Town of Milton Fire Station Space Needs Study

Milton, Massachusetts
November 23, 2015

DRAFT

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ARCHITECTURE
LANDSCAPE ARCHITECTURE
INTERIOR DESIGN
STRUCTURAL ENGINEERING

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– BUILDING CODE ANALYSIS –

APPLICABILITY

This analysis reviews the existing Milton Fire Department Headquarters Facility in Milton, MA, with regard to the Massachusetts State Building Codes ("Code") for new construction. The 8th Edition of the State Building Code consists, in part, of the 2009 International Building Code (IBC) and the 2009 International Existing Building Code (IEBC) with Massachusetts Amendments to these codes.
Codes used in this analysis are:

International Building Code (IBC, 2009)
International Existing Building Code (IEBC, 2009)
International Energy Conservation Code (IECC, 2012)
Massachusetts State Building Code Amendments (780 CMR 8th Edition)
Architectural Access Board Rules and Regulations (AAB, 521 CMR, 2006)
Uniform State Plumbing Code (248 CMR)

Code compliance with regard to mechanical systems, including electrical, plumbing, fire protection systems and site work are reviewed in separate sections of this study.

Upgrades and corrections to existing structures undergoing renovations are limited to specific items under the IEBC. During renovations, not all existing safety issues and non-compliant conditions are required to be corrected; typically only items within each renovated area are required to be corrected. However, non-compliant conditions at stairs and egress elements, fire rating separations, accessibility, and fire protection (sprinklers) are required to be corrected or provided anew as required by the IBC. Because the main building was constructed almost one hundred and forty years ago, existing conditions which may be allowed to remain under the requirements of the IEBC may also be in conflict with current life safety codes and standards. Over time, since the original construction of these buildings, life safety standards have been improved in reaction to tragic events. *In order to evaluate life safety conditions in accordance with the most current intent of these codes, the current IBC and Fire Safety codes and regulations are used as a basis for judging compliance.*

Correcting existing conditions to comply with current Accessibility and Fire Protection requirements is required when the value of the work exceeds the cost or scope triggers stated in the AAB and the Fire Code.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area *or* in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available. A major alteration is 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, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of M.G.L., any work performed, even if under separate contracts or

building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 33% limit.
- Cost of future building projects requested for permit within 5 years, before or after the permit date for this project, will be considered part of the project costs and may trigger compliance.

Accessibility in public buildings is regulated by 521 CMR, which is enforced by the Massachusetts Architectural Access Board (MA AAB) and the Building Inspector of the municipality. 521 CMR, as issued in 2006, is used for this review.

MA AAB 5.1 Definitions states:

> "Public Buildings: A building privately or publicly financed that is open to and used by the public",

MA AAB 11.1 Commercial Buildings states:

> "The design of commercial *buildings* shall comply with 521 CMR, except as specified or modified in 521 CMR 11.00. Commercial *buildings* are *public buildings* … as well as city and town … *facilities*."

The Fire Facility is considered a public and commercial building and so is required to be accessible in accordance with 521 CMR.

Currently, the AAB regulates only areas and conditions accessed by the "public"; areas occupied solely by staff are not included in the regulation. Staff areas are included in the ADA Accessibility Guidelines as part of federal law, but these are not directly enforceable as part of the Building Code. However, in an effort to unify compliance requirements with the recently adopted IBC as the State Building Code, the AAB will be revising the regulation to include staff areas as well as public areas. In anticipation of the release of the revised AAB regulations, all discussions below regarding accessibility will include compliance of staff areas.

Applicability of the AAB Regulations for renovations of existing buildings is based on the value of the renovations as a percentage of the current assessed value of the building (100% valuation). According to AAB 3.3, partial compliance is required when the value of the renovations exceeds $100,000 and full compliance of the entire facility is required when the value of the renovations exceeds 30% of the assessed value of the building. An exception to this rule is for maintenance work on MEP systems, sprinkler systems, roofs, replacement windows, masonry repair, site utilities, landscaping, and septic system which in aggregate is less than $500,000.

As stated in AAB 3.3 (paraphrased):

> "3.3 EXISTING BUILDINGS
> All additions to, reconstruction, remodeling, and alterations or repairs of existing public buildings or facilities …shall be governed by all applicable subsections in 521 CMR.
> 3.3.1…,

a. if the work costs less than $100,000, then only the work being performed is required to comply with 521 CMR…,

b. if the work costs $100,000 or more, then the work being performed is required to comply with 521 CMR. In addition, an accessible public entrance and an accessible toilet room, telephone, drinking fountain (if toilets, telephones and drinking fountains are provided) shall also be provided in compliance with 521 CMR…,

3.3.2 If the work performed, including the exempted work, amounts to 30% or more of the full and fair cash value (see 521 CMR 5.00) of the building the entire building is required to comply with 521 CMR. "

Also, according to AAB 3.5, any work performed, even if under separate contracts or building permits, within a 3 year period must be included in the aggregate construction cost. This includes sitework and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 30% limit.
- Cost of future building projects requested for permit within 3 years of the permit date for this project will be considered part of the project costs and may trigger compliance.

The building and site must be reviewed together and may affect compliance in areas not anticipated to be updated to comply.

- If a building's renovation cost exceeds 30% of the building assessed value, then the *entire building and site* must be made to comply;

Energy conservation, as required by the IECC for new construction, is not required for renovations to existing structures under the IEBC. However, any new elements or alterations to the exterior building envelope, such as new windows or new roofing, must comply to the greatest degree possible. As stated in the IEBC Alteration Level 3 Section 808 Energy Conservation "*Essentially, the entire building is not require to meet the energy provisions, but only improvement in the energy performance of the building is intended to be achieved by making the new elements meet the IECC…*". Overall upgrade of the exterior envelope of this building is not required or recommended and so is not reviewed as part of this study, except for elements recommended to be replaced.

