applicable to branch circuit wiring serving these devices. The facility does not have a generator or other means of temporary backup power.

Corridor lighting in many areas was recently upgraded to modern LED fixtures which are suitable for continued use, even if relocated. The balance of the lights in the facility are of aged construction. Most have been retrofit with LED lamps but any reuse of the space, especially if it requires relocation of the existing lights, should allow for full replacement of the interior lighting. Several new LED exterior lights are provided. Similar to the recent interior LED fixtures, these could be considered for continued use. Branch circuit wiring to the lights is of an aged state similar to device wiring and should be considered for replacement. Lighting controls within the facility are mostly manual and in poor condition. Replacement with new devices is recommended and can incorporate dimming, occupancy sensing and daylight harvesting for energy savings.

Emergency lighting is provided with twin-head battery units which are limited in number and fair to poor in condition. Some egress paths appear to be lacking emergency lighting completely. Many exit signs are non-illuminated type and not in conformance with current code requirements. Full replacement of this life safety equipment is recommended.

The building has a Fire-Lite zoned fire alarm system. The main panel is a style that is no longer supported by the manufacturer, making replacement parts difficult to obtain. Smoke detectors are past their expected functional life. Notification devices are not ADA compliant and are provided in insufficient quantity to fully cover the facility. Full replacement of the fire alarm system should be considered.

Low-voltage systems including data network, Wi-Fi, telephone and security are sparsely located throughout the facility. These systems are obsolete and almost certainly not useful to any future building use.

Potential Proposed Systems

Electrical Distribution: While the incoming 400 amp service is in good condition, it will be of insufficient size if the building is provided with air conditioning throughout. We project that a 1000 amp, 208-volt, 3-phase service will be necessary. This will drive the need for a pad-mounted utility transformer and new main electrical room. New electrical sub-panels should be provided throughout the facility in a quantity consistent with the needs of the new space use. All associated wiring should be new. Installation of this new distribution system will provide the opportunity for installation of a generator or at least a transfer switch to allow for east connection of a generator in the future. Electrical devices for convenience power, mechanical equipment and building loads should all be new to coordinate with the new use of the space. All associated wiring should be new.

Lighting: Existing LED corridor lights and some LED exterior lights can be retained for reuse – even if they are taken down for relocation to other areas. All other lighting should be replaced with new LED products of styles suiting the new architectural finishes and uses of the space. Lighting controls in compliance with the current Energy Code should be installed. All exterior lighting should be full cutoff style and located to suit any site modifications.

Emergency Lighting and Exit Signs: New emergency lighting can be easily provided in conjunction with the proposed lighting replacement. Small inverter systems can be provided to power a portion of the normal lights during an outage. This can include code-mandated exterior lighting. Exit signs shall be internally illuminated and provided with battery backup power. These shall be located in accordance with current Building Code requirements and include appropriate ADA symbols to mark the accessible route.

A complete new addressable fire alarm system should be provided, including all associated wiring. The exact needs of this system will vary based on the future use of the space and the installation of a fire protection system. Use of a voice system should be considered as it would be required for some likely space uses.

