



CBI CONSULTING INC.

PRINCIPALS

**CRAIG E. BARNES**

**MICHAEL S. TELLER**

**WAYNE R. LAWSON**

SENIOR ASSOCIATE

**ROBERT G. WILKIN**



## **Conditions Assessment, Historical Analysis, and Adaptive Reuse**

### **Town Hall Campus Study Mendon Center Historic District Town of Mendon, Massachusetts**

T 617 • 268.8977

F 617 • 464.2971

[cbiconsultinginc.com](http://cbiconsultinginc.com)





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## **Consultant Team**

### **CBI Consulting Inc.**

Wayne Lawson, P.E. – Principal, Structural Engineer

Steven Watchorn, R.A., LEED AP BD+C – Project Manager

Andrea Willet, AIA – Project Architect

### **Garcia-Galuska-DeSousa Engineers**

Jorge Rosa – Electrical Engineer

Louie Vieira – Mechanical Engineer

Chris Garcia, P.E. – Plumbing Engineer

### **Warner Larson Landscape Architects**

David Warner, ASLA – Landscape Architect

### **Nitsch Engineering**

Steven Ventresca, P.E. – Civil Engineer

### **Code Red Consultants**

Paul Moan, P.E. – Code Consultant

### **PM & C**

Peter Bradley, LEED AP – Cost Estimator





# Section 1



## PRINCIPALS

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## SENIOR ASSOCIATE

**ROBERT G. WILKIN**

June 30, 2016

Kimberly Newman  
Town Administrator  
Town of Mendon  
20 Main Street  
Mendon, MA, 01756

Tel: (508) 478-8863  
Email: KNewman@mendonma.gov

PROJ.: Mendon Town Hall Campus Study  
RE: Building Conditions Assessment, Historical Analysis, and Adaptive Reuse

CBI Project No.: 16036

Dear Kim:

In accordance with our Contract, CBI Consulting Inc. (CBI) has prepared the following building conditions assessment and adaptive re-use / treatment recommendations for the Mendon Town Hall (Harrison Hall), Union Chapel (former Taft Public Library), and the former Fire Station, all located at 18 – 20 Main Street, Mendon, Massachusetts. These contiguous parcels are also known as the 'Mendon Town Hall Campus', and all three buildings are listed as contributing to the Local and National Register Mendon Center Historic District.

This study was commissioned to identify the current condition of the buildings, from an historic approach, and for the continued use and re-programming of the buildings. This report is also being submitted to the Massachusetts Historical Commission as part of the Town's MPPF Round 21 Pre-Development Grant.

CBI and our consultants have reviewed the existing conditions of the buildings, including any available documents, listened to the Town's concerns (including Town Hall employees and Board of Selectmen), and recommended repairs and/or renovations for a long-range planning effort centered on the adaptive re-use of the recently vacated Union Chapel and former Fire Station, and the re-programming of Town Hall. It is anticipated that some short-term repairs and repurposing of Union Chapel can take place in the next 1 – 2 years, but the site improvements, re-programming of Town Hall, and repurposing of the Fire Station will not be able to take place until the Police Department moves off-site, which may take several years.

This report consists of a current building conditions assessment in Section 2. This conditions assessment includes an architectural and structural analysis; an historical analysis; mechanical, electrical, plumbing, and fire protection analysis; a code analysis; and a site conditions and civil analysis.

This report also includes a feasibility study for the adaptive reuse of the three buildings. Section 3 of this report contains existing floor plans and existing site plan. Section 4 contains



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a space needs program for all three buildings, and Section 5 includes the Town's preferred Options.

### **Executive Summary**

Based on our visual review, CBI and our consultants recommended building and site improvements regardless of potential adaptive re-use plans. These recommendations include items such as building envelope and building system repairs or replacements, as well as corrective actions such as building code and life safety improvements. All of the recommendations are made with historic rehabilitation in mind. Please refer to Section 2 of this report for these recommendations.

In addition, after reviewing the space needs of the existing buildings (except for the Police and Fire Departments which we understand are only short-term occupants of the site) and other potential users such as the Historical Commission and Historical Society, we have proposed a re-use plan that has been approved by the Town Administrator, presented to the Board of Selectmen, and consists of the following:

Union Chapel is proposed to be occupied by the Historical Commission and Historical Society on the Upper Level only. The Records Room and Historical Society building contents will be moved into this space. The Lower Level will be used for additional Town Hall overflow Meeting space. This occupancy does not constitute a 'Change in Use'.

However, both floors must be capped at 49 occupants each. A new ramp is proposed to provide accessibility to the Upper Level (refer to proposed Site Plan in Section 5). Consideration could also be made to add a rear elevator addition in lieu or in addition to the ramp, however this was outside of the scope of this report. If an elevator addition is proposed, it would be a "non-occupiable appendage" and therefore a re-evaluation of building height and area would not be required. The toilet room on the Lower Level shall be available for users of both floors, but no additional fixtures are required by code unless there is a decrease in the number of fixtures, an increase in occupant load, or a change in occupancy.

The Fire Station is proposed to be renovated on the First Floor only and occupied by primarily permitting departments, including the Building and Planning Department, Board of Health, Conservation Commission, and Water Commission. The intent is to provide mostly an open-plan layout, but with shared office and meeting space at the back. The existing overhead doors are in poor condition. We are recommending that they be replaced with an aluminum storefront system designed to reflect the original door patterns. Refer to A1-01a in Section 5 of this report for the proposed adaptive re-use Fire Station plan.

The Town Hall is proposed to be renovated on the First Floor only. All offices are proposed to move out of the Second Floor, and these rooms re-purposed as a staff break room, additional storage (if the structure permits) and meeting space. The Town Clerk would move into the Basement Level where the Building and Planning Department is currently located. This would put the Clerk's office in close proximity to their storage and Vault located on the same level, which is desired. Parks & Rec. and Veteran's Agent would share an office across



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the hall from the Clerk, and a new window installed for natural light and ventilation. The remainder of the Basement would be used for storage and meeting space.

The First Floor would be reconfigured from in between the front stair to the rear hallway leading to the elevator. Only the original rear bearing wall (which is the existing wall that currently separates the Town Administrator and Selectmen's Offices) and existing window locations should be attempted to be preserved. All other interior walls have little historical significance. The existing side entrance ramp and door on the South Elevation are proposed to be removed and the door converted to a window. This will allow additional space on the inside (currently a hallway) to be used for another programmed use. The narrow double-loaded corridor is proposed to be widened, and 'borrowed lites' (interior windows) installed in the corridor walls to allow natural light into the corridor. The public counters for the Treasurer/Collector and the Town Assessor would be located off of the corridor in small Lobbies with high visibility from the Main Entrance. The Town Accountant's office would be adjacent to the Treasurer/Collector, and a shared Conference / Meeting Room provided as well. The Copy / Mail room would almost double in size.

Refer to A1-03a and 1-04a in Section 5 of this report for the proposed Town Hall plans.

The Site would be reconfigured with additional parking and green space. Site run-off would be controlled and drywells installed. Vehicular circulation would be limited to a single 2-way access between the Fire Station and the Town Hall, but emergency access would be maintained between the Town Hall and Union Chapel. Pedestrian circulation would be better defined and constructed of brick pavers.

Refer to Section 5 of this report for the proposed Site Plan.

We have provided associated cost estimates for our recommendations in Section 6 of this report. We hope that these recommendations and cost estimates provide direction for the continued use of the buildings and to meet the current and future needs of the town.

Very truly yours,

**CBI Consulting Inc.**

A handwritten signature in black ink, appearing to read 'Steven A. Watchorn', is written over a light gray rectangular background.

Steven A. Watchorn, R.A., LEED AP BD+C  
Project Manager  
swatchorn@cbiconsultinginc.com

# Section 2



## PRINCIPALS

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## SENIOR ASSOCIATE

ROBERT G. WILKIN

**TOWN HALL****EXISTING CONDITIONS ANALYSIS AND RECOMMENDATIONS**

CBI and our consultants have prepared this Conditions Assessment to outline the scope and extent of recommended repairs and replacements to various building components and materials, based on both their condition and historical integrity, regardless of the renovation and re-use options presented in other sections of this report. All building components were reviewed by visual inspection from the ground only. No exploratory investigations were made.

In accordance with the Massachusetts Preservation Projects Fund (MPPF) for development projects, the following building components were reviewed, and recommendations made. Where technically feasible, the Secretary of the Interior's Standards for the Treatment of Historic Properties should apply:

**Town Hall Exterior:****1. Roofing -**

- Historical Integrity: Entire Roof recently was replaced (7-8 years ago).
- Material: 3-tab Asphalt Shingles with underlayment over new plywood sheathing, and standing seam L.C.C. apron at the roof edge.
- Condition: Good. Roofing specified for 30 year manufacturer's warranty.
- Recommendations: Roofing appears to be in good condition and no repairs or replacements are anticipated at this time.

**2. Gutters and Downspouts -**

- Historical Integrity: Recently replaced (7-8 years ago).
- Material: L.C.C.; 8 inch half-round profile gutters and 6" x 4" rectangular downspouts
- Condition: Good
- Recommendations: Overall, the gutters and downspouts appear to be in good condition at this time, but some repairs are necessary to solder and reconnect separated components to make them water-tight.

**3. Flashings -**

- Historical Integrity: Recently replaced at roof edge (7-8 years ago). Head flashing above windows is visible.
- Material: L.C.C. and Aluminum Flashings at roof edge and rake.
- Condition: Good
- Recommendations: Flashings appears to be in good condition and no repairs or replacements are anticipated at this time.



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4. Chimney(s) -

- Historical Integrity: Original Chimney at front of building on the North Elevation. 1927 chimney near rear on the North Elevation.
- Material: Brick, with concrete cap.
- Condition: Both the Brick and the Mortar appear to be in good condition.
- Recommendations: None at this time.

5. Siding -

- Historical Integrity: New and original siding. Some recent replacement of siding at original exterior walls appears to have taken place during the repairs 7 - 8 years ago.
- Material: Wood clapboard siding, painted
- Condition: Fair
- Recommendations: Steel nails are showing rust through paint at head. Countersink nails, sand, prime and paint, and back-prime where replacements occur.

6. Paint Coating(s) -

- Historical Integrity: Existing paint appears to have been scraped at loose areas in 2008 when all exterior wood components that remained were last primed and painted.
- Material: Exterior Oil-Based Paint, specified as one coat pure linseed oil with pigment, and white exterior Alkyd Primer.
- Condition: Fair.
- Recommendations: Scrape and paint entire building. For best results, strip to bare wood and paint. An historical coatings analysis should be performed.

7. Caulking and Sealants -

- Historical Integrity: All sealants appear to be new from the building envelope work completed 7 -8 years ago.
- Material: Appears to be polyurethane sealant.
- Condition: Good
- Recommendations: Flashing and sealants at top and sides of the exterior ramp have open joints and should be flashed and sealed with silicone sealant to prevent water infiltration between the ramp and the building.

8. Trim -

- Historical Integrity: Most siding and trim, corner boards and casing appear to be original to the 1840 building and 1927 addition. Most wood components behind the newer gutters and corner boards at the addition appear to be newer.
- Material: Painted Wood.

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- Condition: Good. Some flaking paint where paint did not adhere well.
- Recommendations: Scrape and Paint areas needed for coverage (see item #6 above). Some trim is separated at roof and should be replaced to fit together and prevent water infiltration.

9. Windows -

- Historical Integrity: Decorative wood casing and sills on the North, West and South Elevations appear to be original, even the trim on window openings that are not original seem to either be carefully done to replicate the original detailing, or are salvaged components from windows that were removed during one of the renovations.
- Material: All windows are vinyl replacement windows
- Condition: Fair
- Recommendations: Remain as-is until which time they are due for replacement, replace with wood double-hung windows taking care to salvage any historic interior and exterior wood components that may be original.

10. Doors -

- Historical Integrity: None
- Material: Wood and metal
- Condition: Poor, paint failures
- Recommendations: Replace all exterior doors and frames with wood or aluminum-clad wood doors.

11. Foundations -

- Historical Integrity: Original to the time of construction. Some basement windows have been in-filled with CMU
- Material: Granite at original building limit and behind Fieldstone at South Elevation Ramp, Concrete at East addition elevations.
- Condition: Good
- Recommendations: None

12. Other - Exterior Ramp and Landings

- Historical Integrity: Fieldstone may be local. Ramp was installed in 1980's or 1990's
- Material: Fieldstone walls and concrete surface with steel railings and posts.
- Condition: Poor, with open / failing joints and loose stones at walls, damaged and rusting railing components, and spalled areas of concrete.
- Recommendations:

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### **Town Hall Interior:**

#### **1. Floor Plan -**

- Historical Integrity: See Floor Plan analysis included in this Report.
- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original walls.

#### **2. Staircases -**

- Historical Integrity: Front Stair was constructed in 1927 to replace the exterior stair. Rear Stair connecting First and Second floors was also constructed in 1927, but documents indicate it was not built to-code and re-constructed at a later date.
- Material: Stained wood treads, painted wood balusters, and painted vertical wainscoting between First and Second Floors at Front Stair.
- Condition: Good
- Recommendation: If required by Code, install code-compliant guards and rails connected to existing.

#### **3. Doors -**

- Historical Integrity: Only two interior doors appear to be original; one 5-panel door connecting the Great Hall on the Second Floor with the original Coat Room (now the Parks & Rec Office) which appears to have remained unaltered during all of the addition and renovations, and another 5-panel door that matches the first – in an opening made in 1927 at the First Floor Stairwell to the Basement. All other doors do not appear to have any historical significance.
- Material: Original doors are Wood
- Condition: Original doors are in Good Condition. Other doors vary in condition.
- Recommendation: Retain existing doors and hardware. If stairwell door must be retrofitted with code-compliant hardware, then consider removing door and installing in new location.

#### **4. Trim -**

- Historical Integrity: Trim on Exterior Walls are mostly original to the time of construction.
- Material: Wood, painted
- Condition: Good
- Recommendation: None. Retain existing components to the original building and 1927 addition/renovation.

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## 5. Walls -

- Historical Integrity: See Floor Plan analysis included in this Report for an indication of walls built during 1840 and 1927 construction.
- Material: Plaster finish on wood frame.
- Condition: Fair. Some walls, especially on the Second Floor, had been exposed to water damage from previous roof leaks, which appear to have been stopped.
- Recommendation: None. Retain existing components to the original building and 1927 addition/renovation.

## 6. Ceilings -

- Historical Integrity: Tin Ceiling exposed on Second Floor, concealed on First Floor.
- Material: Tin & Plaster
- Condition: Good. Some areas on the Second floor had been exposed to water from previous roof leaks, but they have been stopped.
- Recommendation: None. Retain existing components to the original building and 1927 addition/renovation.

## 7. Other -

- Mechanical, Electrical, Plumbing and Fire Protection: Refer to Garcia-Galuska-DeSousa reports.

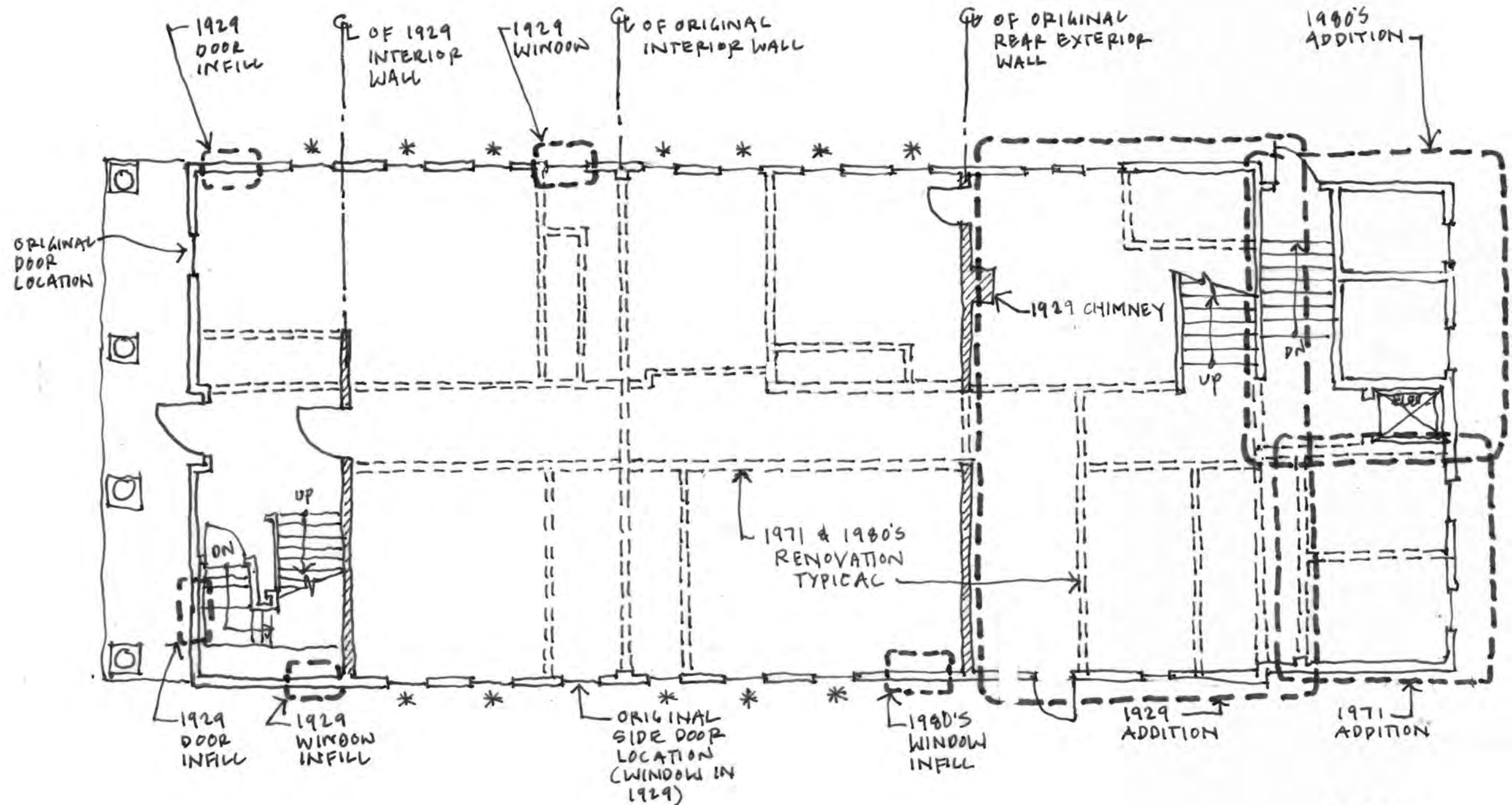
### Site:

#### 1. Site Drainage:

- Historical Integrity: Unknown. No historical data was obtained that indicated original or modified topographies or any site drainage structures.
- Material: Asphalt paving
- Condition: Poor. Refer to Nitsch Report
- Recommendation: Remove and re-pave according to site plan recommendations (see proposed Site Plan), and Civil Engineer's Recommendations (Refer to Nitsch Report).

SAW/ko  
16036 L002 Town Hall Conditions Assessment 06-10-16.docx





#### LEGEND

- \* = ORIGINAL WINDOW
- |||| = ORIGINAL INTERIOR WALLS
- = ORIGINAL EXTERIOR WALLS
- - - = 1971 & 1980'S RENOVATION WALLS

Historical Analysis Sketch  
Town Hall First Floor



## PRINCIPALS

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## SENIOR ASSOCIATE

ROBERT G. WILKIN

**FIELD REPORT #02**

**PROJECT:** Mendon Town Center – Mendon Town Hall  
**CBI JOB NO.:** 16036  
**BY:** Wayne R. Lawson, P.E. SECB, MCPPO  
**DATE:** June 10, 2016  
**CONTRACTOR:** N/A  
**SITE LOCATION:** Mendon, MA  
**WEATHER:** N/A  
**ATTENDEES:** Wayne R. Lawson, P.E., SECB, MCPPO

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**OBSERVATIONS**

CBI recently visited the site for the purpose of performing a limited structural due diligence of the existing building. Our review is limited solely to visual observations and no destructive investigation was completed as part of our site visit. We also reviewed structural engineering reports that were completed in 2005 by McGuire Group, Inc. and by MacLeod Consulting Inc. in 2008.

Each of these reports indicated failures/deficiencies of the existing original building roof framing and provide recommendations for repairs. Based on the MacLeod report it appears that the Maguire repair recommendations were in all likelihood implemented. Further, our field observations suggest that the MacLeod repair recommendations were implemented. However, CBI has not received documentation from the Town of Mendon concerning the construction contracts for this work or confirmation that all of the recommended repairs were completed.

In general the building appears to be in fair condition given its age. Our visual observations made from the ground indicate that there are apparent sags in the roof. According to the 2008 MacLeod Consulting Inc. report there were roof sags visible in 2008 and the repair recommendations included provisions for jacking up the trusses to alleviate the sag. However, CBI's current observations suggest that this jacking work was not completed. We also noted that there is one cracked roof purlin located near the front of the building. This member should be repaired or replaced.

The building is a two-story structure with a gable roof that is supported on a perimeter granite foundation wall. It appears that the structural framing for the floors consists of wood planks supported on rough sawn joists, beams, and posts with wood clapboard siding. The roof consists of wood planks supported on rough sawn wood purlins, beams, and timber trusses that span to the exterior walls.








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Town personnel advised CBI that there is a tripping hazard in the 1<sup>st</sup> floor corridor. We noted that red cones have been placed at this location and the carpet is lifted. There is no noticeable movement and the floor seems to be solid when subjected to foot traffic. Additional physical exploration is needed to evaluate whether or not this condition is the result of some underlying structural issue.

There is an exterior cast in place concrete ramp alongside the building that provides access from the parking lot to the main level near the rear of the building. It appears that this ramp was not original to the building and may have been added in conjunction with the elevator construction. We noted that there are areas of spalled concrete, deteriorated stone and corroded railings that require repairs to extend the life of this ramp system.

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**Mendon Town Center – Mendon Town Hall**  
**Photo Index**  
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Photo No.		Description
1		Existing roof appears to have visible sags.
2		Supplemental roof framing installed following 2008 report.
3		Supplemental roof framing installed following 2008 report.

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Field Report # 002  
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4		Cracked roof purlin that should be repaired.
5		Typical floor framing.
6		Dip in floor at 1 <sup>st</sup> floor level.

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7		Exterior ramp constructed adjacent to the original building.
8		Deteriorated concrete slab and stone wall at base of exterior ramp.

WRL/ko  
16036 Town Hall FR002 06-10-16

# Mendon Town Hall Campus Study Town Hall Photo Index CBI Job No.: 16036

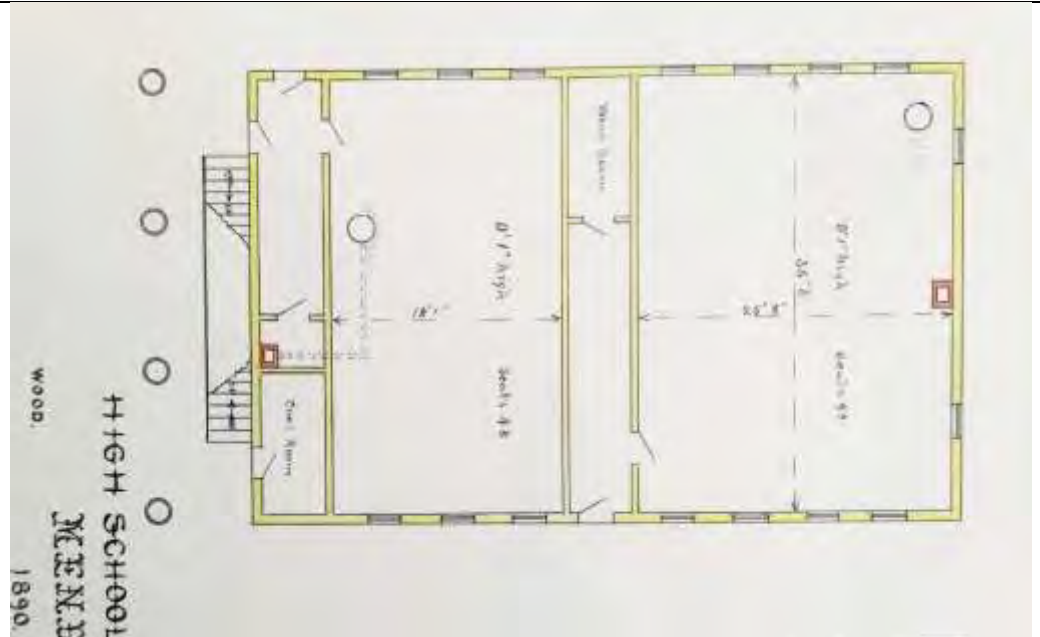
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WAYNE R. LAWSON

SENIOR ASSOCIATE:

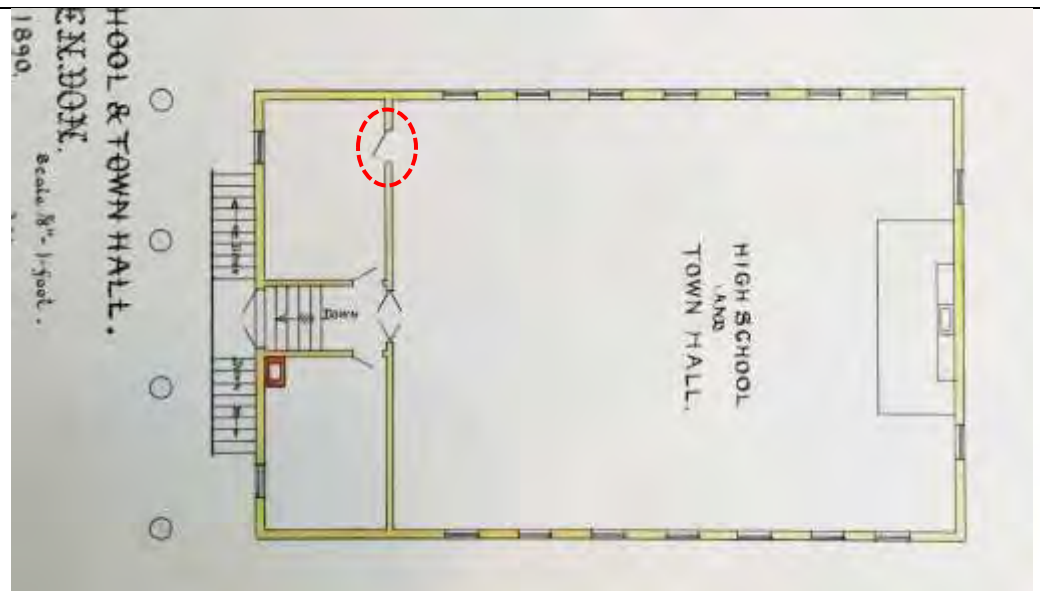
ROBERT G. WILKIN

1



An 1890 plan of the First Floor when it was used as a school shows the First Floor split into two equally sized rooms with separate entries, as was common when boys and girls were educated separately. The two chimneys (in red) no longer exist.

2



The same 1890 plan of the Second Floor with unaltered Great Room that was used at the time by Silas Dudley & Associates. Note the interior door which appears to be the only remaining original interior door. Also note the exterior stairs which are no longer extant.



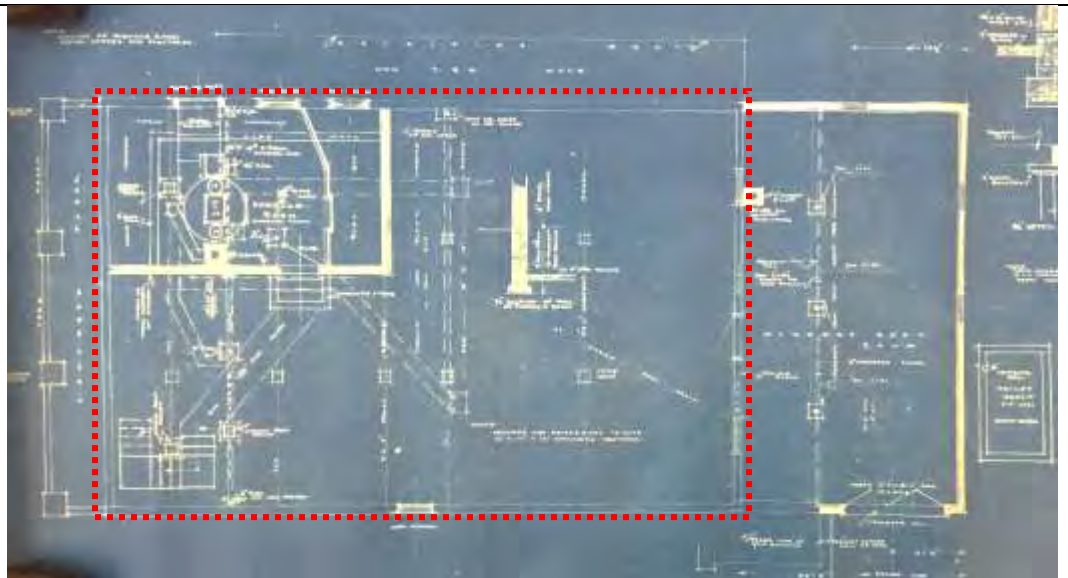
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3



A photo of the Town Hall before any major additions or renovations. Exterior stairs and doors (no longer extant) are seen at the Main Entry

4



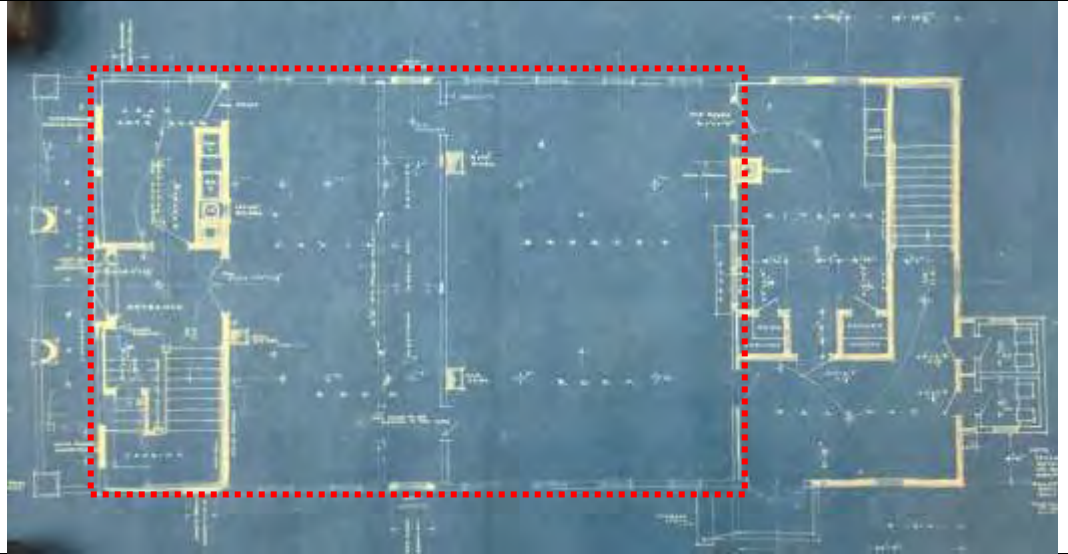
Blueprints from the 1929 addition/renovation kept at the State Archives building in Boston show the work to the Basement including new furnace room. The red outline depicts the original building footprint.



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CBI

5



Blueprints from the 1929 addition/renovation kept at the State Archives building in Boston show the work to the First Floor, including the interior front stair (the exterior stairway is gone), and stair addition and privies to the rear of the building. The red outline depicts the original building footprint.

6



A photo of the Town Hall, South Elevation, after the 1927 addition/renovation project, but prior to the more recent additions at the rear which replaced the shed roof addition seen in this photo. Where the existing Ramp is today appears to be a level sidewalk extending from the same side entry to the street.

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7



Town Hall, South Elevation; current conditions.

8



Town Hall, West Elevation; current conditions.



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9



Town Hall, North Elevation; current conditions.

10



Town Hall, East Elevation; current conditions.

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11



The roof was recently replaced, including new L.C.C. gutters and downspouts. The soffit, fascia and rake appear to be replacements. Paint failures are not throughout, but significant in areas.

12



The window casing on the side elevations are original, while windows are vinyl replacements.



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CBI

13



Replacement siding appears to have been installed in various areas, new and old. The siding was installed using steel nails, which are now beginning to show rust through the paint. This will eventually lead to premature failure of the paint around the nail.

14



The exterior ramp with side walls of fieldstone. The original granite foundation can still be seen.

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The ramp is in poor condition and should be repaired, including the fieldstone walls, the railings and guardrails, and the concrete slab.

16



The First Floor Corridor is narrow, dark, un-inviting, and not reminiscent of the building's history.



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17



The Second Floor, by contrast to the First, has many original components, including the exposed tin ceiling, plaster walls, and wood floor and painted trim.

SAW/ko  
16036 Photo Index 6-02-2016.docx

Town of Mendon – Facility Master Plan  
Mendon, MA  
Plumbing Existing Conditions Systems Report – Town Hall  
J#385 012 00.00  
L#51682/ Page 1/June 3, 2016

## **MENDON TOWN HALL - PLUMBING**

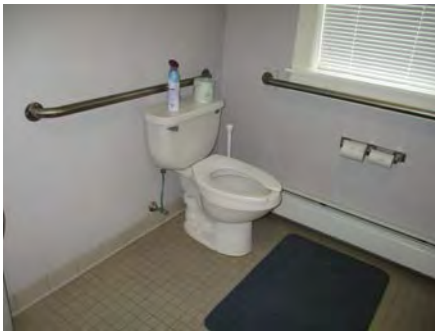
Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system. Building is served by on-site well water and septic system.

### **Fixtures:**

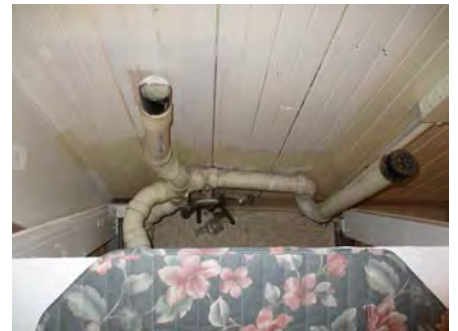
Water closets are generally floor mounted, tank type, vitreous china.

Lavatories are wall hung vitreous china with hot and cold water handles. Lavatories do not have mixing valves.

There appears to have been a drinking fountain on the First Floor. Roughing is capped at wall.



*Upper Level toilet fixtures*



*Capped piping for drinking fountain*

### **Water System:**

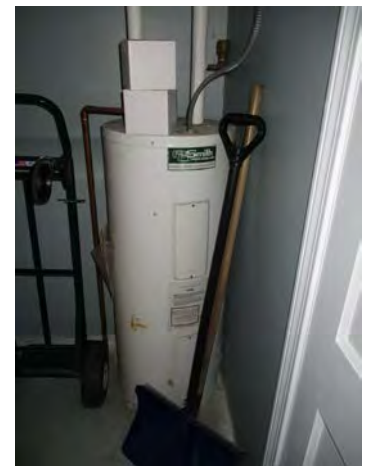
The domestic water service enters the first floor. Building is served by an on-site well.

Piping is copper tubing with sweat joints. Majority of the piping is insulated. In general, the piping appears to be in good condition

The domestic water heater was generated through a tank type electric water heater. There is no mixing valve or expansion tank. Unit is in poor condition.

### **Drainage System:**

In general, cast iron is used for sanitary drainage. Piping and fittings above slab are hub and spigot joints. Where visible, the cast iron pipe appears to be in poor to fair good condition.



*Electric water heater*

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**Plumbing Fixture Requirements:**

- Based on B use group occupancy, required plumbing fixtures are as follows:

Female toilets = 1 per 20

Male toilets = 1 per 25 (33% of toilets required may be urinals)

Lavatories = 1 per 50 each sex

Drinking Fountains = 1 per floor

Service Sink = 1 per floor

**RECOMMENDATIONS:**

Priority #2 - Code

- Provide accessible drinking fountain on each floor.

Priority #4 – Energy Savings

- Provide high efficiency low flow fixtures to reduce water consumption.
- Provide new water heater with mixing valve and expansion tank.

**COST ESTIMATE:**

- New accessible drinking fountain = \$4,000
- New bathroom Fixtures = \$4,000 per fixture
- New water heater = \$8,000

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## **MENDON TOWN HALL - FIRE PROTECTION**

### **Executive Summary**

The Building does not contain an automatic sprinkler system.

The building is not supplied by Municipal water. Building is serviced by on-site well water.

Installation of fire sprinkler systems are required per Massachusetts General Law M.G.L. Chapter 148 Section 26G in existing buildings subject to major renovations or building additions when gross square feet floor area exceeds 7,500 square feet. A major alteration can be defined as a reconfiguration of walls, doors, windows, mechanical systems, etc., which effectively makes installation of sprinkler systems easier and which affects more than 33% of the building area or more than 33% of the assessed value of the building. Buildings for which sufficient water flow and pressure does not exist are exempt. Proposed scope will need to be reviewed with Town code officials.

The existing Town Hall is greater than 7,500 square feet. Should a major renovation or an addition be constructed then a fire suppression may be required throughout the existing building and its addition.

As the site is not supplied by Municipal Water, an on-site storage tank and fire pump will be required.

New fire suppression system cost= \$6.50 per square feet.

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## **MENDON TOWN HALL - HVAC**

### **Executive Summary**

The Town Hall building has received average maintenance on the heating system and equipment over the years. The heating system presently installed is not original to the building, the boiler plant and several terminal pieces of equipment have been upgraded and are currently functioning properly. We recommend a ventilation/cooling system be provided and the buildings controls be completely upgraded.

### **Heating, Ventilation and Air Conditioning System**

The original heating plant has been modified and replaced with two Buderus cast iron sectional boilers with Beckett burners. The system generates heating hot water and supplies heat to the entire building through wall mounted fin tube radiation and cast iron radiators. The boiler plant operates on No.2 fuel oil, the site does not have any natural gas. Fuel oil is stored on site within the boiler room, there are two 275 gallon residential style fuel oil tanks utilized. The vent and fill lines travel from the tanks to the exterior utilizing schedule 40 black steel. Both these boilers and associated pumps and zone valves were installed approximately three years ago and all appear to be in good condition. The piping system utilized throughout the building is copper and is insulated with fiberglass insulation. The piping system appears to be in good condition however, several section of piping should be removed and reviewed to determine the internal condition of the piping. There were several sections of piping where insulation was missing, these locations should be identified and insulation provided. Combustion gases generated from the boilers exhaust to an existing masonry chimney through a galvanized sheet metal breeching system. The hot water system circulates water throughout the building through the use of inline Taco pumps. There are approximately five system pumps and two boiler circulator pumps. All these pumps were recently installed and in good condition. Each pump appears to serve several zones, each zone is provided with a zone Taco valve. Each one of these zone valves are associated with an individual space and is controlled through the space's wall mounted thermostat. Therefore each space is provided with individual temperature control. The hot water system utilizes a floor mounted vertical expansion tank which is used to eliminate any air within the system. Combustion air for both boilers is provided through a wall mounted energy recovery unit, the manufacture is Fantech. This unit is provided with insulated flexible ductwork which travels from the unit to the outdoors and is equipped with an energy recovery section. Return air for the unit is being drawn from the adjacent corridor therefore providing outside air to the boilers for their combustion process. Both boilers are provided with all operating and safety controls.



*Existing Boiler*



*Non-Insulated Piping*



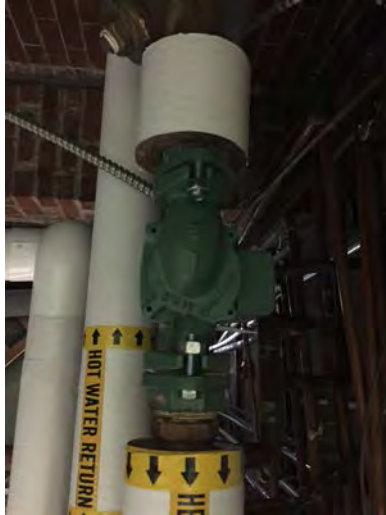
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*Typical Inline Pump*



*Boiler Breeching*



*Existing Fuel Tank*



*Typical Zone Valve*



*Combustion Air Fan*

The hot water that is generated from the main boiler plant is distributed throughout the building which feeds the entire building. The basement level consists of the original cast iron radiators and supplemental electric heaters. These radiators and spaces are not provided with individual temperature control. The first

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and second floors are provided with fin tube radiation. The fin tube is typically located within each office space. Control of the fin tube are wall mounted thermostats which are connected to the zone valves within the boiler room. There is a records room located on the first floor which consist of a vertical floor mounted cooling unit which has no distribution system and basically freely blows air into the space. This unit prevents the room from overheating however the unit is inadequate and does not provide any controllability of the spaces humidity levels. We would recommend a new critical applications unit for this space which would provide temperature and humidity control.



*Typical Cast Iron Radiator*



*Typical Fin Tube Radiation*



*Vertical Cooling Unit*



*Typical Exposed Fin Tube*

Currently the building is not provided with any mechanical ventilation, the operable windows within the building are used for ventilation purposes. However, the current building layout has created interior spaces that do not communicate with any windows therefore this condition is not code compliant. We would recommend that a new ventilation system be provided for the entire building. The unit would be provided with energy recovery, heating and cooling components to ensure the discharge air is tempered and dry.

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There is no actual cooling plant provided for the building however, ductless split cooling units are provided within the basement level which is now temporarily occupied by the police station. There are a total of two outdoor condensers which communicate with the indoor units. The systems are manufactured by Daikin and are in good working condition. On the other levels window air conditioners are utilized for cooling purposes.



*Typical Ductless Cooling Unit*



*Typical Outdoor Condenser*

### **Temperature Controls**

The automatic temperature control system is a standalone electronic system. It utilizes Lux thermostats which are connected directly to the space's hot water zone valve located in the boiler room. Throughout the building within each space there is a wall mounted standalone thermostat which controls the heating component within that space. There are also electric unit heaters which have their own unit mounted thermostats for temperature control. There is one Honeywell thermostat within the building which appears to control the on/off operation of the boiler plant. This thermostat is a programmable thermostat therefore it offers a scheduling feature for each day of the week. The overall control system is functioning however, a new complete direct digital control system would offer much better temperature control and allow for troubleshooting and web access to all the building components.



*Typical Zone Thermostat*

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**Exhaust Systems**

The building does not have any general exhaust systems. There are no roof mounted exhaust fans as well. All toilet rooms utilize operable windows for ventilation purposes. If any modifications are done to the building then exhaust systems will be required per code specifically for toilet rooms and janitor closets.