General Information

According to the Town of Milton Assessors Department, the Fire Headquarters Building is located at 515 Canton Avenue; construction of the facility completed in 1878 and was added onto in 1987. The area of the building is listed on the Assessor's Card as 12,500 total gross square feet (GSF).

The current assessed value of the Fire Headquarters building (structure only) is $360,000.

- The threshold value of the cost trigger for accessibility (full compliance) is 30% of this value less the cost of permitted work within the last 3 years.
- The threshold value of the cost trigger for fire protection is 33% of this value less the cost of permitted work within the last 5 years.

This cost threshold is shown below. The cause of the renovation or the source of the funding is not relevant, only the total value of cost for renovations, including demolition. Any work within these time limits which exceed these cost triggers will require that the entire structure and site be modified to be compliant. Because each threshold is based on the aggregate value of recent work (requiring a building permit) over the most recent 3 or 5 years, respectively, these threshold values are dynamic and will

change based on the aggregate value of recent projects over time. The values below are only a guide and should be recalculated when a new renovation project is considered.

COST THRESHOLDS FOR ACCESSIBILITY AND FIRE SUPPRESSION COMPLIANCE	
Assessed Value (Structure Only)	$360,000
30% Cost Trigger for Accessibility Compliance	$108,000
33% Cost Trigger for Fire Protection	$120,000

AGGREGATE TOTAL VALUE OF RECENTLY COMPLETED WORK		
Date	Description	Approximate Value
8/2015	Fire Alarm Upgrades	$ 4,500
9/2015	Boiler Replacement	$ 15,000
3 year aggregate total value for accessibility compliance		$ 19,500
5 year aggregate total value for fire protection compliance		$ 19,500

ACCESSIBILITY UPGRADE REQUIREMENT	
30% of Assessed Building Value	$108,000
Less the Aggregate Cost of Projects Completed in the Past 3 Years	$ 19,500
Current Value for Renovation Work to the Cost Trigger for Full Accessibility Compliance	$ 88,500

Fire Protection Upgrade Requirement	
33% of Assessed Building Value	$ 120,000
Less the Aggregate Cost of Projects Completed in the Past 5 Years	$ 19,500
Current Value for Renovation Work to the Cost Trigger for Full Fire Protection Compliance	$ 100,500

There are two building permits on file with the Inspectional Services Department dated within the last three years.

BUILDING CODE COMPLIANCE ANALYSIS (IEBC / 780 CMR - IBC)

Although the Fire Headquarters Building would be regulated under the IEBC for the purposes of a renovation of the existing building, this analysis reviews compliance with regard to requirements of the new IBC. This is to ensure that existing conditions which do not meet the current intent for life safety, and which may be allowed to remain as part of a renovation under the IEBC, are identified for correction. In the discussion below, references to specific code sections are noted before each paragraph with parentheses.

(IEBC 101.4.2) Applicability: Under this definition, as a building that has been previously occupied prior to the issuance of the Code, this building is considered an existing building and regulated under the IEBC.

(IEBC 101.5.2) IEBC offers three methods for compliance analysis and four levels of work classification. For the purposes of this study, the *Work Area Compliance* method will be used and future renovations will be considered as an *Alteration Level 3* work classification.

(IEBC 701.3) Compliance: All new elements must comply with IBC.

**The following discussions regarding Type of Construction, Use Group Classification, and Height and Area Limitations are provided to document the existing facility classification only. These characteristics are not regulated by the IEBC and existing buildings are not required to be modified to comply as a result of renovations. Additions to an existing building, however, must conform to current limitations of allowable height and area and are regulated by the IBC. Determination of the allowable height and area of the existing structure provides guidance for the extent of any new additions that may be planned.*

(IBC Ch. 3 – Use and Occupancy)

(IBC 305.1) Primary Use Group:	Group B - Business
(IBC 305.1) Mixed Use Areas:	Group R-2 Residential (Bunk Area)
(IBC 305.1) Mixed Use Areas:	Group S-1 Storage (Apparatus Bays)

(IBC Ch. 5 – General Building Limitations)

Height and area limitations for the existing building are presented below to show the allowable area for the uses within the building and possible expansion of the existing building. As stated above, the aggregate area of any new additions and renovations that exceed 7,500 square feet or that exceed 33% of the assessed value of the existing building will require sprinklers to be installed throughout the new and existing structure. The allowable floor area calculations below include increases permitted for fire protection sprinkler system, and the increase for existing building frontage accessible to emergency vehicles. This allowable increase in area for accessible frontage may be affected by additions to the building.

According to information from the Milton Assessing Department, the current building area is listed at 12,500 gross square feet (occupied space) for all floors combined. Storage uses and Assembly uses are believed to occupy less than 10% of the gross area of the relative floor levels and so are considered to be accessory to the Business Use on each floor.

(Table 503) Based on the presumption that any renovation or new construction for this building will require the installation of a new sprinkler system, the allowable height may be increased by one story and the allowable area may be increased by 200%. Additionally, as the building perimeter is accessible for fire and rescue vehicles from the road or parking areas on all sides of the building, the maximum allowable area may be increased by an additional 75% for this accessible frontage.

- The accessible street frontage combined with the allowable area increase for a sprinkler system will allow a total increase in area of 275% in addition to the limitations stated in Table 503. This total allowable area is shown in the last column of the table below.
- The total area of the building cannot exceed the allowable area used for the primary Residential ("R-2") Use Group. Other uses within the mixed use building cannot exceed an area proportional to the percentage of the area that Use Group occupies in the building. Because this ratio of allowable areas between uses may vary based of differing layouts, it is impossible to provide an allowable area for all uses in every possible combination. As such, the allowable area for Use Group B is calculated as a baseline and further calculation will be required to confirm if future renovations are within Code requirements.

