Town of Bolton
Notch Road Municipal Center
104 Notch Road, Bolton, Connecticut

BVH Project No. 21-18-009

Existing Facility Study
Building Systems Review

August 27, 2018

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1. PROJECT SUMMARY

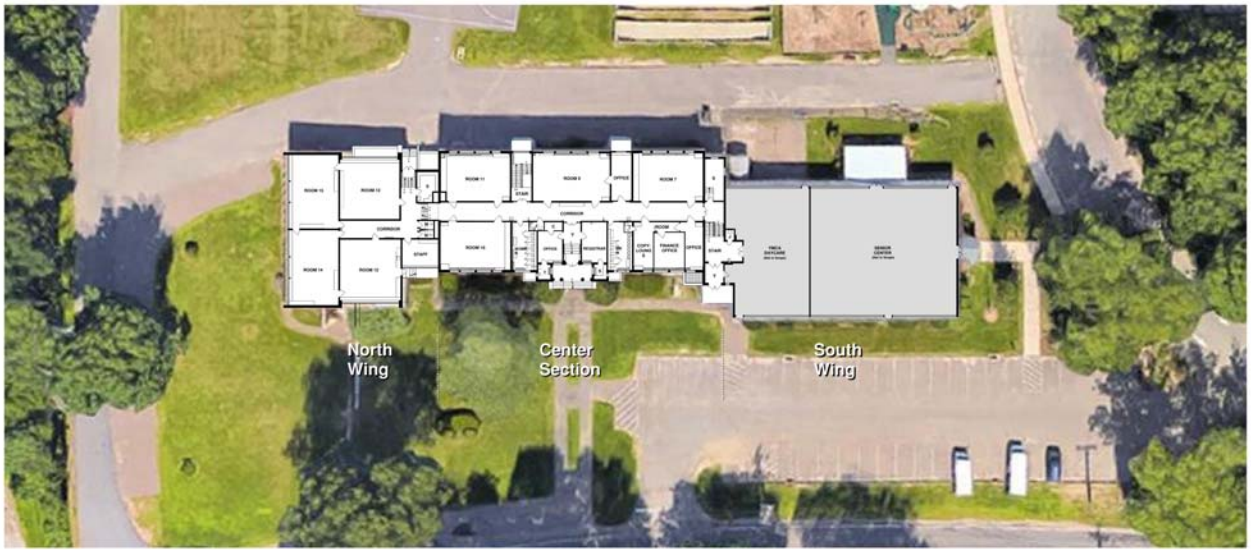
OVERVIEW

The Notch Road Municipal Center (NRMC) is a former school building that ceased being a school in the mid 1990's when an addition to the Bolton Center School was completed. Since that time, the Town has leased out various areas of the building and has utilized areas throughout the building for municipal purposes including renovation of four (4) classrooms in the South Wing for a Senior Center. In 1999, it was evident that the current Town Hall space was no longer adequate. As a result, space was secured at the NRMC for the Finance Department, three (3) meeting rooms, recreation program space, Registrar of Voters, and storage space (equivalent to two classrooms). The Town is considering consolidation of all municipal offices at the NRMC. The first step is a structural review of the NRMC to determine the renovation feasibility of the building as a Town Hall.

The center section of the NRMC was built in 1949 with additions added to the south and north in 1953 and 1956. The additions are offset a half level from the center section. The South Wing which includes the Senior Center, is not included as part of this structural review.

Limited renovation work has been completed in the central section and North Wing of the NRMC since the mid 1990's. The boiler system has been replaced and is currently being converted to natural gas.

SITE & FLOOR PLANS



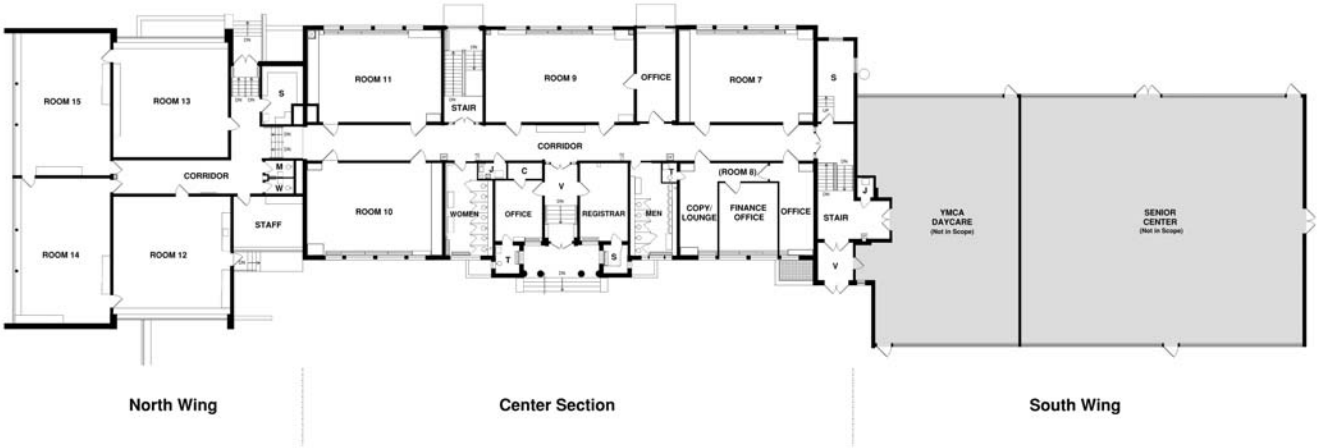
SITE PLAN
Scale 1/16" = 1'-0"

NOTCH ROAD MUNICIPAL CENTER
104 Notch Road, Bolton, CT

LOWER LEVEL FLOOR PLAN
Scale 1/8" = 1'-0"

NOTCH ROAD MUNICIPAL CENTER

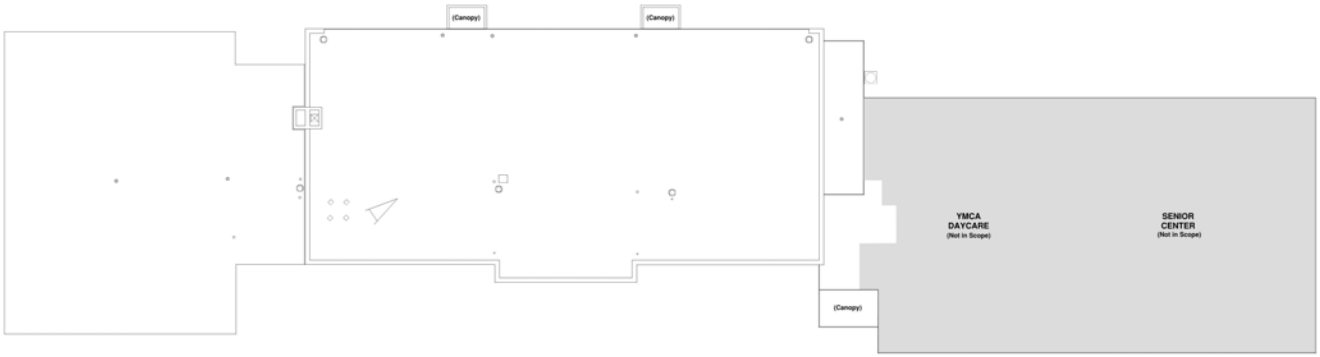
104 Notch Road, Bolton, CT



UPPER LEVEL FLOOR PLAN
Scale 1/8" = 1'-0"

NOTCH ROAD MUNICIPAL CENTER

104 Notch Road, Bolton, CT



ROOF PLAN
Scale 1/8" = 1'-0"

NOTCH ROAD MUNICIPAL CENTER
104 Notch Road, Bolton, CT

2. ARCHITECTURAL

BUILDING CODE ANALYSIS

a. Applicable Codes

Any proposed building systems would be designed in accordance with standard engineering practice, FM Global or other insurer requirements, and current building code requirements including, but not limited to the following with all amendments:

2016 Connecticut State Building Codes [1], [2]

- 2012 International Existing Building Code, with Connecticut amendments.
  - As a change of occupancy would be required, it would likely need to be permitted under the existing building code
  - The project would not be a threshold building, as defined
- 2012 International Building Code, with Connecticut amendments.
- 2012 International Plumbing Code with Connecticut amendments
- 2012 International Mechanical Code with Connecticut amendments
- 2012 International Energy Conservation Code with Connecticut amendments
- 2014 National Electrical Code with Connecticut amendments
- 2009 ANSI A117.1 Accessible & Usable Buildings & Facilities with CT amendments
- 2016 Connecticut State Fire Safety Code
- 2015 Connecticut State Fire Prevention Code with errata sheet
- 2010 Americans with Disabilities Act Standards for Accessible Design (ADASAD)
- Occupational Safety and Health Administration
- Other codes and standards as referenced by the above codes.

Footnotes

[1] The new 2018 Connecticut State Building Code is currently expected to be adopted in the fall of 2018.

[2] This building would not be considered a threshold building as defined by Code.

b. Occupancy Classification

The building is assumed to retain its original occupancy classification Education Use (E). A renovation to alter the building's use to Town Offices will required; also a change of occupancy to either all Business (B) or Mixed Use (E+B) due to the adjacent YMCA daycare; and also Assembly A-3 for the Senior Center. A

change of occupancy will trigger more stringent requirements to be followed than if no change were required, such as compliance with accessibility requirements and area and height limitations as for new construction. It is also understood from conversations with the Town that the existing Assembly (A) occupancy in the lower level of the North Wing will not be retained.

Based on our preliminary review, the South Wing (A-3, Senior Center and E, YMCA) might be able to function as a separated use building from the remaining Center and North Sections, which could eliminate the mixed occupancy classification and also reduce the overall height and building area requirements. If the stair at the south end of the Center Section, currently used as the entrance to the YMCA daycare space, can be assumed to constitute a 2-hour fire wall, then the building use separation can be assumed. This would need to be reviewed with, and confirmed by the local Code Official.

c. Building Areas

Center Section & North Wing

1. Lower Level - 12,500 gsf @ 100 persons/sf = 125 occupants
2. Upper Level - 12,500 gsf @ 100 persons/sf = 125 occupants

250 total occupants

Note: the building area, height, and story limitations would likely be met given the construction classifications identified in the next section.

YMCA Daycare - 2,300 GSF
Senior Center - 4,300 GSF

d. Construction Classification

Existing is unknown. Given the assumed change to B, Business Occupancy, the building complex could potentially be designated as Type 5-A, Unprotected, or Type III-B, Unprotected.

1. The Senior Center was designated as Construction Type 5-A in the 1998 Construction Documents.
2. Given similar construction, it is presumed that the Daycare Center can also be designated as Construction Type 5-A.

e. Sprinklers

There are currently no sprinklers in the building complex.

f. Means of Egress Issues

A final layout for the future design of the interior layout would determine the extent of the means of egress issues, but a number of core egress elements are problematic. One example is a low height condition at the corridor connecting the Center Section and North Wing that would require significant structural modification. Another example is the need to add another egress point in the North Wing on the west side toward the street, which would also require a ramp on the exterior.

g. Lot Description

This is a municipal lot. The boundary dimensions were not determined, but are generous and not anticipated to be an issue relative to both lot coverage and open frontage requirements.

ACCESSIBILITY

a. Applicable Standards

The 2016 Connecticut Building Code and 2009 ANSI A117.1 Accessible & Usable Buildings & Facilities apply. ADA Standards for Accessible Design would also treat the facility as commercial with all areas being employee work areas and therefore required to be accessible.

b. Accessibility Issues to be Addressed

The main public entrance as well as 60% of all public entrances would be required to be accessible. Currently, no entrances are accessible.

Within the main entrance, there are stairs to the main upper level; therefore, an elevator would need to be installed to provide access from the level at the entrance door. In addition, the elevator would need to provide access to the lower level work space for employees, even if it is not a general public area.

Within the building, the Center Section and North Wing are at different levels connected by stair in the corridor. Ramps, if feasible, and/or additional elevators will be needed to meet current accessibility requirements.

All toilet rooms will be required to be accessible and all existing toilet rooms will need to be enlarged and upgraded to meet current standards.

Sprinklers may be required to be added to the building complex (Center, North, and South.

a. If the wall between the Central and South Sections meets the requirements of an existing 2-hour fire wall, then the South Section can be considered independent of the North/Central Sections, and sprinklers within the South Section or North/Central Sections would not be required.

   1) Area of refuge at each stair and stair level would need to be added within the North/Central Section.

   2) Area or refuge within the South Section would not be required since horizontal exits can take the place of AORs.

b. If the existing wall between the Central and South Sections cannot be classified as an existing 2-hour firewall, sprinklers are required throughout the building complex (North, Central, and South Sections).

   1) Area of refuge would not be required if sprinklers provided throughout the complex.