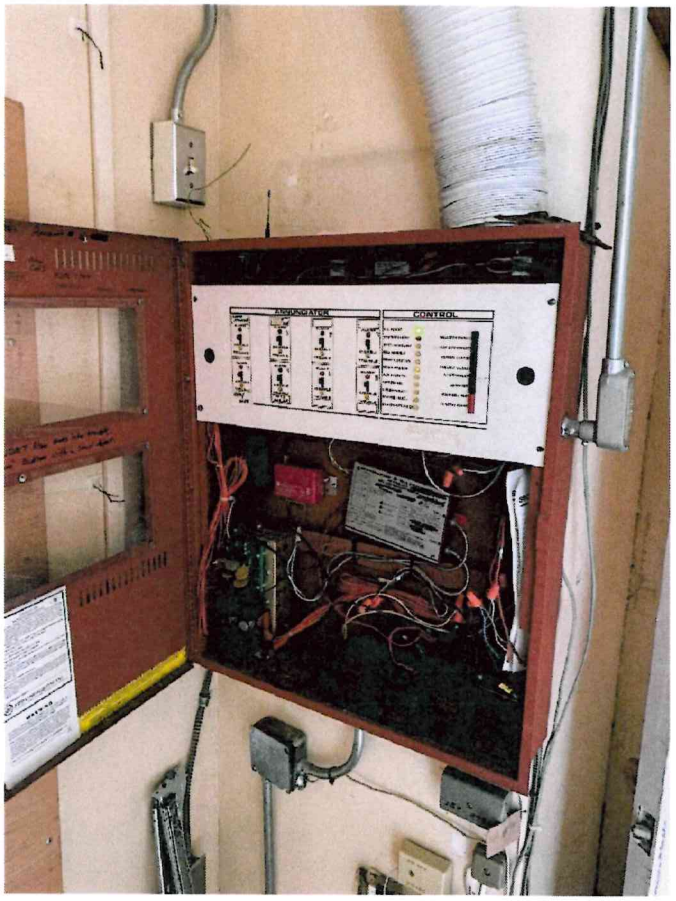
All new data network, Wi-Fi, telephone and security systems should be provided. The exact needs of such systems can be coordinated with the proposed use of the facility and may need to be separated if multiple organizations (or tenants) are intended to occupy the space. Security system scope can vary significantly in scope based on the occupants needs and can include access control, intrusion detection, communication and video surveillance.

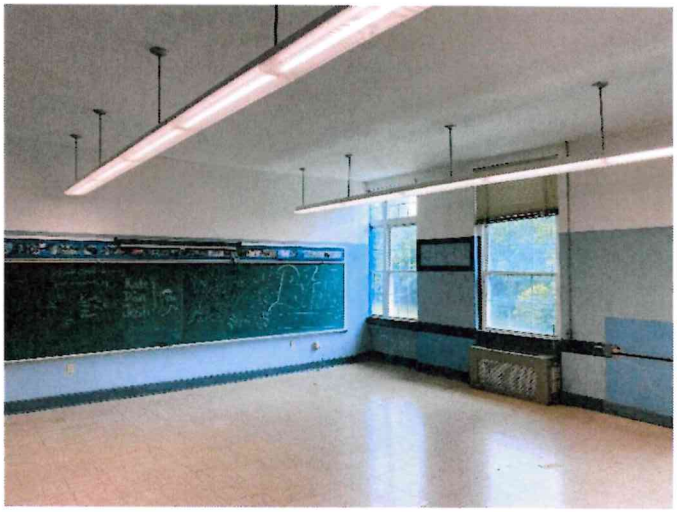
Energy Conservation Measures

New lighting fixtures and controls will provide a significant energy savings for utilization of the facility and may be eligible for a small Utility incentive. The installation of a rooftop solar photovoltaic (PV) system in the south and west facing roofs could be considered in conjunction with a roof replacement. Installation of electric vehicle charging stations will likely be mandated by current zoning regulations if the future parking capacity exceeds 30 spaces.

Opinion of Probable Construction Cost:

@ $60.00/SF x 31,000 SF = **$ 1,860,000**





SECTION VII - OPINION OF PROBABLE CONSTRUCTION/RENOVATIONS COSTS:

Proposed Site Improvements:	**$600,000**
Proposed Architectural Improvements (exterior):	**$2,462,500**
Proposed Architectural Improvements (interior code compliance):	**$1,932,500**
Proposed Architectural Improvements (interior general):	**$1,335,000**
Proposed Mechanical Improvements:	**$2,325,000**
Proposed Plumbing Improvements:	**$1,000,000**
Proposed Fire Protection Improvements:	**$620,000**
Proposed Electrical Improvements:	**$1,860,000**
Total Facility Improvements:	**$12,135,000**

These final costs exclude the following:

Environmental cleanup costs
Architecture and Engineering costs
CM or owner's representatives
Offsite improvements.
Specific costs associated with potential future building uses.

SECTION VIII - ESCALATION

Silver Petrucelli & Associates was not told when this project is projected to be constructed. Since our opinion of probable construction costs is based on Construction rates for the year 2023/2024, below is an escalation schedule based on 5% increase per year, which has been the average annual construction increase percentage in Connecticut in recent years. Escalation is due to labor and material increases year after year.

	2023	2024	2025	2026	2027	2028
Projected Costs	$12,135,000	$12,741,750	$13,378,837	$14,047,778	$14,750,166	$15,487,674