(Table 503) The allowable height and area for each Use Group under Type V-B (5-B) Construction is:

USE GROUP	**Total Allowable Height (+1 Story Increase for Sprinkler System**	**Allowable Area per Story Plus Increase for Sprinkler System and Accessible Perimeter**			
		Allowable Area (Table 503)	**Sprinkler System Area Increase (+200%)**	**Accessible Perimeter +75%**	**Total Allowable Area per Floor with Allowable Increases**
R-2	4 Stories	7,000 sf.	+ 14,000 sf.	+ 5,250 sf.	26,250 sf.

(IBC 508.3 & 508.4) Buildings with multiple Use Groups are called mixed-use buildings. Buildings are further classified as a 'separated' mixed use or a 'non-separated' mixed use. If classified as a 'separated' mixed-use building, the different use groups within the building must be separated by fire rated construction as required in Table 508.4. If classified as a 'non-separated' mixed-use building, then fire rated separations are not required BUT the most restrictive use group is used to calculate the allowable height and area. This building is assumed, based on field observations, to be a non-separated mixed-use building. (IBC 508.2.4 and Table 508.4) In table 508.2.4, rooms used for storage and assembly may be considered to be accessory to the primary Use Group if the aggregate area of these rooms is less than 10%

of each floor area and smaller than the area allowed by Table 503. Spaces considered to be accessory to the primary use are not required to be separated from the primary use by fire rated partitions. This report assumes that all Storage and Assembly uses are considered to be accessory and so not separated.

IBC Ch. 6 – Types of Construction

(IBC Table 601) No information is provided by the Milton Assessing Department with regard to the type of construction of the building. As observed in the field, the building is constructed of brick masonry bearing walls supporting the Main and Upper floors, Attic and gable roof structures. The Upper Level floor is wood framed with joists and interior bearing walls. The attic and roof are framed with wood trusses spanning the width of the building and supporting wood floor joists and roof purlins.

As the existing construction system is assumed to be multi-wyth masonry construction with non-fire rated structural members, this generally conforms to the requirements for Type V-B (Roman numeral 5 - B, unprotected) construction in the current IBC. The structure does not appear to be protected with spray fireproofing or other rated construction. Interior partitions are believed to be a combination of non-load bearing stud / drywall construction and load bearing masonry. The Use Group is assumed to be Residential (R-2) with accessory or mixed use areas for Assembly and Storage.

Type V-B Construction Type Min. Fire Resistance Rating Requirements (780 CMR Table 601)

Building Elements	Required Fire Resistance Rating (Hrs)
Structural Frame (including columns, girders, and trusses)	0
Exterior Bearing Walls	0
Interior Bearing Walls	0
Exterior Non-Bearing Walls and Partitions (See Table 602)	0
Interior Non-Bearing Walls and Partitions	0
Floor Construction (including support beams and joist)	0
Roof Construction (including support beams and joist)	0

Table 601 establishes the required minimum fire rating of construction elements and is related to the allowable height and area discussed in Table 503 below. Type V-B (5-B) construction allows the building structural members to be unprotected (not fire rated). The tradeoff for not protecting the building structure is a reduction in the allowable height and area that can be built; essentially, the greater the fire protection of building structural elements, the larger the building height and area which is allowed.

(IBC Chapter 10 - Means of Egress)

Occupancy load in the existing facility is determined by the functions in each area of the building and not the primary use group. According to the IBC Table 1004.1.1, Business functions require an occupant

load calculated at 100 GSF per person, Residential sleeping areas (bunks) are calculated at 120 GSF per person, Locker rooms are calculated at 50 GSF per person, and Mechanical/Storage areas are calculated at 300 GSF per person, and Assembly spaces are calculated at 5, 7, or 15 GSF per person dependent upon whether the persons are standing, sitting, or at tables. As the functions and areas for each may change over time, areas with lesser occupancy rates may be renovated for a use with a higher occupancy rate. This summary will not break out each function separately; as a preliminary determination of occupancy, a rate of 100 GSF per person will be used as an overall general occupancy rate for this building as this will be the predominant occupancy for any renovation of the building:

- 12,500 GSF (All Floors) / 100 sf. per occupant = 125 occupants on all floors

The egress capacity (0.3"/per occupant for non-sprinklered buildings) for a minimum 44-inch wide stairway is approximately 146 occupants. The egress capacity (0.2"/per occupant for non-sprinklered buildings) for a typical single 36-inch wide egress doorway is approximately 170 occupants.

IEBC 102.2.2.1 is an amendment by the State of Massachusetts and supersedes other less restrictive paragraphs in the IEBC. This amendment requires that all existing stairs comply with current requirements of the IBC with regard to the quantity of exit ways on each floor, the width of all exit ways, fire rating, handrails, continuity, etc., to "provide safe and adequate means of egress".

- The existing egress stair in the building is not enclosed in required fire rated construction, does not have risers and treads of required dimensions, does not have railings and guards on both sides of the stair, does not have railings and guards with required height and spacing, does not have required rail extensions, and does not have fire rated doors which comply. All stair conditions must be corrected in accordance with current egress requirements as part of any renovation project.



(IEBC 703.2.1 Existing Vertical Openings)
All existing vertical openings connecting 2 or more floors must have an enclosure with a fire-resistive rating of 1 hour minimum.

- The stair connecting the basement, main, upper and attic levels is a vertical opening. This opening is not separated from adjacent areas by fire rated construction. This stair cannot be used as an exit in its current configuration..