**RECOMMENDATIONS:**

The following is our professional opinion on what recommendations could help in improving, overall system performance, temperature controllability and energy savings,

**Priority #1 – Health and Safety**

- Indoor air quality is poor
  - Cost – See Second Bullet Item Under Priority #4.

**Priority #2 – Code Violations**

- Provide insulation on all un-insulated hot water piping.
  - Cost: \$4.00/l.f.

**Priority #3 – Maintenance**

- Service existing boilers and pumps annually.
  - Cost \$3,500

**Priority #4 – Comfort**

- Replace Cast iron radiators with new wall mounted fin tube radiation.
  - Cost \$2,500/radiator
- Provide a new 100% outside air ventilation system with energy recovery, hot and cooling sections and MERV 13 filters. This system would be associated with a new galvanized sheet metal duct distribution system and would serve all floors.
  - Cost \$100,000
- Provide a new direct digital control system and connect to a town wide building management system with web access and alarm notifications.
  - Cost \$60,000



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- Provide general exhaust systems for storage and toilet rooms for improved indoor air quality.
  - Cost \$7,000

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## **MENDON TOWN HALL - ELECTRICAL**

### **Executive Summary:**

Generally, the existing electrical systems are in fair condition, lighting is not the most energy efficient, and the fire alarm system does not provide complete coverage. The entire power distribution system and life safety system should be replaced with new systems.

### **Electrical Distribution System:**

The secondary service originates on a utility company pole where it runs overhead to a utility company meter located in the building.

The service consists of a 400 Amp main breaker panel adjacent to the meter located in a closet off of the office on the second floor. The main panel is manufactured by Westinghouse, and is 120/240V, 1 phase, 3 wire.



*Overhead Service Weather-head*



*Utility Pole*



*Meter*



*Main Breaker Panel*

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There is a manual transfer switch adjacent to the meter with a portable generator hook-up outlet located on the exterior of the building. A sub-panel is located in a closet on the first floor.



*Manual Transfer Switch*



*Sub-Panel*

### **Exterior Lighting System:**

Exterior lighting consists of HID wall packs located above the doors. These fixtures are not the cut-off type.



*Wall Pack*



*Wall Pack*

### **Interior Lighting:**

Corridor lighting consists of prismatic fixtures with (3) T8 lamps and electronic ballasts. Lighting is locally switched.

Other corridor lighting generally consists of surface bowl type fixtures with screw-in fluorescent lamps. Fixtures are locally switched.

The Great Hall has a pendant paddle fan with a light fixture attached to the bottom of the fan.

Most office lighting generally consists of recessed 2'x4', 18 cell parabolic fixtures with (3) T8 lamps and recessed 2'x2' prismatic fluorescent fixtures. Offices are generally controlled with a single switch including perimeter offices. Offices are generally well lit.

Storage lighting consists of recessed 1'x4' fixtures with acrylic lens with T8 lamps and electronic ballasts.

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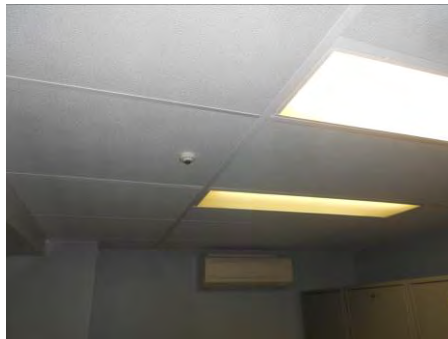
Stair lights are wall mounted, 1'x4', 2 lamp wraparound fixtures located at intermediate landings. Stair lights are controlled with one switch at the first floor landing.



*Paddle Fan w/ Light Fixture*



*Bowl Type Fixture*

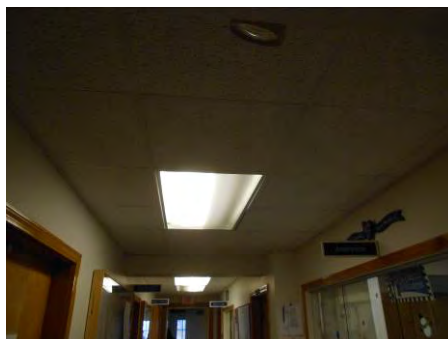


*Recessed 1' x 4' Fixture*

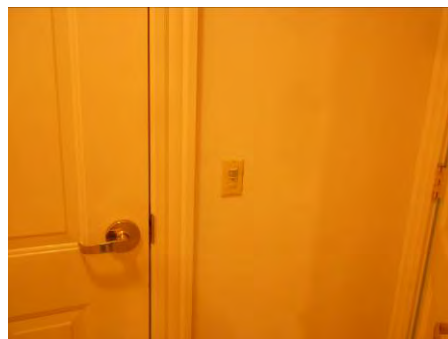


*Recessed 2' x 2' Fixture*

Toilet Rooms have occupancy sensor type switches.



*Recessed 2' x 4' Fixtures*



*Occupancy Sensor Switch*



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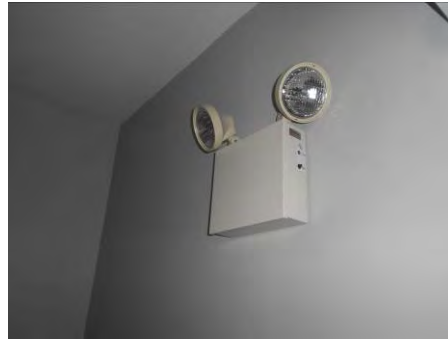
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**Emergency Stand-by System:**

The Emergency Stand-by System is provided with self-contained battery units. Most units are the exit sign and emergency light combination type.



*Exit and Emergency Light*

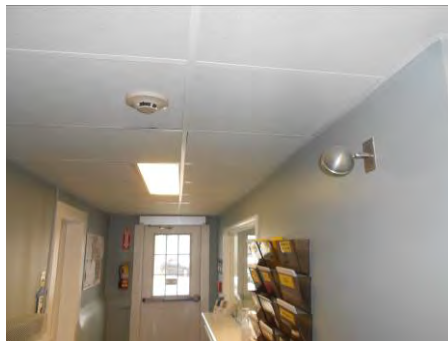


*Emergency Battery Unit*

**Fire Alarm System:**

The fire alarm system consists of a Fire-Lite, Fire Alarm Control Panel (FACP) located in the first floor entry lobby. Horn/strobes are not of the ADA type. There is inadequate coverage of horn/strobes and smoke detectors.

Pull stations are located at the exits.



*Smoke Detector*



*FACP*

Generally, there are smoke detectors in the corridors and in large areas.

The Great Hall has no pull stations or horn/strobes.

Toilet and Conference Rooms have no strobes.

There is a key repository box (knox box) located at the front exterior door.

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*Pull Station*



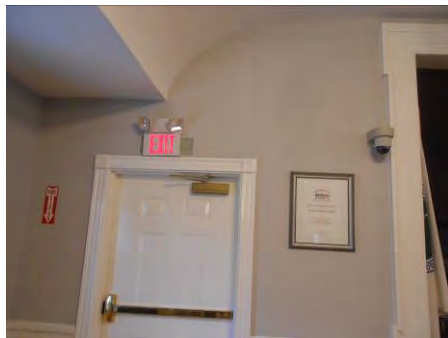
*Horn/Strobe*

**Miscellaneous:**

There is a CCTV System located in the Great Hall with headend equipment located in the corner of the room.

Duplex receptacles are sparsely located within most office areas.

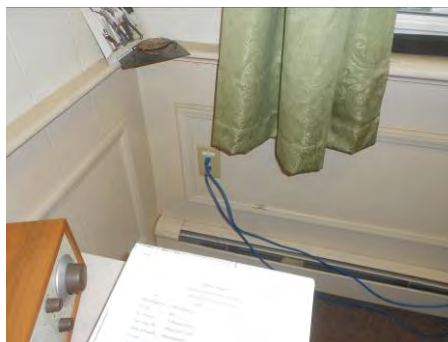
Data wiring consists of category 5 cabling. One (1) voice and one (1) data provided in most offices.



*CCTV Camera*



*CCTV Headend Equipment*



*Data Jack*



*Receptacle*

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**Recommendations:**

Priority #1 – Safety

- Fire alarm system should be replaced with a new addressable, ADA, code compliant system.
  - Cost: \$30,000.00

Priority #3 – Maintenance

- The power distribution system upgrade with a new secondary main service housed in a dedicated electric room. A system of new panelboards to be provided throughout the building.
  - Cost: \$15,000.00

Priority #4 – Energy Savings

- Exterior building mounted fixtures of the LED and cut-off type to be provided and connected to emergency battery back-up power. Fixtures should be controlled with photocell ON, timeclock OFF.
  - Cost: \$5,000.00
- Provide ceiling mounted occupancy sensors in offices/work spaces to turn lights OFF.
  - Cost: \$3,000.00

Priority #5 - Optional

- Additional receptacles to be provided in offices with dedicated neutrals for computer usage.
  - Cost: \$5,000.00
- An exterior generator may be provided if the building is desired to operate during a power loss. (Approx. 60 kW)
  - Cost: \$60,000.00



## PRINCIPALS

CRAIG E. BARNES  
MICHAEL S. TELLER  
WAYNE R. LAWSON

## SENIOR ASSOCIATE

ROBERT G. WILKIN

**UNION CHAPEL (FORMER TAFT LIBRARY) – 1896; no additions****EXISTING CONDITIONS ANALYSIS AND RECOMMENDATIONS**

CBI and our consultants have prepared this Conditions Assessment to outline the scope and extent of recommended repairs and replacements to various building components and materials, based on both their condition and historical integrity, regardless of the renovation and re-use options presented in other sections of this report. All building components were reviewed by visual inspection from the ground only. No exploratory investigations were made.

In accordance with the Massachusetts Preservation Projects Fund (MPPF) for development projects, the following building components were reviewed, and recommendations made. Where technically feasible, the Secretary of the Interior's Standards for the Treatment of Historic Properties should apply:

**Union Chapel Exterior:****1. Roofing -**

- Historical Integrity: Existing roofing is not original
- Material: Asphalt shingle
- Condition: Poor
- Recommendations: Replace roofing in its entirety.
  - New Asphalt Shingle Roof and Underlayment

**2. Gutters and Downspouts -**

- Historical Integrity: None are original
- Material: Aluminum
- Condition: Poor
- Recommendations: Replace all gutters and downspouts.
  - New Gutters and Downspouts

**3. Flashings -**

- Historical Integrity: Original head flashings above windows
- Material: Various
- Condition: Good
- Recommendations: Replace flashings at roof.
  - Edge Metal, Step and Cheek Wall Flashings at Roof

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4. Chimney(s) -

- Historical Integrity: Original chimney remains
- Material: Brick
- Condition: Good
- Recommendations: None

5. Siding -

- Historical Integrity: Appears to be all original: clapboard siding, shingles at belfry and upper gable ends.
- Material: Wood, painted
- Condition: Good, but paint coverage is limited. Some of the shingles on the belfry are missing or damaged
- Recommendations: Replace shingles to match, and paint, see item #6 below
  - 10% Shingle and Siding Replacement

6. Paint Coating(s) -

- Historical Integrity: Not likely original
- Material: on wood
- Condition: Poor
- Recommendations: Scrape and paint entire building. For best results, strip to bare wood and paint. An historical coatings analysis should be performed at the original building.

7. Caulking and Sealants -

- Historical Integrity: Unknown
- Material: Unknown
- Condition: Poor
- Recommendations: Replace all sealants at window and door perimeters

8. Trim -

- Historical Integrity: Appears to be original
- Material: Wood, painted
- Condition: Good, but paint coverage is limited
- Recommendations: Paint, see item #6 above

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9. Windows -

- Historical Integrity: Original single-pane double-hung with newer aluminum storms
- Material: Original Wood Windows
- Condition: Fair
- Recommendations: Remove, repair, re-glaze and reinstall with new ropes. Replace storms with historic aluminum.

10. Doors -

- Historical Integrity: Front Door appears to be original. Side door is not.
- Material: Original Wood
- Condition: Good
- Recommendations: Paint and re-glaze. Replace side door with wood door and insulated glazing.

11. Foundations -

- Historical Integrity: Original exposed
- Material: Fieldstone
- Condition: Fair
- Recommendations: Re-point all fieldstone with historic mortar to match existing.

**Union Chapel Interior:**

1. Floor Plan -

- Historical Integrity: The building remains mostly unaltered except for the built-ins associated with the library.
- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original walls. The carpet should be removed on the upper level and the original wood floor sanded and refinished.

2. Staircases -

- Historical Integrity: Original construction
- Material: Wood
- Condition: Code compliance issues
- Recommendation: Refer to Code Report

3. Doors -

- Historical Integrity: Upper Floor appear to be original
- Material: Wood



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- Condition: Good
  - Recommendation: None. Retain existing components to the original building
4. Trim -
- Historical Integrity: Most trim at windows, floor and ceiling are original. Trim associated with library shelving is not.
  - Material: Wood, painted
  - Condition: Good
  - Recommendation: None. Retain existing components to the original building
5. Walls -
- Historical Integrity: Original
  - Material: Plaster
  - Condition: Good
  - Recommendation: None. Retain existing components of the original building. All walls should be painted where bookshelves are removed.
6. Ceilings -
- Historical Integrity: Original
  - Material: Plaster
  - Condition: Good
  - Recommendation: Retain existing components of the original building.
7. Other -
- Mechanical, Electrical, Plumbing and Fire Protection: Refer to Garcia-Galuska-DeSousa reports.

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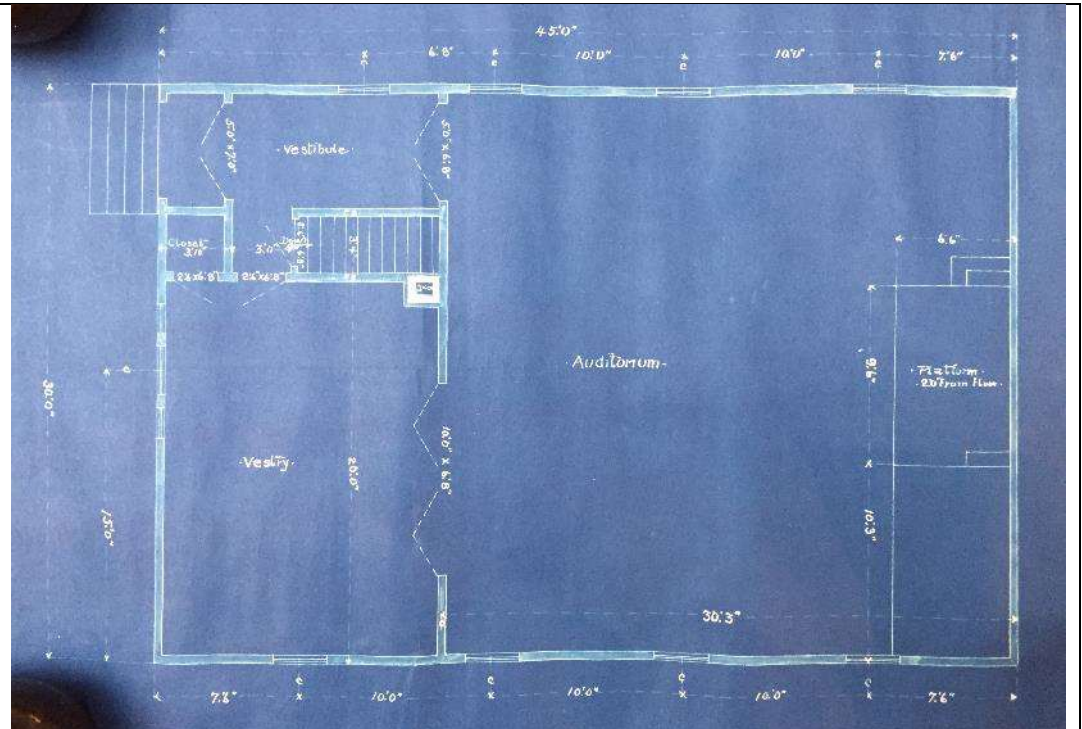
PRINCIPALS:

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**WAYNE R. LAWSON**

SENIOR ASSOCIATE:

**ROBERT G. WILKIN**

1



Blueprints from the original construction kept at the State Archives building in Boston show the First Floor design.

2



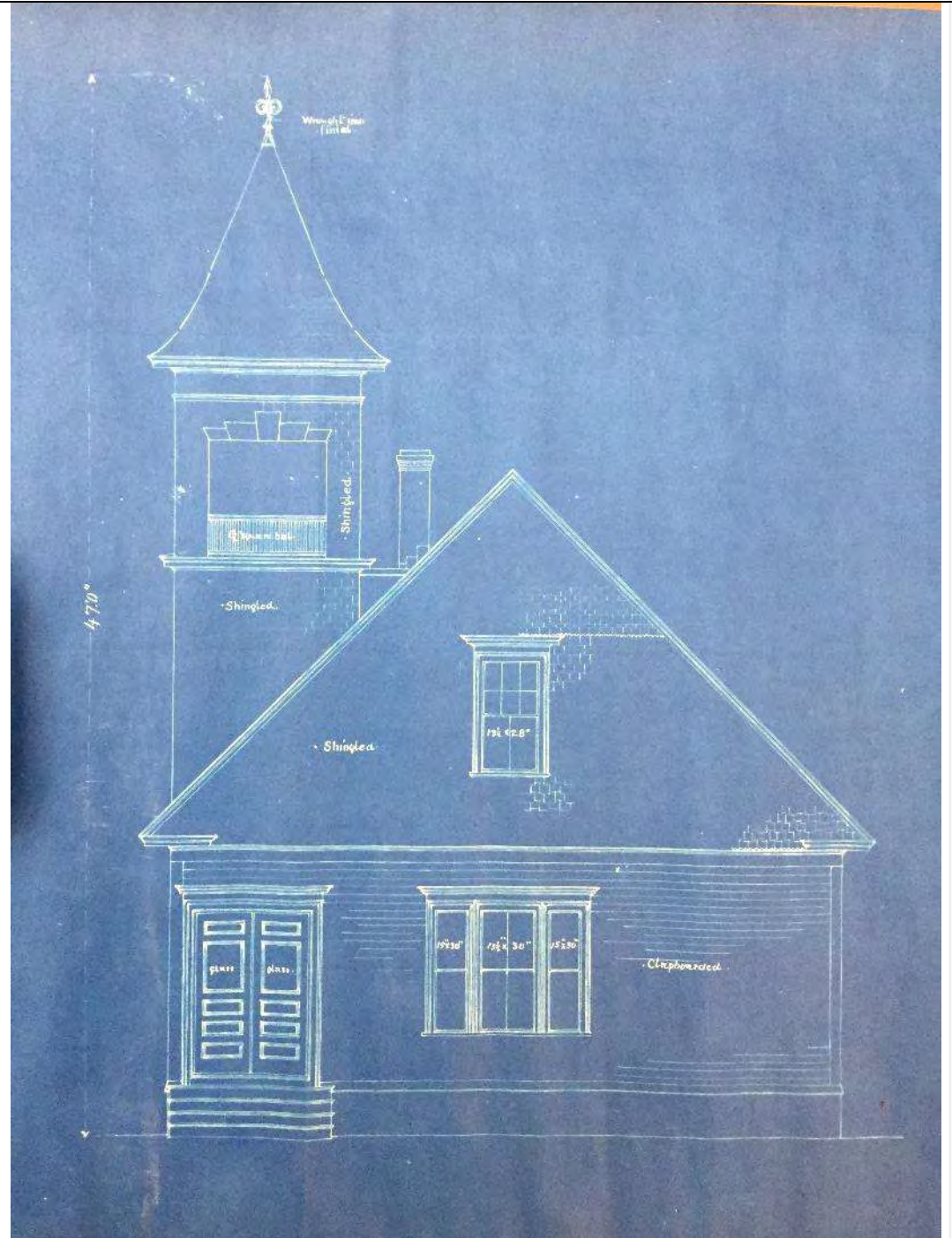
A photograph of the former Taft Library before it was re-painted in different colors.



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3



Blueprints from the original construction kept at the State Archives building in Boston show the front elevation design.



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Union Chapel, West Elevation; current conditions.

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Union Chapel, South Elevation; current conditions.



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Union Chapel, East Elevation; current conditions.

7



Union Chapel, North Elevation; current conditions.



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8



The belfry. A leak was patched with ice & water shield on the roof and cheek wall where the roof meets the belfry wall.



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9



The roof is in need of being replaced. All flashing should be replaced as well.

10



The belfry railings and walls are in poor condition. The access hatch should be made watertight.

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Aluminum gutters should be replaced along with the roof. The wood trim should be repaired and painted.

12



The siding is in good condition but the trim and window casing should be repaired and painted.



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First Floor interior.

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The chandelier in the photo above is the same as the one in photo #13.

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The Lower Level exit door is seen here. The books have been removed but shelves remain.



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The stair connecting the two levels is not code-compliant. Also, because of its proximity to the Main Entry above, the Upper Level doesn't have two remote exits.

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 16036 L005 Union Chapel Photo Index 6-10-2016

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## **UNION CHAPEL - PLUMBING**

Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system.

### **Fixtures:**

There is one bathroom located on the lower floor. Water closet is floor mounted, tank type, vitreous china. Urinal is wall hung vitreous china with manual flush valve. Lavatory is wall hung vitreous china with hot and cold water handles. Lavatories do not have mixing valves.



*Lower level plumbing fixtures*

### **Water System:**

The domestic water service enters the lower level. Building is served by an on-site well.

Piping is copper tubing with sweat joints. The majority of piping is not insulated. In general, the piping appears to be in good condition.

The domestic water heater is generated through a tank type electric water heater. There is no mixing valve or expansion tank.



*Electric water heater*

### **Drainage System:**

In general, cast iron is used for sanitary drainage. Piping and fittings above slab are no-hub with coupling joints. Where visible, the cast iron pipe appears to be in good condition. Waste piping at sink is PVC.

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**Plumbing Fixture Requirements:**

- Based on A use group occupancy, required plumbing fixtures are as follows:

Female toilets = 1 per 50

Male toilets = 1 per 100 (50% of toilets required may be urinals)

Lavatories = 1 per 200 each sex

Drinking Fountains = 1 per floor

Service Sink = 1 per floor

**RECOMMENDATIONS:**

Priority #2 - Code

- Provide dedicated men's and women's accessible plumbing fixtures. Provide with high efficiency low flow fixtures to reduce water consumption.
- Provide mixing valve at lavatories to prevent scalding.
- Insulate all domestic water piping.

Priority #3 – Maintenance

- Install mixing valve and expansion tank on domestic water system.

**COST ESTIMATE:**

- New bathrooms = \$30,000
- New water heater accessories = \$5,000
- Insulate Piping = \$2,000

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## **UNION CHAPEL - Fire Protection**

### **Executive Summary**

The Building does not contain an automatic sprinkler system.

The building is not supplied by Municipal water. Building is serviced by on-site well water.

Installation of fire sprinkler systems are required per Massachusetts General Law M.G.L. Chapter 148 Section 26G in existing buildings subject to major renovations or building additions when gross square feet floor area exceeds 7,500 square feet. A major alteration can be defined as a reconfiguration of walls, doors, windows, mechanical systems, etc., which effectively makes installation of sprinkler systems easier and which affects more than 33% of the building area or more than 33% of the assessed value of the building. Buildings for which sufficient water flow and pressure does not exist are exempt. Proposed scope will need to be reviewed with Town code officials.

The existing building is less than 7,500 square feet. Should an addition be constructed to the building and the gross floor area of the exiting building and addition combined exceeds 7,500 square feet then a fire suppression may be required throughout the existing building and its addition.

As the site is not supplied by Municipal Water, an on-site storage tank and fire pump will be required.

New fire suppression system cost= \$6.50 per square feet.



Town of Mendon – Facility Master Plan  
Mendon, MA  
HVAC Existing Conditions Systems Report – Union Chapel  
J#385 012 00.00  
L#51678/ Page 1/April 8, 2016

## **UNION CHAPEL - HVAC**

### **Executive Summary**

The former Taft Library building has received average maintenance on the heating system and equipment over the years. The heating system presently installed is not original to the building, the forced hot air furnace has been upgraded and is currently functioning however, controllability and comfort are minimal. We recommend a separate indoor unit for each floor to provide code required heating, ventilation and cooling capabilities and provide a direct digital control system for adequate temperature control and comfort.

### **Heating, Ventilation and Air Conditioning System**

The heating and air conditioning system for this building consists of an indoor oil fired air handling unit with direct expansion cooling. The system is associated with a galvanized sheet metal duct distribution system which travels throughout the building to the first and second floors. Most of the ductwork is insulated however, there are several sections of ductwork within the closet space that are not insulated, this should be corrected. The air handling unit, manufactured by Thermo Pride is equipped with a Riello burner which utilizes No.2 fuel oil which is stored within the adjacent residential style 275 gallon storage tank. The unit and the tank is located in a closet space/room, the tank's vent and fill line exit the building and terminate at the exterior wall. The unit creates combustion gases that are forced to exit the building with the help of a fan inducer located on the unit. These gases exit the building through the use of a galvanized sheet metal flue which enters the existing masonry chimney and travels upward and terminates above the chimney with a rain cap. This same unit supplies the air conditioning for the entire building, the unit is supplied with an "A" frame direct expansion cooling coil which is associated with the outdoor condenser. The unit appears to be equipped with a controller which operates zone dampers within the ductwork, these zones would appear to be the first and second floors of the library. It is uncertain as to whether or not this controller and associated zone dampers are functioning properly. This controller also monitors and controls the air purification filter system that is equipped on the return air side of the unit. The unit is equipped with all safety controls and is code compliant.



*Typical Ceiling Grille*



*Typical Wall Grille*

Town of Mendon – Facility Master Plan

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HVAC Existing Conditions Systems Report – Union Chapel

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*Indoor Air Handling Units*



*Un-Insulated Duct*



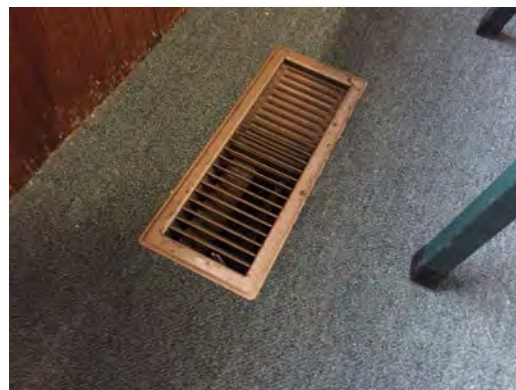
*Typical Ductwork*



*Unit Breeching*



*Fuel Oil Tank*



*Typical Floor Grille*

Town of Mendon – Facility Master Plan

Mendon, MA

HVAC Existing Conditions Systems Report – Union Chapel

J#385 012 00.00

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Currently the building is not provided with any mechanical ventilation, the operable windows within the building are used for ventilation purposes. We would recommend that a new ventilation system be provided for the entire building. The ductwork system would be located within the attic space and terminate at the second floor through ceiling mounted diffusers, as for the first floor several duct mains could be installed within a chase which would travel down to the first floor and terminate with wall mounted grilles. The unit would be provided with energy recovery, heating and cooling components to ensure the discharge air is tempered and dry.

### **Temperature Controls**

The automatic temperature control system is a standalone electronic system. It utilizes a Maple Chase thermostat which is connected directly to the unit and is located on the wall near the return air system. There is only one thermostat for the building, this provides uneven temperatures between downstairs and upstairs. The thermostat is a programmable thermostat therefore it offers a scheduling feature for each day of the week. The overall control system is functioning however, a new complete direct digital control system would offer much better temperature control and allow for troubleshooting and web access to all the building components.



*Thermostat*

### **Exhaust Systems**

The building does not have any general exhaust systems. There are no roof mounted exhaust fans as well. All toilet rooms utilize operable windows for ventilation purposes. If any modifications are done to these specific areas in the building then exhaust systems will be required per code specifically for toilet rooms and janitor closets.

Town of Mendon – Facility Master Plan

Mendon, MA

HVAC Existing Conditions Systems Report – Union Chapel

J#385 012 00.00

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**RECOMMENDATIONS:**

The following is our professional opinion on what recommendations could help in improving, overall system performance, temperature controllability and energy savings,

**Priority #1 – Health and Safety**

- Indoor air quality is poor
  - Cost – See Second Bullet Item Under Priority #4.

**Priority #2 – Code Violations**

- Provide insulation on all exposed and un-insulated ductwork if the existing unit remains.
  - Cost: \$4.00/s.f.

**Priority #3 – Maintenance**

- Service existing indoor air handling unit prior to start up if the unit remains.
  - Cost \$1,000

**Priority #4 – Comfort**

- Provide individual zone control for the first and second floor with interconnecting control wiring from the zone dampers to the existing unit. This should be provided if the existing unit remains.
  - Cost \$5,000
- Provide two new heating, ventilation and air conditioning system with energy recovery, heating and cooling sections and MERV 13 filters. This system would be associated with a new galvanized sheet metal duct distribution system and would serve the first and second floors.
  - Cost \$80,000
- Provide a new direct digital control system and connect to a town wide building management system with web access and alarm notifications.
  - Cost \$20,000
- Provide general exhaust systems for storage and toilet rooms for improved indoor air quality.
  - Cost \$4,000



Town of Mendon – Facility Master Plan  
Mendon, MA  
Electrical Existing Conditions Systems Report – Union Chapel  
J#385 012 00.00  
L#51674/Page 1/June 3, 2016

## **UNION CHAPEL – ELECTRICAL**

### **Executive Summary:**

Generally, the electrical systems are in fair condition. All interior and exterior lighting should be replaced with energy efficient LED type. A new fire alarm should be provided and occupancy sensors provided where possible.

### **Electrical Distribution System:**

The secondary service originates on a utility company pole where it runs overhead to a utility meter mounted on the exterior of the building. A 100 ampere, 2 pole main breaker load center exists in the Storage Room. The voltage is 120/240 volts, single phase, 3 wire. The load center was manufactured by Westinghouse and is in good condition.



*Overhead Service*



*Main Breaker Panel*

The wiring method is generally nonmetallic-sheathed cable (Romex) and in some instances runs exposed in finished spaces where it may be subject to damage and become a safety hazard. Exposed Romex needs to be replaced with concealed wiring.



*Wiring*

Town of Mendon – Facility Master Plan

Mendon, MA

Electrical Existing Conditions Systems Report – Union Chapel

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### **Exterior Lighting:**

The exterior lighting consists of building mounted flood lights, wall packs, and surface mounted fixtures with an incandescent lamp at the front entrance. Lighting is switch controlled from the vestibule.



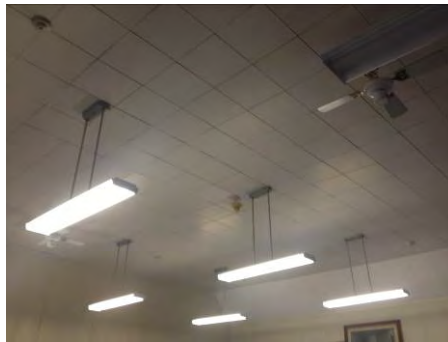
*Exterior Lighting*



*Surface Fixture*

### **Interior Lighting:**

Interior lighting in the main area consists of pendant mounted wrap-around fixtures.



*Pendant Fixture*

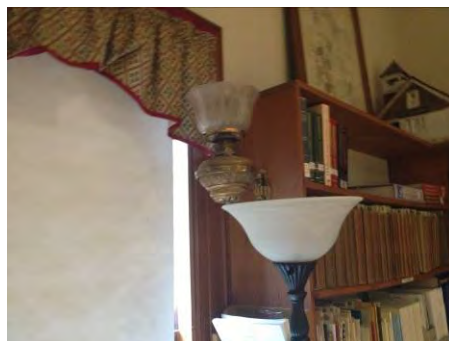


*2'x4' Recessed Fixture*

Some track lights are provided throughout the building with a few wall sconces.



*Track Lighting*



*Wall Sconce*

Town of Mendon – Facility Master Plan  
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**Fire Alarm System/Security:**

A control panel exists in the storage room with provisions to be connected to a remote central station. A security keypad exists in the vestibule.



*Key Pad*



*Fire/Security Panel*

Smoke detectors are provided throughout the building. No horn/strobes were noted in the facility. Fire alarm system does not meet current code requirements.

Low energy cable used for security/fire alarm.

**Miscellaneous:**

Some receptacles are not of the grounding type.

Wall mounted data rack is provided in the office.



*Data Rack*

Town of Mendon – Facility Master Plan  
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**Recommendations:**

Priority #1 – Health and Safety

- A fire alarm system with a dedicated control panel with audible/strobes, addressable initiating devices, pull stations, etc. with full coverage should be provided. Change of occupancy and scope of work would determine the extent of fire alarm system required.
  - Cost: \$15,000.00

Priority #2 – Code

- Replace all non-ground receptacles and wiring.
  - Cost: \$3,000.00

Priority #4 – Energy Savings

- Replace all exterior building mounted lighting, with LED and cut-off type automatically controlled with photocell on, time clock off. Egress lighting to be provided with emergency backup power.
  - Cost: \$2,500.00
- Replace existing interior lighting with energy efficient historic LED type fixtures.
  - Cost: \$10,000.00
- Provide occupancy sensor to toilet, offices, etc.
  - Cost: \$2,000.00





## PRINCIPALS

CRAIG E. BARNES  
MICHAEL S. TELLER  
WAYNE R. LAWSON

## SENIOR ASSOCIATE

ROBERT G. WILKIN

## FIRE STATION

### EXISTING CONDITIONS ANALYSIS AND RECOMMENDATIONS

CBI and our consultants have prepared this Conditions Assessment to outline the scope and extent of recommended repairs and replacements to various building components and materials, based on both their condition and historical integrity, regardless of the renovation and re-use options presented in other sections of this report. All building components were reviewed by visual inspection from the ground only. No exploratory investigations were made.

In accordance with the Massachusetts Preservation Projects Fund (MPPF) for development projects, the following building components were reviewed, and recommendations made. Where technically feasible, the Secretary of the Interior's Standards for the Treatment of Historic Properties should apply:

#### Fire Station Exterior:

1. Roofing -
  - Historical Integrity: Existing roofing is not original
  - Material: Asphalt shingle
  - Condition: Poor
  - Recommendations: Replace roofing in its entirety with new asphalt shingle roof and underlayment.
2. Gutters and Downspouts -
  - Historical Integrity: None are original
  - Material: Aluminum
  - Condition: Poor
  - Recommendations: Replace all gutters and downspouts with aluminum gutters and downspouts.
3. Flashings -
  - Historical Integrity: original
  - Material: varies, or not visible
  - Condition: varies
  - Recommendations: Replace all edge metal, step and cheek wall flashing at roof.
4. Chimney(s) – metal flue only
  - Recommendations: Refer to Mechanical report.

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Mendon Fire Station  
Building Conditions Assessment  
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5. Siding -

- Historical Integrity: Original masonry at lower level, siding above
- Material: Aluminum Siding
- Condition: Fair
- Recommendations: Remove all siding when the roof is replaced and replace with wood clapboards.

6. Paint Coating(s) – only on windows and doors

- Recommendations: Refer to Window, Door and Trim Items below.

7. Caulking and Sealants -

- Historical Integrity: Likely original
- Material: unknown
- Condition: Poor
- Recommendations: Replace all sealants at perimeter of fenestrations on the entire building.

8. Trim -

- Historical Integrity: unknown
- Material: Aluminum break metal covering original wood
- Condition: Fair
- Recommendations: Remove aluminum, repair & paint wood. Include allowance to replace wood (20%).

9. Windows -

- Historical Integrity: Original single-pane double-hung with newer aluminum storms
- Material: Original Wood Windows
- Condition: Fair
- Recommendations: Remove, repair, re-glaze and reinstall with new ropes. Replace storms with historic aluminum.

10. Doors -

- Historical Integrity: Side Door appears to be original. Front O/H doors are not.
- Material: Wood
- Condition: Poor
- Recommendations: Repair and paint wood side door. Replace O/H Doors with aluminum storefront framing.

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Mendon Fire Station  
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#### 11. Foundations -

- Historical Integrity: original
- Material: Concrete
- Condition: Fair
- Recommendations: none

#### **Fire Station Interior:**

##### 1. Floor Plan -

- Historical Integrity: Building appears to remain mostly unaltered from original construction.
- Recommendation: Building is contributing to the historic district because of its municipal building vernacular. Interior components are less significant, but the overall retention of the fire station atmosphere is desired.

##### 2. Staircases -

- Recommendation: Seal off the 2<sup>nd</sup> floor. Refer to Code Red Report.

##### 3. Doors -

- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original interior doors where feasible.

##### 4. Trim -

- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original trim where feasible.

##### 5. Walls -

- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original interior walls where feasible.

##### 6. Ceilings -

- Recommendation: Any renovation plans should attempt to retain extant interior elements, including original interior ceilings where feasible.

##### 7. Other -

- Mechanical, Electrical, Plumbing and Fire Protection: Refer to Galuska-DeSousa reports.



PRINCIPALS

CRAIG E. BARNES  
MICHAEL S. TELLER  
WAYNE R. LAWSON

SENIOR ASSOCIATE

ROBERT G. WILKIN

## FIELD REPORT #01

**PROJECT:** Mendon Town Center – Fire Station  
**CBI JOB NO.:** 16036  
**BY:** Wayne R. Lawson, P.E. SECB, MCPPO  
**DATE:** June 10, 2016  
**CONTRACTOR:** N/A  
**SITE LOCATION:** Mendon, MA  
**WEATHER:** N/A  
**ATTENDEES:** Wayne R. Lawson, P.E., SECB, MCPPO

---

### OBSERVATIONS

The existing building is a two-story structure with three apparatus bays at ground level and a shed dormer at the rear of the building, and three (3) individual dormers at the front of the building. The second floor access is provided by a single stairway that is located at the North end of the building. The second floor and roof framing consists of wood board sheathing supported on wood joists and steel beams. The beams are supported on steel pipe columns at the building interior and on the masonry bearing walls at the exterior. The exterior walls appear to be constructed of exterior brick with concrete masonry unit (cmu) back up walls from ground (1<sup>st</sup>) to the second floor level. The gable end walls and the dormer walls are wood stud with vinyl siding.



In general the building structure appears to be in fair condition. The exterior brick is in good condition and mortar joints appear to be sound. We observed signs of previous roof leaks, although we did not note any active leaks at the time of our visit. We viewed newspaper clippings inside the building that contained references to carpenter ant problems. During our visit we did not observe any signs of past or present insect activity. However there are areas of rotted trim at the front of the building.





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Mendon Town Center – Mendon Fire Station  
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June 10, 2016

**Mendon Town Center – Fire Station**  
**Photo Index**  
**CBI Job No.: 16036**  
**June 10, 2016**

Photo No.		Description
1		Front elevation of the building.
2		Shed dormer at the rear of the building.
3		Steel beam and column supporting wood roof framing.

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Field Report # 001  
Mendon Town Center – Mendon Fire Station  
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4		Steel beam supporting roof framing.
5		Typical wood roof purlins.
6		Steel post supporting second floor framing.
7		Missing wood trim at front of the building.

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June 10, 2016

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Existing building is unoccupied and the first floor is being used for general storage.

WRL/ko  
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**Mendon Town Hall Campus Study**  
**Fire Station Photo Index**  
**CBI Job No.: 16036**

PRINCIPALS

**CRAIG E. BARNES**  
**MICHAEL S. TELLER**  
**WAYNE R. LAWSON**

SENIOR ASSOCIATE

**ROBERT G. WILKIN**

1



Black & White Photo of the Mendon Fire Station. In the background is the no longer extant Highway Garage.

2



Mendon Fire Station, West Elevation, current conditions.



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CBI

3



Mendon Fire Station, North Elevation, current conditions.

4



Mendon Fire Station, East Elevation, current conditions.



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5



Mendon Fire Station, South Elevation, current conditions.

6



The asphalt shingle roof has failed and should be replaced.



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7



The existing wood double-hung windows remain and can be repaired and painted. The masonry appears to be in good condition.

8



The gable ends and dormer walls have aluminum siding. Several trim pieces are missing.

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Mendon Town Hall Campus Study  
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CBI

9



The First Floor is an open 3-bay layout for apparatus. It is currently used for storage.

10



The overhead doors and tracks.



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11



The only toilet room is on the First Floor.

12



The only stairwell is steep. It is open to the Second Floor Corridor.

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13



The Second Floor had been the Living Quarters. It is not rated for Storage, and currently unused.

14



Second Floor Corridor between dormers.

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16036 L007 Fire Station Photo Index 6-10-2016.docx

Town of Mendon – Facility Master Plan

Mendon, MA

Plumbing Existing Conditions Systems Report – Fire Station

J#385 012 00.00

L#51680/ Page 1/June 3, 2016

## **MENDON FIRE STATION - PLUMBING**

Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system, and LP gas. The building is not occupied. Plumbing systems are in poor condition.

### **Fixtures:**

There is one bathroom located on the first floor. Water closet is floor mounted, tank type, vitreous china. Lavatory is wall hung vitreous china with hot and cold water handles. Lavatories do not have mixing valves.

Kitchen sink is a two-bowl, stainless steel, counter mounted unit with a gooseneck faucet and vegetable spray.



*Abandoned bathroom fixtures*

### **Water System:**

The domestic water service enters the first floor. Building is served by an on-site well.

Piping is copper tubing with sweat joints. The piping is not insulated. In general, the piping appears to be in poor condition.

The domestic water heater was generated through a tank type electric water heater. There is no mixing valve or expansion tank. Unit is in poor condition.



*Abandoned water heater*

### **Drainage System:**

In general, cast iron is used for sanitary drainage. Piping and fittings above slab are hub and spigot joints. Where visible, the cast iron pipe appears to be in poor to fair good condition.

There are floor drains located in the vehicle garage area. We could not determine where floor drains discharge too. There was no evidence of an on-site holding tank.



*LP Gas tank*

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J#385 012 00.00  
L#51680/ Page 2/June 3, 2016

**LP Gas:**

There is an above grade LP gas storage tank located in the rear of the Fire Station. LP gas is provided to the emergency generator.

Piping is black steel with threaded joints.