In general, doors, door hardware, drinking fountains, signage, parking spaces, curb cuts, access from public way to the building, and numerous other building and site elements would all need to be upgraded to meet current standards.

The accessibility issues noted above present on the lower level of the North and Central Sections, including the low clearance of the existing piping within the corridor, will need to be addressed. Restricting the lower level to employee access only would still require the accessibility issues to be addressed.

ESSENTIAL FACILITY

a. Essential Facility

Based on the anticipated Town's building program, this facility or a portion of the facility will need to be designated as an Occupant Category IV Essential Facility. An essential facility is one that is designated for emergency preparedness, communications and operations centers, and required for emergency response. The Building Code requires that such a facility meet significantly more stringent features relative to structural/seismic, architectural, mechanical, and electrical/lighting/communication systems than a typical standard building.

The existing building complex or a portion of the existing building complex cannot function as an essential facility as the Town's operational program needs

the facility to function as without major renovations including new lateral (wind and seismic) systems.

PHYSICAL CONDITION - BUILDING ENVELOPE

a. Center Section

Roofing

1. The built up roofing system is well beyond its useful life and requires complete replacement. It is last known to have been replaced around 1990 and has been patched in various locations since that time. Evidence of active and past water intrusion is visible in the rooms below and likely contributing to a deterioration of the roof system membranes, as well as likely creating mold and deteriorated conditions in concealed areas. There is an inconsistent mixture of ballasted stone regions and un-ballasted regions in the same roof zones. Ballast is typically an integral element of particular roof assembles.

2. The only roof drains in the Center Section are along the east edge and have insufficient capacity for the area of roof served. Numerous leaks are evident from within the building and water damage and mold are both likely to be issues.

Aerial View of Roof

Roof and Parapet at Chimney Stack

Roof Vent and Parapet

Roof Drain at East Edge

Brick Masonry and Related Materials

1. The exterior wall is a combination of brick and concrete masonry units (CMU). The interior was observed to be an inconsistent mixture of these elements throughout the building, with numerous patches evidently intended to be covered up but only painted and therefore visible. The general construction is a 12" masonry bearing wall consisting of 4" face brick and 8" CMU in a stack bond. The majority of concrete sills below the windows are cracked and deteriorated, and need replacement. Efflorescence is visible below most of the windows and is an indication of extensive water intrusion.

View at East Elevation

2. The brick surface masonry is in very poor condition with a very high percentage of areas with spalling of the brick surface. Spalling, as with efflorescence, is an indication of moisture entering brick, concrete, or natural stone and forcing the surface to peel, pop out, or flake off, and is a sign of water penetration into the walls. The mortar has also deteriorated in many areas. Since the walls are structural as well, the structural integrity of the walls may be impacted, so covering up the wall with a stucco or exterior insulation finish system may not be a viable solution. Further investigation of the CMU wall should be performed. The brick façade should be replaced completely if the building is renovated.

Brick Spalling and Concrete Sill Deterioration

Close Up of Brick Spalling

Entry Stairs, Landings, and Canopies

1. The main stairs could be repaired, but addressing accessibility issues with exterior ramps would require the stairs to be moved and rebuilt. Overall

the entrances are in fair condition, but the door and hardware would need to be replaced to meet accessibility requirements.

Stairs at Main Entrance

Entrance at South Stair Used for YMCA Daycare

Stair Egress Canopy at East Side
(Note - Single Riser is Not Permitted by Code)

Windows and Doors

1. The windows are a mixture aluminum and steel framed window types, single and double glazing, and awning and double hung units. The doors are typically of wood and most are in fair to poor condition. The exterior sealants are in poor condition and most have failed.

Close-Up of Typical Steel Window Condition

Storage Shed

1. The storage shed on the east side was not reviewed as part of this project.

b. North Wing

Roofing

1. Similar to the Center Section, the built up roofing system is well beyond its useful life and would require complete replacement. Our understanding is the roof was replaced around 1990 and has been patched in various locations since that time. Numerous leaks are clearly evident and significant in numerous rooms below. Water damage and mold are anticipated to be extensive in multiple areas.

North Wing Roof Edge

Chimney Stack Looking at Center Section from North Wing Roof

North Wing Roof Joint Against Center Section

Brick Masonry and Related Materials

1. The brick and CMU masonry in the North Wing, as well as the limestone infill panels and sills, are generally in better condition than those of the Center Section, with less spalling or signs of efflorescence.

North Wing Lower Level at West Side - Brick and Infill Panel

North Wing at East Side - Precast Panels and Louvers

Stairs and Landings

1. Stair tread have deteriorated and handrails are either lacking or do not meet current code requirements. Some of the steps have settled and do not meet code requirements for size uniformity. These exits do not meet accessible egress requirements.

North Wing Upper Level Stair at West Side

North Wing Lower Level Exit Stair

Windows and Doors

1. The curtainwall on the north side consists of a two-story, single glazed aluminum system with operable units and transoms panels. Other areas have smaller units from the same system. The exterior sealants have failed and are falling out in many areas, with mold and deterioration anticipated.

North Wing Curtain Wall

North Wing Curtainwall at Precast Panels

North Wing Lower Level East Door - Rusted Door and Frame Bottom

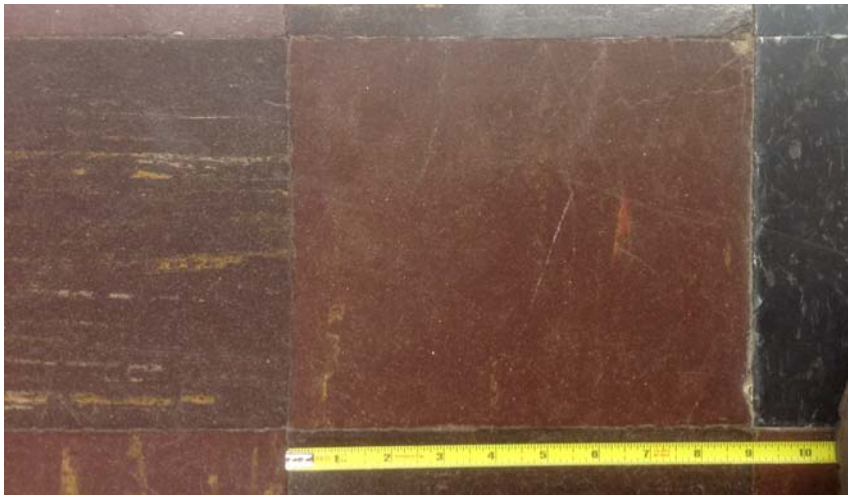
PHYSICAL CONDITION - BUILDING INTERIOR

Note: Investigation of hazardous materials was not part of the scope of this project; however, the Town has performed preliminary investigations which noted hazardous materials were encountered.

a. Center Section

Floors

1. Many of the floor finishes are original and composed of vinyl asbestos tiles (VAT) and also vinyl composition tiles (VCT). Some rooms have carpet installed over the VAT. Most of the flooring is beyond its useful life and should be replaced.

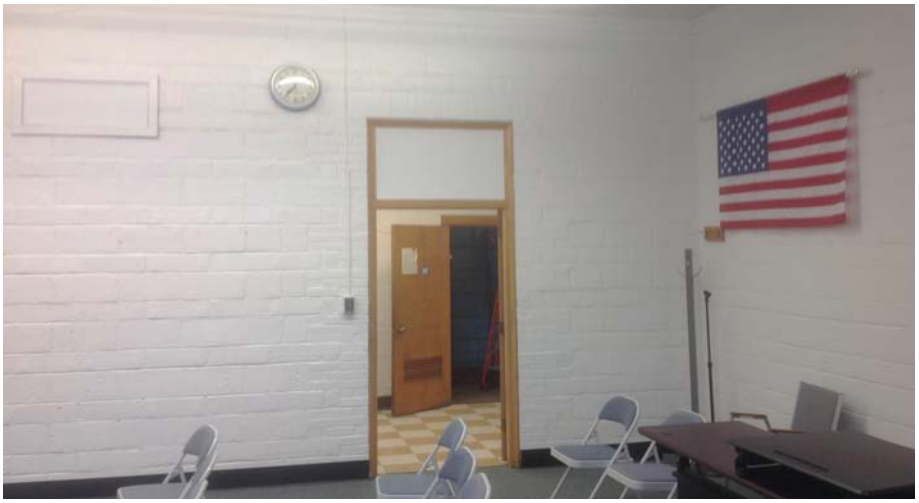


Typical Original VAT Flooring

Upper Level Corridor Flooring with View of Classroom Flooring

Walls and Doors

1. The walls are a combination of painted brick and CMU, sometimes following a pattern and sometimes randomly infilled with either. The south stair has structural glazed tile (SGT - also known as glazed block). Within some office areas, gypsum board and gypsum board partitions have been used to subdivide the rooms.



Painted Alternating Size CMU Courses and Brick Infill

Lower Level Corridor Walls

Upper Level Classroom Doors

Ceilings

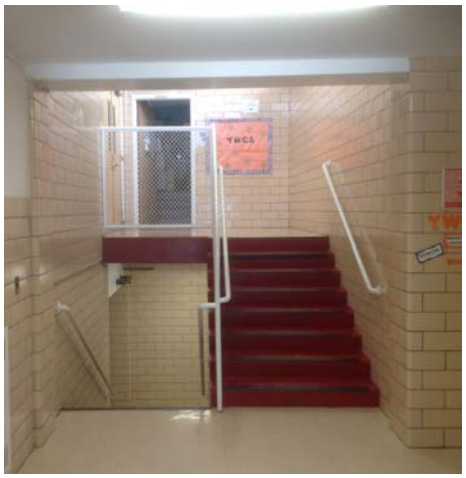
1. The ceiling tiles primarily consist of fiber-cane type tiles glued to the structure above. There are also areas of unpainted exposed concrete structure on the lower level.

Typical Classroom Fiber-Cane Ceiling Tiles

Stairs

1. The stairs are of concrete construction with metal tread nosings and center metal guardrails with wood caps and separate handrails. There are also separate handrails on the wall sides of the stairs, but none of the handrails meet the code required top and bottom extensions and returns.

Center Section Stairs




Stair Between Center Section and South Wing

Toilet Rooms

1. The main toilet rooms have ceramic tile floors, structural glazed tile wainscot on the perimeter, painted CMU on the upper walls, fiber-cane ceiling tiles, and metal partitions. The stall sizes, handrails, and accessories do not meet current accessibility standards and are past their useful life. There are also a number of small toilet rooms that have been added in various places throughout the building, none of which are accessible.


Men's Toilet Room on Upper Level

Attic

1. The attic, accessed through a ladder and ceiling hatch in the main floor janitor's closet, is a low height space with batt insulation loose laid over the ceiling structure with exposed structure above.

Attic Space Showing Loose Fill Insulation Over Ceiling

b. North Wing

Floors

1. Many of the floor finishes are original and composed of VAT and also VCT. Some rooms have carpet installed over the VAT. Most of the flooring is beyond its useful life and should be replaced.

Typical Corridor Flooring

Walls and Doors

1. On the upper floor, the lower portions of the walls consist of structural glazed tile (also known as glazed block) and the upper portions are painted CMU. There are also some gypsum board walls on the lower floor in the northeast corner.

Structural Glazed Tile with Painted CMU Above

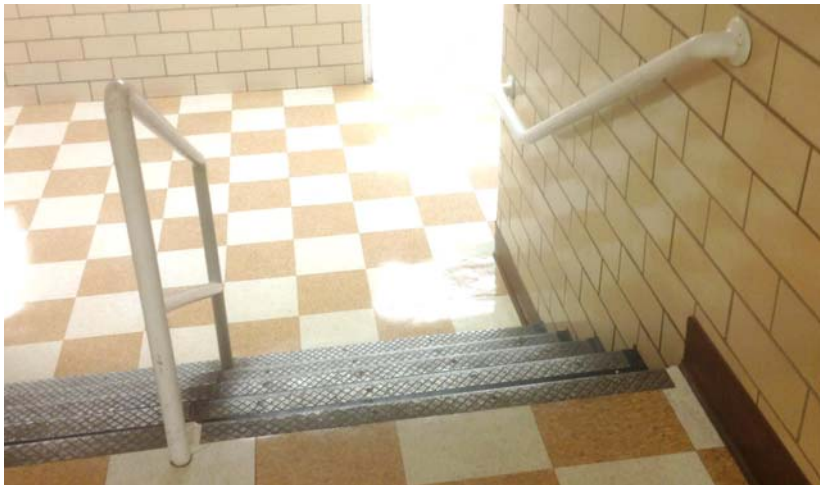
Ceilings

1. The ceiling tiles consist of perforated metal tiles, fiber-cane type tiles glued to the structure above, and also a few rooms with 2 x 4 suspended acoustical ceiling tile systems.