(IBC Table 1016.1 Exit Access Travel Distance)

- The greatest travel distance to an exit enclosure occurs on the 2nd floor and is approximately 100 feet. This is far less than the allowable travel distance of 200 feet.

(IBC 1014.3) In buildings of a Business Use with a sprinkler system, the allowable length of a common path of travel is 100 feet.

- All locations appear to be compliant.

(IBC 1018.4) In buildings of a Business Use without a sprinkler system, the allowable length of a dead end corridor is 20 feet.

- Far end of the upper level corridor appears to be non-compliant.

(IBC 1015.2) When multiple exits are required, the exits must be separated by a minimum distance equal to 1/3 of the longest diagonal distance of the floor plate.

- There is only one non-compliant Exit from the basement, main and upper floors. As a result separation distance is not applicable.

(IBC 1021.1) All stories are required to provide a minimum of 2 means of egress, except when serving a maximum of 4 dwelling units. As this building is classified as a Business B Use Group with more than 4 dwelling units on the second floor, a minimum of 2 means of egress must be provided.

ACCESSIBILITY CODE COMPLIANCE ANALYSIS (521 CMR AAB)

AAB 11 – Commercial Buildings (Municipal Facilities)
(521 CMR 11.1)
Public Areas, Toilet rooms, transaction counters and other work areas are required to be accessible.

- Accessible transaction counters at First Floor Public Lobby is not provided.
- Accessible male and female toilet rooms are not provided for public use near the First Floor Lobby.

AAB 14 – Places of Assembly
(AAB 14.2) Places of assembly are not provided in the existing building.

AAB 19 – Recreational Facilities (Fire Only)

(AAB 19.4) Locker rooms are provided for male and female Fire staff and officers. These lockers and associated toilet rooms are not required to be accessible.

AAB 20 - Accessible Routes

(AAB 20.1) Accessible routes within the building generally comply with requirements for width, passing space, protruding objects, headroom, etc.

- Access to all floors is not provided for public and administrative staff. A compliant elevator is required to provide access to all floor levels and activities.
- Many doorways reviewed do not provide required clearance for accessibility.

(AAB 20.6.1) Objects projecting from walls with their leading edges between 27 inches and 80 inches above the finished floor must not protrude more than 4 inches into walks, halls, corridors, passageways or aisle and must not have sharp edges.

- There does not appear to be any non-compliant conditions.

(AAB 20.12) Areas of rescue assistance at stairways and means of egress are not required in accordance with Exception a. Existing Buildings.

AAB 24.00 - Ramps

There are no ramps required on the exterior of the building.
Please refer to the Landscape section of this study for information regarding site accessibility.

AAB 25.00 – Entrances

(AAB 25.1) All public entrances to the building must be accessible and be on an accessible route.

- Access to the building from the exterior is compliant at the Ground Level public entrances.

AAB 26.00 – Doors and Doorways

(AAB 26.6 – Maneuvering Clearances)
Many doors in the building do not provide required pull and push clearances for accessible doors. In public areas or areas accessed by civilian staff, modify these doorways to provide accessible clearances.

(AAB 26.11 - Door Hardware)
Existing hardware throughout building is not compliant and replacement with lever-type hardware at all doors is recommended .

AAB 27.00 – Stairs

(AAB 27.3 – Nosings)
Stair nosings are required to be angled or radiused and not abrupt. Existing wood stair nosings at the connecting stair between the Garage Level and the First Floor have a protruding lip at each tread.

- The stair treads need to be modified to comply. Modification of the treads with tread covers is necessary to reduce the abrupt nosing.

AAB 28.00 – Elevator

(AAB 28.1) Multistory buildings are required to be served by an elevator.

- The building must be modified to provide an elevator to access all floors of the building.

AAB 30.00 – Public Toilet Rooms

The existing unisex toilet room off of the apparatus bay on the main level does not comply with accessibility requirements and must be modified if civilian staff or disabled staff is allowed to use these facilities. The plumbing code requires separate toilet rooms for men and women; although unisex fixtures are allowed for compliance with AAB, this is not compliant with the plumbing code.

AAB 31.00 – Public Bathing Rooms

(AAB 31.7) A single unisex toilet/shower room is provided for able-bodied staff only and compliance is not required. However, the plumbing code requires separate toilet/shower rooms for men and women; although unisex rooms are allowed for compliance with AAB, this is not compliant with the plumbing code.

AAB 32.00 - Kitchens

(AAB 32.1) Commercial kitchens are not regulated by the AAB.

AAB 36.00 – Drinking Fountains

(AAB 36.1.1)

Drinking fountains are not provided within the building.

- Please refer to the plumbing section of this report for discussion about requirements for drinking fountains

AAB 41.00 – Signage

(AAB 41.00)

Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage.