**Plumbing Fixture Requirements:**

- It is our understanding the building will be renovated into Town office space. Based on B use group occupancy, required plumbing fixtures are as follows:

Female toilets = 1 per 20

Male toilets = 1 per 25 (33% of toilets required may be urinals)

Lavatories = 1 per 50 each sex

Drinking Fountains = 1 per floor

Service Sink = 1 per floor

**RECOMMENDATIONS:**

Priority #2 - Code

- Provide dedicated men's and women's accessible plumbing fixtures. Provide with high efficiency low flow fixtures to reduce water consumption.
- Provide new domestic water distribution system. Insulate all domestic water piping.
- Provide new water heater with mixing valve and expansion tank.
- Existing floor drains to be removed and piping capped to allow for office renovation.

**COST ESTIMATE:**

- Full plumbing renovation = \$8 per square foot



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Fire Protection Existing Conditions Systems Report – Fire Station  
J#385 012 00.00  
L#51683/ Page 1/June 3, 2016

## **MENDON FIRE STATION - FIRE PROTECTION**

### **Executive Summary**

The Building does not contain an automatic sprinkler system.

The building is not supplied by Municipal water. Building is serviced by on-site well water.

Installation of fire sprinkler systems are required per Massachusetts General Law M.G.L. Chapter 148 Section 26G in existing buildings subject to major renovations or building additions when gross square feet floor area exceeds 7,500 square feet. A major alteration can be defined as a reconfiguration of walls, doors, windows, mechanical systems, etc., which effectively makes installation of sprinkler systems easier and which affects more than 33% of the building area or more than 33% of the assessed value of the building. Buildings for which sufficient water flow and pressure does not exist are exempt. Proposed scope will need to be reviewed with Town code officials.

The existing fire station is less than 7,500 square feet. Should an addition be constructed to the building and the gross floor area of the exiting building and addition combined exceeds 7,500 square feet then a fire suppression may be required throughout the existing building and its addition.

As the site is not supplied by Municipal Water, an on-site storage tank and fire pump will be required.

New fire suppression system cost= \$6.50 per square feet.

Town of Mendon – Facility Master Plan  
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HVAC Existing Conditions Systems Report – Fire Station  
J#385 012 00.00  
L#51677/ Page 1/April 8, 2016

## **MENDON FIRE STATION - HVAC**

### **Executive Summary**

The Fire Station building is currently shut down. The building has received no maintenance on the heating system and equipment over the last year or so. The heating system presently installed is not original to the building, the forced hot air furnace is an upgrade however, it was unknown as to whether or not the unit functions. From a visual inspection it appears that the unit is in fair condition however, since there is no cooling or ventilation air associated with the unit we recommend a new indoor unit to provide code required heating, ventilation and cooling capabilities. Also we would recommend a direct digital control system for adequate temperature control and comfort.

### **Heating, Ventilation and Air Conditioning System**

The heating system for the second floor quarters consists of an indoor oil fired air handling unit which is located within the apparatus bay on the first floor. The unit does not appear to have any cooling components nor does it have any ventilation air associated with its ductwork. The system is associated with a galvanized sheet metal duct distribution system which travels to floor mounted diffusers on the second floor and duct mounted diffusers for the apparatus bay. None of the ductwork is insulated which decreases the units efficiency. The air handling unit is equipped with a burner which utilizes No.2 fuel oil which is stored within a residential style 275 gallon storage tank located outside. The unit creates combustion gases that are forced to exit the building with the help of a fan inducer located on the unit. These gases exit the building through the use of a galvanized sheet metal flue which exits through the masonry wall.



*Ductwork & Unit*



*Typical Un-Insulated Ductwork*

Town of Mendon – Facility Master Plan

Mendon, MA

HVAC Existing Conditions Systems Report – Fire Station

J#385 012 00.00

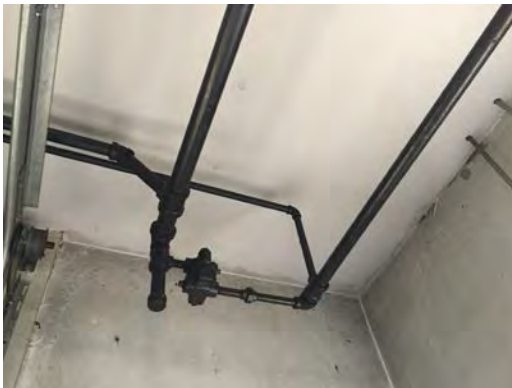
L#51677/ Page 2/April 8, 2016



*Typical Floor Grille*



*Typical Ceiling Grille*



*Existing Abandoned Steam Piping*



*Fuel Oil Tank*

Currently the building is not provided with any mechanical ventilation, the operable windows within the building are used for ventilation purposes. We would recommend that a new ventilation system be provided for the entire building. The unit would be provided with energy recovery, heating and cooling components to ensure the discharge air is tempered and dry.

### **Temperature Controls**

The automatic temperature control system is a standalone electronic system. It utilizes a wall mounted thermostat which is connected directly to the unit and is located on the second level. There is only one thermostat for the building, this provides uneven temperatures between downstairs and upstairs. The thermostat is a programmable thermostat therefore it offers a scheduling feature for each day of the week. A new complete direct digital control system would offer much better temperature control and allow for troubleshooting and web access to all the building components.

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**Exhaust Systems**

The building does not have any general exhaust systems nor does it have a vehicle exhaust capture system. There are no roof mounted exhaust fans as well. All toilet rooms utilize operable windows for ventilation purposes. If any modifications are done to these areas of the building then exhaust systems will be required per code specifically for the apparatus bay, toilet rooms and janitor closets. If the apparatus bays are to remain then per code a carbon monoxide and nitrogen dioxide monitoring system is required, this system would be associated with its own galvanized sheet metal duct distribution system.

**RECOMMENDATIONS:**

The following is our professional opinion on what recommendations could help in improving, overall system performance, temperature controllability and energy savings,

**Priority #1 – Health and Safety**

- Indoor air quality is poor.
  - Cost – See Second Bullet Item Under Priority #4.
- There is no CO/NO<sub>2</sub> monitoring system within the apparatus bays.
  - Cost \$7,500

**Priority #2 – Code Violations**

- Provide insulation on all exposed and un-insulated ductwork if the existing unit remains.
  - Cost: \$4.00/s.f.
- Provide a code required vehicle exhaust capture system if the apparatus bay remains.
  - Cost: \$8,000/bay

**Priority #3 – Maintenance**

- Service existing indoor air handling unit prior to start up if the unit remains.
  - Cost \$1,000

**Priority #4 – Comfort**

- Provide individual zone control for the first and second floor with interconnecting control wiring from the zone dampers to the existing unit. This should be provided if the existing unit remains.
  - Cost \$5,000



Town of Mendon – Facility Master Plan

Mendon, MA

HVAC Existing Conditions Systems Report – Fire Station

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- Provide one new heating, ventilation and air conditioning system with energy recovery, heating and cooling sections and MERV 13 filters. This system would be associated with a new galvanized sheet metal duct distribution system and would serve the second floor only.
  - Cost \$60,000
- Provide propeller style unit heaters within the apparatus bay for heating purposes only.
  - Cost \$4,500
- Provide a new direct digital control system and connect to a town wide building management system with web access and alarm notifications.
  - Cost \$30,000
- Provide general exhaust systems for storage and toilet rooms for improved indoor air quality.
  - Cost \$5,000

Town of Mendon – Facility Master Plan

Mendon, MA

Electrical Existing Conditions Systems Report – Fire Station

J#385 012 00.00

L#51673/Page 1/June 3, 2016

## **MENDON FIRE STATION - ELECTRICAL**

### **Executive Summary:**

Generally, the electrical systems are in poor condition and have reached the end of their useful serviceable life. The building was not occupied or operational at the time of the survey. The electrical service is undersized for its current use. The generator is undersized and is not connected to all of the necessary loads required for proper operation under a power outage condition. Panel boards have limited additional capacity, and are in poor condition. Systems have been retro-fit into the station and are located in poor environmental conditions due to lack of useable properly conditioned space. There is no fire alarm system in the building.

### **Electrical Distribution System:**

The facility's power is fed via overhead utility lines owned by the utility company. The service comes from a utility pole then overhead to a building mounted weather-head, to exposed building mounted conduit. A 120/240V, 4W, 3Phase meter is mounted on the exterior of the building.

The building's service has a 200 ampere, 120/208V main circuit breaker that feeds a 200 ampere main distribution panel that serves the normal side of the automatic transfer switch.

There are sub-panels in the basement that serve most loads, as well as, various sub-panels mounted exposed in the Fire Station. These sub-panels are full with little to no room for expansion. The service is undersized. The electrical distribution is in poor condition and should be replaced.



*Overhead Service*



*Meter*

Town of Mendon – Facility Master Plan

Mendon, MA

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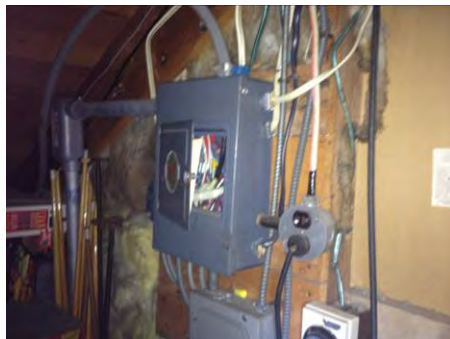
*Service Main Breaker*



*Sub-Panel*

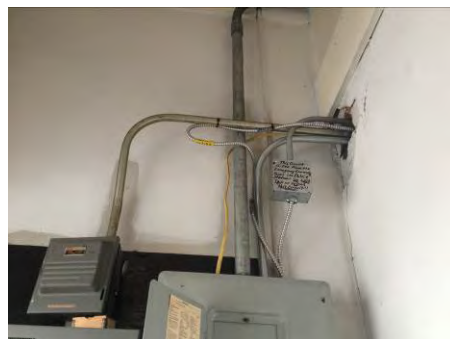


*Main Distribution Panel*



*Attic Sub-Panel*

Branch circuit wiring has been added on over the years. The installation varies in quality and type. Both MC cable and NM sheathed cable “Romex” have been used. Romex is not code compliant in commercial installations. Lack of receptacles results in the use of extension cords and plug strips. Most wiring has been installed exposed and some MC and Romex are subject to physical damage.



*Wiring*



*Wiring*

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Mendon, MA

Electrical Existing Conditions Systems Report – Fire Station

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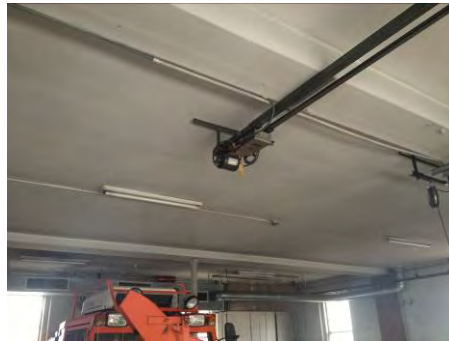
**Lighting:**

The lighting consists of 1'x4' wraparound fluorescent fixtures with acrylic lenses in the corridors. In general, the lighting is in poor condition and many spaces within the Fire Station are under-lit and still utilize incandescent fixtures which are very inefficient.

The apparatus bay lighting is in poor condition and consists of a one lamp cross section, fluorescent strip fixtures. Lighting control is via local line voltage, there was no automatic lighting control system noted. Current energy code requires either an automatic lighting control system or the use of occupancy sensors.



*Corridor Fixtures*



*Apparatus Bay Fixtures*



*Strip Fixtures*



*Porcelain Socket*



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Mendon, MA

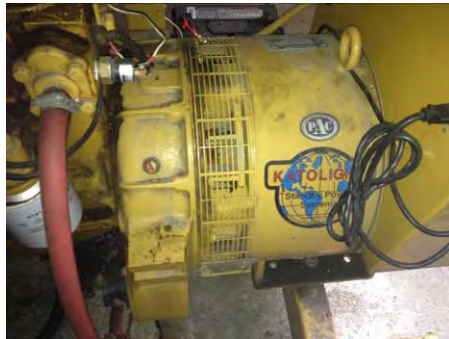
Electrical Existing Conditions Systems Report – Fire Station

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**Emergency Stand-by System:**

The facility is equipped with a Katolight natural gas fired interior pad mounted generator. The generator is in poor condition, and is undersized. It feeds an ASCO automatic transfer switch that serves an emergency panel. No exterior emergency egress lighting was noted during the field visit.



*Generator*



*Automatic Transfer Switch*

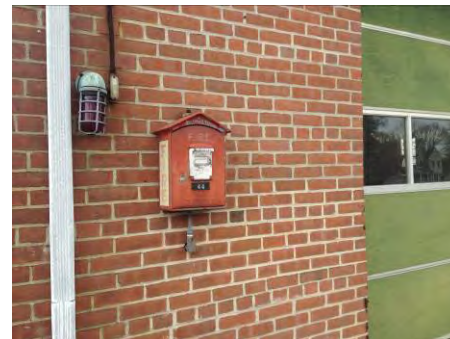
The emergency lighting and optional loads are not separated. The emergency system does not comply with today's codes. No exit signs were found in the building.

**Fire Alarm System:**

There is no fire alarm system in the building. The fire alarm consists of panel and an exterior master box. There are no pull stations, detectors, or horn/strobe units. A new addressable fire alarm system needs to be provided.



*Fire Alarm Panel*



*Master Box*

Town of Mendon – Facility Master Plan

Mendon, MA

Electrical Existing Conditions Systems Report – Fire Station

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**Recommendations:**

Priority #1 – Health and Safety

- A fire alarm system needs to be provided with ADA compliant devices and meet current code requirements.
  - Cost: \$40,000.00

Priority #2 – Code

- Replace all existing non-sheathed cable throughout the building.
  - Cost: \$5,000.00

Priority #3 – Maintenance

- A new electrical service and distribution system will need to be provided to accommodate the new loads.
  - Cost: \$20,000.00
- The generator should be replaced with a larger exterior unit to provide the required emergency system needs. (approx. 60kW)
  - Cost: \$60,000.00

Priority #4 – Energy Savings

- All interior and exterior lighting fixtures should be replaced with new energy efficient LED type fixtures.
  - Cost: \$30,000.00



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## **Mendon Center**

### Existing Building Code Report

**May 24, 2016**

#### **Prepared for:**

CBI Consulting, Inc.  
250 Dorchester Ave  
Boston, MA 02127

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## 1. Introduction & Project Description

CBI Consulting, Inc. has retained Code Red Consultants to provide fire protection and life safety code consulting services for the evaluation of the existing Mendon Town Center. This document has been prepared to describe the existing conditions of the building and to help identify the major existing Massachusetts State Building Code, Fire Code and Accessibility Code retroactive upgrade requirements that could impact the scope and expenditure of future projects to the building.

The scope of this evaluation included survey and review of the Union Chapel (existing Taft Public Library), Town Hall, and Old Fire Station within the Mendon Town Center complex.

- The Taft Public Library is two stories above grade with a children's library section on the Ground Floor and adult library section on the First Floor.
- The Town Hall is 3 stories above grade with Police Department offices on the Basement Level, Town Administration offices on the First Floor, and an open meeting hall on the Second Floor.
- The Old Fire Station is 2 stories above grade and was formerly utilized for vehicle parking and storage on the Ground Floor with offices and sleeping quarters on the Second Floor.

Both the Union Chapel and Town Hall are combustible wood buildings while the Old Fire Station is constructed of combustible wood interior members with a masonry exterior. Figure 1 below illustrates the general site configuration of the Mendon Town Center Complex.



FIGURE 1: MENDON TOWN CENTER

The observations outlined herein are based on visual observations taken by Paul Moan, P.E. and Jason Hopkins of Code Red Consultants on Thursday March 31, 2016. No destructive inspection or testing occurred.

## 2. Applicable Codes

The applicable codes and standards to the existing building are as follows:

<b>Building</b>	<p>780 CMR - Massachusetts State Building Code 8<sup>th</sup> Edition, which is an amended version of the 2009 International Building Code (IBC).</p> <p>780 CMR 34.00 is deleted and replaced by the Massachusetts Existing Building Code (MEBC), which is an amended version of the 2009 International Existing Building Code (IEBC).</p> <p>It is expected that the 9<sup>th</sup> Edition of 780 CMR will be adopted at the end of 2016 with a 6 month concurrency period during which either the 8<sup>th</sup> or 9<sup>th</sup> Editions can be used. The 9<sup>th</sup> Edition will be an amended version of 2015 IBC Codes.</p>
<b>Fire Code</b>	<p>527 CMR - Massachusetts Comprehensive Fire Safety Code, which is an amended version of the 2012 Edition of NFPA 1, Uniform Fire Code. The 2009 International Fire Code (IFC) is applicable for fire code references in 780 CMR not addressed by 527 CMR.</p>
<b>Plumbing Code</b>	<p>248 CMR 10.00 - Uniform State Plumbing Code.</p>
<b>Electrical Code</b>	<p>527 CMR 12.00 - Massachusetts Electrical Code, which is an amended version of the 2014 Edition of NFPA 70, National Electrical Code.</p>
<b>Mechanical Code</b>	<p>International Mechanical Code (IMC) as amended by 780 CMR 28.00.</p>
<b>Energy Code</b>	<p>2012 International Energy Conservation Code (IECC)</p> <p>The stretch code (adopted by Mendon) will continue to be based on amendments to the 2009 IECC until such a time as the stretch code is updated and is applicable to additions to existing commercial buildings.</p>
<b>Elevator Code</b>	<p>524 CMR - Massachusetts Board of Elevator Regulations, which adopts and amends the 2004 Edition of ANSI A 17.1, Safety Code for Elevators and Escalators.</p>
<b>Accessibility Regulations</b>	<p>521 CMR - Architectural Access Board (AAB) Rules and Regulations</p> <p>2010 ADA Standards for Accessible Design</p>
<b>Other</b>	<p>Various National Fire Protection Association (NFPA) codes and standards as referenced by the codes listed above</p>

This report addresses the key features of these codes and standards. The primary intent of this document is to summarize the results of our investigation and evaluation of the aforementioned building in accordance with the MEBC. The evaluation has been provided in sufficient detail to ascertain the effects of the proposed work on the work area under consideration as well as the impact on the entire existing building. This report is intended to address code requirements as enforced by local and state authorities only. It is the responsibility of the design team to ensure that any owner or insurance carrier requirements, which may exceed the provisions of the applicable codes and standards, are met.

### 3. Existing Building Code: Scoping Requirements

Portions of an existing building undergoing repair, alteration, addition, or a change in use are subject to the requirements of the MEBC. In general, existing materials and conditions can remain provided they were installed in accordance with the code at the time of original installation and are not deemed a hazardous condition by an authority having jurisdiction (AHJ). Work to existing buildings should be performed in accordance with 780 CMR for new construction unless otherwise specified by the MEBC. Alterations to existing buildings are not permitted to reduce the level of safety currently provided within the building unless the portion altered complies with the requirements of 780 CMR for new construction.

Where compliance with the requirements of the code for new construction is impractical due to construction difficulties or regulatory conflicts, compliance alternatives may be approved by the building official (MEBC 101.5.0). Any compliance alternatives being sought are required to be identified on the submittal documents (MEBC 101.5.0.1).

### 4. Compliance Method & Classification of Work

#### 4.1 Summary

Once a scope of work has been identified for each building, an analysis in accordance with the requirements of the MEBC is required to be performed and submitted as part of the permit submittal package.

The MEBC has 3 different compliance methods that can be used to evaluate a renovation project:

- Prescriptive Method (MEBC Chapter 3)
- Work Area Method (MEBC Chapters 4-10)
- Performance Method (MEBC Chapter 13)

It is recommended that the compliance method to be applied to future projects be selected once the scope of work is known, as the selected method can impact the retroactive requirements triggered for the project. For the purpose of this report, requirements from the prescriptive method and work area method were considered and are provided in the analysis below. It should be noted that only one compliance method is allowed to be selected for each permitted project in the future. Use of the prescriptive method requires compliance with the existing building chapter of the International Fire Code (2009 Edition) in accordance with MEBC Section 101.5.1. The performance method involves a more complex scoring system and is best applied where there is a specific deficiency within an existing building.

The recommended compliance methods to evaluate the proposed scope of work are the Prescriptive Method (MEBC 101.5.1) and the Work Area Method (MEBC 101.5.2).



## **4.2 Repair**

A Repair is defined as “the restoration to good or sound condition of any part of an existing building for the purpose of its maintenance” (MEBC 202).

Where there is work that involves the substantial replacement of a system (i.e. replacement or corridor walls, providing new wiring for electrical systems, etc.) such that it is permissible work and not merely an ordinary Repair, it will be considered an Alteration.

## **4.3 Alteration**

An **Alteration** is defined as any construction or renovation to an existing structure other than a repair or addition (MEBC 202).

**Alterations** are classified as either Level 1, Level 2, or Level 3 (MEBC 403-405):

- A Level 1 Alteration includes the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.
- A Level 2 Alteration includes the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.
- A Level 3 Alteration applies where the work area of a project exceeds 50 percent of the aggregate area of the building.

The determining factor in assigning the Level of an Alteration is the size of the work area. “Work Area” is defined as the portion or portions of a building consisting of all *reconfigured spaces* as indicated on the construction documents (MEBC 202). If there is no reconfiguration of space, then there is no work area, even though construction may be occurring throughout the building for the renovation or installation of building systems.<sup>1</sup>

## **4.4 Addition**

An **Addition** is defined as an extension or increase in floor area, number of stories, or height of a building or structure (MEBC 202).

Where there is a project that involves a scope of work classified as an addition it will be subject to the requirements of MEBC Chapter 10.

## **4.5 Change of Occupancy**

A **Change of Occupancy** is defined as a change in the purpose or level of activity within a building that involves a change in application of the requirements of this code (MEBC 202).

Where there is work that involves a change in occupancy classification, it will be considered as a change of use subject to the requirements of MEBC Chapter 9.

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<sup>1</sup> Clarification provided in BBRS Official Interpretation, dated February 11, 2014

#### **4.6 Historic Buildings**

It is our understanding that both the Union Chapel and the Town Hall Buildings are registered as a National Historical Places, and are permitted to be evaluated using the provisions in MEBC Chapter 11, Historic Buildings. The application of this chapter is an option for compliance and is not obligatory for the design team (MEBC 1101.1). For the purpose of these buildings, the use of the requirements and allowances of Chapter 11 does not have a significant impact on the outcome of the code analysis, and as such have not been applied. Historic buildings also fall under the purview of 521 CMR Section 3.9 relative to accessibility requirements. The effect of this section is that both the Union Chapel and the Town Hall Buildings may seek a MAAB variance to allow alternate accessibility based on the Building's historic registration.

#### **4.7 Potential Hazardous Conditions**

Materials already in use within the building in conformance with requirements or approvals in effect at the time of construction are permitted to remain in use unless determined by the building official to render the building unsafe or dangerous (780 CMR 102.6). Where an existing condition is deemed hazardous by the building official, it can be required to be retroactively upgraded regardless of the scope of work.

#### **4.8 Prescriptive Method Evaluation**

The use of the prescriptive method as the basis of evaluation is permitted where the existing building complies with the IFC Chapter 46, *Construction Requirements for Existing Buildings* (MEBC 101.5.1). The following summarizes the major applicable requirements from Chapter 46:

- If the existing elevator has a travel distance of 25 feet or more, it is required to be provided with emergency operation in accordance with ASME A17.3 (IFC 4603.2). **The Town Hall is the only building equipped with an elevator and it is not provided with emergency operation. As such, the prescriptive method should not be considered for the Town Hall Building without a scope of work that includes an elevator upgrade.**
- Exit signs are required to be externally or internally illuminated and provided with emergency power (IFC 4604.3 & 4604.4). **Such exit signs are required per 780 CMR Section 102.6.4 regardless of the scope of new work**
- Means of egress illumination is required to be provided with an emergency power source (IFC 4603.2). **Such illumination is required per 780 CMR 102.6.4 regardless of the scope of new work**
- Any open sides of means of egress that are more than 30" above the floor or grade below are required to be provided with guards that are not less than 42" in height and do not permit the passage of a 6" sphere (IFC 4604.6). Where approved, existing guards are not required to satisfy the 6" sphere passage requirement. **Existing means of egress are in compliance with this requirement.**
- Existing doors are required to have a minimum clear width of 28" and have a maximum leaf width of 48" (IFC 4604.8). **Existing doors were observed to provide at least a 28" clear width.**

- The opening forces for side-hinged swinging doors are not permitted to exceed the following (IFC 4604.9):
  - 5 pounds for interior doors without closers
  - For all other doors, the door latch is required to release when subject to a 15 pound force, is required to be set in motion when subject to a 30 pound force, and is required to swing to a full open position when subject to a 50 pound force.

**Verification would be required with scopes of work as necessary.**

- The egress system is required to be arranged such that the dead end travel distances, common path of travel distances, and travel distances to exits do not exceed the following (IFC 4604.18):
  - Business Areas:
    - Dead end: 50 feet
    - Common path of travel: 100 feet
    - Travel distance: 250 feet
  - Assembly Areas:
    - Dead end: 20 feet
    - Common path of travel: 20 feet if > 50 people, 75 feet if < 50 people
    - Travel distance: 250 feet

**The Town Hall Building is in compliance with the above and the Union Chapel Building is in compliance with the above as long as the occupant load of each floor is posted at 49 or less.**

**Should the prescriptive method be used for a project in the Old Fire Station, an additional exit stair that discharges directly to the exterior would be required from the Second Floor due to the common path of travel from the Second Floor.**

In general, where the prescriptive method is utilized, new work is required to meet the requirements of 780 CMR for new construction (MEBC 302.1 & 303.1). Where the prescriptive method is utilized and the project scope includes modifications to existing structural elements, additional structural analysis is required as applicable in accordance with MEBC Section 302.3 (Additions), MEBC Sections 303.3 & 303.4 (Alterations), and MEBC Sections 304.2 & 304.3 (Repairs).

The use of the Prescriptive Method is recommended for small projects with very limited scope, or substantial renovation projects where a significant portion of the interior of the building is being replaced (gut renovation). The Work Area Method is the most appropriate methodology where there is a significant renovation project to a portion of a building, with other portions of the building remaining unaltered.

## 5. Town Hall

The existing Town Hall is located in the center of the Mendon Town Center complex. The building serves police department uses on the Basement Level, town administrative functions on the First Floor, and general town assembly uses on the Second Floor.



FIGURE 2: TOWN HALL

The MEBC analysis of the Town Hall Building includes the following major existing building applications that may require attention depending on the scope of work. A complete analysis of the Town Hall Building in accordance with the MEBC is provided in Section 5.2 of this report.

- The existing building is currently not compliant for height, so if the building undergoes an addition, it is expected that the construction type will need to be upgraded (i.e. additional fire rating) as the height is currently non-compliant.
- If the stairs are part of the work area they should be confirmed to have a 30-minute FRR (MEBC 703.2).
- The administrative side of the Basement Floor does not satisfy the requirements for a single means of egress based on the maximum common path of travel. As such, the existing cross-corridor doors must either be unlocked from the administrative side of the corridor or a special locking arrangement must be installed in accordance with 780 CMR Section 1008.1.4.
- 780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official. Additional hazardous means of egress are identified and described in detail as part of Section 5.2 of this report.



### **5.1 Existing Building Summary**

<u>Use and Occupancy:</u>	<u>Primary Use(s):</u> Group B, Business Group A-3, Assembly	<u>Accessory Use(s):</u> Group S-2, Storage
<u>Construction Type:</u>	Type VB, combustible unprotected	
<u>Height:</u>	3 Stories	
<u>Area:</u>	Footprint: approx. 3,100 ft <sup>2</sup> Aggregate: approx. 9,000 ft <sup>2</sup>	
<u>Vertical Openings:</u>	The exit stairs and elevator shafts are enclosed with what appeared to be 1-hour fire-resistance rated construction.	
<u>Automatic Sprinkler System:</u>	The building does not contain a sprinkler or standpipe system.  Fire extinguishers with up to date inspection tags are provided.	
<u>Fire Alarm System:</u>	The building is protected with a fire alarm system that generally consists of the following: <ul style="list-style-type: none"><li>• Smoke detection in corridors</li><li>• Audible/visual notification devices in some of the building common areas</li><li>• Heat detection in kitchenette</li></ul>	
<u>Means of Egress:</u>	The building is served by two egress stairs. The rear stair discharge at the Basement Level and the Front Stair discharge on the 1 <sup>st</sup> Floor. Each of the two stairs discharge directly to the exterior. An additional First Floor exit discharges to grade by means of an exterior ramp.  The egress capacity from each floor is sufficient to accommodate the calculated occupant load and the exit arrangement satisfies the travel distance, common path of travel, dead end, and exit remoteness requirements, with the exception of the Basement Floor police area as noted in Section 5.2 (see drawings in Appendix A).	
<u>Exit Signage and Emergency Lighting:</u>	Exit signage on battery backup is provided in the corridors and emergency lighting is provided in the egress stairs. The building is not served by an emergency generator; however, a connection for a portable generator is provided.	

## 5.2 Existing Building Analysis by System

This section of the report is organized by building system and discusses the application of the scoping language presented above on the project.

### Height and Area

Code Analysis: The height and area of the building are only required to be evaluated if there is an addition as part of the project (MEBC 1002). **If the building undergoes an addition, it is expected that the construction type will need to be upgraded (i.e. additional fire rating) as the height is currently non-compliant.**

### Construction Materials

Existing Condition: The building is constructed of wood framing throughout, which is consistent with Type VB combustible, unprotected construction.

Code Analysis: The use of combustible construction materials is permitted in buildings of Type VB construction (780 CMR 602.5).

### Vertical Openings

Existing Condition: The vertical openings within the Town Hall consist of:

- An exit stair that serves all three floors, which is enclosed on the First and Second Floors
- An exit stair that serves all three floors, which is enclosed on all three floors
- An elevator that serves all three levels

Several door/frame labels were painted over; however, it appeared that the shaft construction was minimally consistent with a 1-hour fire resistance rating and substantial opening protectives.

Code Analysis: The existing exit enclosures are permitted to remain unless deemed as a hazardous condition by the building official. **If the stairs are part of the work area they should be confirmed to minimally have a 30-minute FRR (MEBC 703.2).**

Where the work area on any floor exceeds 50% of that floor area, stairways that are part of the means of egress serving that area are required to be enclosed with smoke-tight construction on the highest work area floor and all floors below (MEBC 703.2.3).

Doors protecting openings to the shafts are required to contain an appropriate fire resistance rating and be automatic or self-closing and latching. **See Existing Hazardous Means of Egress Section for applicable locations.**

### Interior Finish

**Existing Condition:**

Typical finishes within the exit stair enclosures consisted of paint on gypsum wallboard. The floors consisted of laminate and carpet flooring. Non-compliant interior finishes were not observed in the exits.

**Code Analysis:**

Where renovation work occurs:

- Existing finishes that are not included in a renovated area are permitted to remain (MEBC 703.4).
- The interior wall and ceiling finishes in exits and corridors within the work area are required to comply with the requirements of 780 CMR for new construction (provided below) (MEBC 703.4).
- Where the work area on any floor exceeds 50 percent of the floor area, the interior finish requirements from 780 CMR apply to the exits and corridors serving the work area throughout the floor (MEBC 703.4.1).
- The interior wall and ceiling finishes in exits serving the work area between the highest floor on which there is work to the floor of exit discharge are required to comply with the requirements of 780 CMR for new construction (MEBC 803.3).

Use Group	Exits and Exit Passageways	Exit Access Corridors	Rooms and Enclosed Spaces
A-3	A	A	C
B	A	B	C

New floor finishes are required to be of Class I or II materials, as classified in accordance with NFPA 253. The classification corresponds to the following: Class I, 0.45 watts/cm<sup>2</sup> or greater; Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR 804.3).

New decorative materials and trim are required to comply with the requirements of 780 CMR Section 806.

**Fire Alarm System**

## Existing Condition:

The existing building's fire alarm system consists of the following:

- System smoke detection in corridors
- Audible/visual notification devices in some of the building common areas
- Heat detection in the kitchenette

## Code Analysis:

The MEBC does not contain any specific requirements that would stipulate retroactive replacement of the existing system since it is a previously approved system that has been maintained. If work is done which impacts the fire alarm system, such as moving a device location or adding a new device, the requirements for new construction would apply to the installation of the new device only.

**It should be noted that coverage from existing notification devices outside of the work area are permitted to remain as long as they are not deemed hazardous by the building official.**

**Should a partial or full upgrade/replacement of the fire alarm system be necessary, all new components and devices are required to comply with new construction requirements relative to coverage, spacing, device type, mounting height, etc. without requiring upgrades outside of the scope of work. It should be confirmed that any system components (i.e. fire alarm control panel, battery backup, etc.) supporting new devices (i.e. horn strobe) have adequate capacity.**

**Sprinkler System**

## Existing Condition:

The building is not protected by a sprinkler system.

## Code Analysis:

1. MGL Ch. 148 S. 26G would require that a sprinkler system be provided throughout the entire building if any of the following are met:
  - a. **Addition:** There is an addition of any size to the building.
  - b. **Renovation/Alteration (where both i. & ii. apply):**
    - i. The work to the existing building exceeds 7,500 square feet and is significant in scope and expenditure and involves the reconfiguration of interior spaces, demolition of existing ceilings, or the removal or replacement of a significant portion of the building HVAC system ; and
    - ii. The renovation affects more than 1/3 of the area of the building or the cost of the work (excluding sprinkler installation) is equal to or greater than 1/3 of the assessed value of the building. One-third of the total assessed value



- of the building is equal to \$108,766.
- iii. Exception: No such sprinkler system is required unless sufficient water and water pressure exists.

**Standpipes**

Existing Condition: A standpipe system is not provided within the building.

Code Analysis: As the highest floor is not located more than 50 feet above the lowest level of fire department access, standpipes are not required (780 CMR 905.3.1).

**Means of Egress- Number of Exits & Exit Capacity**

Existing Condition: The existing Building is provided with two exit enclosures that discharge directly to grade and two doors that discharge directly to grade with one of these doors discharging to grade via a ramp. See the plans in Appendix A for more information.

Code Analysis: The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

Each floor is required to be provided with a minimum of two means of egress (780 CMR 1021.1) and the means of egress capacities should be sized based on the following factors (780 CMR 1005.1):

- Stairways: 0.3 inch/occupant
- Other Egress Components: 0.2 inch/occupant

**The existing exit capacity is sufficiently sized to accommodate the calculated occupant load under the current layout.**

**Means of Egress- Locking Arrangement**

**Existing Condition** Currently, the corridor locking arrangement on the Basement Floor segregates the floor into two sections that are each served by a single means of egress.

**Code Analysis:** The administrative side of this floor does not satisfy the requirements for a single means of egress based on the maximum common path of travel. As a result, the cross-corridor doors must either be unlocked from the administrative side of the corridor or a special locking arrangement must be installed in accordance with 780 CMR 1008.1.4. It should be noted that locking this door will not constitute a dead-end from the vault side of the basement as

**the common path of travel is less than 75 feet and the occupant load is less than 49 occupants (780 CMR Table 1015.1).**

### Means of Egress- Exit Arrangement

Existing Condition: The arrangement of the egress was well maintained and consistent with the requirements of 780 CMR Chapter 10. Exit access travel distance, common path of travel, dead end travel distance, and exit remoteness were reviewed from interior spaces and found to be in accordance with 780 CMR Chapter 10:

- Allowable travel distance: 200'
- Allowable common path of travel: 75'
- Allowable dead end: 20'

The current exit arrangement satisfies the above maximum distances.

Code Analysis: The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

### Emergency Lighting & Exit Signage

Existing Condition The building is served by interior means of egress lighting that is powered by battery backup power. Exterior exit discharge points were provided with lighting, but they did not appear to be on battery backup.

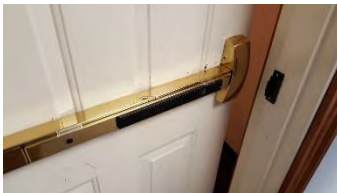
Code Analysis **780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official.**

### Existing Hazardous Means of Egress

Code Analysis 780 CMR Section 102.6.4 states that existing means of egress elements can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official. Additionally, 527 CMR requires existing means of egress components to be maintained in a safe and operable condition.

**The following summarizes means of egress conditions that were observed to be out of compliance with the requirements of 780 CMR and 527 CMR and could potentially be deemed hazardous.**

Picture



Condition

Basement Mechanical Room

The basement mechanical room is provided with a 90-minute rated door and it appears the intent was to provide a rated mechanical room; however, numerous penetrations and nonprotected louver opening are provided. 780 CMR 102.6.4(2) requires that means of egress including corridors be maintained in a safe condition.

In our experience, building officials will not cite this as a hazardous condition; however, if a work area includes the corridor, it will require the mechanical room to be separated from the corridor by at least 1-hour fire resistance rated construction in accordance with 780 CMR 508.2.5.

Exit Stair/Ramp without Handrails

The exit stair providing access from the Second Floor Stage and the ramp providing access to the front door are not provided with handrails on either side. 780 CMR 102.6.4(2) requires stairs to be maintained in a safe condition.

**It is our understanding that as part of this study a redesign of the front entrance will eliminate the hazardous means of egress cited above.**

Doors Not Latching or Closing

Exit stair doors, including the elevator machine room door and door to the basement stair, were observed to not be latching and/or not self-or automatic-closing. Additionally, panic hardware throughout the building was observed to be either taped or pinned open such that the door latch was not operational.

It should be confirmed that all exit doors are self-or automatic-closing and positive latching (527 CMR 12.4.1).

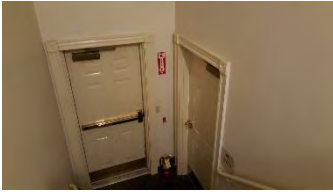
Exit Stair Door Held Open

The Second Floor entrance door to the Front Stair was observed to be held open. 527 CMR 10.03(9) requires all fire rated doors to be maintained in good working order including all hardware necessary for proper operation. The use of door stops, wedges, and unapproved hold open devices is prohibited. The obstruction blocking this door open should be removed such that the door is self-closing.

Storage in Exit Enclosure

Combustible storage was observed within the Front Stair on the Second Floor. 527 CMR Section 10.03(13)(b) prohibits combustible materials to be placed, stored, or kept in any portion of an exit,

stairway, fire escape, or other means of egress. The combustible storage is required to be removed from within the exit enclosures.



#### Exit Signage

At the Basement Floor level of the rear exit stair there was observed to be no exit sign provided at the door nor was there a sign on the elevator machine door identifying this door as not an exit.

**Either (1) an exit sign above the exterior door or (2) a sign identifying that the door to elevator machine room is not an exit should be provided.**

#### Head Height

The Front Stair to the basement is provided with a head height of 78.5 inches at its lowest point.

In our experience, building officials will not cite this as a hazardous condition; however, if a work area includes the stair it will require the stair to be provided with a minimum 80 inch head height in accordance with 780 CMR Section 1009.2.

### Accessibility

#### **MAAB Requirements (521 CMR via MEBC 505 & 605)**

Alterations and repairs to existing public buildings or facilities, which require a building permit or which are so defined by a state or local inspector, are governed by all applicable subsections of 521 CMR (521 CMR 3.3).

The requirements of 521 CMR are limited to buildings or portions thereof that are open to the public. Employee-only spaces are exempt from these requirements.

**Existing Condition:** The value of the building was found to be \$326,300 as recorded at the Town of Mendon assessor's office. The Massachusetts Department of Revenue has assigned Mendon an assessment ratio of 0.96<sup>2</sup>. Thus, the full and fair cash value of the building is \$339,896.

The 30% threshold if the entire building is considered public is \$101,969. It should be noted that the costs referred to in the scoping requirements below are taken for all projects within a rolling 36 month period.

**Code Analysis:** 521 CMR Section 3.3 contains the following scoping requirements for projects in existing buildings:

1. If the work is less than \$100,000, then only the work being performed is required to comply with 521 CMR.

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<sup>2</sup><http://www.mass.gov/dor/local-officials/assessor-info/equalized-valuations-eqv.html>



2. If the work costs more than \$100,000 but is less than 30% of the full and fair cash value of the building then in addition to the working being performed, the following accessible features are also required to be provided in the building:
  - a. Accessible entrance
  - b. Accessible toilet room
  - c. Accessible drinking fountain (if provided)
  - d. Accessible public telephone (if provided)
3. If the work costs more than 30% of the full and fair cash value of the building, then all public portions of the building are subject to the requirements of 521 CMR.

**It should be noted that the difference between the \$100,000 threshold and 30% threshold for this building is only \$1,969.**

MAAB also has a variance process where relief may be granted based on illustrating that complying with the code is either not technically feasible given existing conditions or that the level of accessible gain is disproportionate when compared with the cost to perform the work. In our experience on similar projects, the variance process may be utilized to provide relief on a number of items that are outside of the planned scope of work. Furthermore, as a historic building, the Town Hall falls under the scope of 521 CMR Section 3.9, which permits a building's historical significance to be used as the basis for a variance request.

Existing Building  
Application

A summary of the major existing accessible features of the building is provided below. If the 30% threshold is exceeded by a scope of work, a full accessibility survey is warranted.