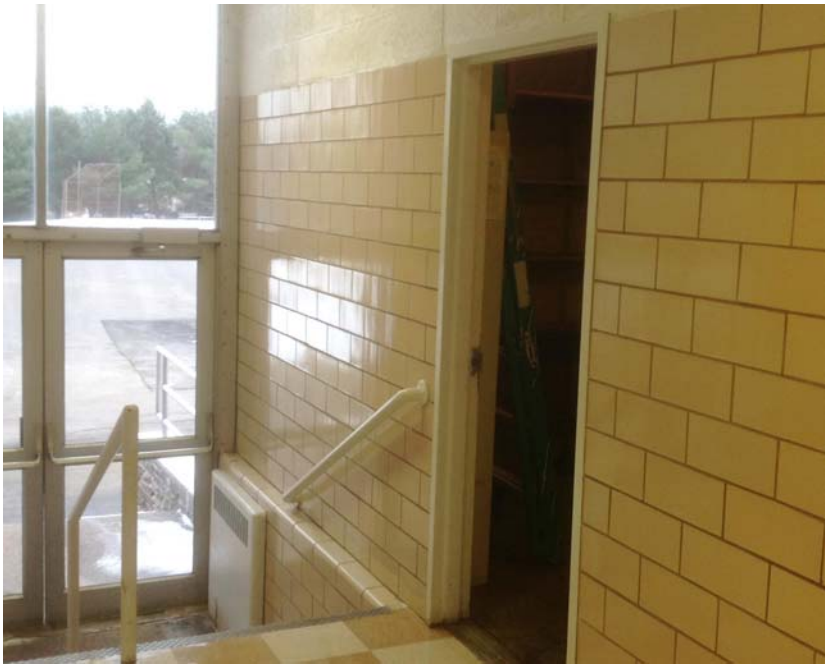
Upper Level Classroom Showing Water Damage

Stairs

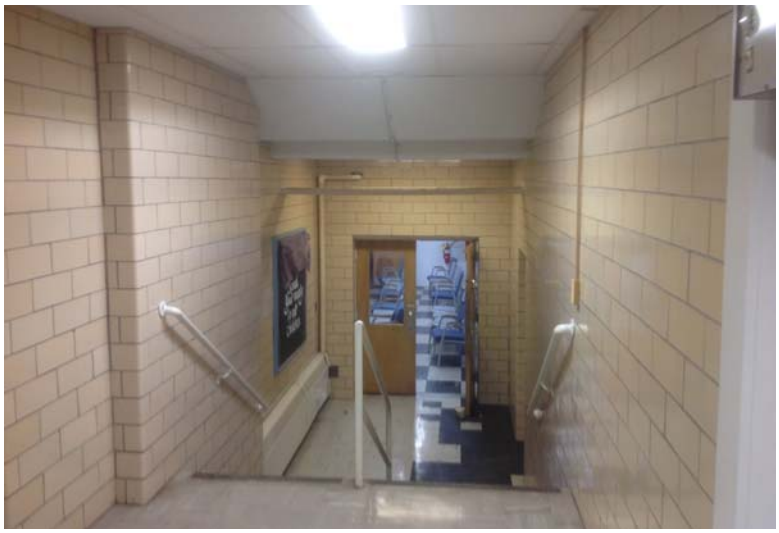
1. The stairs are of concrete construction with VCT flooring, metal tread nosings, and painted metal railings. There are no stairs between levels exclusive to the North Wing. There are also egress stairs to the east and small stairs from the lower level assembly space to the exterior.



Transition Stair in Upper Corridor from Center Section



North Wing Stair Out to East Side



Transition Stair in Lower Corridor from Center Section

Toilet Rooms

1. There are very small inaccessible toilet rooms on each level with tile floors and structural glazed tile wainscot on the perimeter.

Lower Level Toilet Rooms

3. STRUCTURAL

BUILDING CODE ANALYSIS

a. Applicable Codes and Standards

- International Building Code (IBC) 2012, Chapter 34 Existing Structures.1
- International Existing Building Code (IEBC) 2012, Alternative Compliance Method.
- ASCE 11, Guideline for Structural Condition Assessment of Existing Buildings.
- ASEC 31, Seismic Evaluation of Existing Buildings.

Footnotes:
[1] The new 2018 Connecticut State Building Code is currently expected to be adopted in the fall of 2018.

b. Design Criteria

The following design criteria are established in accordance with the 2012 International Building Code. This criterion establishes the minimum design loads and forces that new building structures are required to meet.

Floor Live Loads

- Offices: 50 psf
- Areas of Assembly: 100 psf
- Areas of Assembly with Fixed Seating: 60 psf
- Platforms (Assembly) 100 psf
- Corridors above First Floor: 80 psf
- Stairs, Lobbies, and First Floor Corridors: 100 psf
- File and computer rooms shall be designed for heavier loads based on anticipated occupancy.

Ground Snow Load 30 psf

Wind Load (Ultimate Wind Speeds)	115 mph Risk Cat. I 125 mph Risk Cat. II 135 mph Risk Cat. III and IV
Seismic Load:	SS = 0.177, S1 = 0.063 SDS = 0.189, SD1 = 0.101

EXISTING CONSTRUCTION

The three (3) sections of the complex - South, Center, and North where constructed at different times. The Center Section was the original building and the North and South Wings followed. Although the three sections were built at separate times, there was no provision made at the interfaces of the sections to allow for thermal or lateral movement between the individual sections as is typically done per modern construction standards by installing expansion joints at these locations. The walls, floors, and roofs of the three sections were constructed tight to one another. With thermal expansion and lateral movement, these interfaces typically separate and become a potential path for water infiltration into the building, as seen in numerous locations of the building complex.

South Wing

Substructure and Foundations

1. There are no existing documents depicting the original building substructure or foundations. Portions of the South Wing were renovated in 1998 for the Bolton Senior Center Renovation Project; however, no structural documents were included as part of that project.
2. The building is supported on concrete foundation walls and assumed to be supported on standard shallow footings based on the geology of the area and the adjacent buildings. The plan dimensions and thicknesses of the footings; as well as the quantity, location, and size of steel reinforcement installed in the foundation walls and footings are unknown.
3. Below the South Wing a utility tunnel runs around the perimeter of the building footprint. The area around the utility tunnel is unexcavated and is likely typical slab-on-grade construction. The thickness and reinforcing in the slab are unknown.

a. Superstructure

1. The South Wing is a single story structure.
2. The structure consists of steel framing, load bearing masonry walls, and wood joists and decking.
3. The east and west sides of the building have perimeter steel posts spaced approximately 12'-0" on center. There are two (2) interior CMU bearing walls on each side of what was previously the corridor when this area was part of the school. Steel beams span between the CMU bearing walls and the perimeter steel posts.

4. In the north/south direction, there are 2 x 8 wood joists spaced at approximately 16" o.c. spanning between the steel beams. The roof is sheathed with 1 x 6 tongue and groove wood planks.

5. The end walls on the north and south side of the South Building are masonry construction. The exact composition of the walls is unknown; however, it is likely a combination of brick and CMU as was observed in other areas of the buildings.

b. Center Section

Substructure and Foundations

1. There are no existing documents depicting the original building substructure or foundations.

2. The building is supported on concrete foundation walls and supported on standard shallow footings based on original construction photographs found in the Town of Bolton Department of Land Use files and original plumbing and heating drawings overlaid on the original foundation plan. The plan dimensions and thicknesses of the footings; as well as the quantity, location, and size of steel reinforcement installed in the foundation walls and footings are unknown.

Foundation Construction

Concrete and Masonry Wall Construction

Superstructure

1. The Center Section is two (2) stories high, although the original 1947 Architectural Elevation and Mechanical Drawing depict an additional future partial third story labelled as a Future Library. The third story of the additional story was never constructed. The intent appears to have been to continue the existing bearing walls up the additional story, and although there is no information to support the theory, the foundations may have been sized for the additional future level.

2. The structure consists of steel framing, load bearing masonry walls, and wood joists and decking.

3. The exterior and interior masonry walls of the building are load bearing walls. In addition to providing support for the floor and roof, the walls provide strength and load resistance of external wind force on the building. During the time of construction, buildings of this size and construction were not formally designed for lateral wind loads but empirically relied on the stiff masonry walls to provide overall lateral stability of the structure. Typically the exterior walls and corridor walls along the longitudinal axis of the building are the load bearing walls; however, the roof framing of the Center Section is supported by many of the transverse masonry walls around the building main entrance and the stairs.

4. The main floor of the building is a combination of cast-in-place concrete columns, beams, girders, and slabs, and precast I-joists. The precast I-joists typically span between the exterior walls and interior corridor walls, and span across the corridor between the two (2) interior corridor walls. Under

the main entrance, the structural framing is rotated 90 degrees to address the main entrance stair and the change in the floor elevation.

Precast I-Joint with Cast-In Place Slab

Cast-In-Place and Precast Cosntruction Below Main Entrance

5. The longer joists are approximately 11-1/2" deep and are spaced roughly 3'-0"” o.c. The precast joists in the corridor are about 7-1/2" deep with similar spacing. The concrete slab over the joists was measured at a small existing conduit penetration and is estimated as being 3-1/2" to 4" thick. Wire mesh reinforcement was also observed at the penetration. Below the upper level corridor, a few diagonal cracks and cracks between floor penetrations were observed on the underside of the slab. Recently more cracks in the VCT flooring in the corridor above have been noticed by Town Employees. The cracks in the VCT are linear and similar to the checkerboard pattern of the floor tiles, although spaced further apart than the typical tile dimension. The cracks do not follow the seams of the tiles, but occur through the tiles in each orthogonal direction. The cracks observed in the flooring and in the underside of the slab did not appear to coincide with one another; however, it is common for cracks in concrete slabs to propagate through flooring materials.

Cracks in Main Level Flooring

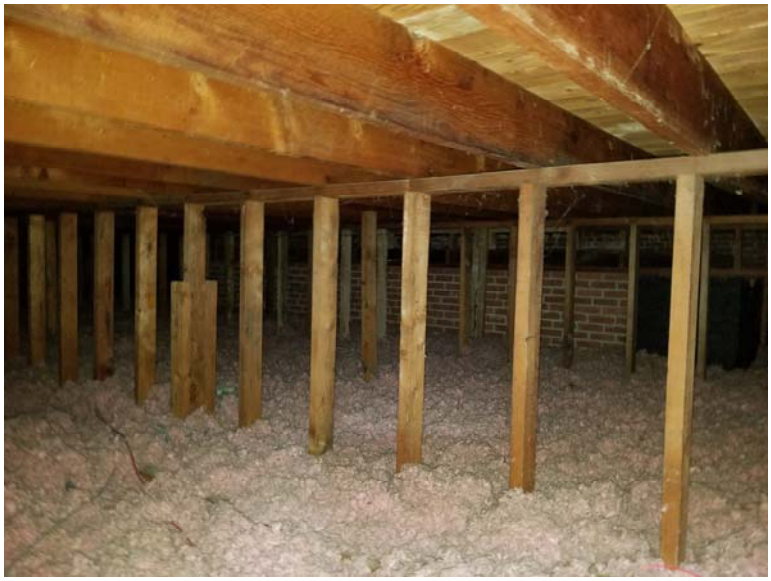
Slab Crack on Underside of Slab

Mesh Pattern on Underside of Slab

6. The roof of the building is constructed of timber joists and wood plank sheathing. The primary rafters directly below the sheathing are 2 x 7 joists spaced at approximately 16" o.c. At the north and south sides of the building, they are pocketed into and supported directly on the exterior walls. As typically observed in many wood framed masonry bearing wall structures, this is a common area were joist deterioration is found caused by water infiltration into the masonry at the building perimeter or damaged roof flashing at parapets. Access to the perimeter of the building was limited due to space constraints; however, we did not observe any deterioration of the timber joists visible beyond the masonry beam pocket inside the attic space. The joists inside the pockets were not accessible; further investigation and selective demolition would be required if the building was to be renovated.

7. Typically masonry buildings with central corridors are designed with the exterior walls and the interior corridor walls longitudinal to the axis of the building as the only load bearing walls. In this building, the 7" roof joists were not designed to span from the exterior wall to the interior corridor walls. On the south side of the building over the main entrance, there are a series of wood-framed knee walls that reduce the span of the 7" joists (rafters). The knee walls sit on timber headers which are supported by the masonry walls orientated in the north/south direction adjacent to the main entrance. Hence, many of the masonry walls at the entrance are bearing walls and will make any reconfiguration of interior spaces and walls more complicated.