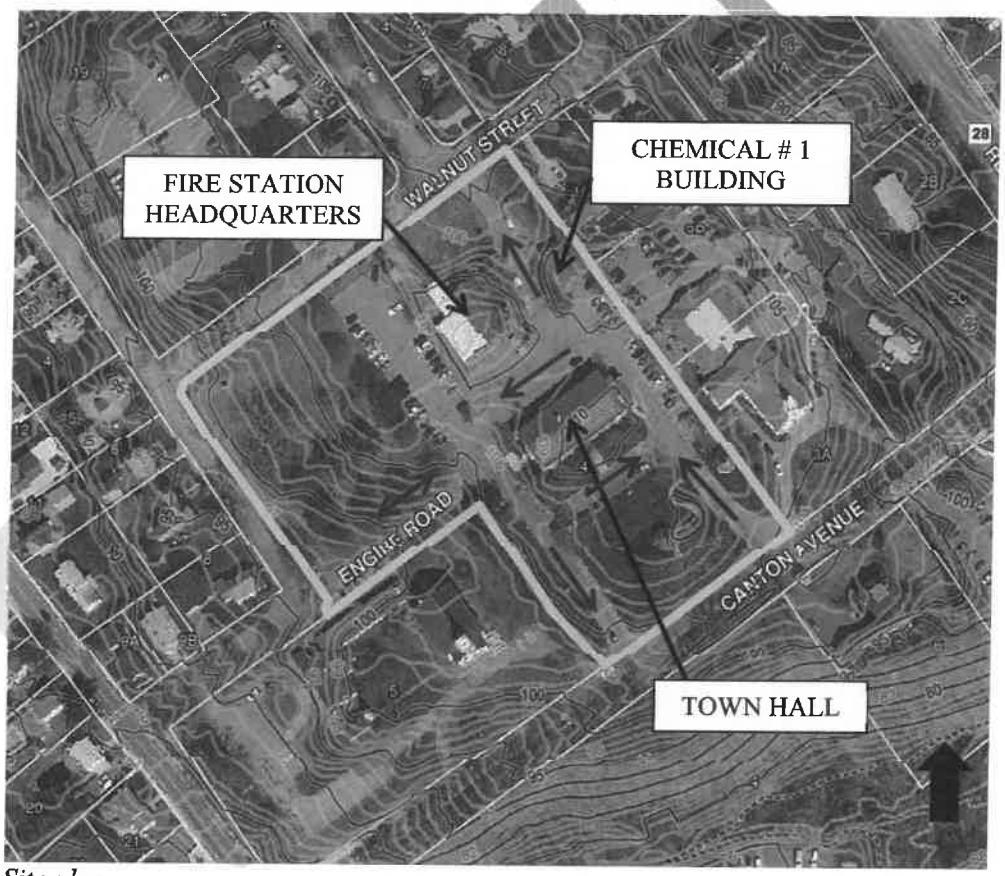
- Compliant signage and Symbols of Accessibility are missing throughout the building. Where exit signs indicate an accessible route, if all routes are not accessible, these signs shall include the symbol of accessibility.

– EXISTING CONDITIONS ANALYSIS –

LANDSCAPE ARCHITECTURE

Site Overview

The Headquarters Station is located behind the Town Hall as part of the Milton Municipal campus. It is bordered to the north and east by residential and church properties and to the west by a small park that is part of the campus property. The main headquarters building is a two story brick building with a three story attached tower built on a small mound set slightly higher than the town hall and about 415' from Canton Avenue. Only one of the four apparatus bays in the main building is drive through. There are two other buildings used by the department located in close proximity, those being the Chemical #1, an historic two story brick structure and a green painted wooden shed/garage building located behind the Chemical #1 building. Accessories around the building include a generator protected by bollards, a wooden bench in front of the station and trash cans and a dumpster. A flagpole is attached to the building. The total overall site, including the park and Town Hall, is 5.25 acres.



Site plan

A new vehicle circulation plan has recently been implemented at the town campus (shown with arrows). Fire department parking is located to the west of the headquarters building in a lot of approximately 42 spaces (some are not striped). This parking lot is approximately 4' below the elevation of the apparatus bays and level with Walnut Street. There are four marked spaces to the east of the Headquarters building and some unmarked parking by the Chemical #1 building and in the rear of the fire department. Asphalt pavement provides access to the wooden shed/garage structure. There are no curbs in the rear of the site

and a single line of unaligned granite curb on one side of the apparatus bays in the front (see picture below).
Asphalt conditions are fair to poor, with some patching along the edges of roadways and major patches on the driveway that access the drive through fire bay. The asphalt that forms the fire department's apron has spider cracks and has lost sections of pavement. The site is adequately sloped to allow proper drainage to the catch basins found around the site.

Apron pavement at front of building

Chemical #1 building with paver apron

Pedestrian access to the building is by asphalt walk, which on the east side of the building is being lifted and cracked apart by a mature sweetgum tree. There is no paved access from the west parking lot to the building so that anyone accessing the building would have to cross the sloped lawn.

Rear fire station building and open lawn

Rear of fire station drive through addition

Zoning

Municipal buildings are exempt from the Zoning Bylaws

The property is in the Residential B district. Property ID is D 52 4
Maximum Height: 2 ½ stories or 35'
Minimum Frontage: 100'
Minimum Front yard: 25'
Minimum Side yard: 12' or within 24' of adjacent building
Minimum Rear yard setback: 30'
Maximum building coverage: 20% or 2,500 sf, whichever is greater. GFA shall not exceed 40% or 5,000 sf, whichever is greater.
Minimum Open Space requirements: 50% of ground area of buildings & parking and drives
Parking requirements: Section VII. 5. Sufficient parking for employees and users under normal conditions.

There are no Wetlands on either site, or Water or Natural Resource Protection restrictions on the properties.

Utilities

The buildings are served by natural gas (National Grid), town water, town sewer and electric (Eversource). Utility poles run from Walnut Street. A pole centered between the Chemical #1 building and the headquarters building appears to feed both buildings by underground conduit. Communication utilities run on poles along the west side of the headquarters building. The gas line runs between the two brick buildings, as evidenced by the placement of the gas meters feeding the Headquarters building and Chemical #1 are facing each other across the access road.

– EXISTING CONDITIONS ANALYSIS –

STRUCTURAL

515 CANTON AVENUE– HEADQUARTERS BUILDING

DISCRIPTION

The Milton Fire Department Headquarters Building consists of the original multi story 1878 building, a two bay addition with basement on the southwest side of the original building built in 1987 and a single story addition attached to the 1987 addition.