Element	Existing Condition
Accessible Entrance	<p>All public entrances to the building are required to be accessible (521 CMR 25.1). In order for an entrance to be accessible it should satisfy the following:</p> <ul style="list-style-type: none"> <li>• Within the vestibule, the space between two side-swinging doors is required to be a minimum of 48" including the width of any door swining into the space (521 CMR 25.3).</li> <li>• The slope and cross slope of the exterior paths to the entrance are not permitted to exceed the maximum allowable (5% &amp; 2%, respectively) for a walkway (521 CMR 22.3, 22.3.1).</li> <li>• Where a ramp is included as part of the access to an accessible entrance, it should have handrails and slopes in accordance with 521 CMR Chapter 24.</li> </ul> <p>The basement entrance is accessible and no required upgrades are anticipated.</p> <p>It is our understanding that a front entrance redesign will occur as part of the project which will provide an accesible ramp at this lcoation.</p>

	<p>The First Floor side entrance is by means of a ramp that is not currently accessible and is expected to require only minor upgrades in order to be made fully accessible in accordance with 521 CMR. These upgrades include resurfacing and the addition of handrail extensions but it is not anticipated that the ramps 46 inch width will need to be widened to 48 inches clear.</p>
Accessible Route	<p>Vertical access within the building is provided by means of an elevator. The existing elevator does not comply with 521 CMR Chapter 28 for minimum car dimension, call button height, and interior car control height.</p>
Accessible Toilet Rooms	<p>A summary of the accessible male and female toilet rooms within the building is provided below (521 CMR 30.00)</p> <ul style="list-style-type: none"> <li>Basment – A single user bathroom without accessible features or accessible access is provided.</li> <li>First Floor Men’s- Accessible fixture provided. The toilet is currently 18.5” from the adjacent side wall (measured from the centerline of the toilet). The toilet is required to be 18” from the sidewall (521 CMR 30.6.1) and should be relocated. The paper towel roll is 52” above the floor which exceeds the 42” maximum permitted (521 CMR 30.11). The dispenser should be replaced or relocated. The mirror is 54” above the floor which exceeds the 40” maximum permitted (521 CMR 30.12). The mirror should be replaced or relocated.</li> <li>First Floor Women’s- Accessible fixture provided. The toilet is currently 17.5” from the adjacent side wall (measured from the centerline of the toilet). The toilet is required to be 18” from the sidewall (521 CMR 30.6.1) and should be relocated. The paper towel roll is 51” above the floor which exceeds the 42” maximum permitted (521 CMR 30.11). The dispenser should be replaced or relocated. The mirror is 42.5” above the floor which exceeds the 40” maximum permitted (521 CMR 30.12). The mirror should be replaced or relocated.</li> <li>Second Floor Unisex- Accessible fixture provided. The toilet is currently 18.5” from the adjacent side wall (measured from the centerline of the toilet). The toilet is required to be 18” from the sidewall (521 CMR 30.6.1) and should be relocated. The mirror is 50” above the floor which exceeds the 40” maximum permitted (521 CMR 30.12). The mirror should be replaced or relocated.</li> </ul>
Stairs	<p>The stairs serving the levels above grade are not currently fully accessible in accordance with 521 CMR 27.00. The following deficiencies were noted:</p> <ol style="list-style-type: none"> <li>The stairs should be provided with handrails that have a height of 34-38 inches and are provided with handrail extensions in accordance with 521 CMR Section 27.4.3 on both sides.</li> <li>The rear stair has abrupt nosings that should be addressed as part of the project.</li> </ol>

Accessible Drinking Fountains (Not Applicable)	There were no public drinking fountains observed within the building (521 CMR 36.00).
Accessible Public Telephones (Not Applicable)	There were no public telephones observed within the building (521 CMR 37.00).

### **ADA Application**

Although not enforced by any authority having jurisdiction on the project, the requirements of ADA are also applicable and enforced through civil litigation only. Code Red Consultants did not perform a comprehensive accessibility review of the facility for ADA compliance. The scope of our analysis was limited to entrances and main accessible routes.

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) requires that altered portions of an existing building must be readily accessible to and usable by individuals with disabilities to the maximum extent feasible (ADAAG 36.402(a)(1)). Further, alterations to primary function areas should be made such that the level of accessibility, including the path of travel to the space, is made accessible to the maximum extent feasible. When determining if the upgrade is feasible, the ADAAG requirements state that the upgrade to the path of travel is disproportionate to the project when the cost to perform the work exceeds 20% of the cost of the alteration to the primary function area. In choosing which accessible elements to provide if the cost is disproportionate, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance
2. An accessible route to the altered area
3. At least one accessible restroom for each sex or a single unisex restroom
4. Accessible drinking fountains
5. Accessible telephones

When possible, additional accessible elements such as parking, storage, and alarms should be addressed if within the disproportionality criteria.

### **Structural (MEBC 506 & 606)**

The review of existing conditions and application of the structural requirements will be performed by the structural engineer on the project. Evaluation of structural elements and their connections should consider the cumulative effects of alterations, additions, or changes of occupancy since the original construction, except where permitted by MEBC Section 101.9.

Addition	Where there is an addition to the existing building it should be structurally independent and should comply with the new construction requirements of 780 CMR (MEBC 302, 1003).
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## Alteration

New Structure:

New structural elements, including connections and anchorage, are required to meet the requirements of 780 CMR for new construction (MEBC 303.1, 707.2, 807.2).

Gravity Load-Carrying Structure

The load carrying capacity of structural members is not permitted to be reduced as a result of the project unless it can be demonstrated that the members meet the requirements of 780 CMR for new construction. If a structural element's stress is increased by more than 5% since the time of original installation, it is required to comply with the provisions of 780 CMR for new construction (MEBC 302.3, 707.4, 807.3).

Lateral & Seismic Load-Carrying Structure

The evaluation of lateral and seismic loading differ between the Prescriptive Method and Work Area Method. The primary difference between the two evaluation methods is that under the Prescriptive Method, work must be done to the structure in order to warrant a seismic evaluation, whereas under the Work Area Method, if the work area of the project exceeds 50% of the gross building area, a seismic evaluation is required regardless of the scope of work to the existing structural system.

Note that under both methods, voluntary seismic upgrades that are not otherwise required and are initiated for the purpose of improving the performance of the seismic force-resisting system are permitted, provided that they are supported by an engineering analysis (MEBC 303.5; 707.6).

**Plumbing Fixtures (248 CMR)**

## Existing Condition:

Male and female toilet rooms are provided on both the First and Second Floors with a single toilet provided on the Basement Floor.

## Code Analysis:

The MEBC and 248 CMR do not contain any specific provisions which outline when an updated plumbing fixture quantity analysis is required in an existing building. Based on past experiences, plumbing officials generally require an updated plumbing fixture count analysis to be performed where the renovation project includes work to existing toilet rooms, or where the occupant load of the space is being increased as a result of the renovation project.



Energy (2012 IECC)

## Code Analysis:

Alterations and repairs to existing buildings, building systems, or portions thereof are required to conform to the provisions of the Stretch Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with the new construction requirements (MEBC 607.1).

If existing insulation has been removed and is being replaced, it will be subject to the requirements for new construction. If an interior wall surface has been removed, thereby exposing the insulation, and the existing installation is in suitable condition to remain, it is not retroactively required to be upgraded based on the code sections cited above.

## 6. Union Chapel

The Union Chapel (existing Taft Public Library) Building is located to the north of the Town Hall in the Mendon Town Center complex. The building serves children's library and office uses on the Ground Floor and adult library uses on the First Floor. It should be noted that the Union Chapel is moving to a new location in Mendon later this year and at that time the building will become vacant. It is our understanding that continued use as meeting space is currently planned.



FIGURE 3: UNION CHAPEL

The MEBC analysis of the Union Chapel Building includes the following major existing building applications that may require attention depending on the scope of work. A complete analysis of the Union Chapel Building in accordance with the MEBC is provided in Section 6.2 of this report.

- The existing building is currently not compliant for height, so if the building undergoes an addition, it is expected that the construction type will need to be upgraded (i.e. additional fire rating) as the height is currently non-compliant. If the occupant load of the Ground Floor is maintained at less than 49 occupants, a second means of egress would not be required and there would not be an obligation to rate the existing stair (780 CMR 708.2(7)). If the stairs are part of the work area, and the occupant load of the Ground Floor is greater than 49 occupants, they should be confirmed to have a 30-minute FRR if in a Group A occupancy (MEBC 703.2).
- The interior stair is only permitted to be a means of egress from the Ground Floor due to exit remoteness (780 CMR 1015.2.1). As such the occupant load of the First Floor is limited to 49 people.
- 780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official.

## **6.1 Existing Building Summary**

<u>Use and Occupancy:</u>	<u>Primary Use(s):</u> Group B, Business Group A-3, Assembly
<u>Construction Type:</u>	Type VB, combustible unprotected
<u>Height:</u>	2 Stories
<u>Area:</u>	Footprint: approx. 1,300 ft <sup>2</sup> Aggregate: approx. 2,600 ft <sup>2</sup>
<u>Vertical Openings:</u>	The stair is enclosed at the First Floor but is not constructed of fire-resistance rated construction and the stair is not provided with separation at the Ground Floor.
<u>Automatic Sprinkler System:</u>	The building is unsprinklered and a standpipe system is not provided.  Fire extinguishers with up to date inspections are provided.
<u>Fire Alarm System:</u>	The fire alarm system consists of several system smoke detectors within the building.
<u>Means of Egress:</u>	<p>The existing building is provided with one interior stair that connects the Ground and First Floors. The stair is signed as an exit from the Ground Floor only. A door that discharges directly to grade via a ramp is provided on the Ground Floor and a door that discharges directly to grade via stairs is provided on the First Floor.</p> <p>The egress capacity from each floor is sufficient to accommodate the calculated occupant load provided that the exit arrangement satisfies the travel distance, common path of travel, dead end, and exit remoteness requirements (see drawings in Appendix B).</p>
<u>Exit Signage and Emergency Lighting:</u>	Exit signage consists of laminated printouts and emergency lighting is not provided. The building is not served by an emergency generator.

## **6.2 Existing Building Analysis By System**

This section of the report is organized by building system and discusses the application of the scoping language presented above on the project.

### **Height and Area**

Code Analysis: The height and area of the building are only required to be evaluated if there is an addition as part of the project (MEBC 1002). **If the building undergoes an addition, it is expected that the construction type will need to be upgraded (i.e. additional fire rating) as the height is currently non-compliant.**

### **Construction Materials**

Existing Condition: The building is constructed of wood framing throughout, which is consistent with Type VB combustible, unprotected construction.

Code Analysis: The use of combustible construction materials is permitted in buildings of Type VB construction (780 CMR 602.5).

### **Vertical Openings**

Existing Condition: The vertical openings within the Union Chapel consist of one egress stair that serves the Ground Floor only. The stair was only enclosed at the top with what appeared to be a non-rated solid wood core door and non-rated construction.

Code Analysis: The existing vertical opening is permitted to remain unless deemed as a hazardous condition by the building official. **If the occupant load of the Ground Floor is maintained at less than 49 occupants, a second means of egress would not be required and there would not be an obligation to rate the existing stair (780 CMR 708.2(7)).**

**If the stair is part of the work area, and the occupant load of the Ground Floor is greater than 49 occupants, the stair should be confirmed to have a 30-minute FRR if in a Group A occupancy (MEBC 703.2).**

### **Interior Finish**

Existing Condition: Typical finishes within the exit stair enclosures consisted of paint on gypsum wallboard. The floors consisted of laminate and carpet flooring. Non-compliant interior finishes were not observed in the exits.



Code Analysis:

Where renovation work occurs:

- Existing finishes that are not included in a renovated area are permitted to remain (MEBC 703.4).
- The interior wall and ceiling finishes in exits and corridors within the work area are required to comply with the requirements of 780 CMR for new construction (provided below) (MEBC 703.4).
- Where the work area on any floor exceeds 50 percent of the floor area, the interior finish requirements from 780 CMR apply to the exits and corridors serving the work area throughout the floor (MEBC 703.4.1).
- The interior wall and ceiling finishes in exits serving the work area between the highest floor on which there is work to the floor of exit discharge are required to comply with the requirements of 780 CMR for new construction (MEBC 803.3).

Use Group	Exits and Exit Passageways	Exit Access Corridors	Rooms and Enclosed Spaces
A-3	A	A	C
B	A	B	C

New floor finishes are required to be of Class I or II materials, as classified in accordance with NFPA 253. The classification corresponds to the following: Class I, 0.45 watts/cm<sup>2</sup> or greater; Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR 804.3).

New decorative materials and trim are required to comply with the requirements of 780 CMR Section 806.

**Fire Alarm System**

Existing Condition:

The existing building's fire alarm system consists of several system smoke detectors.

Code Analysis:

The MEBC does not contain any specific requirements that would stipulate retroactive replacement of the existing system since it is a previously approved system that has been maintained. If work is done which impacts the fire alarm system, such as moving a device location or adding a new device, the requirements for new construction would apply to the installation of the new device only.

**It should be noted that coverage from existing notification devices outside of the work area are permitted to remain as long as they are not deemed hazardous by the building official.**

Should a partial or full upgrade/replacement of the fire alarm system be necessary, all new components and devices are required to comply with new construction requirements relative to coverage, spacing, device type, mounting height, etc. without requiring upgrades outside of the scope of work. It should be confirmed that any system components (i.e. fire alarm control panel, battery backup, etc.) supporting new devices (i.e. horn strobe) have adequate capacity.

### Sprinkler System

Existing Condition: The building is not protected by a sprinkler system.

Code Analysis:

1. MGL Ch. 148 S. 26G would require that a sprinkler system be provided throughout the entire building if any of the following are met:
  - a. **Addition:** There is an addition that increases the buildings size to greater than 7,500 square feet.
  - b. **Renovation/Alteration (Where both i. & ii. apply):**
    - i. The work to the existing building exceeds 7,500 square feet and is significant in scope and expenditure and involves the reconfiguration of interior spaces, demolition of existing ceilings, or the removal or replacement of a significant portion of the building HVAC system ; and
    - ii. The renovation affects more than 1/3 of the area of the building or the cost of the work (excluding sprinkler installation) is equal to or greater than 1/3 of the assessed value of the building.
    - iii. Exception: No such sprinkler system is required unless sufficient water and water pressure exists.

### Standpipes

Existing Condition: A standpipe system is not provided within the building.

Code Analysis: As the highest floor is not located more than 50 feet above the lowest level of fire department access, standpipes are not required (780 CMR 905.3.1).

### Means of Egress- Number of Exits & Exit Capacity

Existing Condition: The existing building is provided with one interior stair that connects the Ground and First Floors. The stair is signed as an exit from the Ground Floor only. A door that discharges directly to grade via a ramp is provided on the Ground Floor and a door that

discharges directly to grade via stairs is provided on the First Floor. See the plans in Appendix B for more information.

Code Analysis:

The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

Each floor, serving an occupant load of 50 or more occupants, is required to be provided with a minimum of two means of egress (780 CMR 1021.1) and the means of egress capacities should be sized based on the following factors (780 CMR 1005.1):

- Stairways: 0.3 inch/occupant
- Other Egress Components: 0.2 inch/occupant

**The First Floor is provided with a single means of egress. The interior stair is not permitted to be a means of egress from the First Floor due to exit remoteness (780 CMR 1015.2.1).**

**As a Group A occupancy, the occupant load of the Ground Floor may exceed 50 occupants provided this existing stair is not considered as a hazardous means of egress.**

**Means of Egress- Exit Arrangement**

Existing Condition:

The arrangement of the egress was well maintained and consistent with the requirements of 780 CMR Chapter 10. Exit access travel distance, common path of travel, dead end travel distance, and exit remoteness were reviewed from interior spaces and found to be in accordance with 780 CMR Chapter 10:

- Allowable travel distance: 200'
- Allowable common path of travel: 75'
- Allowable dead end: 20'

Code Analysis:

The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

The current exit arrangement satisfies the above maximum distances.

**Emergency Lighting & Exit Signage**

Existing Condition

The building is not served by interior means of egress lighting. Exterior exit discharge points were provided with lighting.

## Code Analysis

**780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official. Paper signage is required to be replaced with signage that is internally illuminated regardless of the scope of work.**

**Existing Hazardous Means of Egress**

## Code Analysis

780 CMR Section 102.6.4 states that existing means of egress elements can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official. Additionally, 527 CMR requires existing means of egress components to be maintained in a safe and operable condition.

**Accessibility****MAAB Requirements (521 CMR via MEBC 505 & 605)**

Alterations and repairs to existing public buildings or facilities, which require a building permit or which are so defined by a state or local inspector, are governed by all applicable subsections of 521 CMR (521 CMR 3.3).

The requirements of 521 CMR are limited to buildings or portions thereof that are open to the public. Employee-only spaces are exempt from these requirements.

## / Existing Condition:

The value of the building was found to be \$180,200 as recorded at the Town of Mendon assessor's office. The Massachusetts Department of Revenue has assigned Mendon an assessment ratio of 0.96<sup>3</sup>. Thus, the full and fair cash value of the building is \$187,709.

The 30% threshold if the entire building is considered public is \$56,313 and thus any work will not meet the more than \$100,000 but less than 30% threshold outlined below. It should be noted that the costs referred to in the scoping requirements below are taken for all projects within a rolling 36 month period.

## Code Analysis:

521 CMR Section 3.3 contains the following scoping requirements for projects in existing buildings:

1. If the work is less than \$100,000, then only the work being performed is required to comply with 521 CMR.

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<sup>3</sup> <http://www.mass.gov/dor/local-officials/assessor-info/equalized-valuations-eqv.html>



2. If the work costs more than \$100,000 but is less than 30% of the full and fair cash value of the building then in addition to the working being performed, the following accessible features are also required to be provided in the building:
  - a. Accessible entrance
  - b. Accessible toilet room
  - c. Accessible drinking fountain (if provided)
  - d. Accessible public telephone (if provided)
3. If the work costs more than 30% of the full and fair cash value of the building, then all public portions of the building are subject to the requirements of 521 CMR.

**It should be noted that all work exceeding \$56,313 will trigger the 30% threshold for this building.**

MAAB also has a variance process where relief may be granted based on illustrating that complying with the code is either not technically feasible given existing conditions or that the level of accessible gain is disproportionate when compared with the cost to perform the work. In our experience on similar projects, the variance process may be utilized to provide relief on a number of items that are outside of the planned scope of work. Furthermore, as a historic building, the Union Chapel falls under the scope of 521 CMR Section 3.9, which permits a building's historical significance to be used as the basis for a variance request.

Existing Building  
Application

A summary of the major existing accessible features of the building is provided below. If the 30% threshold is exceeded by a scope of work, a full accessibility survey is warranted.

Element	Existing Condition
Accessible Entrance	<p>All public entrances to the building are required to be accessible (521 CMR 25.1). In order for an entrance to be accessible it should satisfy the following:</p> <ul style="list-style-type: none"> <li>• Within the vestibule, the space between two side-swinging doors is required to be a minimum of 48" including the width of any door swining into the space (521 CMR 25.3).</li> <li>• The slope and cross slope of the exterior paths to the entrance are not permitted to exceed the maximum allowable (5% &amp; 2%, respectively) for a walkway (521 CMR 22.3, 22.3.1).</li> <li>• Where a ramp is included as part of the access to an accessible entrance, it should have handrails and slopes in accordance with 521 CMR Chapter 24.</li> </ul> <p>The Ground Floor entrance is not currently accessible and only minor required upgrades are anticipated. It should be noted that landing at the bottom of the ramp is not level, no handrail extensions are provided, the intermediate landing is only 57" by 52", the clear width is only 46", and the lower handrail is at 27"</p>

	<p>above the walking surface. Each of these values meets the intent to make the entrance accessible; however, the dimensions are not in strict compliance with 521 CMR Chapter 24.</p> <p>The main entrance at the First Floor is not accessible and is expected to require significant upgrades in order to be made fully accessible in accordance with 521 CMR. These upgrades will include providing a ramp.</p>
Accessible Route	Vertical access within the building is provided by means of a single stair. The existing stair does not comply with 521 CMR Chapter 27 for abrupt nosings, handrail height, and handrail extensions.
Accessible Toilet Rooms	A single unisex bathroom is provided for the building on the Ground Floor. This bathroom does not meet the requirements of 521 CMR Chapter 30 for an accessible bathroom.
Stairs	<p>The stairs serving the levels above grade are not currently fully accessible in accordance with 521 CMR 27.00. The following deficiencies were noted:</p> <ol style="list-style-type: none"> <li>1. The stairs should be provided with handrails that have a height of 34-38 inches and are provided with handrail extensions in accordance with 521 CMR Section 27.4.3 on both sides.</li> <li>2. The stair has abrupt nosings that should be addressed as part of the project.</li> </ol>
Accessible Drinking Fountains (Not Applicable)	There were no public drinking fountains observed within the building (521 CMR 36.00).
Accessible Public Telephones (Not Applicable)	There were no public telephones observed within the building (521 CMR 37.00).

### **ADA Application**

Although not enforced by any authority having jurisdiction on the project, the requirements of ADA are also applicable and enforced through civil litigation only. Code Red Consultants did not perform a comprehensive accessibility review of the facility for ADA compliance. The scope of our analysis was limited to entrances and main accessible routes.

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) requires that altered portions of an existing building must be readily accessible to and usable by individuals with disabilities to the maximum extent feasible (ADAAG 36.402(a)(1)). Further, alterations to primary function areas should be made such that the level of accessibility, including the path of travel to the space, is made accessible to the maximum extent feasible. When determining if the upgrade is feasible, the ADAAG requirements state that the upgrade to the path of travel is disproportionate to the project when the cost to perform the work exceeds 20% of the cost of the alteration to the primary function area. In choosing which accessible elements to provide if the cost is disproportionate, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance
2. An accessible route to the altered area
3. At least one accessible restroom for each sex or a single unisex restroom
4. Accessible drinking fountains
5. Accessible telephones

When possible, additional accessible elements such as parking, storage, and alarms should be addressed if within the disproportionality criteria.

### **Structural (MEBC 506 & 606)**

The review of existing conditions and application of the structural requirements will be performed by the structural engineer on the project. Evaluation of structural elements and their connections should consider the cumulative effects of alterations, additions, or changes of occupancy since the original construction, except where permitted by MEBC Section 101.9.

**Addition**                      Where there is an addition to the existing building it should be structurally independent and should comply with the new construction requirements of 780 CMR (MEBC 302, 1003).

**Alteration**                      New Structure:  
New structural elements, including connections and anchorage, are required to meet the requirements of 780 CMR for new construction (MEBC 303.1, 707.2, 807.2).

#### Gravity Load-Carrying Structure

The load carrying capacity of structural members is not permitted to be reduced as a result of the project unless it can be demonstrated that the members meet the requirements of 780 CMR for new construction. If a structural element's stress is increased by more than 5% since the time of original installation, it is required to comply with the provisions of 780 CMR for new construction (MEBC 302.3, 707.4, 807.3).

#### Lateral & Seismic Load-Carrying Structure

The evaluation of lateral and seismic loading differ between the Prescriptive Method and Work Area Method. The primary difference between the two evaluation methods is that under the Prescriptive Method, work must be done to the structure in order to warrant a seismic evaluation, whereas under the Work Area Method, if the work area of the project exceeds 50% of the gross building area, a seismic evaluation is required regardless of the scope of work to the existing structural system.

Note that under both methods, voluntary seismic upgrades that are not otherwise required and are initiated for the purpose of improving the performance of the seismic force-resisting system are

permitted, provided that they are supported by an engineering analysis (MEBC 303.5; 707.6).

**Plumbing Fixtures (248 CMR)**

Existing Condition: A single unisex toilet room is provided on the Ground Floor.

Code Analysis: The MEBC and 248 CMR do not contain any specific provisions which outline when an updated plumbing fixture quantity analysis is required in an existing building. Based on past experiences, plumbing officials generally require an updated plumbing fixture count analysis to be performed where the renovation project includes work to existing toilet rooms, or where the occupant load of the space is being increased as a result of the renovation project.

**Energy (2012 IECC)**

Code Analysis: Alterations and repairs to existing buildings, building systems, or portions thereof are required to conform to the provisions of the Stretch Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with the new construction requirements (MEBC 607.1).

If existing insulation has been removed and is being replaced, it will be subject to the requirements for new construction. If an interior wall surface has been removed, thereby exposing the insulation, and the existing installation is in suitable condition to remain, it is not retroactively required to be upgraded based on the code sections cited above.



## 7. Old Fire Station

The existing Old Fire Station is located to the south of the Town Hall in the Mendon Town Center complex. When occupied, the building served vehicle parking and storage uses on the Ground Floor and both residential and office uses on the Second Floor. Currently the Second Floor of the building is vacant and the Ground Floor is being utilized for municipal storage and vehicle parking. It is our understanding that a change of use to include assembly spaces is being considered for this building.

It is our understanding that the existing Old Fire Station was utilized as a non-separated mixed use Group B, Business, Group S-2, Parking and Group R-2, Residential Occupancy. As a result of a renovation project should an assembly occupancy be introduced into the Old Fire Station, a change in occupancy would occur and be subject to the requirements of MEBC Chapter 9. It should be noted that use of the Ground Floor for any of the previously utilized non-separated mixed uses would not constitute a change in use.



FIGURE 4: OLD FIRE STATION

The MEBC analysis of the Old Fire Station includes the following major existing building applications that may require attention depending on the scope of work. A complete analysis of the Old Fire Station Building in accordance with the MEBC is provided in Section 7.2 of this report.

- Based on the size and layout of the First and Second Floor of the building, the common path of travel from the existing Second Floor exceeds 75 feet and thus a second means of egress would be required.
- If a project with a change of occupancy or addition occurs, further evaluation of the existing building's height and area will be necessary; however, it should be noted that given the building's construction type, if there is not an addition, the First Floor could serve as a Group A occupancy provided a second means of egress is provided. It should also be noted that conference rooms less than 50 occupants are considered Group B use and would not constitute a change of occupancy.

- If the stair is part of the work area, or serves occupants within the work area, it should be confirmed to have a 30-minute FRR (MEBC 703.2).
- 780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official.
- Where a change of occupancy or addition requires the installation of a fire alarm system in accordance with 780 CMR Chapter 9, a fire alarm system must be installed throughout the building (MEBC 912.2.2, 1002.3).

### **7.1 Existing Building Summary**

<u>Use and Occupancy:</u>	<u>Primary Use(s):</u> Group B, Business Group R-2, Residential Group S-2, Vehicle Parking
<u>Construction Type:</u>	Type IIIB, combustibile unprotected, masonry exterior
<u>Height:</u>	2 Stories
<u>Area:</u>	Footprint: approx. 2,000 ft <sup>2</sup> Aggregate: approx. 4,000 ft <sup>2</sup>
<u>Vertical Openings:</u>	The stair serving the Second Floor is enclosed at the First Floor and is not constructed with fire-resistance rated construction.
<u>Automatic Sprinkler System:</u>	The building is unsprinklered and a standpipe system is not provided.  Fire extinguishers are not provided.
<u>Fire Alarm System:</u>	Fire alarm system is not provided.
<u>Means of Egress:</u>	The Second Floor is served by one egress stair, which discharges to the interior of the First Floor. The First Floor is served by one exit that discharges to grade.  The egress capacity from each floor exceeds that necessary to accommodate the calculated occupant load provided; however, the exit arrangement does not satisfy the travel distance, common path of travel, and exit remoteness requirements from the Second Floor (see drawings in Appendix C).
<u>Exit Signage and Emergency Lighting:</u>	Exit signage and emergency lighting is not provided. The building is served by an emergency generator located in a shed addition at the rear of the building.

## 7.2 Old Fire Station Existing Building Analysis by System

This section of the report is organized by building system and discusses the application of the scoping language presented above on the project.

### Height and Area

Code Analysis: The height and area of the building are only required to be evaluated if there is a change of occupancy or an addition as part of the project (MEBC 912.5.1, 1002). **If the building undergoes an addition, based on site restrictions it is not expected that the construction type will need to be upgraded as the height is currently compliant. Additionally if the building undergoes a change in use, it is not anticipated that the maximum allowable height or area would exceed the limitations of 780 CMR Table 503.**

### Construction Materials

Existing Condition: The building is constructed of wood framing throughout with a masonry exterior, which is consistent with Type IIIB combustible, unprotected construction.

Code Analysis: The use of combustible construction materials is permitted in the interior of buildings of Type IIIB construction (780 CMR 602.5).

### Vertical Openings

Existing Condition: The vertical openings within the Old Fire Station consist of one egress stair that serves the Second Floor. It appeared that the shaft construction was consistent with a non-rated construction with a solid wood core door at the Ground Floor and no separation at the Second Floor.

Code Analysis: The existing stair is permitted to remain unless deemed as a hazardous condition by the building official. **If the stairs are part of the work area they should be confirmed to have a 30-minute FRR (MEBC 703.2).**

Where the work area on any floor exceeds 50% of that floor area, stairways that are part of the means of egress serving that area are required to be enclosed with smoke-tight construction on the highest work area floor and all floors below (MEBC 703.2.3).

In addition to the wall construction, doors protecting openings to the shafts are required to contain an appropriate fire resistance rating

and be automatic or self-closing and latching. **Should this stair be utilized as a means of egress, the door is required to be at least 20-minute fire resistance rated and be automatic or self-closing and latching.**

### Interior Finish

#### Existing Condition:

Typical finishes within the exit stair enclosures consisted of paint on gypsum wallboard. The floors consisted of laminate and carpet flooring. Non-compliant interior finishes were not observed in the exits.

#### Code Analysis:

Where renovation work occurs:

- Existing finishes that are not included in a renovated area are permitted to remain (MEBC 703.4).
- The interior wall and ceiling finishes in exits and corridors within the work area are required to comply with the requirements of 780 CMR for new construction (provided below) (MEBC 703.4).
- Where the work area on any floor exceeds 50 percent of the floor area, the interior finish requirements from 780 CMR apply to the exits and corridors serving the work area throughout the floor (MEBC 703.4.1).
- The interior wall and ceiling finishes in exits serving the work area between the highest floor on which there is work to the floor of exit discharge are required to comply with the requirements of 780 CMR for new construction (MEBC 803.3).

Use Group	Exits and Exit Passageways	Exit Access Corridors	Rooms and Enclosed Spaces
A-3	A	A	C
B	A	B	C

New floor finishes are required to be of Class I or II materials, as classified in accordance with NFPA 253. The classification corresponds to the following: Class I, 0.45 watts/cm<sup>2</sup> or greater; Class II, 0.22 watts/cm<sup>2</sup> or greater (780 CMR 804.3).

New decorative materials and trim are required to comply with the requirements of 780 CMR Section 806.



**Fire Alarm System**

Existing Condition: An existing fire alarm system is not provided. Disconnected spot-type smoke detection was observed.

Code Analysis: Where the building is not equipped with an existing fire alarm system, the MEBC does not contain any specific requirements that would stipulate retroactive installation in a Group B occupancy.

Where a change of occupancy or addition requires the installation of a fire alarm system in accordance with 780 CMR Chapter 9, a fire alarm system must be installed throughout the building (MEBC 912.2.2, 1002.3).

**Sprinkler System**

Existing Condition: The building is not protected by a sprinkler system.

Code Analysis:

1. MGL Ch. 148 S. 26G would require that a sprinkler system be provided throughout the entire building if any of the following are met:
  - a. **Addition:** There is an addition that increases the buildings size to greater than 7,500 square feet.
  - b. **Renovation/Alteration (Where both i. & ii. apply):**
    - i. The work to the existing building exceeds 7,500 square feet and is significant in scope and expenditure and involves the reconfiguration of interior spaces, demolition of existing ceilings, or the removal or replacement of a significant portion of the building HVAC system ; and
    - ii. The renovation affects more than 1/3 of the area of the building or the cost of the work (excluding sprinkler installation) is equal to or greater than 1/3 of the assessed value of the building.
    - iii. Exception: No such sprinkler system is required unless sufficient water and water pressure exists.

**Standpipes**

Existing Condition: A standpipe system is not provided within the building.

Code Analysis: As the highest floor is not located more than 50 feet above the lowest level of fire department access, standpipes are not required (780 CMR 905.3.1).

**Means of Egress- Number of Exits & Exit Capacity**

Existing Condition: The existing Building is provided with a single stair that discharges to the interior of the Ground Floor. A single door that discharges directly to grade is provide on the Ground Floor. Each Floor of the building is provided with a single means of egress. See the plans in Appendix C for more information.

Code Analysis: The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

Each floor is required to be provided with a minimum of two means of egress (780 CMR 1021.1) and the means of egress capacities should be sized based on the following factors (780 CMR 1005.1):

- Stairways: 0.3 inch/occupant
- Other Egress Components: 0.2 inch/occupant

In a Group A or Group B occupancy on the first floor a single means of egress may be provided if the occupant load is 49 or less and the maximum common path of travel is 75 feet. In a Group B or S occupancy on the Second Floor, a single means of egress may be provided if the occupant load is 29 or less and the maximum common path of travel is 75 feet.

**A second means of egress that discharges directly to the exterior is required from the Second Floor regardless of the occupant load because the common path of travel exceeds 75 feet (780 CMR Table 1021.2).**

**A second means of egress is only required from the First Floor if the occupant load exceeds 49 occupants since the common path of travel is less than 75 feet (780 CMR Table 1021.2).**

**Means of Egress- Exit Arrangement**

Existing Condition: Exit access travel distance, common path of travel, dead end travel distance, and exit remoteness were reviewed from interior spaces and found to be in accordance with 780 CMR Chapter 10:

- Allowable travel distance: 200'
- Allowable common path of travel: 75'
- Allowable dead end: 20'

Code Analysis: The MEBC contains a requirement for all existing buildings undergoing a renovation, regardless of the scope of work, to be provided with adequate egress in terms of number, capacity, and arrangement in accordance with 780 CMR (780 CMR 102.6.4).

**The current exit arrangement does not satisfy the above maximum distances. See Means of Egress – Number of Exits & Exit Capacity section for more details.**

### Emergency Lighting & Exit Signage

Existing Condition The building is not served by interior means of egress lighting. The exterior exit discharge point was not provided with lighting.

Code Analysis **780 CMR Section 102.6.4 states that existing means of egress elements including signage and lighting can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official.**

### Existing Hazardous Means of Egress

Code Analysis 780 CMR Section 102.6.4 states that existing means of egress elements can retroactively be required to be upgraded regardless of the planned scope of work if deemed hazardous by the building official. Additionally, 527 CMR requires existing means of egress components to be maintained in a safe and operable condition. No hazardous means of egress were observed on site.

### Accessibility

#### **MAAB Requirements (521 CMR via MEBC 505 & 605)**

Alterations and repairs to existing public buildings or facilities, which require a building permit or which are so defined by a state or local inspector, are governed by all applicable subsections of 521 CMR (521 CMR 3.3).

The requirements of 521 CMR are limited to buildings or portions thereof that are open to the public. Employee-only spaces are exempt from these requirements.

Existing Condition: The value of the building was found to be \$103,200 as recorded at the Town of Mendon assessor's office. The Massachusetts Department of Revenue has assigned Mendon an assessment ratio of 0.96<sup>4</sup>. Thus, the full and fair cash value of the building is \$107,500.

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<sup>4</sup> <http://www.mass.gov/dor/local-officials/assessor-info/equalized-valuations-eqv.html>

The 30% threshold if the entire building is considered public is \$32,250 and thus any work will not meet the more than \$100,000 but less than 30% threshold outlined below. It should be noted that the costs referred to in the scoping requirements below are taken for all projects within a rolling 36 month period.

Code Analysis:

521 CMR Section 3.3 contains the following scoping requirements for projects in existing buildings:

1. If the work is less than \$100,000, then only the work being performed is required to comply with 521 CMR.
2. If the work costs more than \$100,000 but is less than 30% of the full and fair cash value of the building then in addition to the working being performed, the following accessible features are also required to be provided in the building:
  - a. Accessible entrance
  - b. Accessible toilet room
  - c. Accessible drinking fountain (if provided)
  - d. Accessible public telephone (if provided)
3. If the work costs more than 30% of the full and fair cash value of the building, then all public portions of the building are subject to the requirements of 521 CMR.

**It should be noted that all work exceeding \$56,313 will trigger the 30% threshold for this building.**

MAAB also has a variance process where relief may be granted based on illustrating that complying with the code is either not technically feasible given existing conditions or that the level of accessible gain is disproportionate when compared with the cost to perform the work. In our experience on similar projects, the variance process may be utilized to provide relief on a number of items that are outside of the planned scope of work. Furthermore, as a historic building, the Town Hall falls under the scope of 521 CMR Section 3.9, which permits a building's historical significance to be used as the basis for a variance request.

Existing Building  
Application

A summary of the major existing accessible features of the building is provided below. If the 30% threshold is exceeded by a scope of work, a full accessibility survey is warranted.



Element	Existing Condition
Accessible Entrance	<p>All public entrances to the building are required to be accessible (521 CMR 25.1). In order for an entrance to be accessible it should satisfy the following:</p> <ul style="list-style-type: none"> <li>• Within the vestibule, the space between two side-swinging doors is required to be a minimum of 48" including the width of any door swining into the space (521 CMR 25.3).</li> <li>• The slope and cross slope of the exterior paths to the entrance are not permitted to exceed the maximum allowable (5% &amp; 2%, respectively) for a walkway (521 CMR 22.3, 22.3.1).</li> <li>• Where a ramp is included as part of the access to an accessible entrance, it should have handrails and slopes in accordance with 521 CMR Chapter 24.</li> </ul> <p>The Ground Floor entrance is not currently accessible and only minor required upgrades are anticipated in regards to the 5" step down at the door.</p>
Accessible Route	Vertical access within the building is provided by means of a single stair. The existing stair does not comply with 521 CMR Chapter 27 for abrupt nosings, handrail height, and handrail extensions.
Accessible Toilet Rooms	A single unisex bathroom is provided for the building on the Ground Floor. This bathroom does not meet the requirements of 521 CMR Chapter 30 for an accessible bathroom.
Stairs	<p>The stairs serving the levels above grade are not currently fully accessible in accordance with 521 CMR 27.00. The following deficiencies were noted:</p> <ol style="list-style-type: none"> <li>1. The stairs should be provided with handrails that have a height of 34-38 inches and are provided with handrail extensions in accordance with 521 CMR Section 27.4.3 on both sides.</li> <li>2. The stair has abrupt nosings that should be addressed as part of the project.</li> </ol>
Accessible Drinking Fountains (Not Applicable)	There were no public drinking fountains observed within the building (521 CMR 36.00).
Accessible Public Telephones (Not Applicable)	There were no public telephones observed within the building (521 CMR 37.00).

### **ADA Application**

Although not enforced by any authority having jurisdiction on the project, the requirements of ADA are also applicable and enforced through civil litigation only. Code Red Consultants did not perform a comprehensive accessibility review of the facility for ADA compliance. The scope of our analysis was limited to entrances and main accessible routes.

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) requires that altered portions of an existing building must be readily accessible to and usable by individuals with disabilities to the maximum extent feasible (ADAAG 36.402(a)(1)). Further, alterations to primary function areas should be made such that the level of accessibility, including the path of travel to the space, is made accessible to the maximum extent feasible. When determining if the upgrade is feasible, the ADAAG requirements state that the upgrade to the path of travel is disproportionate to the project when the cost to perform the work exceeds 20% of the cost of the alteration to the primary function area. In choosing which accessible elements to provide if the cost is disproportionate, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance
2. An accessible route to the altered area
3. At least one accessible restroom for each sex or a single unisex restroom
4. Accessible drinking fountains
5. Accessible telephones

When possible, additional accessible elements such as parking, storage, and alarms should be addressed if within the disproportionality criteria.

### **Structural (MEBC 506 & 606)**

The review of existing conditions and application of the structural requirements will be performed by the structural engineer on the project. Evaluation of structural elements and their connections should consider the cumulative effects of alterations, additions, or changes of occupancy since the original construction, except where permitted by MEBC Section 101.9.

Addition	Where there is an addition to the existing building it should be structurally independent and should comply with the new construction requirements of 780 CMR (MEBC 302, 1003).
Change of Occupancy	<p>Where there is a change of occupancy that results in the structure being classified to a higher occupancy category, the structure is required to conform to the seismic requirements for a new structure of the higher occupancy category (MEBC 307.4, 907.3.1). Buildings are exempt from this requirement where all of the following conditions are satisfied (MEBC 907.3.1):</p> <ul style="list-style-type: none"><li>• The new occupancy is Group A, E, I-1, R-1, R-2, or R-4;</li><li>• The building is less than 6 stories in height; and</li><li>• The building is seismic design category A, B, or C.</li></ul>
Alteration	<p><u>New Structure:</u> New structural elements, including connections and anchorage, are required to meet the requirements of 780 CMR for new construction (MEBC 303.1, 707.2, 807.2).</p>

Gravity Load-Carrying Structure

The load carrying capacity of structural members is not permitted to be reduced as a result of the project unless it can be demonstrated that the members meet the requirements of 780 CMR for new construction. If a structural element's stress is increased by more than 5% since the time of original installation, it is required to comply with the provisions of 780 CMR for new construction (MEBC 302.3, 707.4, 807.3).

Lateral & Seismic Load-Carrying Structure

The evaluation of lateral and seismic loading differ between the Prescriptive Method and Work Area Method. The primary difference between the two evaluation methods is that under the Prescriptive Method, work must be done to the structure in order to warrant a seismic evaluation, whereas under the Work Area Method, if the work area of the project exceeds 50% of the gross building area, a seismic evaluation is required regardless of the scope of work to the existing structural system.

Note that under both methods, voluntary seismic upgrades that are not otherwise required and are initiated for the purpose of improving the performance of the seismic force-resisting system are permitted, provided that they are supported by an engineering analysis (MEBC 303.5; 707.6).

Plumbing Fixtures (248 CMR)

Existing Condition: A single unisex toilet is provided on the Ground Floor.

Code Analysis: The MEBC and 248 CMR do not contain any specific provisions which outline when an updated plumbing fixture quantity analysis is required in an existing building. Based on past experiences, plumbing officials generally require an updated plumbing fixture count analysis to be performed where the renovation project includes work to existing toilet rooms, or where the occupant load of the space is being increased as a result of the renovation project.

Energy (2012 IECC)

Code Analysis: Alterations and repairs to existing buildings, building systems, or portions thereof are required to conform to the provisions of the Stretch Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with the new construction requirements (MEBC 607.1).

If existing insulation has been removed and is being replaced, it will be subject to the requirements for new construction. If an interior

wall surface has been removed, thereby exposing the insulation, and the existing installation is in suitable condition to remain, it is not retroactively required to be upgraded based on the code sections cited above.

If you have any questions or comments on the above information, please do not hesitate to contact me.

CODE RED CONSULTANTS

Prepared By:



Jason M. Hopkins

Reviewed By:



Paul J. Moan, P.E.