Roof Rafter Pocketed into Exterior Wall



Knee Wall Supporting Roof Rafters
Stud Wall Supported on Timber Headers Below Insulation

Knee Wall Supporting Roof Rafters
Stud Wall Supported on Interior Masonry Wall

8. Over the classroom areas, the ceiling roof joists span from the interior corridor walls to the exterior walls of the building. Where accessible, the ceiling joists observed were 2 x 12 and are spaced roughly 12" o.c. The 2 x 7 roof joists are support on the 2 x 12 ceiling joists with knee walls similar to the knee walls over the buildings entrance and vestibule.

Ceiling Joists
Roof Rafter Supported on Knee Wall on 2 x 12 Ceiling Joist
Bearing on Interior Masonry Wall

Ceiling Joists
Roof Rafter Supported on Knee Wall on 2 x 12 Ceiling Joist
Bearing on Interior Masonry Wall

c. North Wing

Substructure and Foundations

1. There are no existing documents depicting the original building substructure or foundations.
2. The building is supported on concrete foundation walls and assumed to be supported on standard shallow footings based on the geology of the area and the adjacent buildings. The plan dimensions and thicknesses of the footings, as well as the quantity, location, and size of steel reinforcement installed in the foundation walls and footings are unknown.

Superstructure

1. The North Wing is a two-story structure and consists of steel framing, cast-in-place concrete slabs, load bearing masonry walls, and long span metal roof deck.
2. The building is constructed with steel support columns, and concrete and masonry bearing walls. The interior space is divided by an interior bearing wall orientated east/west. The floor is a cast- in-place concrete slab and varies in thickness depending on location. Based on field measurements taken at the stair opening, the concrete slab over the current assembly room (church hall) is approximately 12" thick.
3. The steel roof deck is approximately 7" deep and spans a distance of roughly 29 ft. from bearing wall to bearing wall at its longest location. Rust stains are evident in many areas on the underside of the deck, especially between panel joints indicating roofing leakage and water infiltration. Based on the extent of the staining on the underside of the deck and previous experience, it is reasonable to expect the top surface of the deck under the roofing has considerably more damage and section loss than is visible from below.
4. Some isolated cracking was observed in the masonry wall intersecting the north curtainwall. The curtainwall does not appear to have moved laterally and the masonry cracks appear to be from typical temperature and shrinkage movement.

Metal Decking

Corosion of Metal Decking

Corrosion of Metal Decking

MODIFICATIONS TO EXISTING STRUCTURES

Evaluating, engineering, and modifying existing structures involve a specialized knowledge of the Building Code requirements and structural engineering techniques for assessing the structures. Working with existing structures requires the Engineer to use their experience and judgment to fill in information that is not easily identifiable or evident, and in many cases may not even be available. Understanding, defining, and discussing the issues within the Owner and Design Team early in the conceptual design process is key to developing a successful project and eliminating unwelcome surprises down the road.

The State of Connecticut currently has adopted the 2012 International Building Code (IBC) as its Model Building Code Standard amended with State errata to comprise the 2016 Connecticut State Building Code; however, the State of Connecticut is intending to adopt a 2018 Connecticut State Building Code which adopts the 2015 International Building Code as its model standard in the near future.

Chapter 34 of the 2012 IBC addresses alterations, repairs, additions, and changes of occupancy classification of existing buildings and structures. As an alternative code compliance method, Chapter 34 states that work performed in accordance with the 2012 International Existing Building Code (IEBC) shall also comply with the provisions of IBC Chapter 34. In the 2015 International Building Code (IBC), Chapter 34, *Existing Building Structures* has been removed, and the provisions contained within the previous 2012 IBC Chapter 34 are entirely contained in the 2015 International Existing Building Code (IEBC).

The International Existing Building Code (IEBC) is intended to provide flexibility and permit the use of alternative approaches while achieving minimum requirements to

safeguard public health, safety, and welfare as they are affected by the repair, alteration, change of occupancy, additions, and relocation of an existing building. The IEBC allows for controlled departure and in some instances from full compliance with the International Building Code dealing with new construction, while maintaining basic levels for fire protection, structural, and life safety features of rehabilitated buildings.

The 2015 International Existing Building Code (IEBC) provide three (3) main options for dealing with repairs, alterations, changes of occupancy, or additions to existing buildings. The method of compliance may be selected by the applicant; however, sections of the various methods may not be applied in combination with each other and must be utilized consistently by all disciplines. The following are the 2015 IEBC compliance methods that may be utilized:

- Chapter 4 Prescriptive Compliance Method - Defines specific criteria which the building is required to meet when modifications are made to an existing building.
- Chapters 6 through 13 Classification of Work - Defines various classifications and levels of work, and defines specific criteria which the building is required to meet for the various classifications or levels of work.
- Chapter 14 Performance Compliance Methods - Evaluates the building utilizing a prescribed process of analysis and establishes a building score for use in comparison to the code defined mandatory safety score. The Performance Compliance Method is the least flexible in regards to structural analysis of the building compared to the other two methods. The structural analysis shall demonstrate that the building with the work completed is capable of resisting the loads specified in Chapter 16 of the International Building Code. This statement requires the existing building to meet all the current code structural requirements for new construction.

The following is an abbreviated summary of the typical design criteria that is presented in each of the three options. Each method has various pieces unique to it section, hence depending on the specifics of the project, one method may be better suited than the others for a particular project.

a. Change of Occupancy

Gravity Loads

Buildings or portions of building subject to change of occupancy such that the change in occupancy results in higher uniform or concentrated floor loads shall comply with the gravity load provisions of the International Building Code (IBC). An exception to the requirement is when the stress in the existing structural element is not increased by more than 5 percent. This exception is not included in the Performance Compliance Method.

Snow and Wind Loads

When changes in occupancy result in a higher wind or snow risk category, the structure shall be analyzed and comply with the applicable wind or snow provisions of the International Building Code.

Seismic Load

When a change in occupancy results a structure being reclassified to a higher risk category, the building shall comply with the seismic requirements of the higher risk category in accordance with the International Building Code. Currently the buildings are classified as Group E occupancy, but will require a change to either all Business (B) or Mixed Use (E+B). This would not move the building to a higher risk category and structural modifications to the lateral load resisting system would not be required; however, if the buildings are classified and converted to essential facilities, then the lateral load resisting system would need to be upgraded to comply with the higher stricter code requirements. Essential facilities include structures designated as emergency preparedness or emergency response centers, emergency shelters, and fire, ambulance, and police stations.

b. Alterations or Additions to an Existing Building

Gravity Loads

Alterations shall not reduce the capacity of existing load carrying structural elements unless it can be demonstrated that elements have capacity to carry the applicable design gravity loads per the current International Building Code (IBC).

Existing structural elements supporting any additional gravity loads as a result of alterations or additions, including the effects of snow drift, shall comply with the current International Building Code (IBC), with the exception where the stress in existing structural elements is not increased by more than 5 percent. This exception is not included in the Performance Compliance Method of IEBC.

Lateral Load (Wind and Seismic)

Where an alteration or addition increases design lateral loads on the lateral structural elements, results in a prohibited structural irregularity, or decreases the capacity of any load carrying structural element, the structure shall be shown to meet the wind and seismic provisions of the International Building Code (IBC). Reduced IBC seismic forces in accordance with the Code may be applicable. Where the seismic force resisting system is required to be investigated, the seismic evaluation and design shall be based on Section 301.1.4 of the IEBC regardless of the selected compliance method utilized.

Any existing lateral load carrying element whose demand-capacity ratio with the alteration considered is not more than 10 percent greater than its demand-capacity ration with the alteration ignored shall be permitted to remain unaltered. For the purpose of this exception, comparisons of demand-capacity ratios, and calculations of design loads shall account for all the cumulative effects of additions and alterations since the original construction. This exception is not included in the Performance Compliance Method of IEBC.

Within the Classification of Work Method where substantial structural alterations are involved, the altered building shall comply with the wind design loading criteria of the International Building Code (IBC) and with the reduced seismic design loading criteria of the IBC. Substantial structural alterations are defined as modifications where more than 30 percent of the total floor and roof area have been or proposed to be involved in structural alterations within a 5-year period.

PROPOSED BUILDING MODIFICATIONS AND CODE IMPACTS

a. Addition of Sloped Roofs to Center Section and South Wing

Center Section

Adding a sloped roof to the building effects both wind and seismic forces. The additional height of the building increases the profile of the structure and creates a larger surface area for wind to react against. Earthquake forces are directly proportional to the weight/mass of the building. Additional weight/mass will increase the overall seismic force on the existing structure. The addition of a slope roof will increase the lateral forces on the existing structure by more than 10 percent requiring the existing structure to meet the lateral force resisting requirement of the current building code. This would require the installation of new structural steel bracing or masonry or concrete shear walls. These elements would require new foundations and would be constructed from the basement to the roof. Additionally, the new lateral framing would need to be properly attached to the floor and roof levels in order to transfer the forces from the floor and roof diaphragms into the new lateral load resisting elements.

South Wing

Based on our conceptual analysis, the addition of a sloped roof would increase the lateral force on the existing structure by more than 10 percent and would trigger the a wind/seismic lateral upgrade of the South Wing structure similar to requirements noted for the Center Section. The South Wing is only a one-story

structure; however, there would still be the need to install new lateral load resisting frames/walls and associated foundations.

b. Change of Occupancy Classification

Based on information provided from the Town, the last approved occupancy category for the building complex was Group E. If the buildings are renovated, the intent would be to change the occupancy classification to all Business (B) or Mixed Use (E+B). This would not move the building to a higher risk category and no structural modifications to the lateral load resisting system would be required; however, if the buildings are classified and converted to essential facilities, the lateral load resisting system would need to be upgraded to comply with the higher risk category requirements.

c. Removal or Reconfiguration of Interior Bearing Walls

As noted previously, many of the interior walls in the buildings are load bearing walls. Removing load bearing walls or creating new openings in the existing walls will require new beams or lintels to re-support the existing floors and roofs. Additionally the bearing walls provide lateral stiffness to the building. Removing or altering the walls will decrease the overall lateral strength of the building. In order to comply with the current 2015 IEBC standards, the structure will need to be evaluated and shown to meet the wind and seismic provisions of the current building code, or the structure will need to be upgraded to comply with the new building code provisions.

To bring the existing structure into compliance with the current building code, additional bracing and/or walls installed within the buildings to resist wind and seismic forces would be anticipated. In addition to the new lateral bracing, new foundations will be required to support the supplemental lateral bracing elements. Locations for these elements would need to be incorporated into the new architectural layouts, coordinated for constructability within the existing structures, and be engineered to resist the applied lateral forces.

d. Existing Floor Loads and Structure

The cracks observed in the surface of the corridor tile flooring do not appear to coincide with the pattern and alignment of the cracks observed on the underside of the structural slab visible from the lower level. The slab cracks on the underside of the slab appear similar to typical shrinkage and temperature cracks that typical occur in concrete over time. The pattern and location of the cracking does not appear comparable to patterns of cracking that would form if the structure was overloaded. The formation of shrinkage and temperature cracking

in concrete is a common occurrence and does not indicate a structural concern at this time; however, it is common for cracks in concrete slabs to propagate through flooring materials and become an aesthetic issue.

Various minimum uniform live loads requirements were noted in the beginning of this Section. Depending on the configuration and use of the new spaces, the existing floors may not have the capacity to support heavier live loads without reinforcing the existing members or supplementing the existing framing with new support framing. The first State of Connecticut Building Code was adopted in 1971, prior to that time building code standards were established by local jurisdictions. The 1955 Basic Building Code (BOCA) and the 1955 American Standard Building Code indicate that school classrooms be designed for a minimum uniform live load of 60 psf and 40 psf respectively, and corridors in schools to be designed for a minimum uniform live load of 100 psf. Per the current building code, general office spaces shall be designed for a minimum uniform live load of 50 psf. Additionally if original classroom spaces are converted to corridors, areas of assembly, or file storage areas, the higher uniform live loading criteria will need to be reviewed and evaluated in those areas and supplemental reinforcement most likely will be required.

If the renovation of the existing buildings is determined to be a feasible option, the load capacity of the existing floor construction will need to be determined as noted above. In order to analyze and determine the capacity of the existing concrete floor superstructure, additional field investigations and material testing would need to be performed. This would likely include removal of concrete cores for compressive strength testing and scanning of the concrete members to determine location, quantity, and extent of reinforcing steel, as well as selective demolition in certain areas.

In order to create an accessible pathway between the North and Center Buildings, a portion of the existing corridor floor could be removed in order to construct an ADA compliant ramp within the existing corridor. This would require demolition of the existing joists and slab in the corridor for the length of the ramp between the existing corridor bearing walls and installation of new structural framing. Lowering the elevation of the floor at the upper level will require that a similar ramp be constructed in the lower level slab-on-grade in order to maintain proper headroom clearance below the new structured ramp. Ramping would create challenges with ramp structural support modifications as well as limit the program layout options for department space allocations, adjacencies, and room and door locations due to the varying elevation.

e. Elevator Construction

The construction of a new elevator in the existing building will require the creation of a new elevator shaft, pit, and foundation. Elevator pits, depending on the type, capacity, and speed of the elevator, typically require a pit approximately 4 feet in depth. If the location of the elevator is adjacent to existing building foundations, concrete underpinning below the existing foundations is usually required.