The original building is constructed with brick masonry bearing walls supporting the Main and Upper floors, Attic and gable roof structures. The Upper Level floor is wood framed with joists and interior bearing walls. The attic and roof are framed with wood trusses spanning the width of the building and supporting wood floor joists and roof purlins. A stair tower is located on the southeast corner and is constructed with similar materials as the remainder of the building. The roof deck is tongue and groove wood decking. The Main Level floor slab was replaced at some point to accommodate the heavier equipment. The replacement structure consists of reinforced concrete beams, columns, footings and slab. The foundation walls were built with mortared stone walls. The foundation walls are at least 24" thick.

Original 1878 building viewed from front of building

Original 1878 building as viewed from Walnut Street

The 1987 addition structure consists of masonry bearing walls supporting steel roof joists. The joists bear on the walls and support the roof deck. The Main Level slab and foundation for the addition are constructed with reinforced concrete

View of steel joists bearing on interior masonry bearing wall

The second addition is a single story masonry bearing wall structure that supports the steel roof joists. The joists bear on the walls and support the roof deck. The Main Level slab is a reinforced concrete slab on grade. Foundation walls and footings for this addition are built with reinforced concrete.

OBSERVATIONS

The building is experiencing structural issues with the stone foundation walls and the brick bearing walls in the stair tower and above the overhead doors at the apparatus bays.

- The stone foundation walls on the northeast side of the original building are exhibiting signs of movement and deteriorated mortar joints which are allowing the infiltration of water into the basement. The cause of the movement is not known by observing the condition.

Deteriorating mortar joint in stone foundation wall.

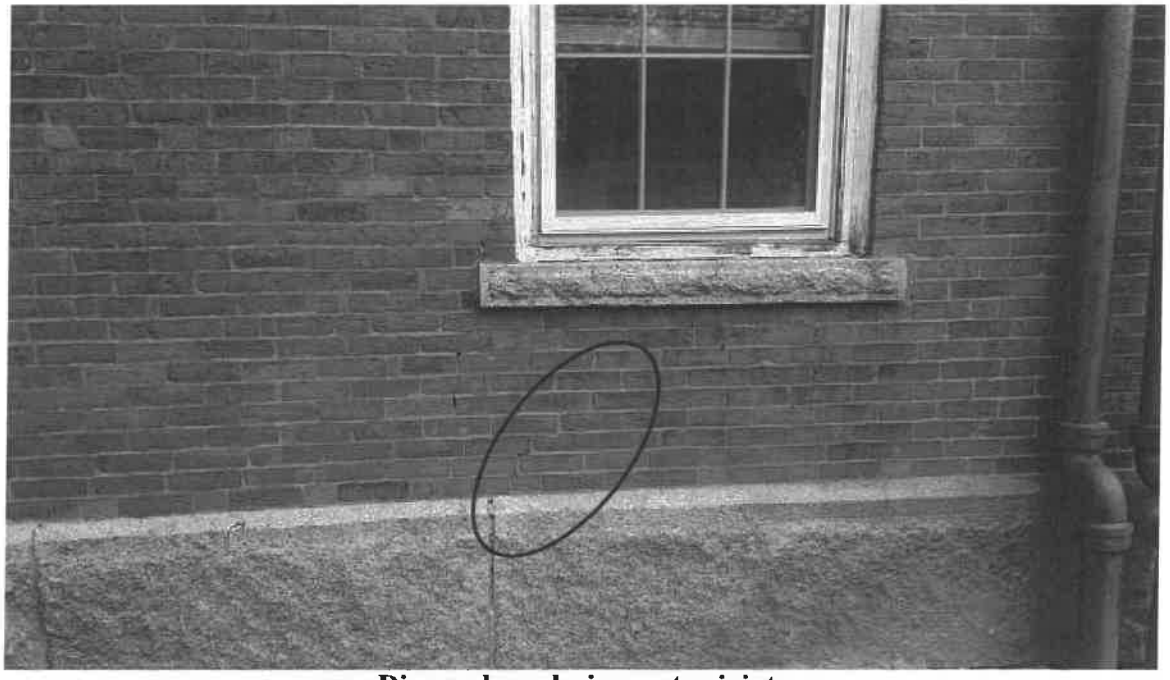
Open mortar joints in the stone foundation wall as viewed from basement.

Powdered mortar on the interior basement wall.

- Cracking, spalling and movement in the brick bearing walls of the stair tower and adjacent northeast wall. The spalling brick is especially noticeable on southeast face of the stair tower at the Upper Level. Cracks are present on the northeast face of the tower and along the east wall of the main building.

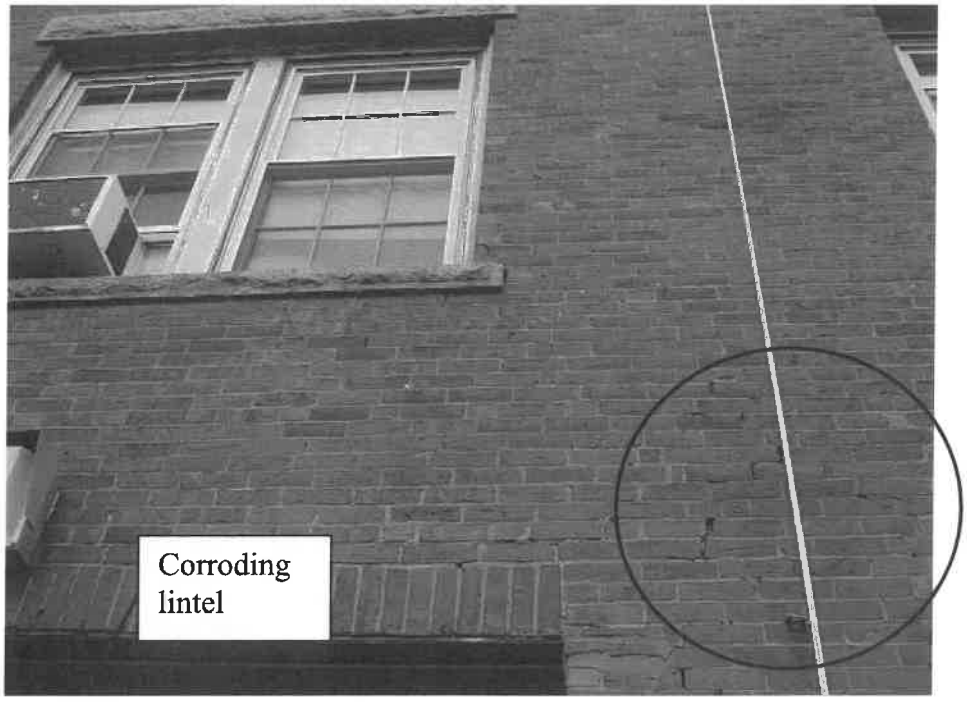
Southeast view of stair tower with spalled brick surface