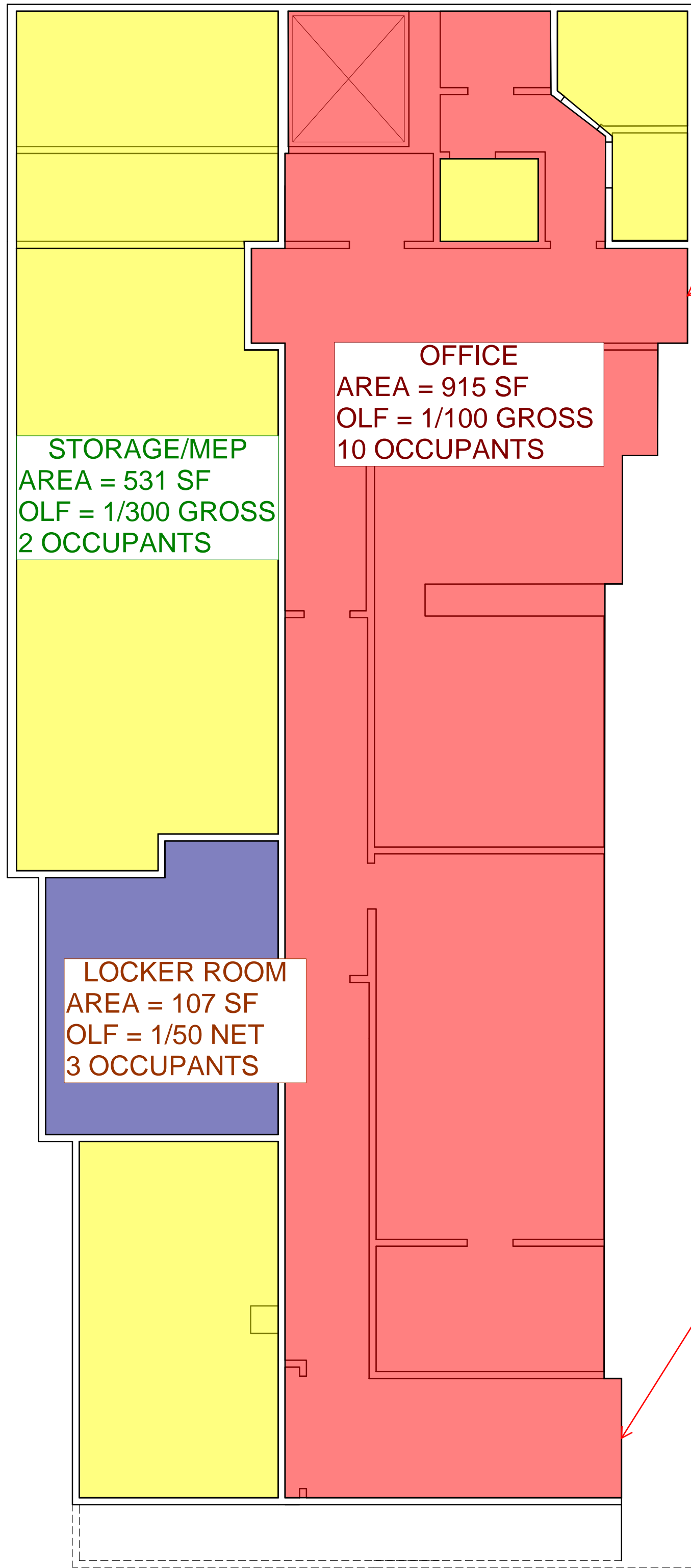
## **Appendix A: Town Hall Exit Capacity and Occupant Load Analysis**

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1

TOWN HALL  
BASEMENT FLOOR PLAN

SCALE: 3/16" = 1'-0"



DOOR WIDTH: 34"  
EGRESS CAPACITY = 170  
CAPACITY USED = 8

DOOR WIDTH: 34"  
STAIR WIDTH: 33"  
EGRESS CAPACITY = 110  
CAPACITY USED = 7



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HALL CAMPUS  
STUDY

TOWN OF  
MENDON

20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

TOWN HALL  
BASEMENT  
FLOOR PLAN

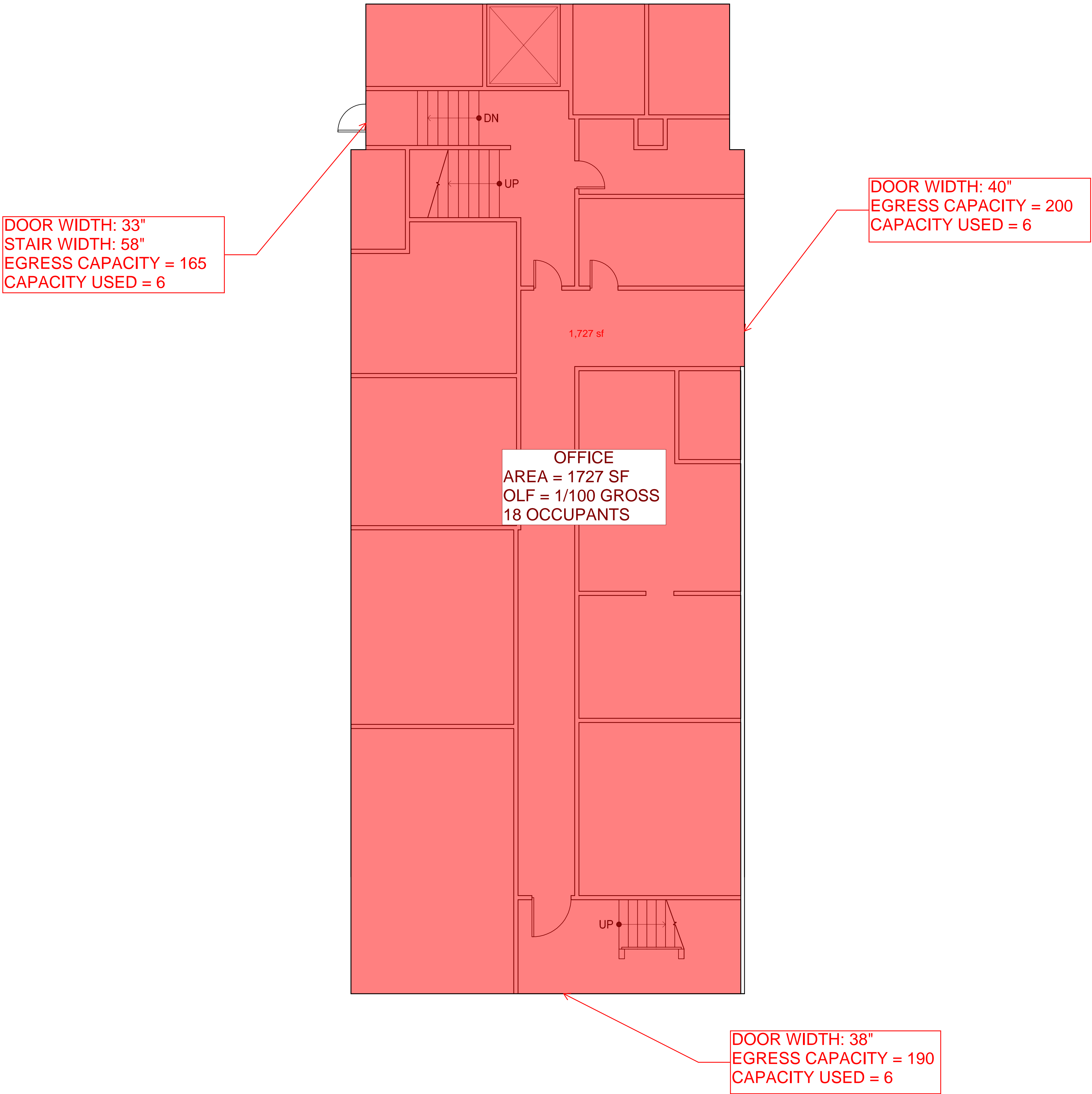
Revisions:

Submission:

Date: 03/29/2016  
Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 3/16" = 1'-0"

A1-05

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30

YEARS

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Drawing Title:

TOWN HALL  
FIRST  
FLOOR PLAN

Revisions:

Submission:

Date: 03/29/2016

Project Number: 16036

Project Manager: SAW

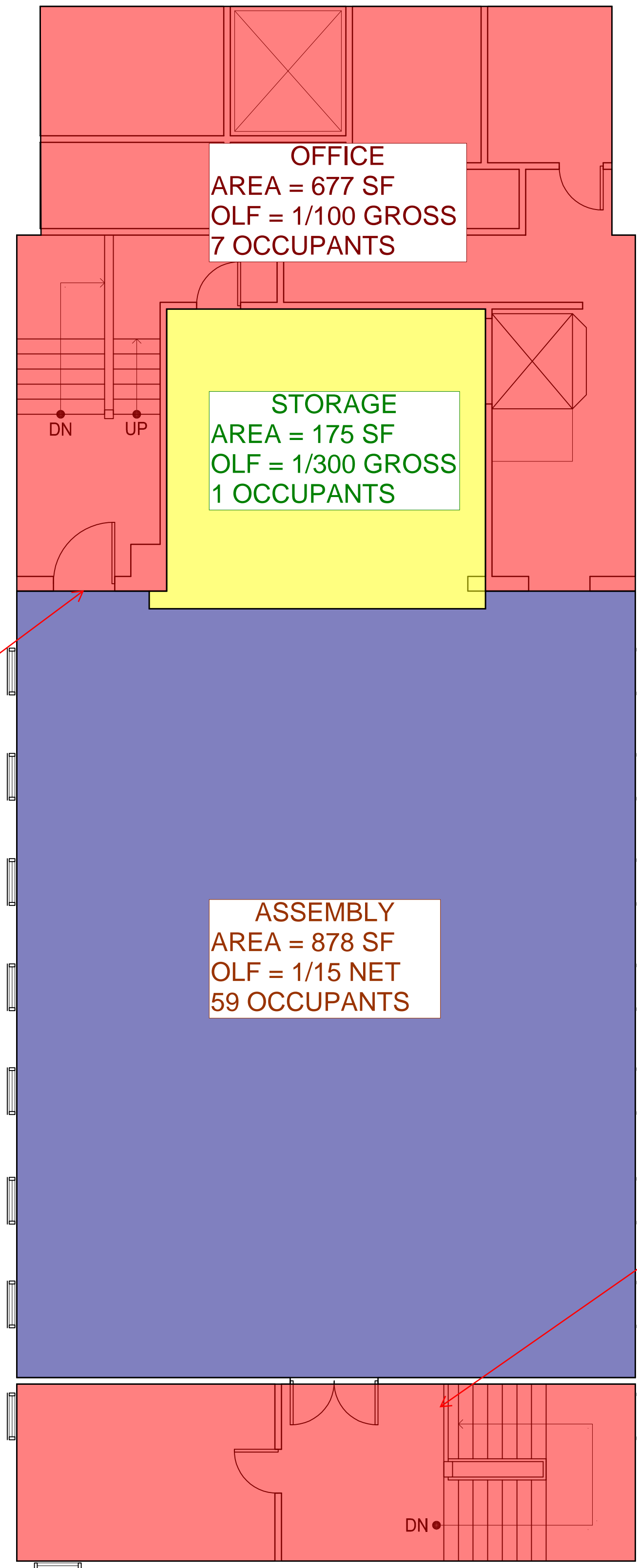
Drawn By: MF

Scale: 3/16" = 1'-0"

AI-06

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DOOR WIDTH: 33"  
STAIR WIDTH: 58"  
EGRESS CAPACITY = 165  
CAPACITY USED = 33



DOOR WIDTH: 38"  
STAIR WIDTH: 55"  
EGRESS CAPACITY = 183  
CAPACITY USED = 34

30

YEARS

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MENDON

20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

TOWN HALL  
SECOND  
FLOOR PLAN

Revisions:

Submission:

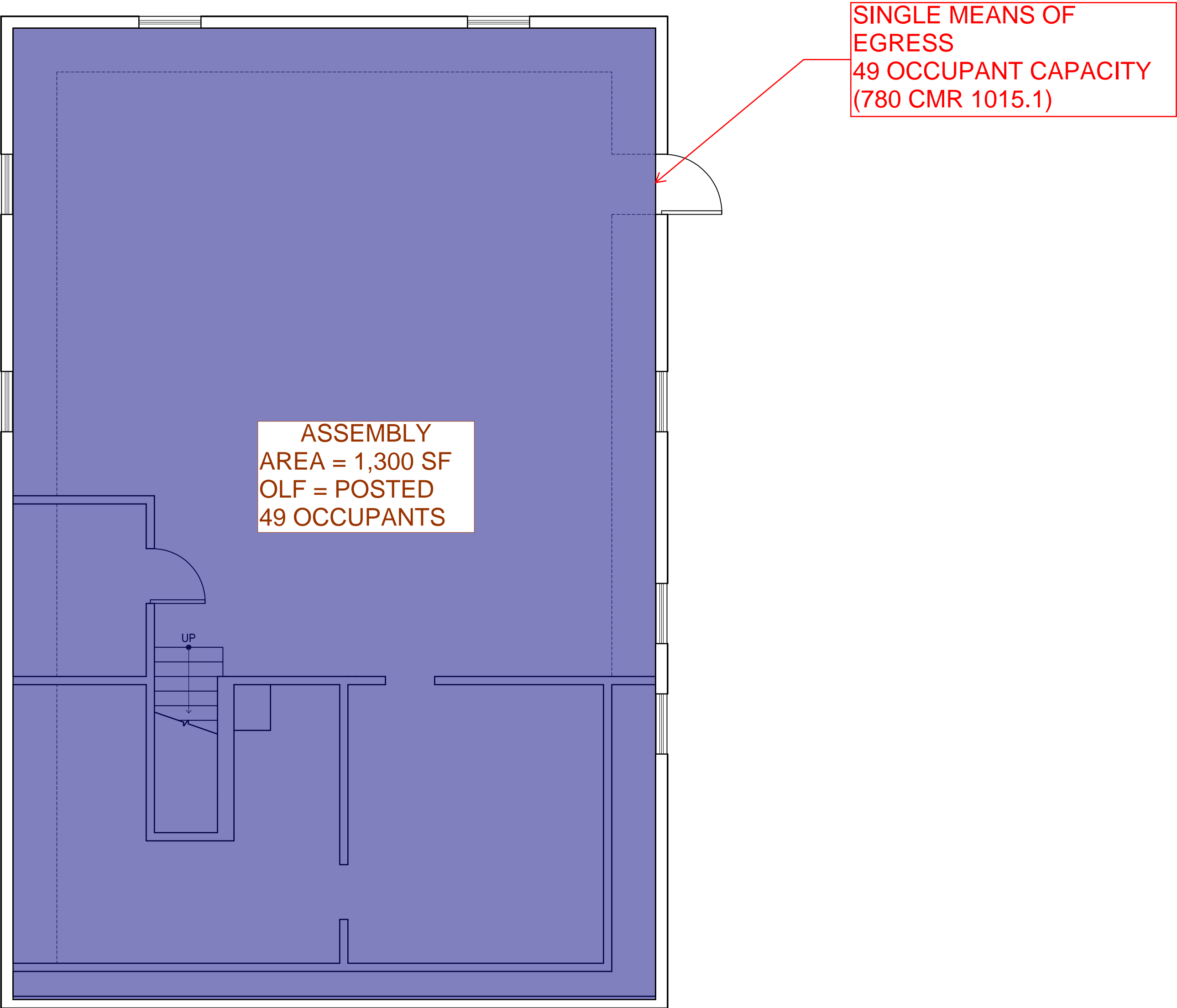
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Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 3/16" = 1'-0"

AI-07



## **Appendix B: Union Chapel Exit Capacity and Occupant Load Analysis**

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STUDY

TOWN OF  
MENDON  
20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

LIBRARY  
GROUND FLOOR  
PLAN

Revisions:

Submission:

Date: 03/29/2016  
Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 1/4" = 1'-0"

AI-03

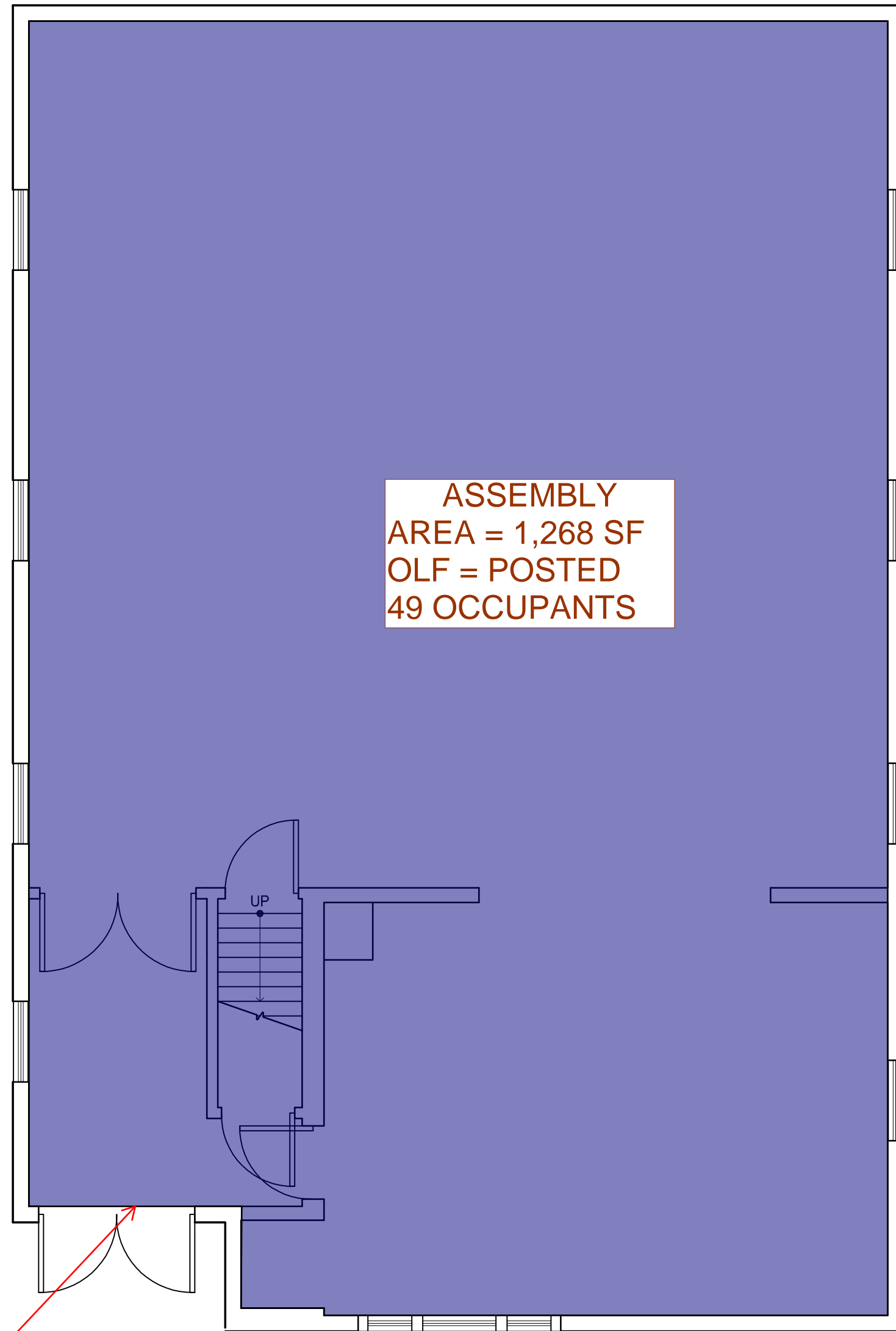
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1

LIBRARY FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

SINGLE MEANS OF  
EGRESS  
49 OCCUPANT CAPACITY  
(780 CMR 1015.1)



ASSEMBLY  
AREA = 1,268 SF  
OLF = POSTED  
49 OCCUPANTS



250 DORCHESTER AVENUE  
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MENDON CENTER  
HISTORIC  
DISTRICT - TOWN  
HALL CAMPUS  
STUDY

TOWN OF  
MENDON

20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

LIBRARY  
FIRST FLOOR  
PLAN

Revisions:

Submission:

Date: 03/29/2016  
Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 1/4" = 1'-0"

AI-04

## **Appendix C: Old Fire Station Exit Capacity and Occupant Load Analysis**





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STUDY

TOWN OF  
MENDON  
20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

FIRE STATION  
FIRST FLOOR  
PLAN

Revisions:

Submission:

Date: 03/29/2016  
Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 1/4" = 1'-0"

AI-01

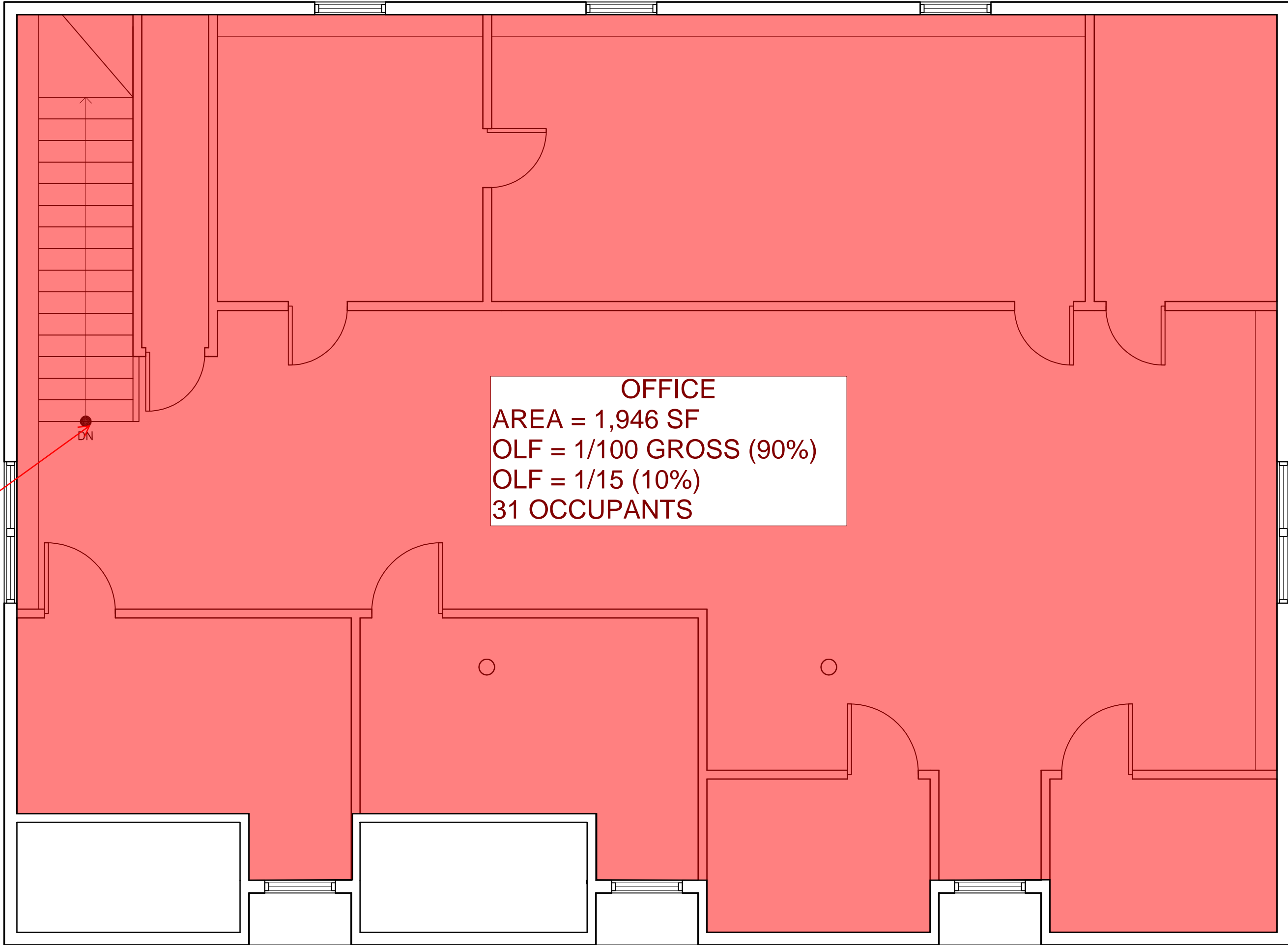


DOOR WIDTH: 33"  
EGRESS CAPACITY = 165  
CAPACITY USED = 64

THE OCCUPANT LOAD OF  
THIS FLOOR HAS  
INCLUDED 10% OF THE  
FLOOR AREA AS  
ASSEMBLY TO ACCOUNT  
FOR POTENTIAL  
CONFERENCE USES

P:\2016\16036\AutoCAD\REF\16036 Fire Station Plans.dwg Mar 29, 2016 - 9:17 am MFOLLETT

DOOR WIDTH: 33"  
STAIR WIDTH: 38"  
EGRESS CAPACITY = 126  
CAPACITY USED = 31



THE OCCUPANT LOAD OF  
THIS FLOOR HAS  
INCLUDED 10% OF THE  
FLOOR AREA AS  
ASSEMBLY TO ACCOUNT  
FOR POTENTIAL  
CONFERENCE USES

30

YEARS

CBI

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DISTRICT - TOWN  
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STUDY

TOWN OF  
MENDON

20 MAIN STREET  
MENDON, MA 01756

Drawing Title:

FIRE STATION  
SECOND FLOOR  
PLAN

Revisions:

Submission:

Date: 03/29/2016  
Project Number: 16036  
Project Manager: SAW  
Drawn By: MF  
Scale: 1/4" = 1'-0"

AI-02



**Mendon Center Historic District  
Town Campus Study  
Mendon, Massachusetts**

**Zoning Analysis Summary**

June 15, 2016

Warner Larson, Inc. reviewed the Town of Mendon Zoning By-Laws, as amended through June 24, 2015 and revised February 18<sup>th</sup>, 2016, for dimensional controls and site development requirements for the Mendon Center Historic District Town Campus Study, located on the existing Library and Town Hall sites at 18-20 Main St Mendon, Massachusetts. Our findings are summarized below:

**As a municipal administration use within an RR district, a special permit from the planning board will be required. Additionally, any new structure will require a site plan review from the planning board.**

As a property listed on National Register of Historic Places, a property owner can do whatever they want with their property as long as there are no Federal monies attached to the property. If Federal monies are attached to the property then any changes to the property have to allow the Advisory Council on Historic Preservation to comment on the project. A Preservation Restriction placed on the Town Hall building requires compliance with the Secretary's Standards for Rehabilitation of Historic Properties, per the Community Preservation Act.

This project is anticipated to receive State and Local funds, including grant money from the Massachusetts Historical Commission (MHC), therefore MHC will also require a review.

The site lies within the Interim Wellhead Protection Area (IWPA) of two wellheads for public water supply.

**18 Main St**

11-174-18, 0.312 Ac (Library)

Zoning District: Rural Residential (RR)

**20 Main St**

11-174-20, 0.125 Ac (Gov Building)

11-174-20-1, 0.759 Ac (Police Station)

11-174-22, 0.057 Ac (Fire Station)  
Zoning District: Rural Residential (RR)

**2.01 Dimensional Regulations**

Min Front Yard Setback: 50 ft  
Min Side Yard Setback: 20 ft  
Min Rear Yard Setback: 20 ft  
Max Structure Size: 2.5 stories or 35 ft

**1.06 Provisions for Applying For a Special Permit**

...there shall be submitted to said Board a site plan of the proposed use prepared by a registered professional engineer, architect or landscape architect. Such site plan shall show among other things, all existing and proposed buildings, structures, parking spaces, driveway openings, driveways, service areas, and other waste disposal and for surface water drainage and landscape features such as fences, planting areas and walks on the lot. Six copies of the site plan shall be filed with the application, two of which shall be forwarded to the Planning Board for its review recommendations. In reviewing a site plan, the Planning Board and Board of Appeals shall consider among other things, the following:

- (i) Compliance with the requirements for parking, lot size, frontage, yards, and heights and coverage of buildings and all other provisions of this by-law.
- (ii) Convenience and safety of vehicular and pedestrian movement within the site and in relation to adjacent streets, properties or improvements.
- (iii) Adequacy of arrangement and the number of parking and loading spaces in relation to the proposed use of the premises.
- (iv) Provisions for off-street loading and unloading of vehicles incidental to the servicing of the buildings, and related uses on the lot or tract.
- (v) Arrangement and appearances of proposed buildings, structures, signs, screening and landscaping.
- (vi) Adequacy of methods for waste disposal, surface and subsurface drainage and lighting.
- (vii) Protection of adjoining premises and the general neighborhood from any detrimental use of the lot or tract. A public hearing must be held by the Board of Appeals within sixty-five (65) days after the application is filed with the Town Clerk.

The Planning Board shall make its report and recommendations on the site plan in writing to the Board of Appeals within thirty (30) days after the hearing before the Board of Appeals, and if it should fail to do so, the Board of Appeals may act without such report and recommendations.

(c) Harmony: For the purpose of promoting and preserving harmony in architectural treatment and avoidance of incongruous or inappropriate character of architectural appearance and arrangement of buildings detrimental to the property values of adjoining owners or the community, no building permit shall be issued for any new buildings or structure or for any addition or alteration to the exterior of any existing structure until plans showing proposed location and exterior appearance shall have been submitted to the Building Commissioner for review, comment, and suggestions, with the advice of the Planning Board, and the Building Commissioner shall have made such comment and suggestions or allowed five (5) weeks to elapse after such submission without action. (d) Appeal: As provided for in Section 17, Chapter 40A of General Laws: Any person aggrieved by a decision of the Board of Appeals, whether or not previously a party to the proceeding, or any municipal officer or board, may appeal to the Superior Court for the County in which the land concerned is situated, by filing a Bill in Equity within twenty (20) days after the decision has been filed in the Office of the City or Town Clerk.

## **2.03 Off Street Parking**

### **Applicability**

Notwithstanding other requirements of these regulations, off-street parking facilities shall satisfy the following minimum requirements with regard to number of spaces and location. Where parking is located on a lot separate from that of the facility, such lot shall also be owned by the applicant or shall be under a lease sufficiently long in term to assure that adequate parking will be available for the probable duration of the use. All parking for an intended use shall be located within 300 feet of the main building entrance and not separated by any streets or ways. The Planning Board may grant a waiver of up to 20% of the parking required provided the applicant can prove that suitable parking will be present for the intended use of the property.

### **(i) Loading space standards.**

Every non-residential use or addition thereto must maintain at least one paved off-street loading space of not less than 15 feet in width, 40 feet in length and 14 feet vertical clearance. For every non-residential building there shall be one such off-street leading space for every 40,000 square feet of gross floor area or portion thereof, excluding basements. No such loading space shall be less than 20 feet from any property line or street line.



**Mendon Historic District Town Campus Study**  
**Mendon, Massachusetts**

**Zoning Analysis Summary**  
June 15, 2016

Page 4 of 13

**Table of Off-Street Parking Regulations**

Principal Use	Minimum Number of Parking Spaces
Single Family Home	2 spaces per dwelling unit
Two Family Dwelling	2 spaces per dwelling unit
Church, Place of Worship	1 space per 4 seats
Convalescent or Nursing Home	3 spaces per 1000 square feet of gross floor area
Bed and Breakfast	1 space per guest room unit plus 2 spaces for family
Hotel	1.5 space per guest unit plus required parking for any restaurant or places of assembly located within the premises.
Restaurants and other places serving food or beverages	1 space for each 5 seats plus 1 space for each 5 employees
Motor Vehicle Service Station	1 space per 200 square feet of gross floor area
Retail store, service establishment, financial institution, shopping center	1 space per 250 square feet of gross floor area
Furniture, floor covering or appliance Store	1 space per 500 square feet of gross floor area
Automobile Repair, Sales or other workshop	1 space per 300 square feet of gross floor space plus requirements for outdoor sales if applicable
Professional office, clinics	1 space per 300 square feet of gross floor area
Home Occupations	3 spaces plus required residential parking with a maximum of 5 spaces
Private Club, Country Club including golf course or other similar recreation facility	1 space per 1000 square feet of fully enclosed area plus required parking for accessory uses such as a restaurant and meeting rooms. Golf Course shall require a minimum of 100 spaces; tennis, racquetball or the like shall require 2 spaces per court in addition to above mentioned requirements.
Funeral or undertaking establishment	40 spaces plus 10 spaces per chapel or parlor in excess of one.
Wholesale, Manufacturing, Contractors Yards, Warehousing	1 space per 1000 square feet of gross floor area
Child Care	1 space per 500 square feet of gross floor area
Schools	4 spaces per classroom plus 1 space per 5 seats of dedicated public assembly space
Library, Museums	1 space per 600 square feet of gross floor area
Theaters and places of assembly	One space per every five seats
Other uses not listed	As determined by the Planning Board

It is the intent of this section to assure that off-street parking and loading spaces are provided to accommodate the motor vehicles of all persons normally using or visiting a use or structure at any one time.

Where the specific use is not listed in the Table of Off-Street parking the minimum number of parking spaces is "as determined by the Planning Board".

#### Parking Calculation for Proposed Use

Town Hall second floor assembly for 70 occupants.  $70/5 = 14$  spaces (less than primary building use so parking need for basement and ground floor occupancy is applicable)

Town Hall basement and first floor GSF = 6,400.  $6,400/300 = 22$  spaces

Fire Station GSF = 3,225.  $3,225/300 = 11$  spaces

Union Chapel will be programmed for assembly up to 98 occupants.  $98/5 = 20$  spaces

TOTAL spaces required = 53 spaces

#### (ii) Parking Lot (space) Standards:

- 1) No parking lot area shall be located within twenty (20) feet of any property line, street, or road, if abutting property is zoned or used residentially. The parking lot area may be located within ten (10) feet of the property line if the abutting lots are not zoned and/or used for residential purposes.
- 2) No parking lot shall be located less than five (5) feet from any wall of any building to allow for pedestrian walks and/or landscaping.
- 3) Dead-end parking aisle interior drives shall be extended five (5) feet further than the last space to allow movement of a vehicle in and out of a parking space.
- 4) Where reasonable alternate access is available, the vehicular access to the lot shall be arranged to avoid traffic use of local residential streets situated in or bordered by residential districts.
- 5) Where a lot has frontage on two (2) or more streets, the access to the lot shall be provided from the street where there is lesser potential for traffic congestion and for hazards to traffic and pedestrians.
- 6) The street giving access to the lot shall have traffic carrying capacity and be suitably improved to accommodate the amount and types of traffic generated by the proposed use.

**Mendon Historic District Town Campus Study**  
**Mendon, Massachusetts**

**Zoning Analysis Summary**  
June 15, 2016

Page 6 of 13

7) Where the lot has frontage on an existing street, proper provisions shall be made for grading and improvement of shoulder and sidewalk areas within the right-of-way of the street and for the provision of curbs and sidewalks, as approved by the Board and in accordance with the pattern of development along the street.

8) Appropriate provisions shall be made to prevent vehicles from overhanging walkways and from damaging trees or other landscaping materials.

9) Adequate lighting shall be provided as required in the Mendon Zoning By-laws, Section 4.02, Site Plan Review.

10) Each parking space for every use, with the exception of single or two family residential dwellings, a minimum of twenty (20) square feet of landscaped area shall be provided within the parking area or along the periphery of the parking area. For the purposes of this section, the parking area shall be defined as that area used for parking, backup space and driveways associated with the parking lot. For those parking lots containing in excess of twenty spaces, a minimum of fifty percent of the required landscaping must be provided within the parking area.

11) Each required parking space, exclusive of driveways and aisles, shall be at least 9 feet wide and 18 feet long. The dimensions for parking spaces and drive aisles shall conform to the following table:

	<b><u>90 deg</u></b>	<b><u>60 deg</u></b>	<b><u>45 deg</u></b>
<b><u>A. Double Parking Bay</u></b>	60 feet	58 feet	53 feet
<b><u>B. Depth of Bay</u></b>	18 feet	20 feet	19 feet
<b><u>C. Width of Aisle</u></b>	24 feet	18 feet *	15 feet *
<b><u>D. Width of Space</u></b>	9 feet	9 feet	9 feet
<b><u>E. Depth of Space</u></b>	18 feet	18 feet	18 feet

\*provided that if the aisle is a fire lane the width shall be 20 ft.

Drive Aisles with two-way circulation shall contain 90 deg parking spaces. Drive Aisles with one-way circulation may contain 60 deg or 45 deg parking.

In addition to the requirements set forth in the above table, the Board may require collector drive aisles to be 30 feet in width and may require major entry and exit drive aisles to be of such a width and to contain sufficient lanes as may be necessary.

Each parking or loading space shall be provided with adequate area for approach, turning and exit of the vehicle for which it was designed without need to use any part of a public street right-of-way. Points of entrance and exit for driveways onto the street shall not be less than 12 feet in width for each lane of traffic using the driveway, but the total width of such entrance or exit shall not exceed 30 feet. No such driveway shall be within 10 feet of any other driveway on the same property or within 10 feet of any property line.

(d) Intendence of parking facility

Lots shall be maintained in good condition and repair and shall be kept clean and free from rubbish and debris.

(e) Construction

All off-street parking and loading areas shall be suitably improved, graded, stabilized and maintained so as to cause no nuisance or danger from dust or from surface water flow and shall be in compliance with the Town of Mendon By-laws, Chapter XVI, Stormwater Management By-law. All such areas shall have a slope of no less than one percent and should in general not exceed a slope of three percent. However, the maximum allowed slope for all such areas shall be five (5) percent. All parking areas, with the exception of single or two family residential uses, shall be constructed of durable materials that will not allow for erosion or the transport of sediment.

(f) Joint use

The Planning Board may permit joint parking areas and loading spaces to be established by the owners of separate contiguous lots in order to provide the total number of off-street parking and loading spaces required for all the users located thereon. In such case the setback requirement may be waived for the common property line.

(g) Hybrid parking

The Planning Board may allow conventional paving for driveways and aisles with permeable paving for stalls. Permeable pavement may also be allowed in other areas where appropriate.

(h) Phased parking development

The Planning Board may, depending on the specific parking needs of a particular use, approve a phased development of the off-street parking area for a proposed or an existing development, in accordance with the following conditions:

- 1) The total number of spaces required to be shown on the site plan shall be determined in accordance with the standards for that particular use, as specified in these regulations.
- 2) The construction of the parking area and the installation of the spaces may be phased according to term requirements, except that no less than fifty (50) percent of the total spaces required shall be constructed as part of the initial term requirement. If this results in a fractional number, the requirement shall be the next highest whole number.
- 3) The balance of the spaces not constructed shall be designated as “reserve spaces” on the site plan, laid out as an integral part of the overall parking layout, must be located on land suitable for parking area development and either left in its natural state or suitably landscaped.
- 4) Under any circumstances, the applicant may construct the total number of parking spaces required as per these regulations; or if the commission determines that additional spaces, identified as reserve spaces on the site plan, may be required, the commission shall notify the owner of the property concerning its findings and the owner shall, construct the required spaces within ninety (90) days of such notification.

(i) Interpretation of off-street parking requirements

- 1) Where fractional spaces result, the parking spaces required shall be construed to be the next highest whole number.
- 2) In the case of mixed uses, uses with different parking requirement occupying the same building or premises, the parking spaces required shall equal the sum of the requirement of the various uses computed separately.



## **2.06 Sign By-law**

- (a) Purpose. The purpose of this section is to regulate and control signs within the Town of Mendon for the safety, convenience, and welfare of the residents; to provide businesses in the Town with precise and reasonable guidelines for identifying themselves; to protect and enhance the visual environment of the Town; and to avoid signs which, individually or collectively, are confusing, distracting, or impair visibility along public ways, or other traffic areas. Municipal Signs and signs not intended to be visible from a public way are exempted from this bylaw. This section is not intended to infringe upon protected noncommercial speech or a property owner's right to freedom of speech.

Refer to Zoning By-law for specific requirements (as necessary)

## **3.0 1 Municipal Administration uses within RR district require Special Permit from the Planning Board.**

### **4.02 Site Plan Review**

(a) Purpose.

To protect the health, safety, convenience and general welfare of the inhabitants of the Town of Mendon by providing for a review of plans for uses and structures which may impact traffic, municipal services, visual and natural environment, community economics, and community values in the Town.

(b) Applicability.

The following types of activities, structures, and uses require site plan review by the Planning Board, except to the extent they are used for, or accessory to, a residential single family dwelling:

(i) Any new building or structure.

(ii) Any addition or alteration to an existing building or structure which results in an increase of five hundred (500) square feet or more of gross floor area.

(iii) Any addition or alteration that results in one thousand (1000) square feet or more of impervious surface.

(iv) Any change in the existing use of land, building or structure to a non-single family residential use.

(v) Any use or structure that requires a special permit or variance.

(vi) Any land disturbance of more than 1 acre. Land disturbance shall include vegetation clearing or trimming, earth removal or relocation, and grading.

(vii) Any new business, commercial or industrial use or structure, or any addition, alteration or expansion of an existing business, commercial or industrial use or structure in excess of five hundred square feet, in the Residential District.

(c) Building Permits.

(i) No building permit can be issued for the proposed project unless an application for site plan review has been prepared in accordance with the requirements of this section and unless such application has been approved by the Planning Board.

(d) Application and Review Procedure.

(i) Submission of Site Plan Review Application. The applicant shall file with the Planning Board, at a regularly scheduled meeting, the completed site plan review application form, along with eight (8) copies each of the submission materials specified in subparagraph h below (collectively, "Site Plan Review Application").

(ii) Reasonable fees. Any fees required, in the amounts set forth in the Planning Board Rules and Regulations, as may be amended from time to time ("Planning Board Rules and Regulations"), shall be included with the Site Plan Review Application. The Board shall also require a deposit of money sufficient to cover any additional expenses associated with the public hearing and review of the Site Plan Review Application. The Planning Board is authorized, at the expense of the applicant, to retain a registered professional engineer, architect, landscape architect, attorney, or other professional consultants to review the Site Plan Review Application and to advise the Board on any or all matters pertaining thereto.

(iii) No Site Plan Review Application shall be considered by the Planning Board until all information necessary for such review, as described herein, is fully provided, unless waivers

are requested by the applicant and granted in writing by the Planning Board in accordance with paragraph Section 4.02 (i) Waiver of Technical Compliance. The Planning Board or its designated agent shall make a determination as to whether the Site Plan Review Application is complete within 7 business days of filing. If the Site Plan Review Application has been determined to be incomplete, the application shall be returned to the applicant either in person or by certified mail with a letter indicating that insufficient information has been provided making it impossible for the Planning Board to adequately review the application. An incomplete Site Plan Review Application shall not constitute a submittal and shall not be considered the start of any time limits within which the Board is required to act under this bylaw or M.G.L. c. 40A. If the submission has been determined to be complete, the applicant shall file the Site Plan Review Application with the Town Clerk. The Town Clerk shall time and date stamp said application to fix the date of submission ("Submission Date").

(e) Review by Other Boards.

Upon receiving a complete Site Plan Review Application and reasonable fees, the Planning Board shall transmit a complete set of plans each to the Board of Selectmen, Highway Department, Building Department, Police and Fire Departments, the Town Engineer, Board of Health, and such other departments, agencies, committees, boards, and town officials (collectively "Town Officials") as the Planning Board may determine necessary. The Town Officials shall, within 21 business days of receiving said copy, report to the Planning Board on:

(i) The adequacy of the data and procedures used by the applicant to determine the impacts of the proposed development.

(ii) The effects of the projected impacts of the proposed development on the surrounding neighborhood and the Town.

(iii) Recommended conditions or remedial measures to accommodate or mitigate the expected impacts of the proposed development.

The Planning Board shall not render a decision on the Site Plan Review Application until it has received and considered all reports from the Town Officials, or until the 21 day period has expired, whichever is earlier.