A new floor opening creating the elevator shaft will need to be constructed in the upper level floor. The existing floor will need to be supported by new structure where existing joists, beams, or girders are cut. One technique commonly used is constructing the walls of the elevator shaft with reinforced load-bearing masonry. The masonry walls can support the existing framing and can also be designed to provide additional lateral stiffness to the structure. CMU walls would be reinforced and fully grouted. The nominal thickness of the CMU wall construction is typically is 8" or 12".

f. Roof Deck Replacement

Based on extent of rust stains on the underside of the North Building roof deck, it is expected a large majority of the existing roof deck will need to be replaced. Because the roof area is relatively small, complete replacement of the existing roof deck should occur if it is determined that renovation of the existing building is a feasible and viable option.

g. New Rooftop Equipment

New rooftop mechanical equipment supported directly on existing framing will need to be evaluated. It is anticipated supplemental framing and reinforcing of existing framing will be required to accommodate new rooftop equipment. Additionally depending on the size and location of the equipment, substantial snow drifting into and around the base of the unit can occur. The weight of the equipment and the weight of the additional snow must be accounted for when evaluating the capacity of the existing structure. Placing the unit above the roof on dunnage can limit the effects of drifting snow, but the weight of the unit, and the effects of wind and seismic forces applied to and by the unit must be addressed in the renovation design.

h. Town Vault

The Town's program includes a vault room which should be located on the lower level slab-on-grade to minimize structural modifications required to

accommodate it. The North Wing lower level assembly room would be a viable location for the vault. Slab-on-grade modifications would be required to accommodate the vault construction, anticipating a 12" thick slab-on-grade over 12" of compacted structural fill. Final design would be based on the vault manufacturer's requirements.

4. PLUMBING & FIRE PROTECTION

The building does not have a sprinkler system, so fire protection is limited to hose valve cabinets and smoke and fire alarm heat detectors in the corridors.

Typical Hose Valve Cabinet

The facility now gets its water from the adjacent Bolton Center School which was completed in the mid 1990s. The water service is 2".

Incoming Water Service

The existing toilet rooms are original construction, except for the Senior Center, and are past their useful service life and should be replaced.

Typical Toilet Room

Typical Lavatory

None of the current Accessibility Codes are met within the existing toilet rooms and new expanded toilet rooms will be required as part of any renovation.

5. HVAC

The existing building mechanical systems are limited to heating and ventilation, except for the Senior Center which is fully conditioned.

The building has two (2) boilers and boiler rooms. The main boiler room in the Central Section has a DeDietrich #GT330A/11 Series, rated for 808 MBH input and 755 MBH output. The boiler was originally oil-fired, but was recently converted to natural gas. This boiler feeds the entire building complex except for the Senior Center and Daycare. The existing combustion air louver and ductwork within the boiler room will need to be modified to comply with code.

The second boiler located in a small boiler room adjacent to the South Section is a Buderus #GE315/5, rated for 350 MBH input. This boiler exclusively feeds the Senior Center and Daycare.

Both boilers appear to be adequately sized for the area served.

Most of the building has either radiation or hot water AAF/Herman Nelson unit ventilators for the classroom portions of the facility to provide heating and outside air.

Typical Classroom Radiation

Typical Classroom Unit Ventilator

The Senior Center has its own air-conditioning unit for cooling and radiation for heating. These systems are intended to remain "as is" although the rooftop unit is approaching its normal lifespan per ASHRAE Life Expectancy Tables.

Proper exhaust fans need to be installed to serve the toilet rooms.

Toilet Room Exhaust Fan

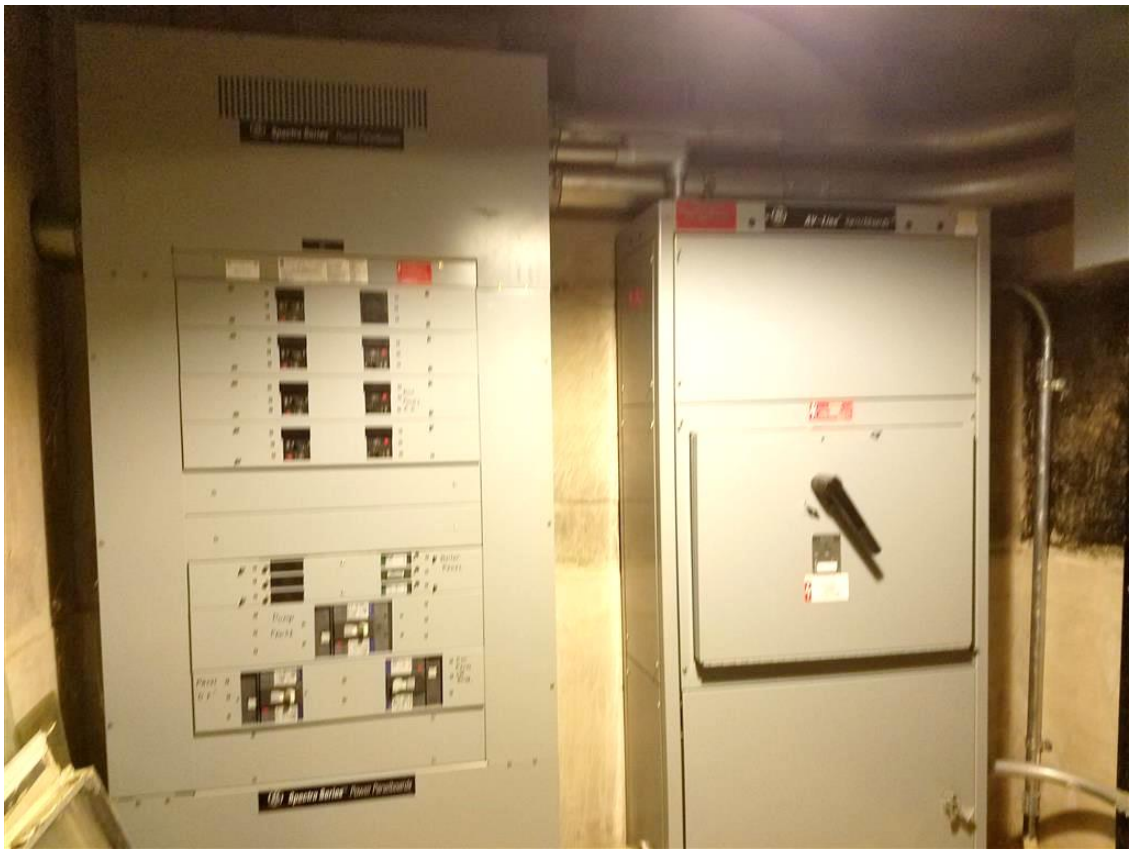
Except for the existing boiler, all of the mechanical systems in the Central and North Sections need to be replaced including replacement of existing pumps.

New rooftop DX air-conditioning units, with gas heat, that would serve both levels of the Central and North Sections would be anticipated for the new systems. The heating loads can utilize the existing boiler for new hot water perimeter radiation. Size of units will need to be coordinated with exterior and existing structure renovations. Since existing floor-floor heights are low, multiple rooftop units which will feed the upper and lower portions of the building with minimal horizontal ductwork between "classrooms" would be anticipated.

A proper DDC Building Management System should be installed to control all of the mechanical systems in the complex, including the Senior Center portion of the facility.

6. ELECTRICAL

The existing building complex has a General Electric 800-Ampere, 120/208-volt, 3-phase bolted pressure switch (fused) main device which feeds an adjacent switchboard distribution section. Both BPS and switchboard distribution are rated for 65,000 AIC.



Incoming Electrical Service

The distribution section feeds local panelboards around the facility for branch circuit loads. Several of the branch panelboards are the fusible switch type.

The lighting in the facility is fluorescent lamps. Most of the light fixtures are surface- or pendant-mounted wraparound fixtures. The church has open single lamp energy efficient reflector style fixtures.

Typical Room Lighting

Emergency lighting for the facility is provided by battery packs within the corridors. Few, if any of the actual rooms have emergency lighting. It does not appear the corridors have 1 FC of emergency lighting as required by current code.

Exit signage is limited and appears to be AC style lamp fixtures. Additional exit signage will be required to meet current code.

The building has a Fire Lite #MS521OUD fire alarm control panel, located in Central Wing's janitor closet. The fire alarm consists of manual pull stations at the exterior doors with smoke and heat detectors located in the building corridors. None of the existing rooms have fire protection.

The electrical service, while in good shape, is undersized to accommodate the installation of air-conditioning throughout the facility and a new elevator.

All of the electrical systems (panelboards, circuits, power outlets, lighting, lighting controls, fire alarm, etc.) within the Central and North Sections are past their useful service life and should be replaced if the building is renovated.

The lighting and controls are anticipated to be replaced with new LED fixtures, which will provide dimming capabilities. The existing lighting is approximately 1 watt/SF; new LED lighting would be approximately half this amount. The use of LED lighting would allow the emergency lighting to utilize one or two small inverters, or an overall building complex generator.

A building complex generator would serve the facility during power outages and allow greater use of the facility. If a portion of the building is to be considered an essential facility, full generator backup of the essential facility area would be required. A generator limited only to serve the essential facility would be anticipated to be approximately 100 kW. A generator to back-up the building complex would be anticipated to be approximately 300 kW. The addition of a generator would allow all of the emergency lighting to be generator-based and eliminate the need for an inverter.

7. OPTIONS

OPTION 1 - RENOVATE AND REUSE THE EXISTING BUILDINGS

Overview

The extent of the renovations necessary to reuse the existing Center Section and North Wing is daunting. It poses many challenges with expensive solutions, while still retaining numerous uncertainties inherent in renovation work of this kind. As an example, the buildings' entire exterior envelope is in poor condition. The rapidly failing perimeter masonry walls are not only intended to be a barrier from the elements, but the main structural support for the buildings. The change of occupancy classification by Code from educational to business will trigger accessibility upgrades that will impact all trades (architectural, structural, mechanical, electrical, plumbing and fire protection). None of the entrances or exits from the buildings are at grade and would require the addition of external ramps. But the greater difficulty is the fact that the floors of the Center Section and North Wing are offset from each other on both levels by several feet that would require long ramps. This would not only be expensive, but also further limit the program layout options for department space allocations, adjacencies, and room and door locations.

Further complicating the structural aspect in particular is the Town's desire to use a portion of the complex as an essential facility which triggers extensive lateral reinforcement requirements for which none of these building were designed for. The existing facility cannot function as an essential facility without significant renovations. While hazardous material and mold contamination are not within the scope of this study, initial environmental surveys indicate hazardous materials are present and associated abatement costs are anticipated to be significant.

The intent of Option 1 is to provide a sense of the scope of work if retaining the Central and North Sections or a portion of is a priority for the Town. Essentially, every building element would be impacted to a great degree. Ultimately a complete gut renovation with significant repairs, but the end result would retain the limitations and inefficiencies of an existing outdated predefined layout due numerous interior bearing walls and major challenges with altering. Additionally, the bearing walls also function as lateral resisting walls and removal will reduce the lateral capacity of the buildings.