Vertical crack and movement in exterior brick wythe.

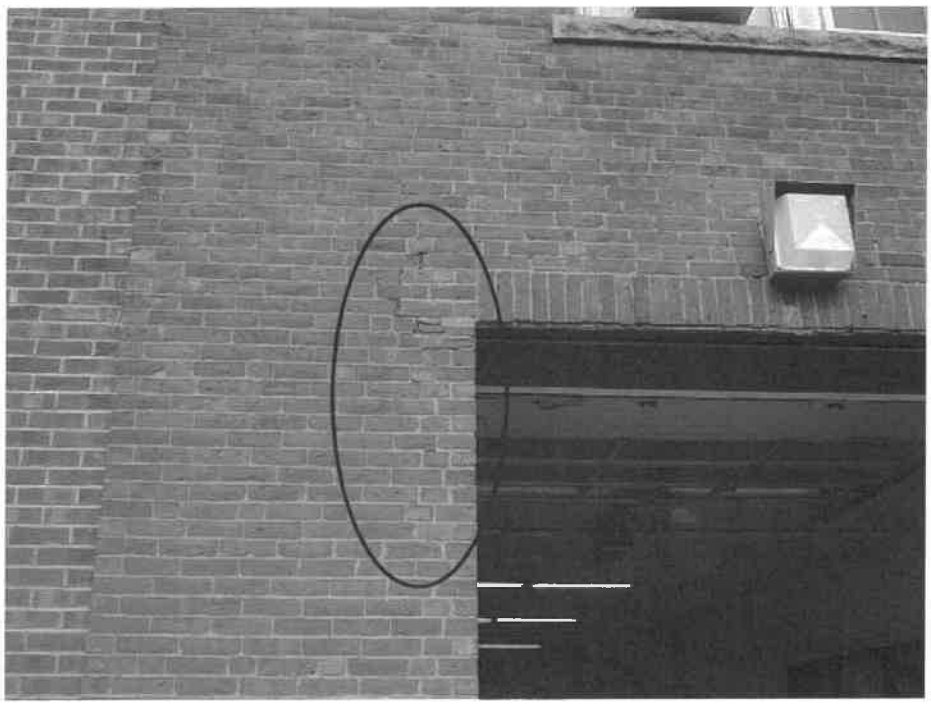


Diagonal cracks in mortar joint.

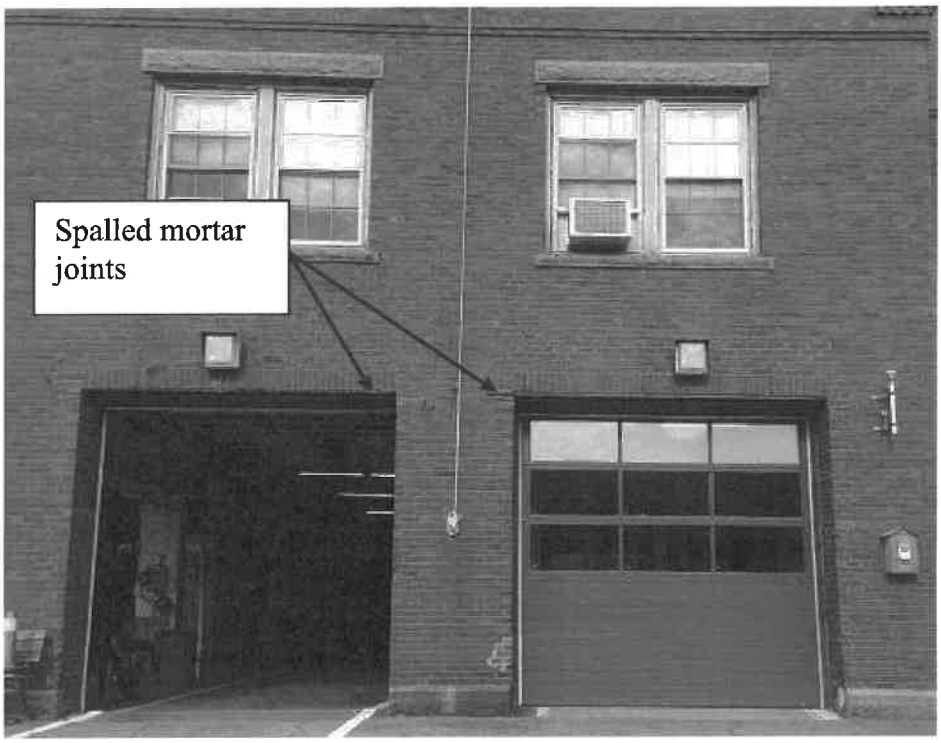
- Corrosion is visible on the steel lintels supporting the masonry above the overhead garage doors. The corrosion is causing spalling and movement in the exterior brick wythe of the building.