(f) Review and Procedure.

(i) Administrative Review for As of Right Uses and Structures.

1) Site plan review for uses and structures that are permitted in the Town as of right without the need for any zoning relief (i.e. special permit, variance, amendment, waiver, or other discretionary approval) shall be reviewed and acted upon at any regular meeting of the Planning Board. A public hearing shall not be required, however the Planning Board shall notify the applicant and the immediate abutters of the time and place when the Site Plan Review Application will be reviewed.

2) The Planning Board shall render a decision on the Site Plan Review Application within 45 days of the Submission Date. A written decision shall be sent to the applicant with a copy to the Building Inspector.

3) The applicant may request, and the Planning Board may grant by majority vote, an extension of the time limits set forth herein.

4) The appeal of any administrative site plan review decision of the Planning Board shall be in

(ii) Site Plan Review.

1) For all uses and structures that are not permitted as of right, the Planning Board shall hold a public hearing on the Site Plan Review Application within 65 days after the Submission Date.

2) In instances where the use or structure requires both a Special Permit and Site Plan Review, and the Planning Board is the special permit granting authority, the applicant may submit a single application for review provided it meets both the Special Permit application requirements of Section 1.06 and the Site Plan Review submission requirements set forth herein. If the joint application is complete, the Planning Board shall hold concurrent hearings on the Special Permit and Site Plan Review. In such cases, M.G.L. c. 40A, §§ 9 and 11 shall govern the time frames and manner in which the Board is required to act.

3) The Planning Board shall render its decision on the Site Plan Review Application within 90 days of the close of the public hearing. A written decision shall be sent to the applicant with a copy to the Building Inspector.

4) The applicant may request, and the Planning Board may grant by majority vote, an extension of the time limits set forth herein.

5) The appeal of any decision of the Planning Board hereunder shall be made in accordance with the provisions of M.G.L. c. 40A, §17.

(g) Final Action.

**In reviewing the impacts of a proposed project, the Planning Board shall consider the information presented in the Site Plan Approval Application, all reports of the Town Officials, or acquired by the Planning Board on its own initiative or research. The Planning Board's final action, rendered in writing, shall consist of one of the following:**

(i) Approval of the site plan based upon a finding that the proposed site plan constitutes a suitable development and is in compliance with the site plan review criteria set forth herein;

(ii) Approval of the site plan, subject to any conditions, modifications and restrictions as required by the Board at the expense of the applicant to promote the objectives of site plan review, mitigate impacts associated with the proposed project, and to ensure compliance with the performance criteria set forth herein;

(iii) Disapproval of the site plan based upon a determination that the use is not allowed as of right or, for special permit uses, if the special permit for the particular use is denied;

(iv) Disapproval based on a finding that the site plan fails to meet the performance criteria set forth herein; or

(v) Disapproval based on a finding that the site plan is so intrusive on the needs of the public in one regulated aspect and no form of reasonable conditions can be devised to satisfy the problem with the plan.

**Any approval of the site plan granted shall require the majority vote of the Planning Board.**



**EXISTING CONDITIONS STUDY - CIVIL  
MENDON TOWN HALL, MENDON, MASSACHUSETTS  
Nitsch Project #11305  
June 30, 2016**

Nitsch Engineering has performed research of the existing site conditions and anticipated site permitting requirements for the Mendon Town Hall renovation project located on Main Street in Mendon, Massachusetts. Nitsch Engineering's research included review of files obtained from CBI Consulting including site photos and an existing conditions site plan prepared by Shea Engineering & Surveying, Inc. dated August 1, 2001. An As-Built of the Force Main Sewer connection was also provided by CBI Consulting prepared by Cullinan Engineering dated July 5, 2006. Other information included in this report is based on MassGIS data, soil information from Natural Resources Conservation Service (NRCS) Worcester County Soil Survey and Flood Insurance Rate Map (FIRM) from the Federal Emergency Management Agency (FEMA).

**GENERAL SITE DESCRIPTION**

The existing Mendon Town Hall is a two-story wood framed structure originally built in 1840 located at 20 Main Street in Mendon, Massachusetts. The site is approximately 1.75 acres including the existing Town Hall, parking areas and associated sidewalks as well as the Library, the Police Station and the Fire Station. The site is bounded by a residence to the northwest, an open field to the northeast, and Main Street to both the southwest and southeast. The town hall site is moderately sloped, with the existing Town Hall at what appears to be the Finish Floor Elevation at 360.60. The site slopes from the west to the east, with the perimeter of the site along the west perimeter in Main Street at elevation 365 and the eastern portion of the site at elevation 340.

**EXISTING SITE UTILITIES**

**STORM DRAINAGE**

There does not appear to be any site drainage based on the existing information available. The overall site is moderately sloped where storm water is directed to the east perimeter of the site where it is discharged onto a grass area of an adjacent property. The roof drainage of the existing town hall is collected by seven (7) downspouts. On the north face of the building, there are three (3) downspouts that appear to be connected to an underground system, and one (1) downspout located at the back corner of the building that discharges to grade. This downspout appears to be damaged. On the south face of the building, three (3) downspouts spill to grade and drain off of the site from west to east.

**FIGURES 1 and 2:** North face (side) building downspouts



**FIGURES 3 and 4:** South face (side) building downspout



## SEWER

Based on record drawing information there is an existing (gravity?) sewer line exiting the building at the rear and runs to an existing 2000-gallon septic tank in the parking lot behind the Police Station. This 2000-gallon septic tank serves the Town Hall, the Fire Station, the Police Station and the Library. The septic tank is then piped by gravity to an adjacent duplex 1500-gallon pump chamber. From the pump chamber, a 2-inch force main of high-density polyethylene (HDPE) pipe connects the pump chamber to a sewer manhole that connects to an existing 4-inch sewer line in Main Street.

## WATER

Based on available utility information, there is a well located in the existing Town Hall that appears to service the surrounding buildings as well. The domestic water service exits the Town Hall at the rear and enters the Police Station at the west corner of the building. The Police Station also appears to have a water connection to the Fire Station on site. There is an additional water line that exits the west face of the Town Hall that appears to connect to the Library. There are no known pipe sizes or pipe materials based on available information. On the west face of the building two water valves were observed approximately 10-feet from the building. There is no record information of a municipal water main in Main Street.

**FIGURE 5:** Water Valves observed at Town Hall





## **GAS**

There is no record information of a gas main located in Main Street. Based on the record drawings, there is a propane tank located directly adjacent to the rear of the Fire Station. There is no other information available at this time.

## **ELECTRICAL**

Record drawings and site photos indicate an electrical service to the Town Hall through overhead wires from a utility pole located in Main Street. The record drawing information also indicates overhead wires connecting the Town Hall to the Library. An existing fiber-optic cable line is also shown on the record drawings connecting the Town Hall and the Library. The electric meter and alarm panel were also observed along the north face of the building. A second observed overhead electric connection was observed at the western (front) corner of the Town Hall.

**FIGURE 6:** Electric utility service onsite



**FIGURE 7:** Electric connections to Town Hall



## **SITE CONDITIONS AND OPERATIONS**

### **SOILS**

Based on the Natural Resources Conservation Service (NRCS) Worcester County Soil Survey, the site of the Mendon Town Hall is classified as Scituate- Fine sandy loam with 3-8 percent slopes. The Scituate series is described as moderately well-draining soils consisting primarily of sandy lodgement till and being very deep to bedrock.

The NRCS classifies the Scituate series as Hydrologic Soil Group (HSG) 'B'. The NRCS describes the soil group as follows:

Group B: Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

## **PAVEMENT**

Asphalt pavement in the entrance to the Town Hall as well as additional parking areas that serve the surrounding buildings was observed to be in poor condition with some heaving, cracking and degradation. Granite curbing was not observed onsite.

**FIGURE 8:** Parking lot looking towards Main Street



## **VEHICLE ACCESS**

The site currently has two vehicular access points both accessed from Main Street. There are several parking areas onsite that serve the Town Hall, the Fire Station, the Police Station and the Library.

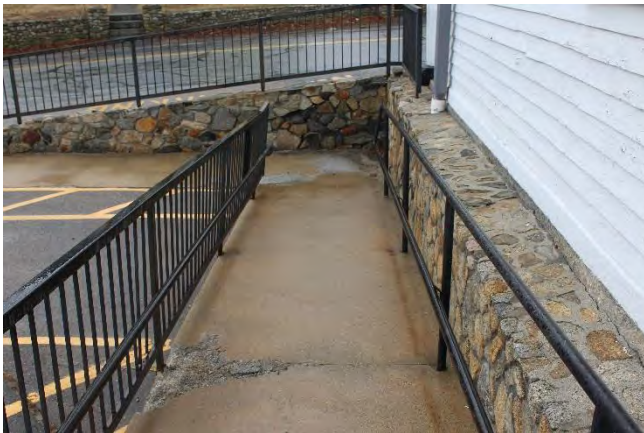
## **PEDESTRIAN ACCESS**

There is limited pedestrian access to the site from a sidewalk in Main Street adjacent to the Library. There are limited crosswalks with the primary crosswalk coming from Maple Street across Main Street to the sidewalk that is adjacent to the library. The Town Hall does have two handicap accessible ramps. The first ramp is located at the entrance of the Town Hall while the second ramp is located on the east side of the building. The area that directly surrounds the front entrance of the Town Hall may not meet current ADA standards as well as the parking space on the east side of the building that services the east ramp.

**FIGURE 9 & 10:** Front Entrance ramp to Town Hall



**FIGURE 11 & 12:** East ramp to Town Hall



Upgrades for handicap accessibility may be required. The sidewalks and pedestrian ramps generally do not appear to meet the most recent ADA requirements for slope configuration. The asphalt pavement walkway leading to the Town Hall entrance is cracked and in need of repair. Both handicap accessible ramps are cracked and in need of repair. The hand railings that are part of the east ramp also look to be deteriorating and may need to be replaced. No pedestrian ramp tactile strips were observed at the site. Additional pedestrian crosswalks are needed.

## **TRASH COLLECTION**

Trash collection receptacles were not observed on site.



## **PRELIMINARY PERMITTING CONSIDERATIONS**

### **WETLANDS PROTECTION ACT (310 CMR 10.00)**

The Wetlands Protection Act ensures the protection of Massachusetts' inland and coastal wetlands, tidelands, great ponds, rivers, and floodplains. It regulates activities in coastal and wetlands areas, and contributes to the protection of ground and surface water quality, the prevention of flooding, and storm damage and the protection of wildlife and aquatic habitat.

A review of the Massachusetts Department of Environmental Protection (DEP) wetland layers available on the Massachusetts Geographic Information System (MassGIS) appear to indicate that the site does NOT have any wetlands located on-site. The nearest wetland area appears to be located to the south of Main Street and East of Maple Street approximately 450 feet from the Town Hall.

### **SURFACE WATER SUPPLY PROTECTION (310 CMR 22.20)**

The Massachusetts DEP ensures the protection of surface waters used as sources of drinking water supply from contamination by regulating land use and activities within critical areas of surface water sources and tributaries and associated surface water bodies to these surface water sources.

A review of the Massachusetts DEP resource layers available on the MassGIS, appear to indicate the site is located within a Surface Water Supply Protection Zone.

### **NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM**

A review of the 13<sup>th</sup> Edition of the Massachusetts Natural Heritage Atlas prepared by the Natural Heritage and Endangered Species Program (NHESP), dated October 1, 2008, indicates that the Mendon Town Hall site is NOT a Priority Habitat of Rare Species or an Estimated Habitat of Rare Wildlife.

### **FLOOD PLAIN**

Based on the Flood Insurance Rate Map (FIRM), Community Panel Number 25027C 1031E, dated July 4, 2011 the site is located within Zone X (Other Areas: Areas determined to be outside the 0.2% annual chance floodplain).

### **USEPA NPDES**

Construction activities that disturb more than one acre are regulated under the United States Environmental Protection Agency's (EPA) National Pollution Discharge Elimination System (NPDES) Program. In Massachusetts, the USEPA issues NPDES permits to operators of regulated construction sites. Regulated projects are required to develop and implement stormwater pollution prevention plans in order to obtain permit coverage.

## **RECOMMENDATIONS FOR PROPOSED BUILDING**

### **Stormwater**

A new site configuration will require modifications and improvements to the stormwater management system to comply with current Department of Environmental Protection (DEP) Stormwater Standards. New deep sump catch basins, bioretention basins/swales, and stormwater quality structures will be needed for vehicular pavement areas. Proposed site improvements will also require the stormwater management system to capture, recharge and mitigate the 1-inch storm event based on current DEP Stormwater Standards and the site being located within a Surface Water Supply Protection Zone.

If the site configuration results in an increase in impervious area, the project will require stormwater detention or infiltration systems to mitigate the increased peak rate of runoff resulting from the increase in impervious area to meet DEP Stormwater Standards.

Based on NRCS soil information, the site contains moderately well-draining soils. Additional drywells or other stormwater infiltration systems may be appropriate for this site.

### **Water**

There is no information on the existing conditions plan that show where the source of water is for the site. The plan does show water services between buildings. The existing conditions drawing does indicate a well located in the existing Town Hall as well as a fire well onsite.

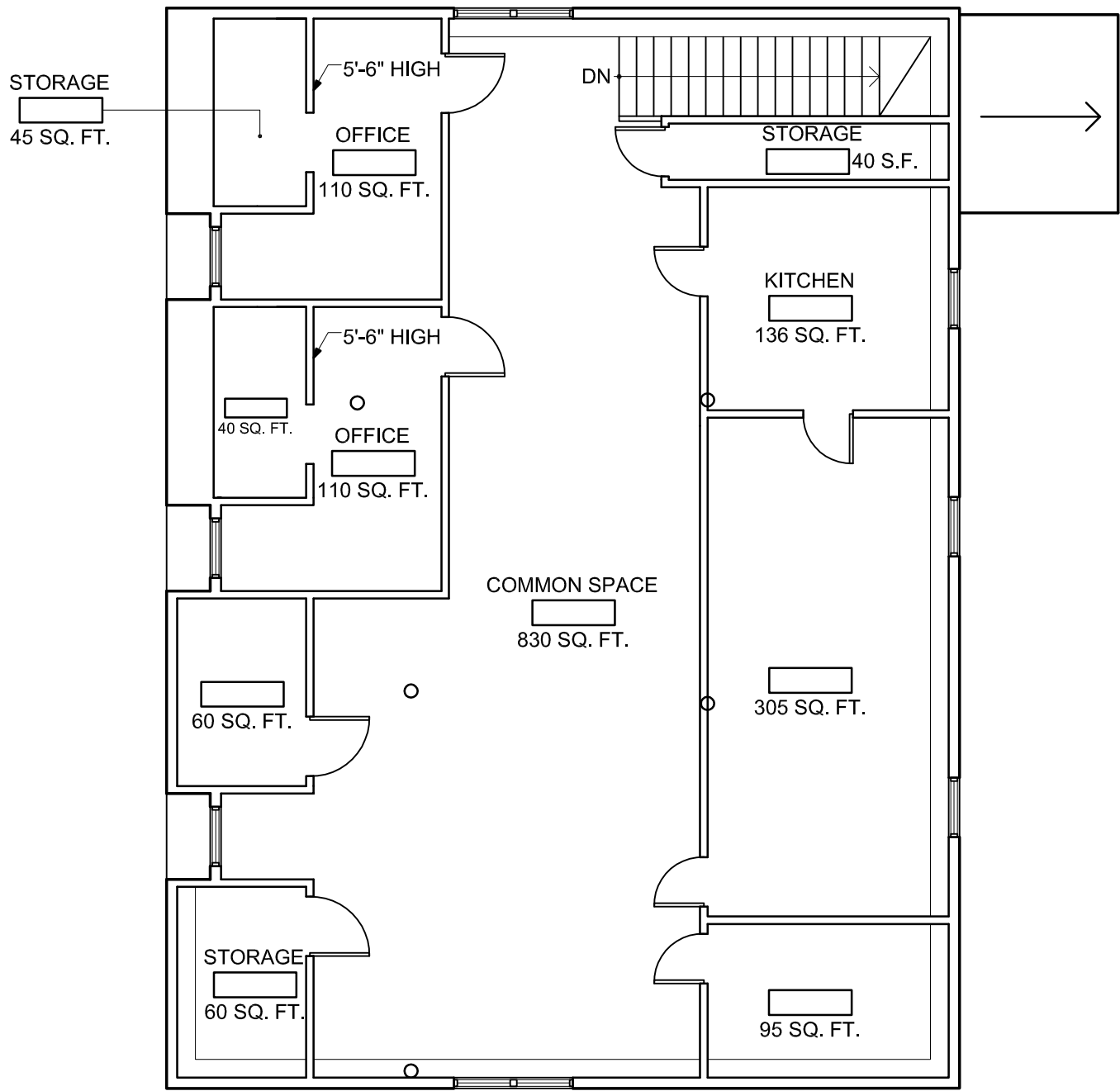
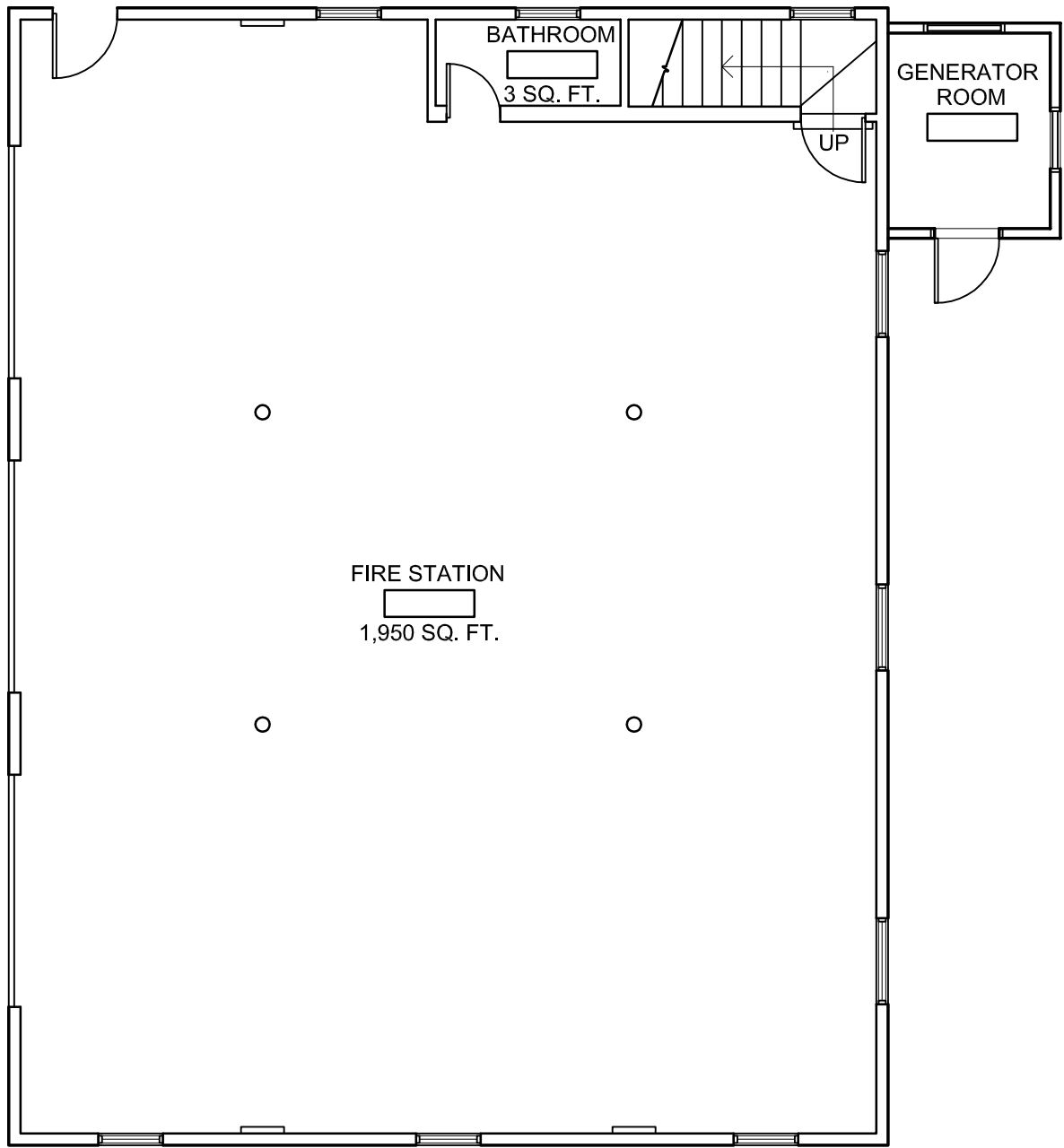
### **Sanitary Sewer**

The existing site sewer system seems to be suitable for reuse as long as the proposed improvements of the project do not increase the daily demand. If the current system is reused, additional capacity may need to be added to the pump chamber to accommodate flows from increased demands.

### **Private Utilities**

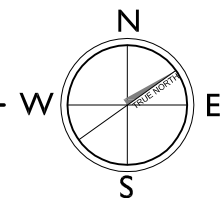
Upgrades to the building systems may require upgrades to the gas and site electric services. Refer to Mechanical and Electrical evaluations for information regarding capacity and function of private utilities.

# Section 3



**1 FIRE STATION FIRST FLOOR PLAN**  
SCALE: 1/8"=1'-0"

**2 FIRE STATION SECOND FLOOR PLAN**  
SCALE: 1/8"=1'-0"



**TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT**

DESCRIPTION  
EXISTING FIRE STATION FLOOR PLANS

CHECKED  
SAW

DATE  
06/10/2016

REVISION

SHEET No.

**A1-01**

PROJ.# 16036

TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
EXISTING LIBRARY FLOOR PLANS

CHECKED  
SAW

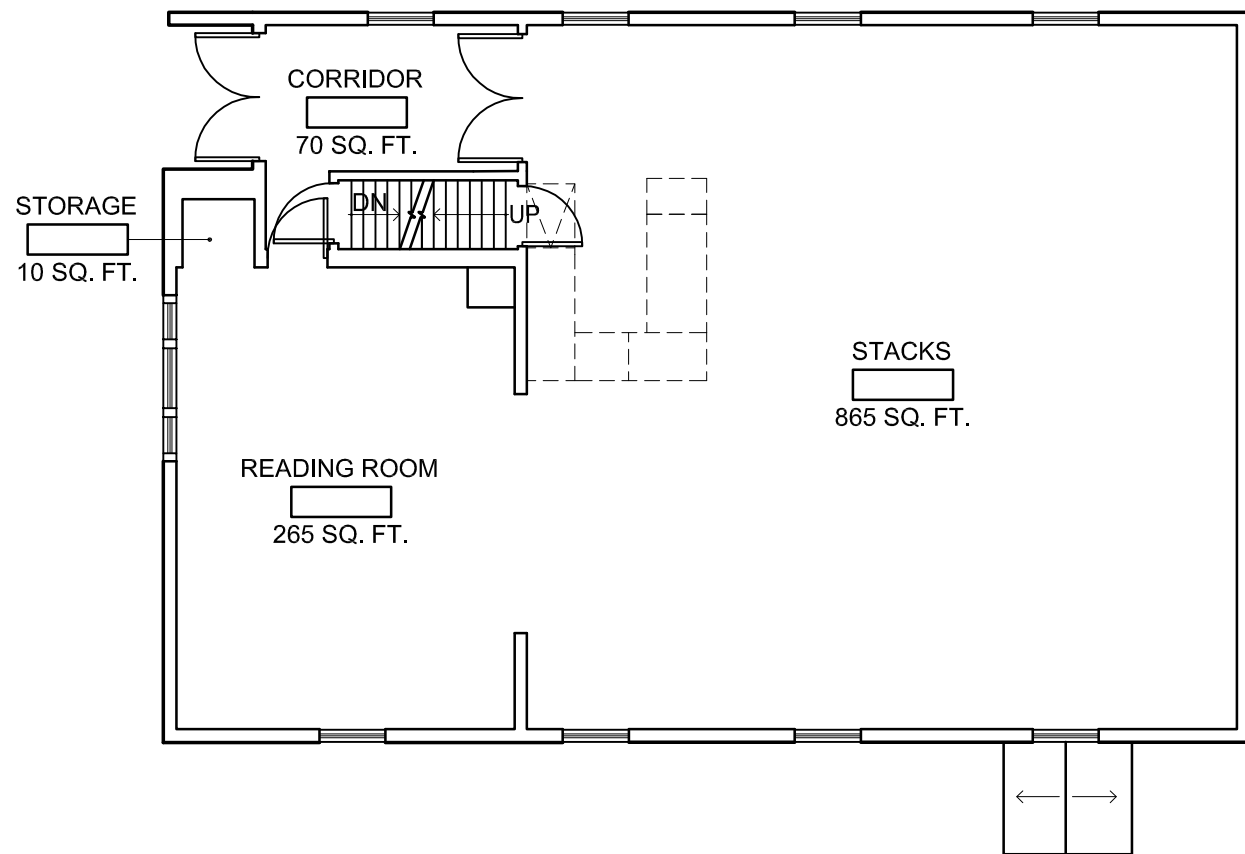
DATE  
06/10/2016

REVISION

SHEET No.

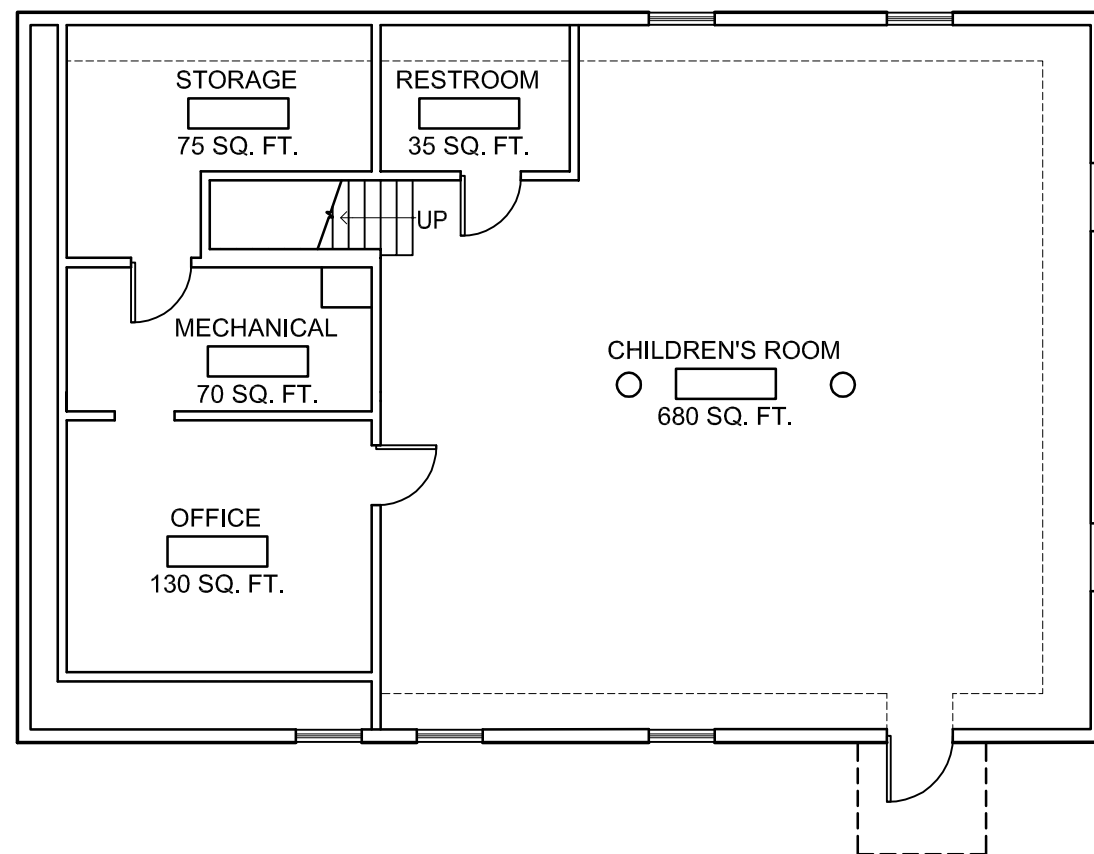
**A1-02**

PROJ.# 16036



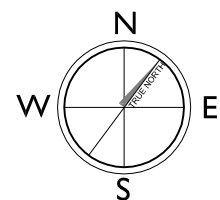
**2** LIBRARY UPPER FLOOR PLAN

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



**1** LIBRARY GROUND FLOOR PLAN

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



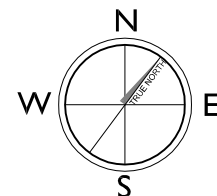
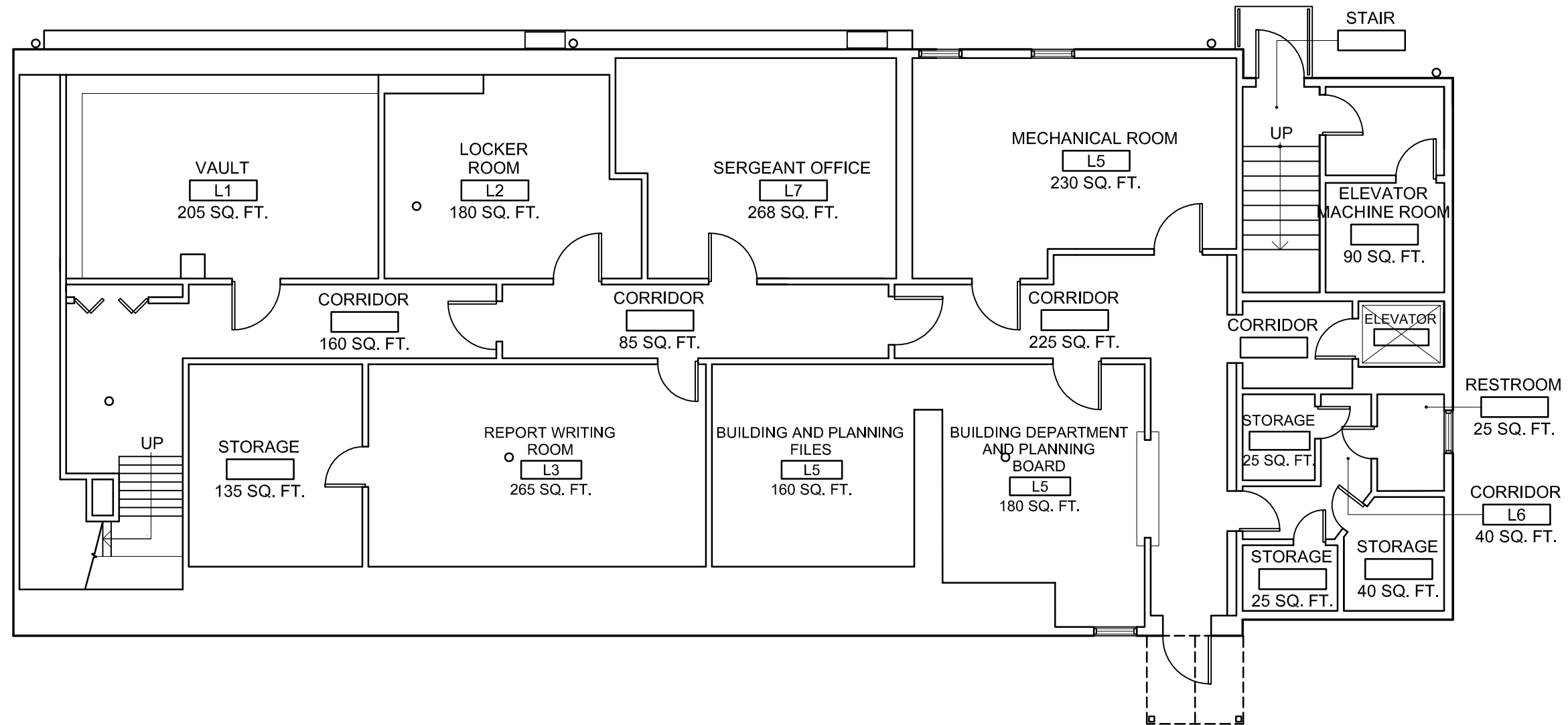


TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT  
EXISTING TOWN HALL BASEMENT FLOOR PLAN

CHECKED  
SAW  
DATE  
06/10/2016  
REVISION

SHEET No.  
**A1-03**

PROJ.#  
16036



**1 TOWN HALL BASEMENT FLOOR PLAN**  
SCALE: 1/8" = 1'-0"

TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT  
EXISTING TOWN HALL FIRST FLOOR PLAN

CHECKED  
SAW

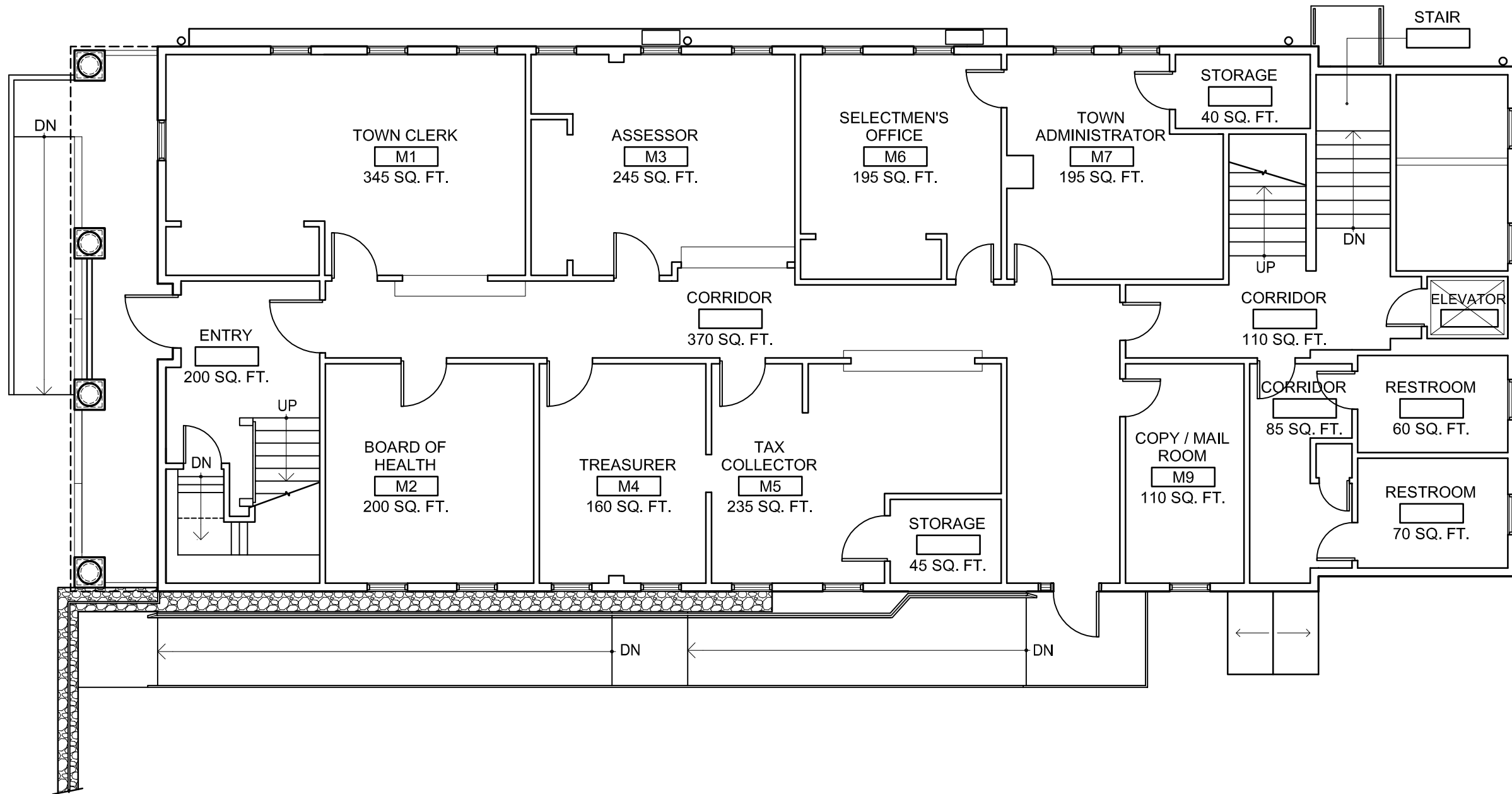
DATE  
06/10/2016

REVISION

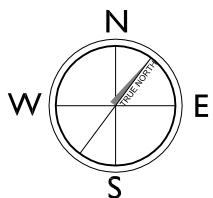
SHEET No.

**A1-04**

PROJ.# 16036



**1 TOWN HALL FIRST FLOOR PLAN**  
SCALE: 1/8" = 1'-0"

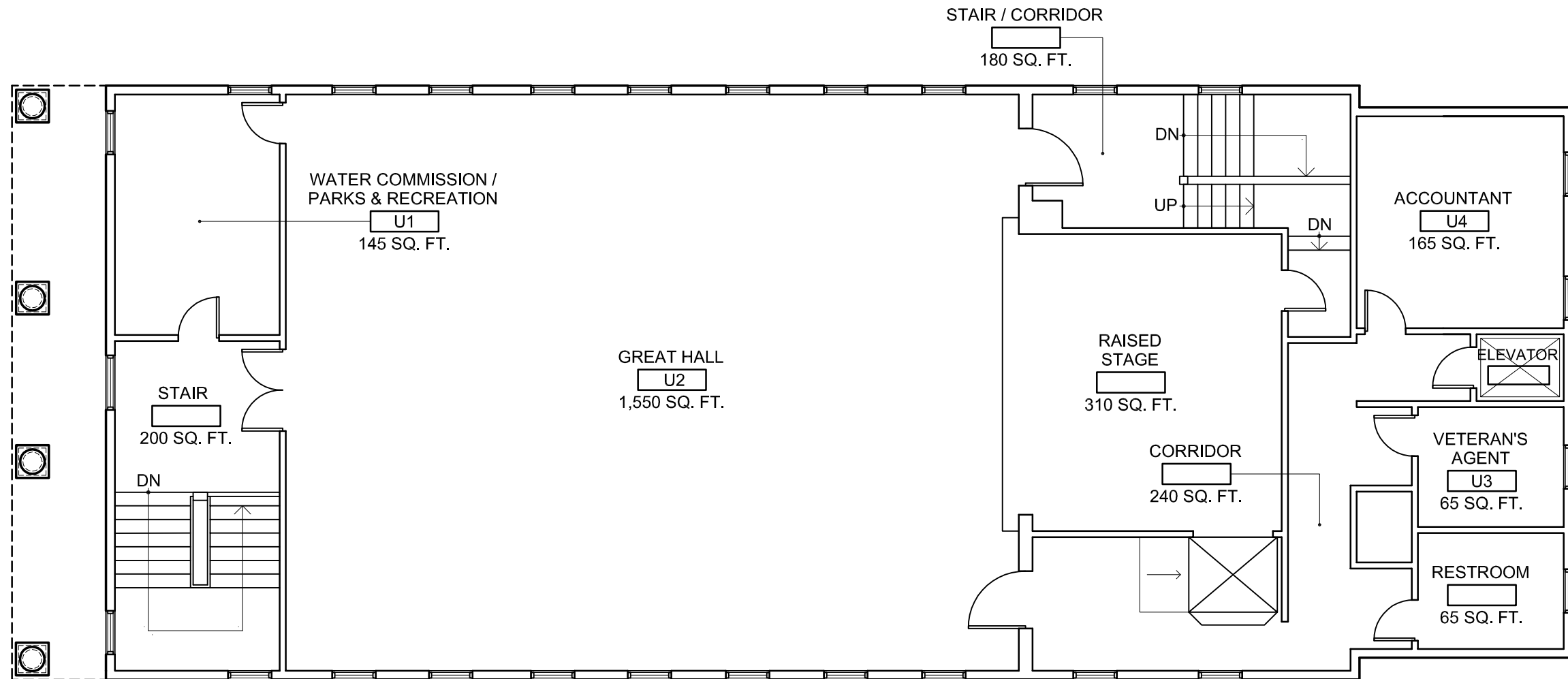


TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT  
EXISTING TOWN HALL SECOND FLOOR PLAN

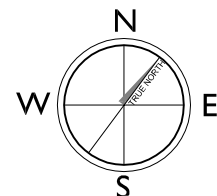
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SAW  
DATE  
06/10/2016  
REVISION

SHEET No.  
**A1-05**

PROJ.#  
16036



**1** TOWN HALL SECOND FLOOR PLAN  
SCALE: 1/8" = 1'-0"









# Section 4





## PRINCIPALS

CRAIG E. BARNES  
MICHAEL S. TELLER  
WAYNE R. LAWSON

## SENIOR ASSOCIATE

ROBERT G. WILKIN

## Space Needs Analysis

CBI met with Town officials and staff on several occasions, including on March 10, March 31, May 12, June 20, and June 21 2016 to discuss the opportunities and constraints of the existing and proposed spaces. The following was discussed or observed. Please also refer to the attached Space Needs Program for an existing room-by-room identification.

### Mendon Town Hall

Based on our review with Town officials and department staff members, and review of the current conditions, we have documented the existing and proposed space needs for each office and Town department including: the Town Administrator's office, Selectmen's office, Town Assessor's office, Town Clerk's office, Treasurer and Collector's office, Town Accountant's office, Building Department office, Board of Health, Water Commission and Parks and Recreation office, and Veterans Agent office, all located in the Mendon Town Hall, as well as other users of the building such as numerous Boards and Commissions.

Currently, municipal offices are spread throughout the 3 floors of the building. Permitting Departments are located in the Basement and Upper Floors. This arrangement leaves several offices spread out in remote areas of the building that are not convenient or easy to access, such as the Town Accountant and Veterans' Agent offices at the rear of the Second Floor. In addition, the Water / Parks & Rec. Office is located off of a Stair on the Second Floor, which is a code violation. The First Floor contains the majority of the Departments that get heavy use, except for the Building Department which is located at the Basement Level. With limited space available on the First Floor, there is nowhere to add additional storage or meeting space on this level without moving some Departments to a new location.

As noted previously, the public areas and circulation spaces on the First Floor are also dark and narrow. The occupied spaces of the basement level have only two windows, one on the south side and one on the north side.

### Union Chapel (former Taft Public Library)

Both the upper and lower floors are open plan arrangements and could be suitable to many different uses. Only repair and finish work would be necessary for certain uses to be move-in ready. Based on the Code Review, only 'Library', 'Hall' and 'Museum' uses are allowed without a Change in Use permit. Some of the bookshelves could remain if suitable for the proposed use(s).