Upper Level

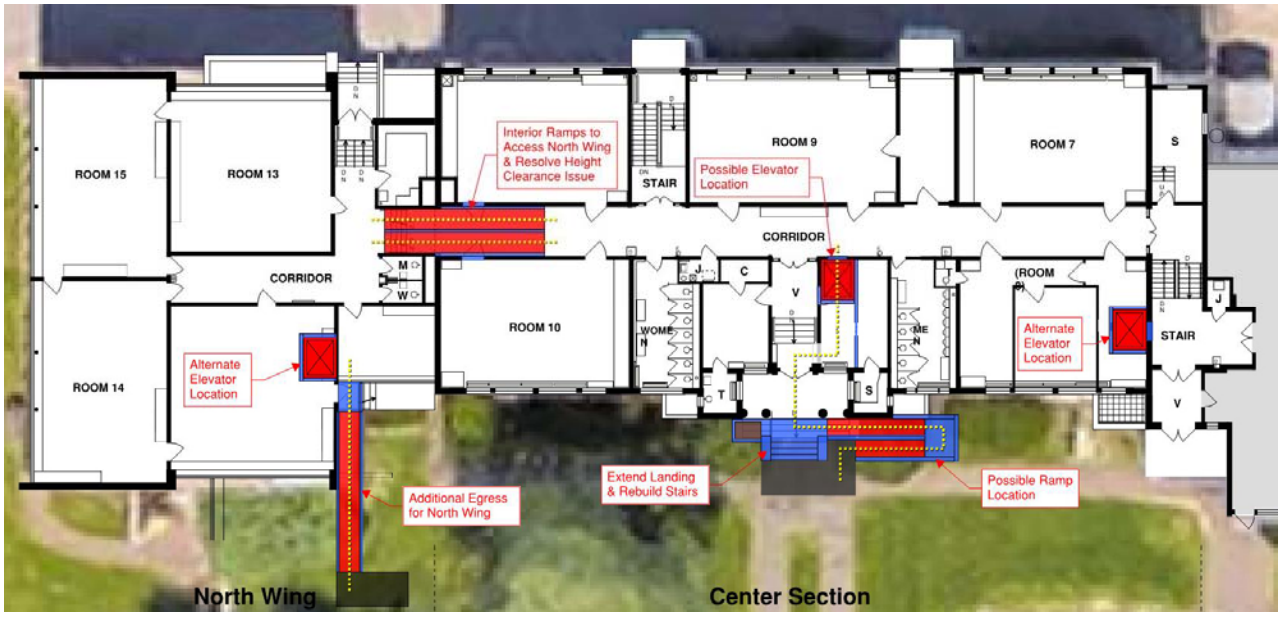
The main public entrance to any building is required to be accessible. We assume the Town would like the Center Section to remain the main entrance if the building was renovated, and as such a new site ramp would need to be built, including extending the existing landing and rebuilding the main entrance stairs.

Further complicating the issues is there are additional stairs within the main entrance. An elevator would be required for public access to all levels and could be located off the main entrance lobby, but the structural requirements at this location would be complex as noted in the structural portion of the report. Interior ramps would also be required to provide accessibility to the North Wing as well as to address the low height accessibility issues at the North/Central connection.

A sprinkler system may need to be added to the Central and North portions and additional exit discharge from the North Wing will be required.

Conceptual layouts as well as alternate locations for the elevator are shown in the graphic below. Depending on the final layout, a second means egress would likely be required from the North Wing upper level which is shown with an external ramp on the west side within the graphic below. Another possible elevator location might be in the North Wing adjacent to Room 10. Any of the proposed elevator locations would need to be investigated further based on the proposed program, distances to primary functions, and desired main entrance location, and structural implications. Location of the elevator(s) would not eliminate the North/Central ramps or another approach to resolve the accessibility headroom issues that currently exist.

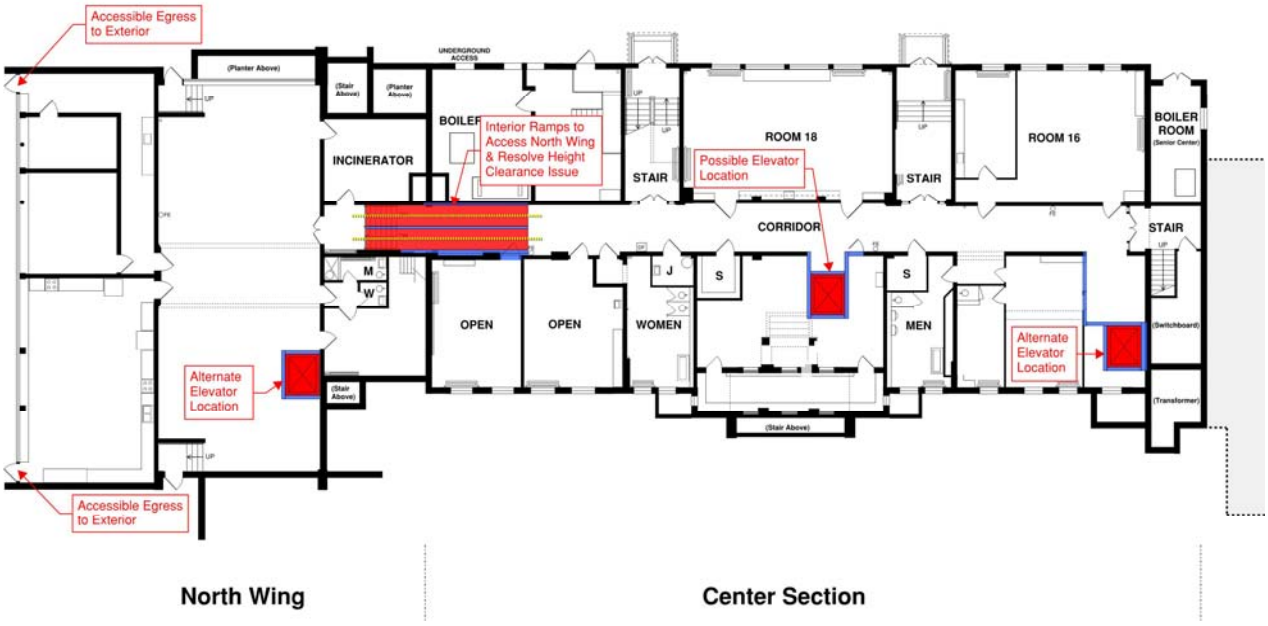
The bathrooms would all need to be demolished, expanded, and designed to current standards.



Upper Level Floor Plan

Lower Level

The lower level would also require interior ramps to provide accessibility from the Center Section to the North Wing. Conceptual layout with alternate elevator locations are shown in the graphic below. The bathrooms on this level would also all need to be demolished, expanded, and designed to current standards.



Lower Level Floor Plan

Building Envelope

The entire Center Section's building envelope of brick is in very poor condition and complete removal and replacement rather than repair/restore would be warranted. Façade replacement is a costly item whether the envelope is brick or an alternative material such as an exterior insulation finish system (EIFS) or metal panels. Limiting brick restoration to the area around the main entrance will at least retain the most aesthetically valuable element of the building. Even there, the bricks would require patching to stabilize the surface and prevent further deterioration. Also, all existing lintels would need to be replaced.

Regarding energy, rebuilding (or repair/restore) the brick facades would not be sufficient to meet the current energy codes, even with new double-glazed insulated windows throughout. Adding an insulated wall to the interior of the building would be necessary to increase the thermal characteristics and performance of the overall facility. If utilizing an exterior insulation finish system (EIFS), adding an additional

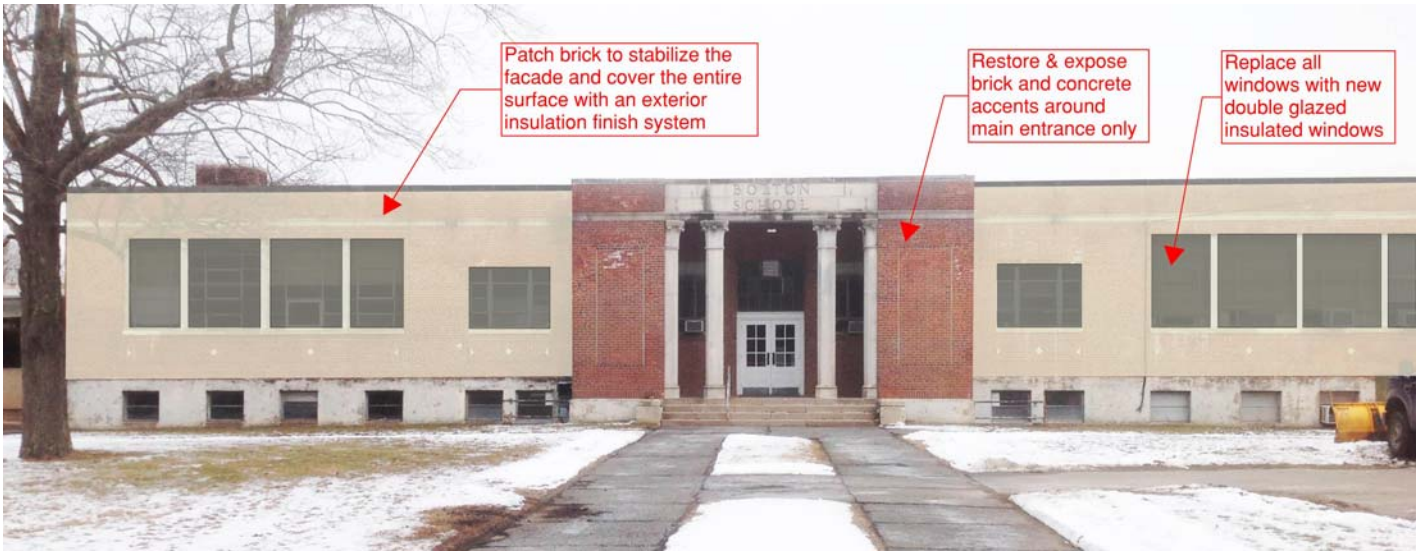
interior insulated wall may not be necessary depending on the design of the EIFS system.

With either approach, further investigation of the masonry backup wall would need to be conducted to verify condition and suitability to support the new façade.

In areas where the existing brick façade was being considered for repair, further investigation and testing of the brick façade would be required to determine if the brick façade can support a direct applied system such as EIFS.

Note that since the foundation is also exposed and not insulated, it would also need to be insulated either on the interior or exterior; however, It is standard practice to insulate the entire exterior wall surface on the same vertical plane so as not the create moisture intrusion issues.

If the existing building is renovated, our recommendation would be to replace the exterior façade with new bricks (rather than EIFS) with new insulated windows and new insulated interior walls.



Revised Front Elevation at Center Section

Essential Facility

The Town has indicated this facility or a portion of the facility is to be designated as an essential facility. The building code requires that such a facility meet significantly more stringent features relative to structural/seismic, architectural, mechanical, and electrical/lighting/communication systems than an ordinary building. Renovating the existing building or a portion of to accommodate an essential facility in our opinion is

not economically feasible based on the significant modifications that would be required.

Site Work

New/renovated parking areas, general regrading, additional drainage, ramps including ramp/retaining walls, separate fire service, etc., would be anticipated.

Structure

All new work, repairs, modifications, and alterations will need to meet the loading and design requirements of the current code. Any modifications to existing structural elements cannot decrease the strength of or increase the load on beyond the percent allowed by the code.

Structural work associated with the renovation option would include slab-on-grade alterations and repairs, new interior corridor ramping, underpinning of existing foundations, and new foundations associated with the new elevator including new CMU shaft walls, new metal decking on the North Wing, repair/replacement of structural elements impacted by hazardous material removals, reinforcement of floors (depending on building program and associated floor loading requirements), reinforcement of existing structural elements to support new work, entrance modifications, façade and masonry backup repairs/replacement, structural modifications to support new rooftop equipment, and potentially lateral (wind/seismic) structural upgrades including new foundations and braces/shear walls.

MEPT Systems

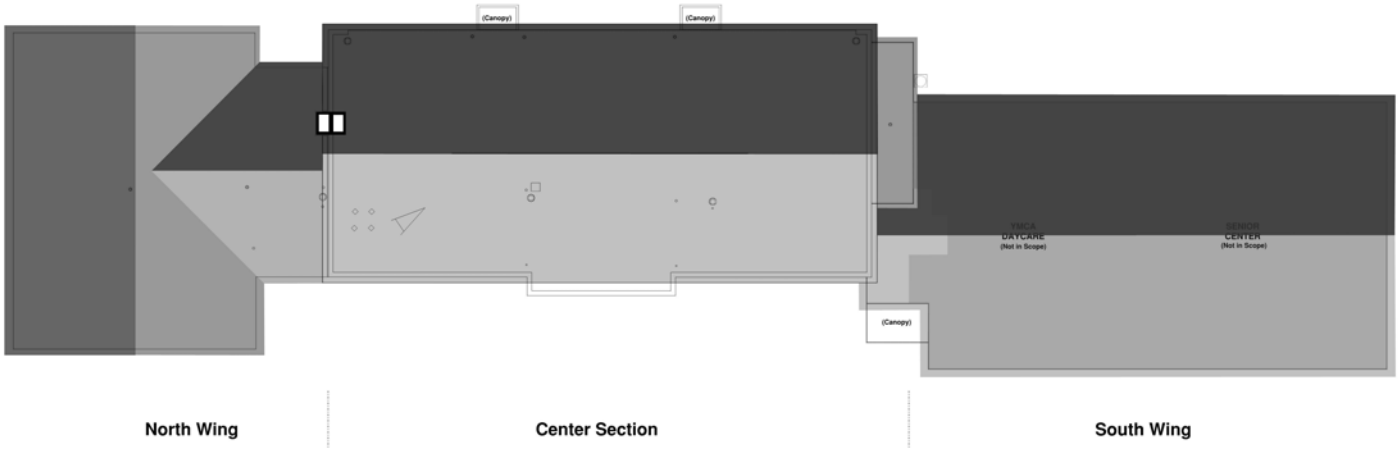
All of the mechanical, electrical, plumbing, fire protection, and technology systems in the Central Section and North Wing would be replaced with new systems. New variable air volume (VAV) rooftop air-conditioning units with gas heat would be utilized. Vertical ductwork distribution between upper and lower levels with limited horizontal ductwork is anticipated to accommodate the limited floor-to-floor height. The existing newer boilers can remain but the associated pumps and piping would be replaced. New radiation or radiant ceiling panels would be utilized for perimeter heating loads.