### Mendon Fire Station

Because the first floor is an open layout with only a few columns and high ceilings, it can remain a large open layout, be sub-divided, or a combination of both. The second floor should be made inaccessible as it is not currently code-complaint for any use and would require significant work, including a stair and elevator addition and renovating the existing stair.

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Page 2  
Architectural Building Conditions and Historical Assessment  
Mendon Town Hall Campus Study  
CBI Job No: 16036  
June 30, 2016

#### Mendon Historical Museum

Located down the road at 3 Main Street, this Building was originally Seth Hastings Bank. Currently, the Historical Society occupies the 600 SF building. We understand the Town wishes to move the contents out of the building and turn it into a 'House Museum' status.

#### Historical Record Room

Located down the road at 13 Main Street, this 1820 Building was originally Seth Hastings Law Office. Currently, the Historical Society occupies the 550 SF building. We understand the Town wishes to move the contents out of the building and turn it into a 'House Museum' status.

SAW/ko

16036 Space Needs Narrative 06-30-16

MENDON TOWN HALL		Existing Conditions				
ROOM / DEPARTMENT NAME		Staff	ROOM NSF	# OF RMS	area totals	Comments
Town Administrator					235	
M7	Office	Kimberly Newman	195	1	195	need proximity to BOS Office / Diane Willoughby requests adjacent meeting space / could be shared
	Conference			0		
	Storage		40	1	40	
Selectmen					195	
M6	Office	Diane Willoughby	195	1	195	need proximity to Town Administrator's Office
Assessor					245	
M3	Office	Jean Berthold	245	1	245	need confidential meeting space / could be shared
						need proximity to Town Clerk
Town Clerk					345	
M1	Office	Margaret Bonderenko, Town Clerk (F.T.)	345	1	345	need meeting space; move counter away from front of building
		Peg Tetreault, Assistant Town Clerk (P.T.)				need proximity to additional storage & Vault - move downstaris
Board of Health					200	
M2	Office	Missy Kakela-Boisvert	200	1	200	permitting - move to Fire Station
Treasurer / Collector					440	
M4	Treasurer's Office	Linda Hawkes, Treasurer / Collector	160	1	160	need adjacency to Collector
M5	Collector's Office	Jenn Welch, Asst. Treasurer / Collector	235	1	235	need adjacency to Treasurer
		Sharlene Harris, Finance Clerk				public counter too small
		unnassigned				room size is sufficient
	Storage		45	1	45	
Water Commission / Parks & Rec					145	
U1	Office	Dan Byer, Director of Parks & Rec	145	1	145	limited office time - can share office
		Leah Cameron, Water Commission				can move to Fire Station
Town Accountant					165	
U4	Office	Eric Kinsherf (interim)	165	1	165	office space is inadequate
		Lisa				need confidential meeting space / could be shared
Veteran's Agent					65	
U3	Office	(P.T.)	65	1	65	needs meeting space and file storage
						limited office time - can share office
Stage					310	
U4	Stage Storage		310	1	310	
Vault					205	
L1	Vault Storage		205	1	205	
Building & Planning					340	
L5	Office	Gail Wellman	180	1	180	need more meeting space, large table for plan review
		Tim Aicardi				
		John Erickson				
		Jack Grenga				
		Albert Jones				
		Joseph Zacchilli				
		Barry Iadarola				
		Benny Pinto				
L5	File Storage		160	1	160	need more storage
Multi-Purpose / Shared					1,660	Need more shared meeting space
M9	Copy / Mail Room		110	1	110	need more space for copy / mail
U2	Great Hall / B.O.S. Meeting		1,550	1	1,550	need secondary large meeting space
Police Department					740	Police to move out of Town Hall / do not include
L7	Sergeant's Office		180	1	180	
L2	Locker Room		160	1	160	
L3	Report Writing		265	1	265	
	Storage		135	1	135	
Boards / Commissions & Committees:					0	
Cultural Council		Joyce Firth				don't need designated space, but need file storage don't need designated space, but need file storage need proximity to Planning & Building - move to Fire Station
Finance Committee		Michael Merolli				
Green Communities						
Housing						
Conservation Commission		Leah Cameron				
Z.B.A.		Sherry Grant				
Land Use Committee		Anne Mazar				
Agricultural Commission		Ellen Gould				
Town Forest Committee		Sue Barnett				
C.P.C.						
Total Building Net Floor Area (NFA)					5,290	
Occupancy		14 F.T. / 4 P.T. Staff / 1 unassigned not including Boads & Commissions				
Total Building Gross Floor Area (GSF) <sup>2</sup>			3200	3	9,600	
Grossing Factor (GSF/NSF)					1.81	

UNION CHAPEL		Existing Conditions			
ROOM / DEPARTMENT TYPE	Staff	ROOM NSF	# OF RMS	area totals	Comments
First Floor				1,140	
Stacks		865	1	865	
Reading Room		265	1	265	
Storage		10	1	10	
Lower Level				810	
Children's Room		680	1	680	
Office		130	1	130	
OTHER				70	
Entry		70	1	70	
Total Building Net Square Foot (NSF)				2,020	
Occupancy					
Total Building Gross Square Foot (GSF) <sup>2</sup>		1350	2	2,700	
Grossing Factor (GSF/NSF)				1.34	

FIRE STATION		Existing Conditions			
ROOM / DEPARTMENT TYPE	Staff	ROOM NSF	# OF RMS	area totals	Comments
First Floor				1,950	
3-Bay Garage		1,950	1	1,950	
Second Floor				1,825	
Common Space		830	1	830	
Kitchen		135	1	135	
Storage		305	1	305	
Storage		95	1	95	
Storage		60	2	120	
Storage		40	3	120	
Office		110	2	220	
OTHER				0	
Other (specify)					
Total Building Net Square Foot (NSF)				3,775	
Occupancy					
Total Building Gross Square Foot (GSF) <sup>2</sup>		2150	2	4,300	
Grossing Factor (GSF/NSF)				1.14	

HISTORICAL MUSEUM		Existing Conditions			
ROOM / DEPARTMENT TYPE	Staff	ROOM NSF	# OF RMS	area totals	Comments
First Floor				540	
Common Space		540	1	540	
Total Building Net Square Foot (NSF)				540	
Occupancy					
Total Building Gross Square Foot (GSF) <sup>2</sup>		600	1	600	
Grossing Factor (GSF/NSF)				1.11	

HISTORICAL RECORD ROOM		Existing Conditions			
ROOM / DEPARTMENT TYPE	Staff	ROOM NSF	# OF RMS	area totals	Comments
First Floor				480	
Common Space	Kathy Schofield	400	1	400	
Storage	Jane Lowell	40	1	40	
Storage	Amy Dewitt	40	1	40	
Total Building Net Square Foot (NSF)				480	
Occupancy					
Total Building Gross Square Foot (GSF) <sup>2</sup>		550	1	550	
Grossing Factor (GSF/NSF)				1.15	

<sup>1</sup> Individual Room Net Square Foot (NSF)

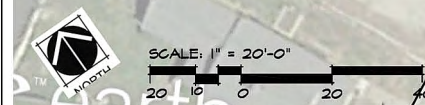
Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

<sup>2</sup> Total Building Gross Square Foot (GSF)

Includes the entire building gross square footage measured from the outside face of exterior walls

# Section 5





TOWN HALL CAMPUS STUDY MENDON CENTER HISTORIC DISTRICT	
PROPOSED SITE PLAN	
6-20-2016	
PROJ.# 16036	



TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
OPTION A PREFERRED -  
FIRE STATION

CHECKED  
SAW

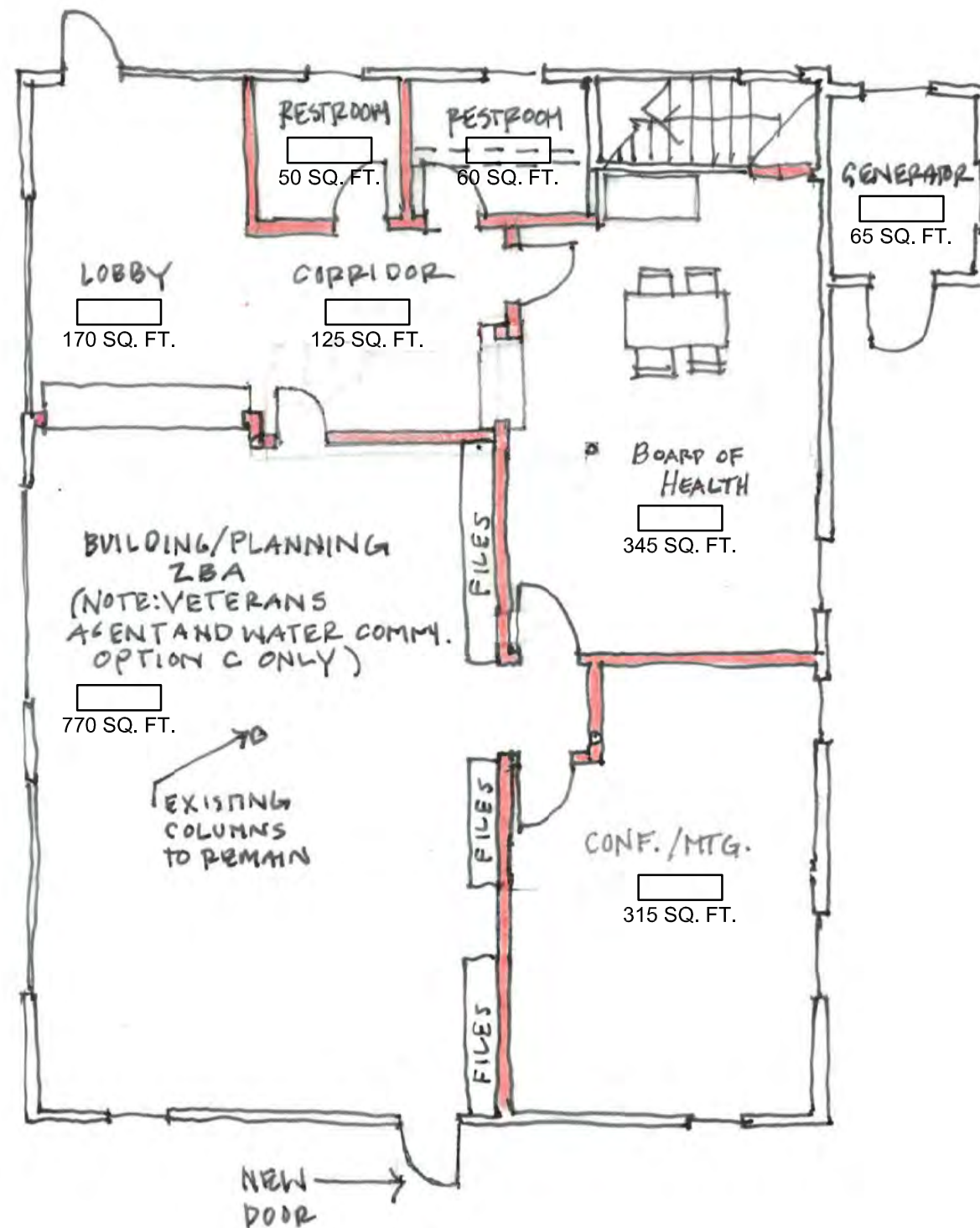
DATE  
06/10/2016

REVISION

SHEET No.

A1-01A

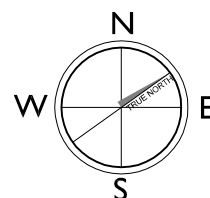
PROJ.# 16036



1

FIRE STATION FIRST FLOOR PLAN

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



TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
LIBRARY FLOOR PLANS -  
OPTION A - PREFERRED

CHECKED  
SAW

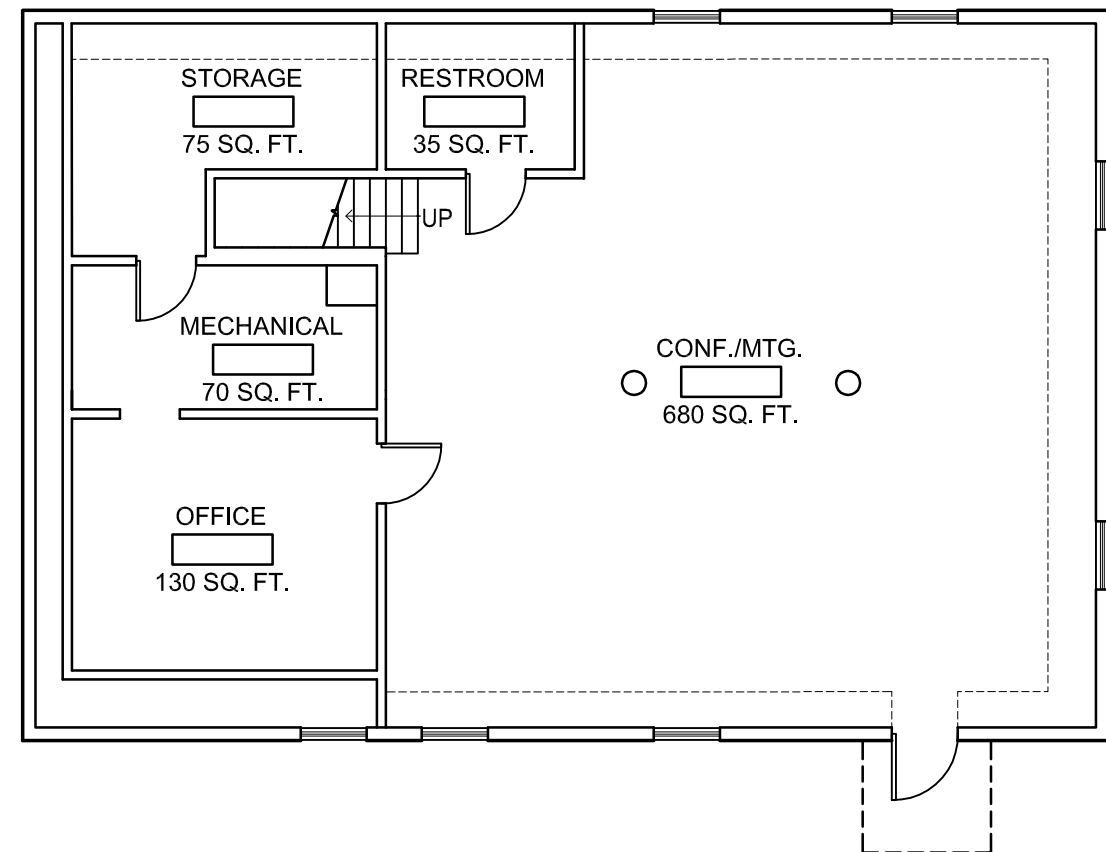
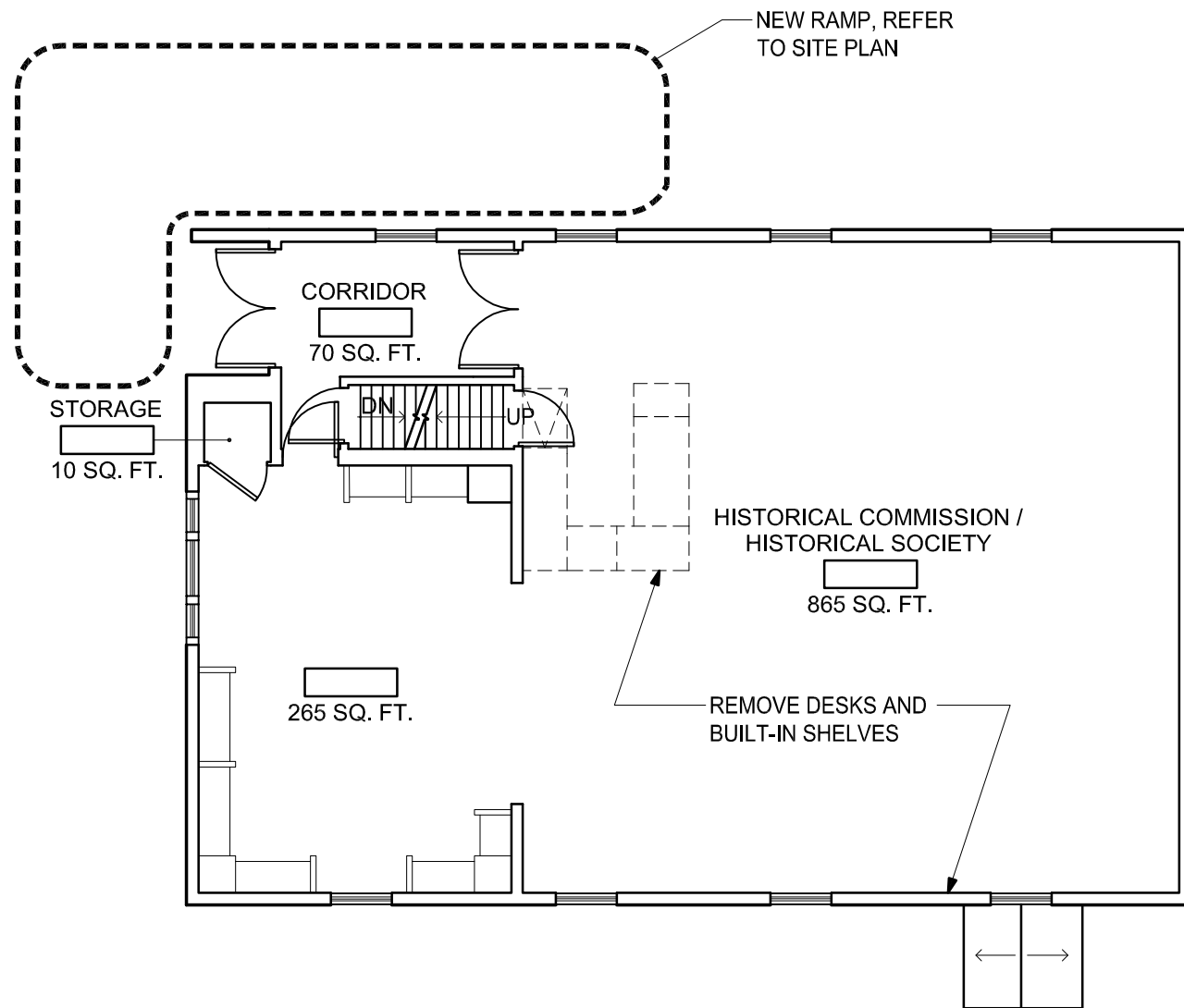
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06/10/2016

REVISION

SHEET No.

A1-02A

PROJ.# 16036



2

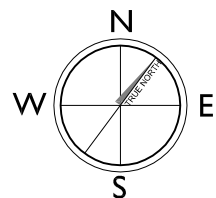
LIBRARY UPPER FLOOR PLAN

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

1

LIBRARY GROUND FLOOR PLAN

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



TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
SCHEME A - PREFERRED  
TOWN HALL FIRST FLOOR

CHECKED  
SAW

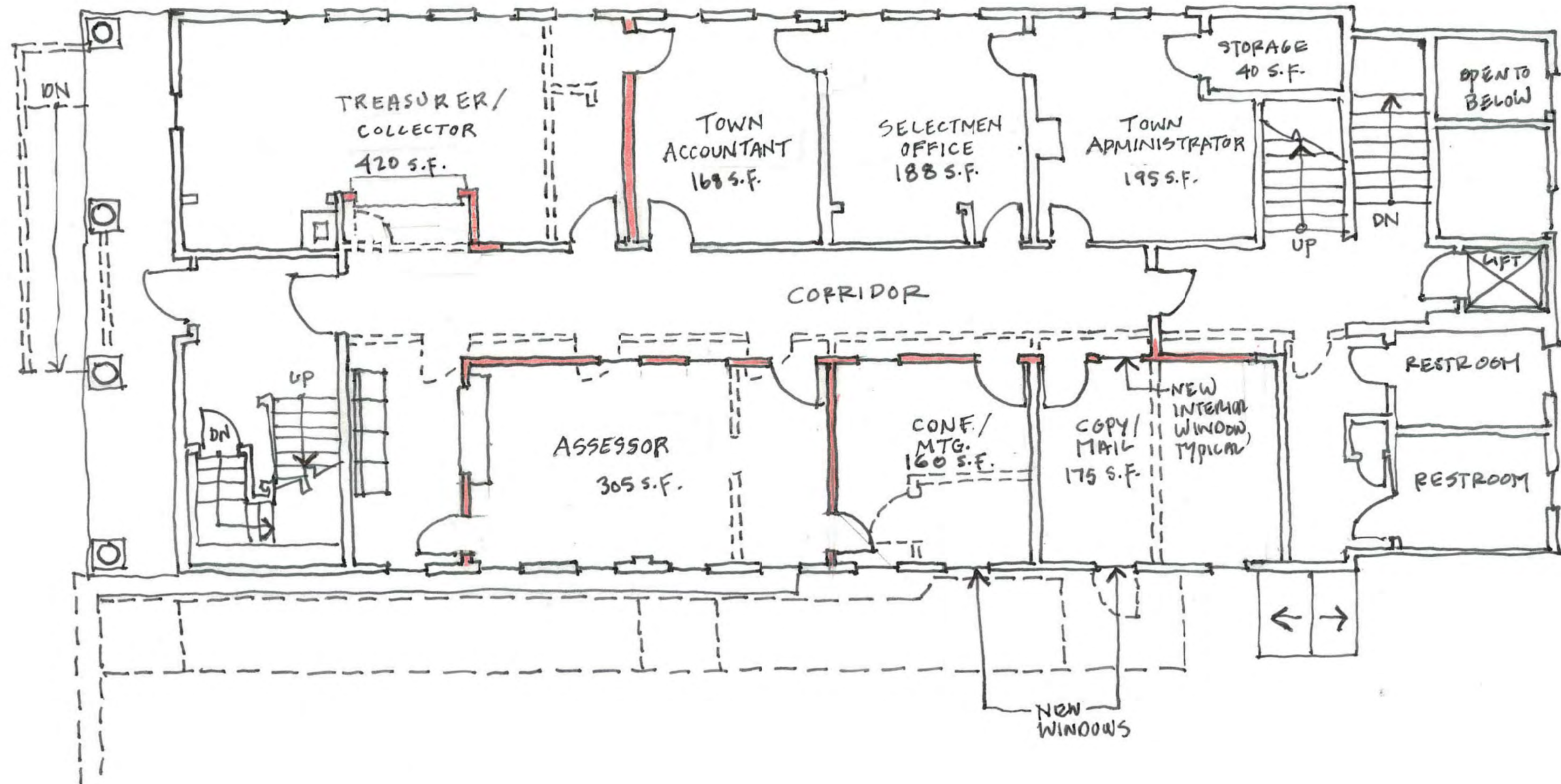
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06/10/2016

REVISION

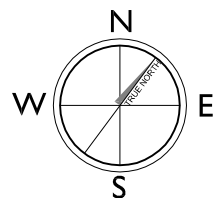
SHEET No.

A1-04A

PROJ.# 16036



**1 TOWN HALL FIRST FLOOR PLAN**  
SCALE: 1/8" = 1'-0"





TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
PROPOSED SCHEME B - TOWN HALL FIRST FLOOR

CHECKED  
SAW

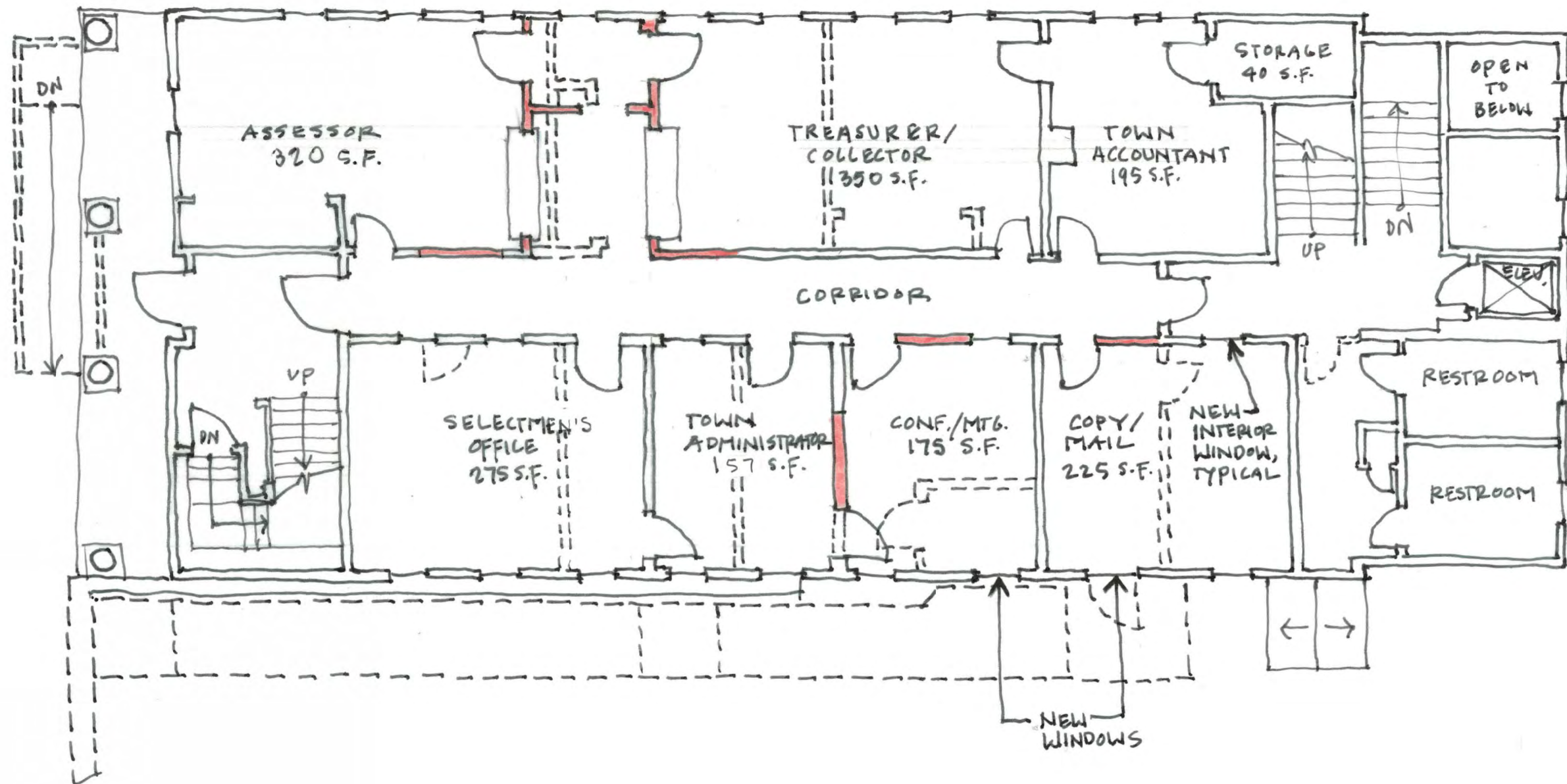
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06/10/2016

REVISION

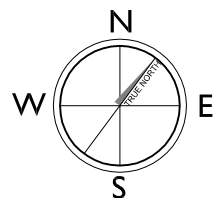
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A1-04B

PROJ.# 16036



1 TOWN HALL FIRST FLOOR PLAN  
SCALE: 1/8" = 1'-0"





TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION

PROPOSED SCHEME C - TOWN HALL FIRST FLOOR

CHECKED  
SAW

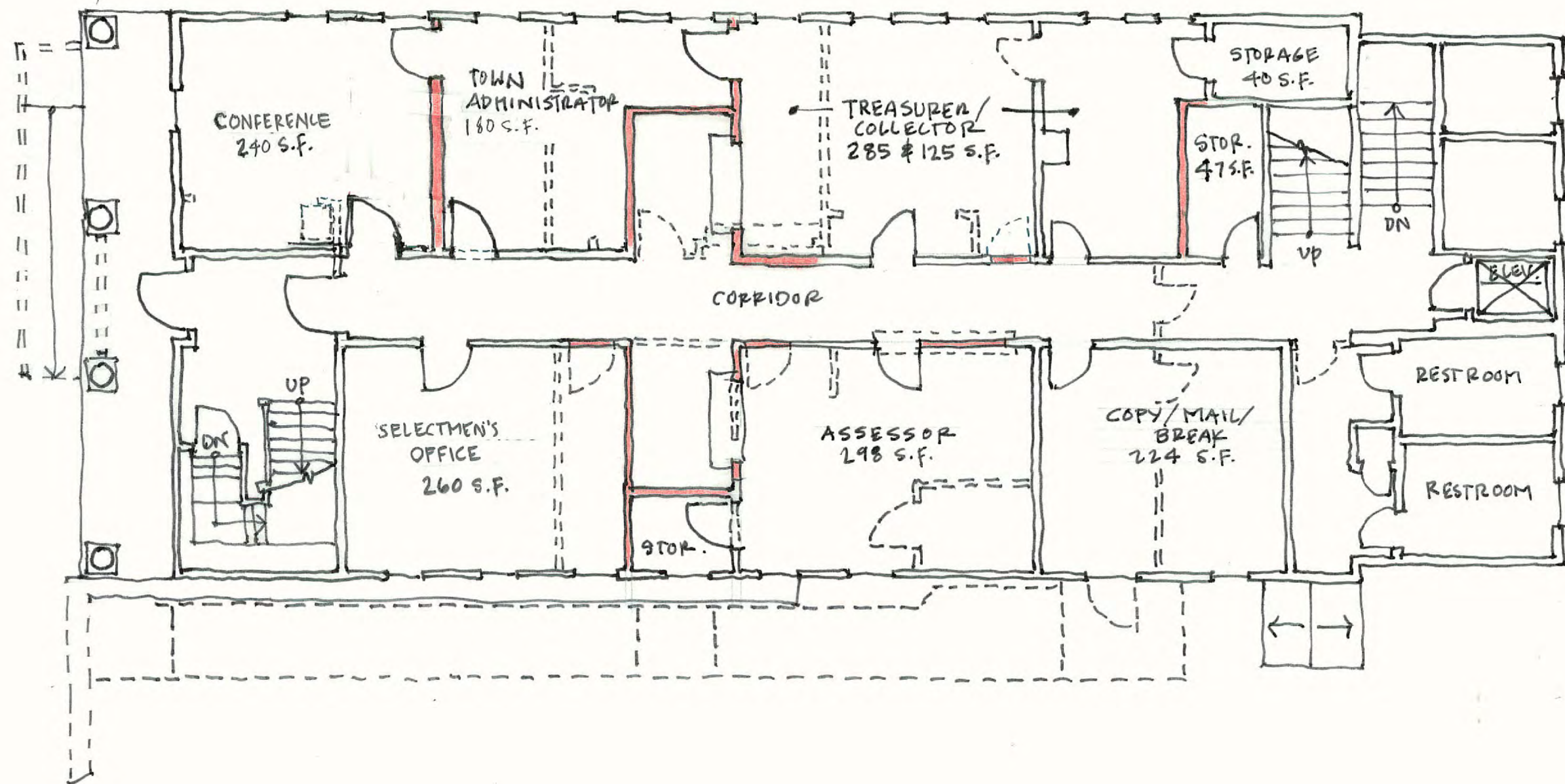
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06/10/2016

REVISION

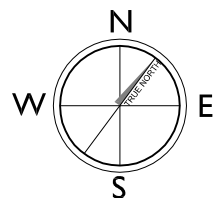
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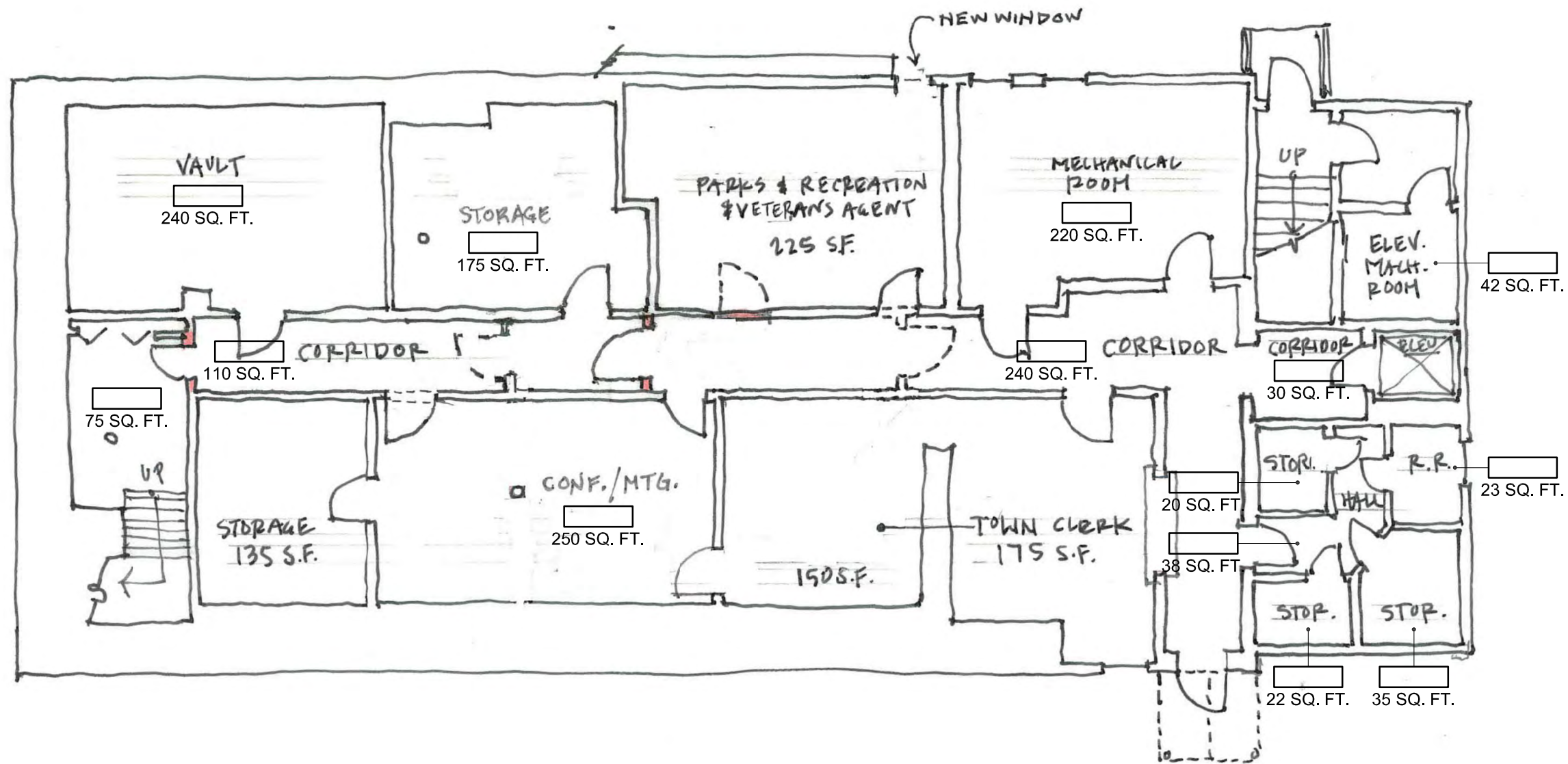
A1-04C

PROJ.# 16036



**1 TOWN HALL FIRST FLOOR PLAN**  
SCALE: 1/8" = 1'-0"





TOWN HALL CAMPUS STUDY  
MENDON CENTER HISTORIC DISTRICT

DESCRIPTION  
SCHEME A - PREFERRED  
TOWN HALL BASEMENT

CHECKED  
SAW

DATE  
06/10/2016

REVISION

SHEET No.

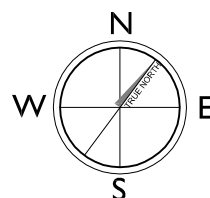
A1-03A

PROJ.# 16036

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TOWN HALL BASEMENT FLOOR PLAN

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





Mendon Center Historic Town Hall Campus Study  
Town Hall – Electrical Systems Narrative  
Mendon, MA  
J#385 012 00.00  
L#52442/Page 1/June 20, 2016

## **ELECTRICAL SYSTEMS**

### **NARRATIVE REPORT**

The following is the Electrical system narrative, which defines the scope of work and capacities of the Power and Lighting system, as well as, the Basis of Design.

#### **1. CODES**

All work installed under Division 26 shall comply with the Massachusetts State Building Code, IBC 2012 Appendix and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Section 260000 is indicated in this narrative report. All work is new, excluding the second floor, and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

#### **3. DESCRIPTION OF THE SYSTEMS**

##### **A. Electrical Distribution System:**

1. New construction service ratings are designed for a demand load of 15 watts/s.f. plus theatrical load. The existing service capacity of 400 amperes, 120/240 volt, 1Ø, 3wire would remain the same. New lighting and power panels will be provided to accommodate respective loads. The main service equipment will be new and relocated to a dedicated room in the basement.

##### **B. Interior Lighting System:**

1. General lighting fixtures consist of recessed mounted 2'x4' LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control and also for multi-level switching. In general lighting power density will be 20 percent less than IECC 2012.
2. Lighting levels will be approximately 30 foot candles in offices.
3. Corridor lighting will be comprised of 2'x4' recessed mounted LED luminaries with dimming drivers. The corridor light level will be designed for approximately 20 foot candles.
4. Office lighting will consist of recessed LED luminaries with dimming drivers. Light levels will be approximately 30 foot candles. Fixtures will be recessed 2'x4' type.

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5. Each area will be locally switched and designed for multi-level controls. Each office space and toilet room will have an occupancy sensor to turn lights off when unoccupied.

C. Emergency Lighting System:

1. Emergency light fixtures and LED exit signs will be installed to serve all egress areas such as corridors, intervening spaces, toilets, stairs, and exit discharge exterior doors.

D. Site Lighting System:

1. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.
2. Corridors will have a cleaning receptacle at approximately 25 foot intervals.
3. A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.

F. Fire Alarm System:

1. A fire alarm and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.
2. Smoke detectors will be provided in offices, open areas, corridors, stairwells, and other egress ways.
3. Horn/strobes will be provided in egress ways, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.
4. Manual pull stations will be provided at exit discharge doors.
5. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.



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4. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Commissioning Agent, Owner, and Owner's Representative present:

- Lighting and power panels for correct phase balance
- Lighting control system (interior and exterior)
- Fire alarm system

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

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## **HVAC SYSTEMS**

### **NARRATIVE REPORT**

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design.

#### **1. CODES**

All work installed under Division 230000 shall comply with the Town of Mendon Building Code and all state, IBC 2009, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

#### **3. BASIS OF DESIGN: (MASS CODE)**

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter -1 deg. F, Summer 86 deg. F DB 73 deg. F WB

Inside: 70 deg. F (+/- 2 deg F) for heating, 75 deg. F (+/- 2 deg F) (55% RH) for cooling in areas with air conditioning. Unoccupied temperature setback will be provided.

Outside air shall be provided in accordance with ASHRAE guide 62.1-2010 and the International Mechanical Code, as a minimum. All occupied areas will be designed to maintain 850 PPM carbon dioxide maximum.

#### **4. SYSTEM DESCRIPTION**

##### **A. Existing Heating Plant:**

Heating for the renovated area on the first floor will be provided through the use of the existing hot water boiler plant system. The existing system has the following capacity:

The existing boiler plant is provided with (2) oil fired cast iron Buderus hot water boilers, each with an output capacity of 294 MBH. The system also includes several Taco pumps which serve individual zones within the building, additionally there are zone valves located within the hot water piping which is associated with each space and is controlled via the wall mounted thermostat located within the space.

The boiler plant supplies heating hot water to fin tube radiation and cast iron radiators located throughout the building. The piping systems located throughout the building utilize a two-pipe fiberglass insulated copper piping system. The boiler plant supplies a maximum hot water temperature of 180 deg F on a design heating day and fluctuates

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based on outdoor air temperature.

**B. Heating, Ventilation and Air Conditioning – First Floor Renovation Area**

The renovated first floor area will be provided with an indoor 100% outside air unit with supply and exhaust fans controlled via ECM motors. The unit will also have energy recovery wheel, hot water heating section with modulating capacity control, DX cooling system with modulating hot gas reheat coil and MERV 13 filtration. This unit will serve a new heating, ventilation and air conditioning system. Supply air will be provided to the spaces through a galvanized sheet metal supply duct distribution system and shall be connected to ceiling mounted variable air volume diffusers. Return air will be drawn back to the units by ceiling return air registers and will be routed back to the air handling unit by a galvanized sheet metal return air duct distribution system. Supplemental fin tube radiation will be utilized in each space for individual space tempering and night set back requirements.

The existing Basement and Second floors will require some slight modifications to the existing fin tube radiation, this work will be based on the architectural renovation plans.

It is estimated that the following indoor air handling equipment will be required to serve the first floor renovated area:

(1) One indoor air handling unit with a capacity of 2,000 CFM (5 tons cooling, 65 MBH heating).

(10) Variable Air Volume Diffusers.

**C. Corridor and Entry Way Heating**

New hot water cabinet unit heaters shall be installed to provide heating to these areas. Corridors shall be ventilated from adjacent air handling unit system.

It is estimated that the following unit heaters will be required to serve the first floor renovated area:

(2) Two hot water unit heaters, each with a capacity of 400 CFM (20 MBH heating).

**D. Custodial Support Areas and Restrooms:**

Custodial support areas and restrooms will be ventilated by dedicated exhaust systems which will communicate ceiling mounted registers to roof mounted or thru wall exhaust fans through the use of galvanized sheet metal duct distribution systems.

It is estimated that the following exhaust fans will be required to serve the first floor renovated area:

(1) One roof mounted exhaust fan with a capacity of 400 CFM.

**E. Testing, Adjusting, Balancing & Commissioning:**

All new HVAC systems shall be tested, adjusted, balanced and commissioned as part of the project scope.

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F. Automatic Temperature Controls – Building Energy Management System:

The building is provided with an existing Honeywell electronic standalone temperature control system. As part of this project all new HVAC equipment will be provided with DDC control components. The controls shall operate in standalone mode for the time being however, will have the infrastructure for future connection to a building management system via a BacNet protocol. All new controls shall be DDC ready and have the capability of being web addressable.

G. Operation Manuals and Maintenance Manuals:

When the project is completed, the HVAC Contractor shall provide operation and maintenance manuals to the Owner.

H. Record Drawings and Control Documents:

When the project is completed, an as-built set of drawings, showing all ductwork, piping and controls including all addendum items, will be provided to the Owner.

I. Commissioning:

The project shall be commissioned per the commissioning specifications.