The existing toilet rooms would be completely renovated including new MEP fixtures and systems to comply with current code requirements. In addition, a separate water (fire) service to the building may be required to serve the new sprinkler system within all sections of the building complex including the Senior Center/Daycare portion of the building, depending on if the existing central/south building wall can be considered an existing 2-hour firewall.

A new electrical service (1600A @ 120/208) will be required to for the anticipated building complex electrical loads including air-conditioning and elevator in the Central and North Sections. New electrical distribution from the switchgear to remote located panels with new receptacles and branch circuits fed from the remote panels. A new fire alarm system will be installed to meet current code requirements and most likely the Senior Center/Daycare section will also need to be updated to function with the new system. New technology raceways (conduits) installed from the street to the building complex main telecom room. Additionally, telecom raceways (conduits and back-boxes) within the Central and North renovated sections.

OPTION 1A - NEW PITCHED ROOFS

Addition of pitched roofs on the building complex was reviewed as a potential aesthetical option to replace the existing roofs and minimize potential water issues with a flat roof system. Based on our review, adding the sloped roofs to the Central , North, and South Sections would increase the lateral loads on the buildings and trigger a lateral (wind/seismic) upgrade and is not economically feasible.

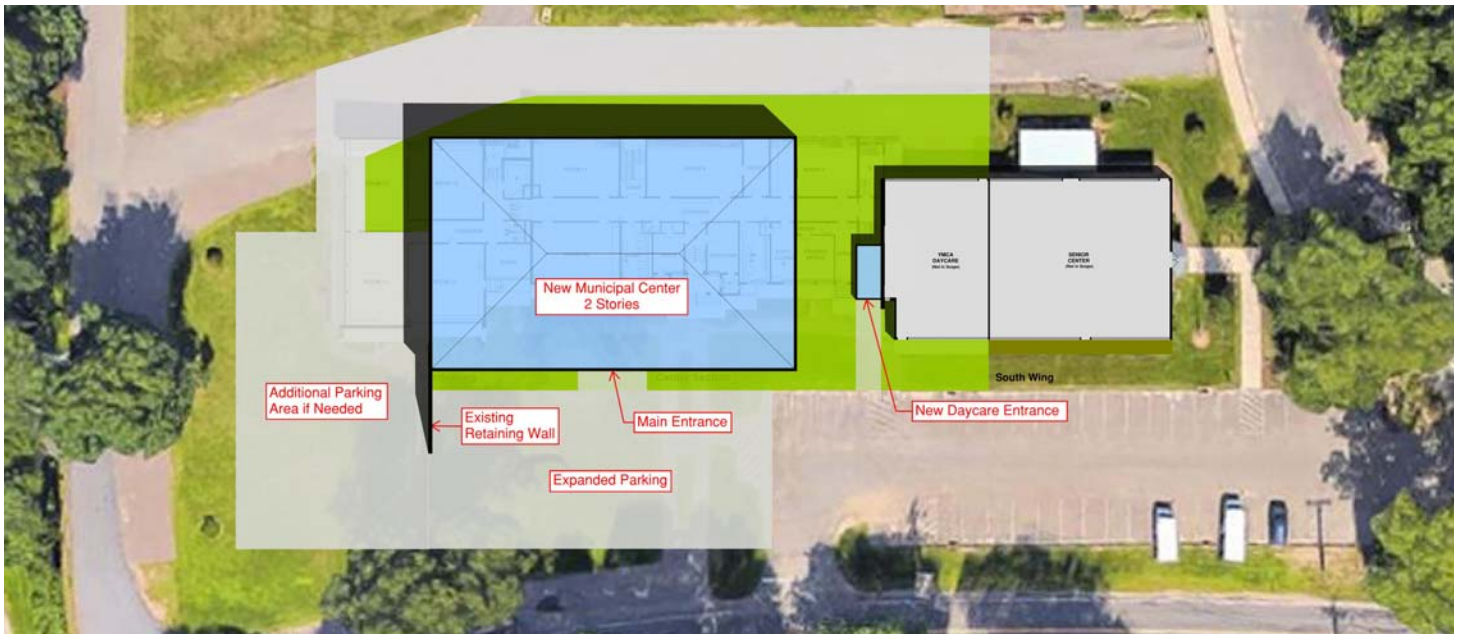


Overall Roof Plan of Center Section and North Wing

Partial Elevation Showing Pitched Roof

OPTION 2 - REPLACE CENTER SECTION AND NORTH WING

The Center Section and North Wing would be demolished to make room for a new, standalone Municipal Center. The South Wing, containing the Senior Center and YMCA Daycare, would be retained and a new entrance created on the north end, including a new north exterior wall. A small boiler equipment room would be constructed adjacent to the South Wing to replace the existing room currently located within the Central Section.



Site Plan with a New Municipal Center Building

A new Municipal Center building would be approximately 25,000 GSF with 12,500 GSF on each of two (2) floors to accommodate the approximately 15,500 NSF of program space identified in the 2014 program study prepared by Fletcher Thompson Architects. The 15,500 NSF must be multiplied by a GSF conversion factor of about 1.60 to account for vertical circulation, interior and perimeter walls, structural elements, mechanical chases, and also the addition of a larger public meeting room.

A new facility would be designed to meet all current building codes and accessibility standards. The new facility can be easily configured efficiently to accommodate the actual programing needs of the Town, incorporate current technologies, be energy efficient, include a pitched roof, and last 50 to 100 years with appropriate maintenance.

MEP Systems

New mechanical, electrical, plumbing, fire protection, and technology systems including a new Building Management System (BMS). New VAV DX rooftop air-conditioning units with gas heat with efficient vertical and horizontal ductwork distribution with local VAV boxes with hot water coil reheats. New boiler with associated pumps and piping for hot water systems including radiation or ceiling radiant panels at perimeter walls. Reuse of the existing newly replaced boiler should be considered, if determined feasible.

New plumbing to toilet rooms and coffee break rooms including underground sanitary piping connected to the existing septic field. New domestic hot and cold, and recirculating water systems for the building. The existing water service will need to be intercepted and extended into the new Municipal Center as well as the existing Senior Center. A separate water (fire) service to the Municipal Center to serve the sprinkler system will be required. Since the existing South Wing would be a standalone building, the building Occupancy Use Group could remain, and adding a sprinkler system should not be required by code.

A new electrical service (1600A @ 120/208) is anticipated for the new Municipal Center and existing South Wing. Due to phasing of the project, creating a separate electrical service for the existing South Wing instead of refeeding from the new building may be warranted and will need to be reviewed in further detail.

New electrical distribution from the switchgear to remote located panels with new receptacles and branch circuits fed from the remote panels. A new fire alarm system will be installed to meet current code requirements and most likely the Senior Center/Daycare section will also need to be updated to function with the new system. New technology raceways (conduits) installed from the street to the building complex main telecom room. Additionally, telecom raceways (conduits and back-boxes) within the Central and North renovated sections.

8. ENGINEER'S OPINION OF PROBABLE COSTS

The opinion of ball park costs provided below, are construction costs only. Owners' "soft" costs for items such as testing and inspections (site and building), financing, legal services, insurance, A/E professional design fees, furnishings and equipment, security, technology, A/V equipment, etc., can increase the construction estimates by as much as 20 to 40% or more.

Costs for hazardous materials and mold abatement have not been fully addressed within the costs provided below and would need to be investigated further. We have included an estimated premium associated with asbestos materials and some PCBs at windows but not mold. If hazardous materials have also leached into adjacent materials (brick, CMU, concrete), which is likely, such cost would be significantly higher for Option 1 than for Option 2 since selective demolition, removal, and replacement would be required. It is not uncommon for sections of masonry walls and concrete foundations walls to be required to be removed and replaced due to leaching of PCBs into the adjacent existing masonry and concrete construction.

OPTION 1 - RENOVATE AND REUSE EXISTING BUILDINGS

Opinion of Ball Park Cost Range: $8.0 Million to $9.0 Million

Partial Summary: Renovate and repair the entire Central Section and North Wing, replace exterior brick with new, all new windows, curtainwalls, and doors, add exterior ramps, interior ramps and elevators. Refer to Section 11 for Opinion of Probable Cost Detail for additional information.

OPTION 1A - ADD NEW PITCHED ROOF

Partial Summary: Due to the fact that the original buildings were neither designed to current seismic requirements, nor designed to support the extra weight required, adding roofs would necessitate exorbitant structural support and seismic bracing solutions that are not financially feasible; therefore, we do not believe adding roofs to this structure should be a consideration.

OPTION 2 - REPLACE CENTER SECTION AND NORTH WING

Opinion of Ball Park Cost Range: $8.5Million to 9.25 Million

Partial Summary: Demolish the existing Central Section and North Wing. Build a new, two-story, 25,000 GSF Municipal Center, detached from the South Wing. Enlarge the parking capacity, and add a new entrance, boiler room, and electrical room for the YMCA Daycare and Senior Center. Refer to Section 11 for Opinion of Probable Cost Detail for additional information.

9. RECOMMENDATIONS

SUGGESTED APPROACH

Given the current condition and age of the Notch Road Municipal Center, it is our opinion that the existing Center Section and North Wing are beyond their useful life and should be replaced with a new facility. We would recommend Option 2.

The new facility would be designed to meet all current building codes and accessibility standards. The new facility can be easily configured efficiently to accommodate the actual programing needs of the Town, incorporate current technologies, be energy efficient, include a pitched roof, and last 50 to 100 years with appropriate maintenance. Additionally, the new facility can easily be designed as an "essential" facility with a minimum premium since it would be all new construction.

Renovating the existing building will require major upgrades to accommodate accessibility requirements as well as repairs of the buildings' overall deterioration (exterior walls and roof) and full replacement of MEP systems which are past their useful life. Additionally, trying to accommodate modern building programing into the existing building's configuration and construction (bearing walls) will be limited and inefficient. Most likely PCBs have leached into the adjacent construction and will need to be selectively removed as will all asbestos and mold encountered. Selective removal is extremely costly.

Option 1 would leave the Town with essentially a 68 year old renovated building with an extended service life of maybe 15 to 20 years at a significant cost. We would not recommend pursuing Option 1 or a variation of Option 1 (demolish Northern Section and Renovate Central Section).

10. USE & RELIANCE RESTRICTION

BVH Integrated Services, P.C. (BVH) has produced this document under an agreement between BVH Integrated Services, P.C. and the Town of Bolton, Connecticut. All terms and conditions of that agreement are included within this document by reference. Other than to the Town of Bolton, BVH Integrated Services, P.C. disclaims any obligations to any other person with respect to any material presented in this document, and no person may rely upon this document without advance and express written consent from BVH Integrated Services, P.C. and such person's written agreement is to be bound by the limitations, qualifications, terms, conditions, and indemnities to BVH Integrated Services, P.C. set forth in that agreement. BVH specifically states that its review of the property in question is subject to monetary restraints and scope limitations. Given those limitations and conditions, it has made what in its opinion, is a reasonable investigation. It has also relied upon interviews and documents with the understanding that independent verification of their factual content is beyond the scope of BVH's work. The materials presented in this document are "to BVH's knowledge" where such phrase means to BVH's actual knowledge of the subject matter after such inquiry as BVH considered reasonable in light of the qualifications and limitations upon the scope of work.

The extent of the physical observation for the preparation of this report has been limited to a walk-around visual review of the property.

BVH does not provide Professional Cost Estimating and the Engineer's Opinion of Probable Costs included are an opinion only using past experiences with similar projects.