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**PLUMBING SYSTEMS**

**NARRATIVE REPORT**

**TOWN HALL**

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design.

1. CODES

- A. All work installed under Section 220000 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

- A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL

- A. The Plumbing Systems that will serve the project are cold water, hot water, sanitary waste and vent system.
- B. The Building is serviced by on-site well water and off-site septic system.
- C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. DRAINAGE SYSTEM

- A. Waste, and Vent piping system is provided to connect to all new plumbing fixtures and equipment. New piping will connect to existing building systems.
- B. Waste and Vent system piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type 'L' copper.

5. WATER SYSTEM

- A. Existing well water service and domestic water distribution piping to remain.
- B. Existing water heater will be demolished. New domestic hot water heating will be provided. Heater shall be electric tank type, 50-gallon storage. System is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures.

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- C. New domestic cold water piping will be provided to new drinking fountain.
- D. Water piping will be type 'L' copper with wrought copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high density fiberglass.

6. FIXTURES

- A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.
- B. Fixtures shall be the manufacturer's guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.
- C. Fixtures shall be as scheduled on drawings.
  - 1. Drinking Fountain: Hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

7. VALVES

- A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.

8. INSULATION

- A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

9. CLEANOUTS

- A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

10. ACCESS DOORS

- A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

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## **ELECTRICAL SYSTEMS**

### **NARRATIVE REPORT**

The following is the Electrical system narrative, which defines the scope of work and capacities of the Power and Lighting system, as well as, the Basis of Design.

#### **1. CODES**

All work installed under Division 26 shall comply with the Massachusetts State Building Code, IBC 2012 Appendix and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Section 260000 is indicated in this narrative report. New work including fire alarm system, lighting, wiring devices, and proposed addition, consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

#### **3. DESCRIPTION OF THE SYSTEMS**

##### **A. Electrical Distribution System:**

1. New construction service ratings are designed for a demand load of 15 watts/s.f. plus theatrical load. The service capacity will be sized for 400 amperes, 120/208 volt, 3Ø, 4wire. New lighting and power panels will be provided to accommodate respective loads. The service size would increase to accommodate the proposed new addition with an elevator.

##### **B. Interior Lighting System:**

1. General lighting fixtures consist of recessed mounted 2'x4' LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control and also for multi-level switching. In general lighting power density will be 20 percent less than IECC 2012.
2. Lighting levels will be approximately 30 foot candles in offices.
3. Corridor lighting will be comprised of 2'x4' recessed mounted LED luminaries with dimming drivers. The corridor light level will be designed for approximately 20 foot candles.
4. Office lighting will consist of recessed LED luminaries with dimming drivers. Light levels will be approximately 30 foot candles. Fixtures will be recessed 2'x4' type.

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5. Each area will be locally switched and designed for multi-level controls. Each office space and toilet room will have an occupancy sensor to turn lights off when unoccupied.

C. Emergency Lighting System:

1. Emergency light fixtures and LED exit signs will be installed to serve all egress areas such as corridors, intervening spaces, toilets, stairs, and exit discharge exterior doors.

D. Site Lighting System:

1. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.
2. Corridors will have a cleaning receptacle at approximately 25 foot intervals.

F. Fire Alarm System:

1. A fire alarm and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.
2. Smoke detectors will be provided in offices, open areas, corridors, stairwells, and other egress ways.
3. Horn/strobes will be provided in egress ways, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.
4. Manual pull stations will be provided at exit discharge doors.
5. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

4. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Commissioning Agent, Owner, and Owner's Representative present:

- Lighting and power panels for correct phase balance
- Lighting control system (interior and exterior)
- Fire alarm system



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Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

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## **HVAC SYSTEMS**

### **NARRATIVE REPORT**

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design.

#### **1. CODES**

All work installed under Division 230000 shall comply with the Town of Mendon Building Code and all state, IBC 2009, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

#### **3. BASIS OF DESIGN: (MASS CODE)**

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter -1 deg. F, Summer 86 deg. F DB 73 deg. F WB

Inside: 70 deg. F (+/- 2 deg F) for heating, 75 deg. F (+/- 2 deg F) (55% RH) for cooling in areas with air conditioning. Unoccupied temperature setback will be provided.

Outside air shall be provided in accordance with ASHRAE guide 62.1-2010 and the International Mechanical Code, as a minimum. All occupied areas will be designed to maintain 850 PPM carbon dioxide maximum.

#### **4. SYSTEM DESCRIPTION**

##### **A. Heating and Air Conditioning:**

Within this building there will be minimal renovations therefore, the existing heating and air conditioning system for this building consists of an indoor oil fired air handling unit with direct expansion cooling. The system is associated with a galvanized sheet metal duct distribution system which travels throughout the building to the first and second floors. This system will remain in place and be utilized for heating and air conditioning purposes. Ventilation will be provided through the operable windows per the current design.

##### **B. Custodial Support Areas and Restrooms:**

Custodial support areas and restrooms will be ventilated by dedicated exhaust systems which will communicate ceiling mounted registers to roof mounted or thru wall exhaust fans through the use of galvanized sheet metal duct distribution systems.

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It is estimated that the following exhaust fans will be required to serve the building:

(1) One roof mounted exhaust fan with a capacity of 750 CFM.

C. Testing, Adjusting, Balancing & Commissioning:

The existing HVAC system shall be tested, adjusted, balanced and commissioned as part of the project scope.

D. Automatic Temperature Controls – Building Energy Management System:

As part of this project the existing indoor air handling unit will be provided with individual variable air volume diffusers. These special diffusers will provide modulating dampers which will allow each separate floor to be tempered per the floors individual temperature requirements. This will provide a more satisfied and comfortable temperature throughout the building. These new devices will be provided with DDC control components. The controls shall operate in standalone mode for the time being however, will have the infrastructure for future connection to a building management system via a BacNet protocol. All new controls shall be DDC ready and have the capability of being web addressable.

E. Operation Manuals and Maintenance Manuals:

When the project is completed, the HVAC Contractor shall provide operation and maintenance manuals to the Owner.

F. Record Drawings and Control Documents:

When the project is completed, an as-built set of drawings, showing all ductwork, piping and controls including all addendum items, will be provided to the Owner.

G. Commissioning:

The project shall be commissioned per the commissioning specifications.

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## **HVAC SYSTEMS**

### **NARRATIVE REPORT**

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design.

#### **1. CODES**

All work installed under Division 230000 shall comply with the Town of Mendon Building Code and all state, IBC 2009, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

#### **3. BASIS OF DESIGN: (MASS CODE)**

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter -1 deg. F, Summer 86 deg. F DB 73 deg. F WB

Inside: 70 deg. F (+/- 2 deg F) for heating, 75 deg. F (+/- 2 deg F) (55% RH) for cooling in areas with air conditioning. Unoccupied temperature setback will be provided.

Outside air shall be provided in accordance with ASHRAE guide 62.1-2010 and the International Mechanical Code, as a minimum. All occupied areas will be designed to maintain 850 PPM carbon dioxide maximum.

#### **4. SYSTEM DESCRIPTION**

##### **A. Central Heating Plant:**

Heating for the entire building including the indoor air handling unit will be through the use of a high efficiency oil-fired non-condensing boiler plant. A new boiler plant with (1) 150 MBH input boiler and (2) inline ECM pumps with a capacity of 20 gpm each. The boiler plant will supply heating hot water to all heating apparatus located throughout the building areas through a two-pipe fiberglass insulated copper piping system. New hot water piping shall be installed to serve new HVAC systems. The boiler plant shall supply a maximum hot water temperature of 180 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the power plant.

Combustion air for the boiler will be directly ducted to the outdoors through a galvanized ductwork distribution system. Venting for the boiler shall be through a separate double wall breeching system and shall discharge between 6 feet to 12 feet above the roof level.



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A new outdoor 500 gallon above ground fuel oil tank will also be provided to store fuel for the boiler plant.

**B. Heating, Ventilation and Air Conditioning – Renovation Area**

The renovated area will be provided with an indoor 100% outside air unit with supply and exhaust fans controlled via ECM motors. The unit will also have energy recovery wheel, hot water heating section with modulating capacity control, DX cooling system with modulating hot gas reheat coil and MERV 13 filtration. This unit will serve a new heating, ventilation and air conditioning system. Supply air will be provided to the spaces through a galvanized sheet metal supply duct distribution system and shall be connected to ceiling mounted diffusers. Return air will be drawn back to the units by ceiling return air registers and will be routed back to the air handling unit by a galvanized sheet metal return air duct distribution system. Supplemental fin tube radiation will be utilized in each space for individual space tempering and night set back requirements.

It is estimated that the following indoor air handling equipment will be required to serve the renovated area:

(1) One indoor air handling unit with a capacity of 2,000 CFM (5 tons cooling, 65 MBH heating).

**C. Corridor and Entry Way Heating**

New hot water cabinet unit heaters shall be installed to provide heating to these areas. Corridors shall be ventilated from adjacent air handling unit system.

It is estimated that the following unit heaters will be required to serve the first floor renovated area:

(2) Two hot water unit heaters, each with a capacity of 400 CFM (20 MBH heating).

**D. Custodial Support Areas and Restrooms:**

Custodial support areas and restrooms will be ventilated by dedicated exhaust systems which will communicate ceiling mounted registers to roof mounted or thru wall exhaust fans through the use of galvanized sheet metal duct distribution systems.

It is estimated that the following exhaust fans will be required to serve the first floor renovated area:

(1) One roof mounted exhaust fan with a capacity of 500 CFM.

**E. Testing, Adjusting, Balancing & Commissioning:**

All new HVAC systems shall be tested, adjusted, balanced and commissioned as part of the project scope.

**F. Automatic Temperature Controls – Building Energy Management System:**

As part of this project all new HVAC equipment will be provided with DDC control components. The controls shall operate in stand-alone mode for the time being however, will have the infrastructure for future connection to a building management system via a

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BacNet protocol. All new controls shall be DDC ready and have the capability of being web addressable.

G. Operation Manuals and Maintenance Manuals:

When the project is completed, the HVAC Contractor shall provide operation and maintenance manuals to the Owner.

H. Record Drawings and Control Documents:

When the project is completed, an as-built set of drawings, showing all ductwork, piping and controls including all addendum items, will be provided to the Owner.

I. Commissioning:

The project shall be commissioned per the commissioning specifications.

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## **ELECTRICAL SYSTEMS**

### **NARRATIVE REPORT**

The following is the Electrical system narrative, which defines the scope of work and capacities of the Power and Lighting system, as well as, the Basis of Design.

#### **1. CODES**

All work installed under Division 26 shall comply with the Massachusetts State Building Code, IBC 2012 Appendix and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

#### **2. DESIGN INTENT**

The work of Section 260000 is indicated in this narrative report. All work is new, excluding the second floor, and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

#### **3. DESCRIPTION OF THE SYSTEMS**

##### **A. Electrical Distribution System:**

1. New construction service ratings are designed for a demand load of 15 watts/s.f. plus theatrical load. The new service capacity will be sized for 400 amperes, 120/240 volt, 1Ø, 3wire. New lighting and power panels will be provided to accommodate respective loads. The main service equipment will be new and relocated to a dedicated room.

##### **B. Interior Lighting System:**

1. General lighting fixtures consist of recessed mounted 2'x4' LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control and also for multi-level switching. In general lighting power density will be 20 percent less than IECC 2012.
2. Lighting levels will be approximately 30 foot candles in offices.
3. Corridor lighting will be comprised of 2'x4' recessed mounted LED luminaries with dimming drivers. The corridor light level will be designed for approximately 20 foot candles.
4. Office lighting will consist of recessed LED luminaries with dimming drivers. Light levels will be approximately 30 foot candles. Fixtures will be recessed 2'x4' type.

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5. Each area will be locally switched and designed for multi-level controls. Each office space and toilet room will have an occupancy sensor to turn lights off when unoccupied.

C. Emergency Lighting System:

1. A diesel or natural gas powered 60KW emergency generator will be provided with sound attenuating weather proof enclosure, critical grade exhaust silencer, and automatic starting and safety controls. The generator will include two (2) service breakers: one (1) for life safety equipment and one (1) for optional standby equipment.
2. The generator will be sized for lighting and power loads, including all heating, communication, etc. The transfer switches will be staged. Air conditioning will not be on the generator.
3. The emergency power distribution system will consist of two (2) automatic transfer switches, one for life safety equipment and one for non-life safety systems. A separate system of distribution panels and conduit systems will be provided for each level of emergency or standby power.

D. Site Lighting System:

1. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.
2. Corridors will have a cleaning receptacle at approximately 25 foot intervals.
3. A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.

F. Fire Alarm System:

1. A fire alarm and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.
2. Smoke detectors will be provided in offices, open areas, corridors, stairwells, and other egress ways.
3. Horn/strobes will be provided in egress ways, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.



Mendon Center Historic Town Hall Campus Study  
Fire Station – Electrical Systems Narrative  
Mendon, MA  
J#385 012 00.00  
L#52447/Page 3/June 20, 2016

4. Manual pull stations will be provided at exit discharge doors.
5. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

4. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Commissioning Agent, Owner, and Owner's Representative present:

- Lighting and power panels for correct phase balance
- Lighting control system (interior and exterior)
- Fire alarm system

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

# Section 6



## **Feasibility Cost Estimate**

### **Mendon Town Hall Renovations and Upgrades**

Mendon, MA

Prepared for:

**CBI Consulting Inc.**

June 29, 2016



**Mendon Town Hall**  
Renovations and Upgrades  
Mendon, MA

29-Jun-16

**Feasibility Cost Estimate**

**MAIN CONSTRUCTION COST SUMMARY**

	<b>Construction Start</b>	<b>Estimated Construction Cost</b>
Town Hall Repairs - Preferred Option A		\$669,121
Allowance for HazMat removals at existing		NIC
<hr/>		
SUBTOTAL TRADE COSTS BUILDING		\$669,121
General Conditions	15.0%	\$100,368
Insurances	1.5%	\$10,037
Bond	1.00%	\$6,691
Fee	10.0%	\$66,912
Design and Estimating Contingency	15.0%	\$100,368
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>		<hr/> <b>\$953,497</b> <hr/>
Escalation Allowance	5.0%	\$47,675
<b>TOTAL OF ALL CONSTRUCTION ESCALATED TO START OF CONSTRUCTION</b>		<hr/> <b>\$1,001,172</b> <hr/> <hr/>
Alternate #1 Remove existing ramp and stone walls @ the South Side		<b>ADD \$178,200</b>





**Mendon Town Hall**  
Renovations and Upgrades  
Mendon, MA

29-Jun-16

**Feasibility Cost Estimate**

Fire Station - Option A		\$653,619
Allowance for HazMat removals at existing		NIC
<hr/>		
SUBTOTAL TRADE COSTS BUILDING		\$653,619
General Conditions	15.0%	\$98,043
Insurances	1.5%	\$9,804
Bond	1.00%	\$6,536
Fee	10.0%	\$65,362
Design and Estimating Contingency	15.0%	\$98,043
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>		<hr/> <b>\$931,407</b> <hr/>
Escalation Allowance	5.0%	<b>\$46,570</b>
<b>TOTAL OF ALL CONSTRUCTION ESCALATED TO START OF CONSTRUCTION</b>		<hr/> <b>\$977,977</b> <hr/> <hr/>



**Mendon Town Hall**  
Renovations and Upgrades  
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**Feasibility Cost Estimate**

Union Chapel - Option A		\$353,780
Allowance for HazMat removals at existing		NIC
SUBTOTAL TRADE COSTS BUILDING		\$353,780
General Conditions	15.0%	\$53,067
Insurances	1.5%	\$5,307
Bond	1.00%	\$3,538
Fee	10.0%	\$35,378
Design and Estimating Contingency	15.0%	\$53,067
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>		<b>\$504,137</b>
Escalation Allowance	5.0%	\$25,207
<b>TOTAL OF ALL CONSTRUCTION ESCALATED TO START OF CONSTRUCTION</b>		<b>\$529,344</b>



**Mendon Town Hall**  
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**Feasibility Cost Estimate**

Remove existing Police Station	2500	sf	\$37,500
Remove existing Garage	600	sf	\$12,000
Sitework			\$818,521
Allowance for HazMat removals at existing			NIC
<hr/>			
SUBTOTAL TRADE COSTS BUILDING			\$868,021
General Conditions	15.0%		\$130,203
Insurances	1.5%		\$13,020
Bond	1.00%		\$8,680
Fee	10.0%		\$86,802
Design and Estimating Contingency	15.0%		\$130,203
<hr/>			
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>			<b>\$1,236,929</b>
<hr/>			
Escalation Allowance	5.0%		\$61,846
<hr/>			
<b>TOTAL OF ALL CONSTRUCTION ESCALATED TO START OF CONSTRUCTION</b>			<b>\$1,298,775</b>
<hr/>			



**Mendon Town Hall**  
Renovations and Upgrades  
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### **Feasibility Cost Estimate**

This feasibility Cost estimate was produced from drawings and information received from CBI Consulting Inc. dated June 10, 2016. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, general contractor's overhead and profit and design contingency. Cost escalation assumes start dates indicated.

Bidding conditions are expected to be public bidding under Chapter 149 of the Massachusetts General Laws to pre-qualified general contractors, and pre-qualified sub-contractors, open specifications for materials and manufactures.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

### **ITEMS NOT CONSIDERED IN THIS ESTIMATE**

Items not included in this estimate are:

- All professional fees and insurance
- Building Permit costs
- Land acquisition, feasibility, and financing costs
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items (e.g. draperies, furniture and equipment)
- Rock excavation; special foundations (unless indicated by design engineers)
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction or occupancy phasing or off hours' work, (except as noted in this estimate)



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**TOWN HALL UPGRADES OPTION A**

**A10 FOUNDATIONS**

**A1010 STANDARD FOUNDATIONS**

Re-set all loose stones and repoint @ exterior ramp	800	lf	15.00	12,000		
SUBTOTAL						\$12,000

**TOTAL - FOUNDATIONS**

**\$12,000**

**B10 SUPERSTRUCTURE**

**B1010 FLOOR CONSTRUCTION**

No work in this section				-		
SUBTOTAL						\$0

**B1020 ROOF CONSTRUCTION**

Gutter and downspout repairs	1	ls	1,440.00	1,440		
Replace wood trim at roof edge	20	lf	55.00	1,100		
SUBTOTAL						\$2,540

**TOTAL - SUPERSTRUCTURE**

**\$2,540**

**B20 EXTERIOR CLOSURE**

**B2010 EXTERIOR WALLS**

Scrape and paint entire building; including countersink and seal existing nails	6,250	sf	9.00	56,250		
Perform historic paint analysis	1	ls	3,000.00	3,000		
Apply clear sealer to chimneys	2	ea	900.00	1,800		
Scaffolding / Lifts	6,250	sf	3.00	18,750		
Patch existing exterior wall @ ramp	420	sf	130.00	Alt #1		
Shoring / Underpinning	1	ls	25,000.00	Alt #1		
SUBTOTAL						\$79,800

**B2020 WINDOWS**

New window in exterior wall	12	sf	150.00	1,800		
Remove and replace all windows and replace with historic wood double hung windows. Assume 4' high windows	264	sf	150.00	39,600		
SUBTOTAL						\$41,400

**B2030 EXTERIOR DOORS**

New wood doors single	3	ea	3,800.00	11,400		
New wood doors single w/ sidelight	1	ea	5,000.00	5,000		
SUBTOTAL						\$16,400

**TOTAL - EXTERIOR CLOSURE**

**\$137,600**

**C10 INTERIOR CONSTRUCTION**

**C1010 PARTITIONS**





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Renovations and Upgrades  
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**TOWN HALL UPGRADES OPTION A**

**092900 GYPSUM BOARD ASSEMBLIES**

3-5/8" MS w/ 1 lyr GWB es, insulated	1,600	sf	11.00	17,600	
Infill existing door opening	21	sf	30.00	630	
Infill existing borrowed light	28	sf	30.00	840	
SUBTOTAL					19,070

**C1020 INTERIOR DOORS**

Wood door, frames and hardware	6	ea	1,900.00	11,400	
SUBTOTAL					11,400

**C1030 SPECIALTIES / MILLWORK**

Wood counter at lobby	15	lf	150.00	2,250	
Interior window at lobby	60	sf	55.00	3,300	
SUBTOTAL					5,550

**TOTAL - INTERIOR CONSTRUCTION**

**\$36,020**

**C20 STAIRCASES**

**C2010 STAIR CONSTRUCTION**

Work to stair for new wall	1	ls	1,500.00	1,500	
SUBTOTAL					\$1,500

**C2020 STAIR FINISHES**

No work in this section					
SUBTOTAL					\$0

**TOTAL - STAIRCASES**

**\$1,500**

**C30 INTERIOR FINISHES**

**C3010 WALL FINISHES**

Paint new walls	3,298	sf	1.50	4,947	
Paint existing walls	4,800	sf	1.50	7,200	
Miscellaneous painting	1	ls	2,000.00	2,000	
SUBTOTAL					\$14,147

**C3020 FLOOR FINISHES**

New carpet in offices	1,600	sf	6.00	9,600	
Patch existing floor	1,400	sf	3.00	4,200	
SUBTOTAL					\$13,800

**C3030 CEILING FINISHES**

New ACT	5,630	sf	6.00	33,780	
SUBTOTAL					\$33,780

**TOTAL - INTERIOR FINISHES**

**\$61,727**

**D20 PLUMBING**

Replace old plumbing fixtures with new high efficiency fixtures	6	ea	1,930.00	11,580	
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**TOWN HALL UPGRADES OPTION A**

104	Replace existing water heater, mixing valve & expansion tank	1	ls	10,000.00	10,000		
105	SUBTOTAL					21,580	

106	<b>TOTAL - PLUMBING</b>						<b>\$21,580</b>
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**D30 HVAC**

111	Insulate all uninsulated HHW pipework; allow	100	lf	10.00	1,000		
112	Service boiler / pumps	1	ls	3,500.00	3,500		
113	Replace cast iron radiators with wall mounted finned tube; allow	20	ea	2,500.00	50,000		
114	Provide 100% outside air ventilation c/w ERV, ductwork, etc.	1	ls	100,000.00	100,000		
115	Provide new DDC system and connect to town wide BMS	1	ls	60,000.00	60,000		
116	Provide general exhaust for storage & toilet rooms	1	ls	10,000.00	10,000		
117	Modify HVAC to suit new room layouts	1	ls	10,000.00	10,000		
118	SUBTOTAL					234,500	

120	<b>TOTAL - HVAC</b>						<b>\$234,500</b>
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**D40 FIRE PROTECTION**

124	No Work in this section						
125	SUBTOTAL					-	

127	<b>TOTAL - FIRE PROTECTION</b>						<b>\$0</b>
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**D50 ELECTRICAL**

131	Demo existing fire alarm system and replace with new addressable ADA/code compliant system	1	ls	30,000.00	30,000		
132	Upgrade power distribution system with a new secondary main service housed in a dedicated electric room. New panelboards to be provided throughout the building	1	ls	20,000.00	20,000		
133	Exterior building mounted fixtures to be changed to LED and connected to emergency battery backup power. Photocell / timeclock control to be provided	1	ls	4,000.00	4,000		
134	Provide ceiling occupancy sensors in offices/work spaces	16	ea	230.00	3,680		
135	Provide additional receptacles in offices with dedicated neutral for computer use	12	ea	500.00	6,000		
136	Provide exterior generator; 60kW	1	ls	55,000.00	55,000		
137	Allowance to modify lighting & light controls to suit new layout	1	ls	5,000.00	5,000		
138	Allowance to modify branch power to suit new layouts	1	ls	4,000.00	4,000		
139	Allowance to modify comms to suit new layouts	1	ls	4,000.00	4,000		
140	SUBTOTAL					131,680	

142	<b>TOTAL - ELECTRICAL</b>						<b>\$131,680</b>
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**E10 EQUIPMENT**

**E10 EQUIPMENT, GENERALLY**



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**TOWN HALL UPGRADES OPTION A**

No Work in this section

SUBTOTAL

\$0

**TOTAL - EQUIPMENT**

**\$0**

**F20 SELECTIVE BUILDING DEMOLITION**

**F2010 BUILDING ELEMENTS DEMOLITION**

Form opening in existing wall for new door opening	2	loc	1,200.00	2,400	
Remove existing doors	6	ea	140.00	840	
Demolish and remove existing partitions	1,512	sf	2.00	3,024	
Remove existing borrowed light and counter	7	lf	30.00	210	
Demo ramp and stone walls	1	ls	10,000.00	Alt #1	
Demo ramp railings	140	lf	15.00	Alt #1	
Remove existing entrance door and infill wall under window	1	ls	5,000.00	Alt #1	
Sawcut and remove pavement	210	sf	10.00	Alt #1	
Patch existing pavement	500	sf	40.00	Alt #1	
Miscellaneous demo/protection	1	ls	10,000.00	10,000	
SUBTOTAL					16,474

**F2020 HAZARDOUS COMPONENTS ABATEMENT**

No Work in this section

SUBTOTAL

\$0

**TOTAL - SELECTIVE BUILDING DEMOLITION**

**\$16,474**

**G SITEWORK**

**G20 SITE IMPROVEMENTS**

Flashing and sealants at joints in ramp	70	lf	25.00	1,750	
Repair and re-set railings @ exterior ramp	250	lf	35.00	8,750	
Repair concrete slab @ exterior ramp	1	ls	3,000.00	3,000	
SUBTOTAL					\$13,500

**TOTAL - SITE DEVELOPMENT**

**\$13,500**

**TOTAL TOWN HALL OPTION A**

**669,121**



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**FIRE STATION UPGRADES OPTION A**

**A10 FOUNDATIONS**

**A1030 LOWEST FLOOR CONSTRUCTION**

No work in this section

-

SUBTOTAL

\$0

**TOTAL - FOUNDATIONS**

**\$0**

**B10 SUPERSTRUCTURE**

**B1010 FLOOR CONSTRUCTION**

No work in this section

-

SUBTOTAL

\$0

**B1020 ROOF CONSTRUCTION**

New asphalt shingle roof system including nailable insulation

**2,475**

sf

22.00

54,450

New aluminium gutter and downspout

**220**

lf

49.00

10,780

Replace wood trim at roof edge

**70**

lf

50.00

3,500

Paint all wood trim

**350**

lf

5.00

1,750

New flashing at roof

**130**

lf

20.00

2,600

Copper drip edge

**200**

lf

25.00

5,000

SUBTOTAL

\$78,080

**TOTAL - SUPERSTRUCTURE**

**\$78,080**

**B20 EXTERIOR CLOSURE**

**B2010 EXTERIOR WALLS**

Remove aluminium siding and install wood clapboard siding

**600**

sf

46.00

27,600

Minor masonry repairs

**1**

ls

2,000.00

2,000

Scaffolding / Lifts

**600**

sf

3.00

1,800

SUBTOTAL

\$31,400

**B2020 WINDOWS**

Remove, repair, re-glaze and reinstall existing windows w/ new ropes

**238**

sf

140.00

33,320

Replace storm windows with historic aluminum.

**238**

sf

65.00

15,470

Replace rotten timber - allowance

**1**

ls

5,000.00

5,000

Aluminum storefront

**384**

sf

140.00

53,760

Replace sealants @ exterior

**1**

ls

5,000.00

5,000

SUBTOTAL

\$112,550

**B2030 EXTERIOR DOORS**

Repair, paint and reglaze front door

**1**

ea

1,600.00

1,600

New door in existing window opening

**1**

ea

3,000.00

3,000

SUBTOTAL

\$4,600

**TOTAL - EXTERIOR CLOSURE**

**\$148,550**



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**FIRE STATION UPGRADES OPTION A**

**C10 INTERIOR CONSTRUCTION**

**C1010 PARTITIONS**

092900 GYPSUM BOARD ASSEMBLIES

3-5/8" MS w/ 1 lyr GWB es, insulated 2,499 sf 11.00 27,489

Fur out existing exterior wall 3,551 sf 6.05 21,484

SUBTOTAL 48,973

**C1020 INTERIOR DOORS**

Wood door, frames and hardware 6 ea 1,800.00 10,800

SUBTOTAL 10,800

**C1030 SPECIALTIES / MILLWORK**

Wood counter at lobby 10 lf 150.00 1,500

Interior window at lobby 40 sf 55.00 2,200

SUBTOTAL 3,700

**TOTAL - INTERIOR CONSTRUCTION \$63,473**

**C20 STAIRCASES**

**C2010 STAIR CONSTRUCTION**

Upgrade stairs to code 1 ls 8,000.00 8,000

SUBTOTAL \$8,000

**C2020 STAIR FINISHES**

No work in this section

SUBTOTAL \$0

**TOTAL - STAIRCASES \$8,000**

**C30 INTERIOR FINISHES**

**C3010 WALL FINISHES**

Paint GWB walls 8,549 sf 1.50 12,824

Miscellaneous painting to existing walls 1 ls 1,500.00 1,500

SUBTOTAL \$14,324

**C3020 FLOOR FINISHES**

Carpet 1,355 sf 6.00 8,130

VCT 500 sf 4.00 2,000

Ceramic tile 100 sf 22.00 2,200

Rubber base 517 lf 2.50 1,293

Patch existing floor 1,955 sf 2.50 4,888

SUBTOTAL \$18,511

**C3030 CEILING FINISHES**

New ACT ceiling 1,123 sf 6.00 6,738

SUBTOTAL \$6,738





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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**FIRE STATION UPGRADES OPTION A**

<b>TOTAL - INTERIOR FINISHES</b>							<b>\$39,573</b>
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**D20 PLUMBING**

Allowance for full gut renovation of plumbing system	1	ls	40,000.00	40,000		
SUBTOTAL						40,000

<b>TOTAL - PLUMBING</b>							<b>\$40,000</b>
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**D30 HVAC**

Insulate all uninsulated ductwork; allow	2,500	sf	5.00	12,500		
Service AHU	1	ls	2,500.00	2,500		
Provide individual zone control for first & second floors	1	ls	7,500.00	7,500		
Provide new DDC system and connect to town wide BMS	1	ls	30,000.00	30,000		
Provide general exhaust for storage & toilet rooms	1	ls	7,500.00	7,500		
Modify HVAC to suit new room layouts	1	ls	30,000.00	30,000		
SUBTOTAL						90,000

<b>TOTAL - HVAC</b>							<b>\$90,000</b>
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**D40 FIRE PROTECTION**

Assumed to be no scope in this section				-		
SUBTOTAL						-

<b>TOTAL - FIRE PROTECTION</b>							<b>\$0</b>
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**D50 ELECTRICAL**

Demo existing fire alarm system and replace with new addressable ADA/code compliant system	1	ls	20,000.00	20,000		
Allowance to replace non-sheathed cable through building	1	ls	5,000.00	5,000		
Upgrade electrical service & distribution	1	ls	20,000.00	20,000		
Provide ceiling occupancy sensors in offices/work spaces	16	ea	230.00	3,680		
Provide exterior generator; 60kW	1	ls	55,000.00	55,000		
Allowance for new feeders for new HVAC equipment	1	ls	10,000.00	10,000		
Replace all existing light fixtures with LED	1	ls	32,000.00	32,000		
Allowance to modify branch power to suit new layouts	1	ls	10,000.00	10,000		
Allowance to modify comms to suit new layouts	1	ls	10,000.00	10,000		
SUBTOTAL						165,680

<b>TOTAL - ELECTRICAL</b>							<b>\$165,680</b>
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**E10 EQUIPMENT**

**E10 EQUIPMENT, GENERALLY**

No Work in this section						
SUBTOTAL						\$0



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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**FIRE STATION UPGRADES OPTION A**

<b>TOTAL - EQUIPMENT</b>						<b>\$0</b>
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**F20 SELECTIVE BUILDING DEMOLITION**

**F2010 BUILDING ELEMENTS DEMOLITION**

Form opening in existing wall for new door opening	1	loc	1,200.00	1,200	
Remove existing overhead doors	3	ea	400.00	1,200	
Demolish and remove existing partitions	144	sf	2.00	288	
Remove existing roof	2,475	sf	5.00	12,375	
Remove existing bathroom fixtures	1	loc	200.00	200	
Miscellaneous demo/protection	1	ls	5,000.00	5,000	
SUBTOTAL					20,263

**F2020 HAZARDOUS COMPONENTS ABATEMENT**

No Work in this section					
SUBTOTAL					\$0

<b>TOTAL - SELECTIVE BUILDING DEMOLITION</b>						<b>\$20,263</b>
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<b>TOTAL FIRE STATION OPTION A</b>						<b>653,619</b>
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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**UNION CHAPEL UPGRADES OPTION A**

**A10 FOUNDATIONS**

**A1010 STANDARD FOUNDATIONS**

Re-point fieldstone foundation wall	360	sf	25.00	9,000		
SUBTOTAL						\$9,000

**A1030 LOWEST FLOOR CONSTRUCTION**

No work in this section				-		
SUBTOTAL						\$0

**TOTAL - FOUNDATIONS**

**\$9,000**

**B10 SUPERSTRUCTURE**

**B1010 FLOOR CONSTRUCTION**

No work in this section				-		
SUBTOTAL						\$0

**B1020 ROOF CONSTRUCTION**

New asphalt shingle roof system including nailable insulation	2,700	sf	22.00	59,400		
New gutter and downspout	120	lf	49.00	5,880		
Seal access hatch	1	ls	250.00	250		
New flashing at roof	40	lf	120.00	4,800		
Copper drip edge	90	lf	24.00	2,160		
Paint all wood trim	250	lf	5.00	1,250		
Repair belfry railings	24	lf	60.00	1,440		
SUBTOTAL						\$75,180

**TOTAL - SUPERSTRUCTURE**

**\$75,180**

**B20 EXTERIOR CLOSURE**

**B2010 EXTERIOR WALLS**

Replace clapboard siding	250	sf	40.00	10,000		
Replace shingles	100	sf	35.00	3,500		
Scrape and paint entire building	4,000	sf	9.00	36,000		
Perform historic paint analysis	1	ls	3,000.00	3,000		
Scaffolding / Lifts	4,000	sf	3.00	12,000		
SUBTOTAL						\$64,500

**B2020 WINDOWS**

Remove, repair, re-glaze and reinstall existing windows w/ new ropes	238	sf	140.00	33,320		
Replace rotten timber - allowance	1	ls	5,000.00	5,000		
Replace storm windows with historic aluminum.	238	sf	65.00	15,470		
Repair and paint window trim	225	lf	20.00	4,500		
Replace sealants @ exterior	300	lf	16.00	4,800		
SUBTOTAL						\$63,090



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**UNION CHAPEL UPGRADES OPTION A**

**B2030 EXTERIOR DOORS**

Replace sealants @ exterior	40	lf	16.00	640		
Repair, paint and reglaze front door	1	ea	1,600.00	1,600		
New wood doors single	1	ea	3,800.00	3,800		
SUBTOTAL						\$6,040

**TOTAL - EXTERIOR CLOSURE**

**\$133,630**

**C10 INTERIOR CONSTRUCTION**

**C1010 PARTITIONS**

092900 GYPSUM BOARD ASSEMBLIES

No work in this section

SUBTOTAL

-

**C1020 INTERIOR DOORS**

No work in this section

SUBTOTAL

-

**TOTAL - INTERIOR CONSTRUCTION**

**\$0**

**C20 STAIRCASES**

**C2010 STAIR CONSTRUCTION**

Upgrade stairs to code

SUBTOTAL

1	ls	4,000.00	4,000	\$4,000
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**C2020 STAIR FINISHES**

No work in this section

SUBTOTAL

\$0

**TOTAL - STAIRCASES**

**\$4,000**

**C30 INTERIOR FINISHES**

**C3010 WALL FINISHES**

Paint & patch existing walls

SUBTOTAL

5,400	sf	1.50	8,100	\$8,100
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**C3020 FLOOR FINISHES**

Refinish existing wood floor

Carpet

SUBTOTAL

1,130	sf	6.00	6,780	
810	sf	6.00	4,860	

\$11,640

**C3030 CEILING FINISHES**

No work in this section

SUBTOTAL

\$0

**TOTAL - INTERIOR FINISHES**

**\$19,740**

**D20 PLUMBING**

Insulate all uninsulated HHW pipework; allow

75	lf	10.00	750	
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**UNION CHAPEL UPGRADES OPTION A**

Provide mixing valve at restrooms

1

ls

2,500.00

2,500

SUBTOTAL

3,250

**TOTAL - PLUMBING**

**\$3,250**

**D30 HVAC**

Insulate all uninsulated ductwork; allow

1,000

sf

5.00

5,000

Service AHU

1

ls

2,500.00

2,500

Provide individual zone control for first & second floors

1

ls

7,500.00

7,500

Provide new DDC system and connect to town wide BMS

1

ls

22,000.00

22,000

Provide general exhaust for storage & toilet rooms

1

ls

7,500.00

7,500

SUBTOTAL

44,500

**TOTAL - HVAC**

**\$44,500**

**D40 FIRE PROTECTION**

Assumed to be no scope in this section

-

SUBTOTAL

-

**TOTAL - FIRE PROTECTION**

**\$0**

**D50 ELECTRICAL**

Demo existing fire alarm system and replace with new addressable ADA/code compliant system

1

ls

13,200.00

13,200

Replace all non-ground receptacles & wiring

1

ls

5,000.00

5,000

Exterior building mounted fixtures to be changed to LED and connected to emergency battery backup power. Photocell / timeclock control to be provided

1

ls

4,000.00

4,000

Replace all non historic light fixtures

1

ls

17,600.00

17,600

Provide occupancy sensors in offices/work spaces

10

ea

230.00

2,300

Provide additional receptacles in offices with dedicated neutral for computer use

12

ea

500.00

6,000

Allowance to modify branch power to suit new layouts

1

ls

4,000.00

4,000

Allowance to modify comms to suit new layouts

1

ls

4,000.00

4,000

SUBTOTAL

56,100

**TOTAL - ELECTRICAL**

**\$56,100**

**E10 EQUIPMENT**

**E10 EQUIPMENT, GENERALLY**

No Work in this section

SUBTOTAL

\$0

**TOTAL - EQUIPMENT**

**\$0**

**F20 SELECTIVE BUILDING DEMOLITION**

**F2010 BUILDING ELEMENTS DEMOLITION**





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CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
UNION CHAPEL UPGRADES OPTION A							
159 024100	Allowance for removal of non-original bookshelves throughout	1	ls	2,000.00	2,000		
160 024100	Remove existing carpet	1,940	sf	2.00	3,880		
161 024100	Miscellaneous demo/protection	1	ls	2,500.00	2,500		
162	SUBTOTAL					8,380	
163							
164	<b>F2020 HAZARDOUS COMPONENTS ABATEMENT</b>						
165	No Work in this section						
166	SUBTOTAL					\$0	
167							
168	<b>TOTAL - SELECTIVE BUILDING DEMOLITION</b>						<b>\$8,380</b>
169							
170							
171	<b>TOTAL UNION CHAPEL OPTION A</b>						<b>353,780</b>



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Feasibility Cost Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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**SITEWORK**

**G SITEWORK**

**G10 SITE PREPARATION & DEMOLITION**

Site construction fence/barricades	1,100	lf	12.00	13,200	
Site construction fence gates	1	ea	2,500.00	2,500	
Remove existing trees	4	ea	5,000.00	20,000	
Stabilized construction entrance	1,200	sf	6.00	7,200	
Pavement/curbing removal	32,700	sf	1.00	32,700	
Remove concrete walkways	3,000	sf	1.00	3,000	
Remove existing utility poles	3	ea	250.00	750	
Miscellaneous demolition	1	ls	5,000.00	5,000	
<u>Site Earthwork</u>					
Strip topsoil and store on site	222	cy	20.00	4,440	
Cuts/Fills	1,817	cy	6.00	10,902	
Fine grading	5,450	sy	1.00	5,450	
Silt fence/erosion control, wash bays, stock piles	1,100	lf	11.00	12,100	
Silt fence maintenance and monitoring	1	ls	1,500.00	1,500	
<u>Hazardous Waste Remediation</u>					
Remove existing underground fuel storage tank					w/ haz mat
Dispose/treat contaminated soils/water					NIC
SUBTOTAL					118,742

**G20 SITE IMPROVEMENTS**

<u>Roadways and Parking Lots</u>					
gravel base; 12" thick	815	cy	38.00	30,970	
bituminous concrete; 4" thick	2,444	sy	26.00	63,544	
VGC	800	lf	38.00	30,400	
Cape cod berm	400	lf	18.00	7,200	
Single solid lines, 4" thick	57	space	25.00	1,425	
Wheelchair Parking	1	space	75.00	75	
Other road markings	1	ls	1,500.00	1,500	
HC curb cuts	3	loc	350.00	1,050	
Signage	3	ea	350.00	1,050	
<u>Pedestrian Paving</u>					
Concrete paving					
gravel base; 8" thick	101	cy	38.00	3,838	
4" concrete paving	3,700	sf	6.50	24,050	
<u>Brick pavers</u>					
Brick pavers	1,100	sf	25.00	27,500	
gravel base; 8" thick	27	cy	38.00	1,026	
concrete base; 8" thick	1,100	sf	11.00	12,100	
Concrete to stair treads	50	lfr	150.00	7,500	
Ramps - concrete paving; 6" thick	350	sf	14.00	4,900	
Wood guardrail	120	lf	90.00	10,800	
Steel benches	6	lf	2,500.00	15,000	
Bike racks	2	ea	1,000.00	2,000	
Trash/recycling receptacles	3	ea	800.00	2,400	
<u>Landscaping</u>					
Topsoil - amended	426	cy	26.00	11,076	
Lawn - loam & seed	23,000	sf	0.25	5,750	
Trees 3.5" cal	12	ea	1,250.00	15,000	
Trees 2.5" cal	7	ea	1,000.00	7,000	
Shrubs	15	ea	175.00	2,625	
SUBTOTAL					289,779

**G30 CIVIL MECHANICAL UTILITIES**



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Feasibility Cost Estimate

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
<b>SITework</b>							
56	Water supply						
57	No work in this section						
58	Sanitary						
59	No work in this section						
60	Storm water						
61	Site parking lot drainage	1	ls	350,000.00	350,000		
62	Gas service						
63	No work in this section						
64	Telecom service						
65	No work in this section						
66	SUBTOTAL					350,000	
67							
68							
69	<b>G40 ELECTRICAL UTILITIES</b>						
70	Allowance for site lighting	1	ls	60,000.00	60,000		
71	SUBTOTAL					60,000	
72							
73	<b>TOTAL - SITE DEVELOPMENT</b>						<b>\$818,521</b>