11. OPINION OF PROBABLE COST DETAIL

Option 1 - Renovation

Option 2 - New Building

ESTIMATE OF PROBABLE COST SUMMARY

OPTION 1 - RENOVATION

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 SF (excluding South Wing)
Date: 8/27/2018

ENGINEER'S OPINION OF PROBABLE COST

Description	Qty.	Units	Unit Cost	COST
Demolition				$396,500
Architecture				$2,830,625
Civil				$315,000
Structural				$300,500
Plumbing				$226,500
Fire Protection				$250,000
HVAC				$1,010,600
Electrical				$1,000,500
Subtotal			$257	**$6,330,225**
General Conditions	10	%		$633,023
Overhead & Profit	10	%		$633,023
Contingencies	20	%		$1,266,045
PROJECT TOTAL	**S.F.**		**$360**	**$8,862,315**

FF&E **By Owner**

Telecom / AV Cabling & Equipment **By Owner**

No Costs For Bearing Wall Removal/Modifications Included

All Hazardous Material Removal Scope/ Costs Not Fully Acconted For

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined Unit Price	Material & Labor Combined Total
DEMOLITION Selective interior and exterior				
Central Perimeter Walls	7,500	sf	$20.00	$150,000
North & Central Interior	24,650	sf	$10.00	$246,500
- includes hauling and disposal				
TOTAL				**$396,500**
COST PER S.F.				**$16**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
ARCHITECTURE				
Exterior Enclosure				
Exterior Walls	7,500	sf	$75.00	$562,500
Exterior Windows	1,800	sf	$30.00	$54,000
Exterior Windows	700	sf	$30.00	$21,000
Exterior Doors & Hardware	10	ls	$3,500.00	$35,000
Curtainwall & Entrances	1,500	sf	$125.00	$187,500
Parapets	760	sf	$75.00	$57,000
Louvers	300	sf	$20.00	$6,000
Foundation Waterproofing	1	ls	$30,000.00	$30,000
Building Joints/Misc Repairs	1	ls	$25,000.00	$25,000
Roofing				
Roof Coverings	12,300	sf	$15.00	$184,500
Roof Accessories	600	lf	$10.00	$6,000
Roof Openings	2	ls	$2,000.00	$4,000
Interior Construction				
Partitions - Acoust Insul	15,000	sf	$10.00	$150,000
Partitions - Perimeter - Therm	7,500		$20.00	$150,000
Interior Doors + Hard	75	ls	$3,000.00	$225,000
Fittings, Millwork, Exp, Sealants	1	ls	$165,000.00	$165,000
Stairs				
Stairs - Guards/Railings	2	ls	$7,500.00	$15,000
Stair - Finishes	2	ls	$2,000.00	$4,000
Interior Ramps	2	ls	$5,000.00	$10,000
Exterior Ramps	2	ls	$75,000.00	$150,000
Exterior Stairs - Rebuild	3	ls	$12,000.00	$36,000
Interior Finishes				
Wall Finishes	30,000	sf	$4.00	$120,000
Wall Fin - Lobby, Corr, Offices	5,000	sf	$25.00	$125,000
Floor Fin - VCT, Carpet, Tile	24,650	sf	$7.50	$184,875
Ceiling Systems/Finishes	24,650	sf	$5.00	$123,250
Blinds, Signage & Accessories	1	ls	$50,000.00	$50,000
Conveying				
Elevators & Lifts	1	ls	$150,000.00	$150,000
TOTAL				**$2,830,625**
COST PER S.F.				**$115**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
CIVIL				
Incoming Fire Service	1	LS	$35,000.00	$35,000
Parking & Site Improvements	1	LS	$250,000.00	$250,000
Excavation & Backfill for foundation waterproofing	1	LS	$30,000.00	$30,000
TOTAL				**$315,000**
COST PER S.F.				**$13**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
STRUCTURAL				
Underpinning - New Elevator	1	LS	$50,000.00	$50,000
Foundations & Shaft - New Elevator	1	LS	$35,000.00	$35,000
New Ramps (main & Lower Floors	1	LS	$35,000.00	$35,000
New Roof Top Equipment Support & Mods	1	LS	$18,000.00	$18,000
New Roof Deck - North Section	4,000	SF	$8.00	$32,000
Misc. Structural Perimeter and Roof Repairs	1	LS	$25,000.00	$25,000
Misc. Shoring	1	LS	$25,000.00	$25,000
Underslab Utility Repairs	1	LS	$8,000.00	$8,000
Exterior Stairs and landings	1	LS	$30,000.00	$30,000
Reinforcing Existing Floors	12,500	SF	$3.00	$37,500
Foundation Modifications - Vault	1	LS	$5,000.00	$5,000
No Costs For Bearing Wall Removal/Modifications Included				
TOTAL				**$300,500**
COST PER S.F.				**$12**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
PLUMBING				
Toilet Rooms	4	EA	$40,000.00	$160,000
Janitor Closets	1	LS	$6,000.00	$6,000
Break Room Kitchen	2	EA	$7,500.00	$15,000
Hot Water Heater(s)	1	LS	$7,500.00	$7,500
Hot & Cold Water Piping	1	LS	$30,000.00	$30,000
New pumps	1	LS	$8,000.00	$8,000
TOTAL				**$226,500**
COST PER S.F.				**$9**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
FIRE PROTECTION				
Sprinkler Piping - North & Central	24,650	SF	$6.00	$147,900
Sprinklers - North & Central	24,650	SF	$2.00	$49,300
Sprinkler Piping - South Wing	6,600	SF	$6.00	$39,600
Sprinklers - South Wing	6,600	SF	$2.00	$13,200
TOTAL				**$250,000**
COST PER S.F.				**$10**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST				
			Material & Labor Combined	
Description	Quantity	Units	Unit Price	Total
HVAC				
RTU's	8	EA	$40,000.00	$320,000
Gas Piping	1	LS	$35,000.00	$35,000
Hot Water Radiation Piping	24,650	SF	$3.00	$73,950
Radiation/Radiant Panels	24,650	SF	$5.00	$123,250
BMS/ATC controls	24,650	SF	$7.00	$172,550
Ductwork	24,650	SF	$8.00	$197,200
Diffusers	24,650	SF	$1.00	$24,650
Pumps	1	LS	$40,000.00	$40,000
VAV Boxes	16	EA	$1,500.00	$24,000
TOTAL				**$1,010,600**
COST PER S.F.				**$41**

ESTIMATE OF PROBABLE COST

OPTION 1

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
ELECTRICAL				
Electrical Service	1	LS	$50,000.00	$50,000
Secondary TX Feeders	1	LS	$50,000.00	$50,000
Switchboard and Panelboards	1	LS	$100,000.00	$100,000
Conduit and Feeders	1	LS	$75,000.00	$75,000
Lighting	1	SF	$6.00	$147,000
Lighting Controls	1	SF	$3.00	$73,500
Receptacles	1	LS	$15,000.00	$15,000
Branch Circuits	1	SF	$6.00	$147,000
Fire Alarm System	1	SF	$4.00	$98,000
Technology Conduits	1	LS	$35,000.00	$35,000
Generator & Automatic Transfer Switches	1	LS	$200,000.00	$200,000
Existing Senior Center Feeder	1	LS	$10,000.00	$10,000
TOTAL				**$1,000,500**
COST PER S.F.				**$41**

ESTIMATE OF PROBABLE COST SUMMARY

OPTION 2 - NEW BUILDING

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F. (excluding South Wing)
Date: 8/27/2018

ENGINEER'S OPINION OF PROBABLE COST				
Description	Qty.	Units	Unit Cost	COST
Demolition				$345,100
South Wing Entrance & Wall				$150,000
Architecture				$2,449,000
Civil				$385,000
Structural				$1,125,000
Plumbing				$233,500
Fire Protection				$200,000
HVAC				$826,500
Electrical				$1,075,000
Subtotal		SF	**$272**	**$6,789,100**
General conditions	10	%		$678,910
Overhead & profit	10	%		$678,910
Contingencies	15	%		$1,018,365
PROJECT TOTAL		SF	**$367**	**$9,165,285**

FF&E **By Owner**
Telecom / AV Cabling & Equipment **By Owner**
All Hazardous Material Removal Scope/ Costs Not Fully Accounted For

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 24,650 S.F. (includes both floors)

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
DEMOLITION	24,650	sf	$9.00	$221,850
- Center Section & North Wing				
- includes hauling and disposal				
Hazardous Material Premium	24,650	sf	$5.00	$123,250
TOTAL				**$345,100**
COST PER S.F.				**$14**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
ARCHITECTURE				
Exterior Enclosure				
Exterior Walls	11,500	sf	$50.00	$575,000
Exterior Windows	2,000	sf	$30.00	$60,000
Alum Storefront Entry & Glazing	1,000	sf	$50.00	$50,000
Exterior Doors + Hardware	10	qty	$3,500.00	$35,000
Louvers	300	sf	$20.00	$6,000
Foundation Waterproofing	6,000	sf	$5.00	$30,000
Roofing				
Roof Coverings	12,500	sf	$15.00	$187,500
Roof Accessories	1	ls	$5,000.00	$5,000
Roof Openings	2	qty	$2,000.00	$4,000
Interior Construction				
Partitions - Acoust Insul	15,000	sf	$10.00	$150,000
Therm + Acoust Insul	1	ls	$115,000.00	$115,000
Interior Doors + Hardware	75	qty	$3,000.00	$225,000
Fittings, Millwork, Exp, Sealants	1	ls	$165,000.00	$165,000
Stairs				
Stair Construction	2	qty	$30,000.00	$60,000
Stair Finishes	2	ls	$2,000.00	$4,000
Interior Finishes				
Wall Finishes	35,000	sf	$4.00	$140,000
Wall Fin - Lobby, Corr, Offices	5,000	sf	$25.00	$125,000
Floor Fin - VCT, Carpet, Tile	25,000	sf	$7.50	$187,500
Ceiling Finishes	25,000	sf	$5.00	$125,000
Blinds, Signage & Accessories	1	ls	$50,000.00	$50,000
Conveying				
Elevators & Lifts	1	qty	$150,000.00	$150,000
TOTAL				**$2,449,000**
COST PER S.F.				**$98**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

ENGINEER'S OPINION OF PROBABLE COST				
			Material & Labor Combined	
Description	Quantity	Units	Unit Price	Total
CIVIL				
Incoming Fire Service	1	LS	$35,000.00	$35,000
Parking & Site Improvements	1	LS	$350,000.00	$350,000
TOTAL				**$385,000**
COST PER S.F.				**$15**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
STRUCTURAL				
Building Excavation	25,000	SF	$8.00	$200,000
Concrete Foundations	25,000	SF	$12.00	$300,000
Superstructure	25,000	SF	$25.00	$625,000
TOTAL				**$1,125,000**
COST PER S.F.				**$45**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
PLUMBING				
Revise incoming water service and pumps	1	LS	$25,000.00	$25,000
Hot Water Heater	1	EA	$7,500.00	$7,500
Domestic Hot, Recirc and Cold Water Piping	1	LS	$30,000.00	$30,000
Plumbing Fixtures	25,000	SF	$6.00	$150,000
Janitor Closets	2	EA	$3,000.00	$6,000
Break Room Kitchen	2	EA	$7,500.00	$15,000
TOTAL				**$233,500**
COST PER S.F.				**$9**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
FIRE PROTECTION				
Sprinkler Piping	25,000	SF	$6.00	$150,000
Sprinkler Heads	25,000	SF	$2.00	$50,000
TOTAL				**$200,000**
COST PER S.F.				**$8**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
HVAC				
RTU's -DX	2	EA	$100,000.00	$200,000
VAV Boxes	25	EA	$1,500.00	$37,500
Gas Piping	1	LS	$40,000.00	$40,000
Boilers	2	EA	$20,000.00	$40,000
Pumps and Accessories	2	EA	$17,000.00	$34,000
Radiation/Radiant Panels	25,000	SF	$4.00	$100,000
Ductwork	25,000	SF	$8.00	$200,000
Diffusers	25,000	SF	$1.00	$25,000
BMS/ATC Controls	25,000	LS	$6.00	$150,000
TOTAL				**$826,500**
COST PER S.F.				**$33**

ESTIMATE OF PROBABLE COST

OPTION 2

Project Name: 2118009 - Town of Bolton, Notch Road Municipal Center Study
Total Area: 25,000 S.F.

BVH integrated services

ENGINEER'S OPINION OF PROBABLE COST

Description	Quantity	Units	Material & Labor Combined	
			Unit Price	Total
ELECTRICAL				
Electrical Service	1	LS	$50,000.00	$50,000
Electrical Service-Senior Center	1	LS	$25,000.00	$25,000
Secondary TX Feeders	1	LS	$50,000.00	$50,000
Secondary TX Feeders-Senior Center	1	LS	$25,000.00	$25,000
Switchboard and Panelboards	1	LS	$100,000.00	$100,000
Senior Center SES	1	LS	$15,000.00	$15,000
Conduit and Feeders	1	LS	$75,000.00	$75,000
Lighting	25,000	SF	$6.00	$150,000
Lighting Controls	25,000	SF	$3.00	$75,000
Receptacles	1	LS	$15,000.00	$15,000
Branch Circuits	25,000	SF	$6.00	$150,000
Fire Alarm System	25,000	SF	$4.00	$100,000
Senior Center Fire Alarm System	1	LS	$10,000.00	$10,000
Technology Conduits	1	LS	$35,000.00	$35,000
Generator & Automatic Transfer Switches	1	LS	$200,000.00	$200,000
TOTAL				**$1,075,000**
COST PER S.F.				**$43**