Movement and spalling mortar in exterior brick wythe at door opening and beyond.

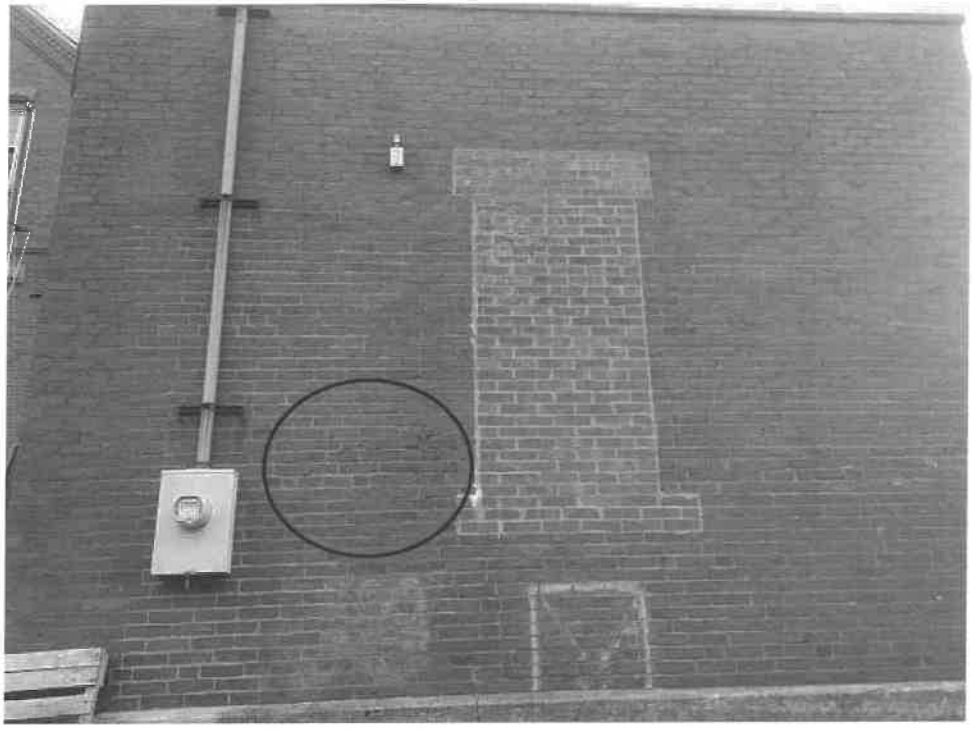


Movement in brick wall due to corrosion in steel angle lintel.



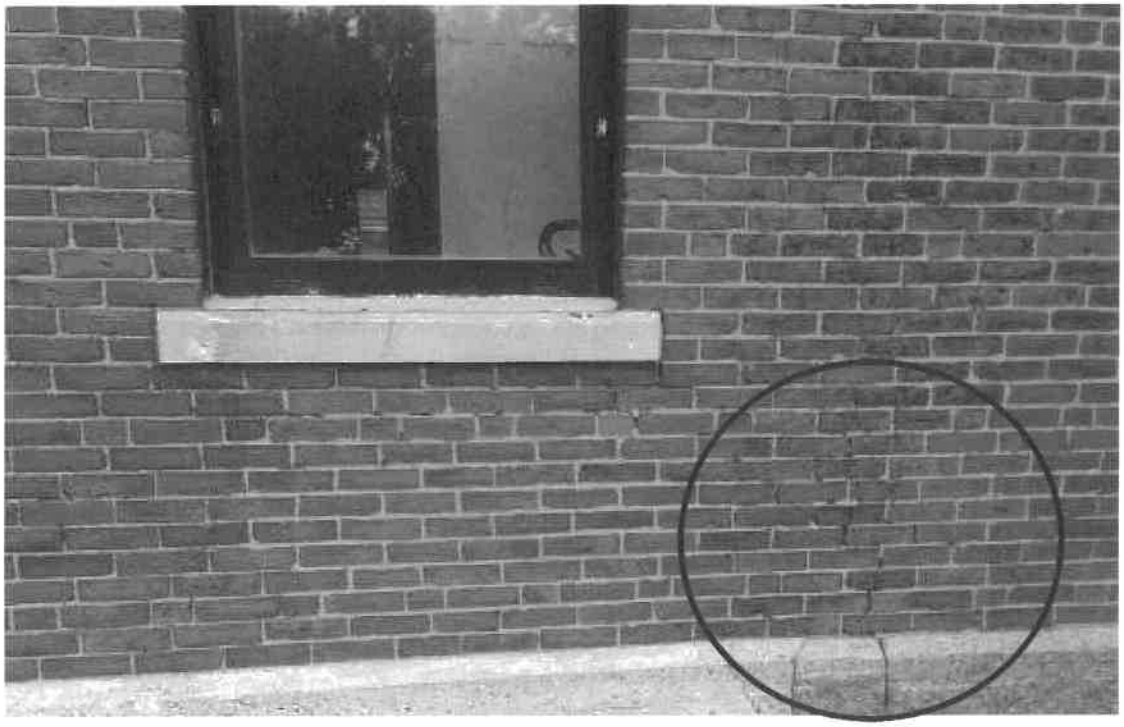
Spalled mortar joint at steel lintel bearing points

- Spalled mortar joints and cracked bricks were observed on the northwest face of the single story addition. Mortar joints are partially or completely open due to the spalled mortar and water is able to enter into the joints between the bricks and be absorbed by the inner masonry wythes which causes more damage over time.

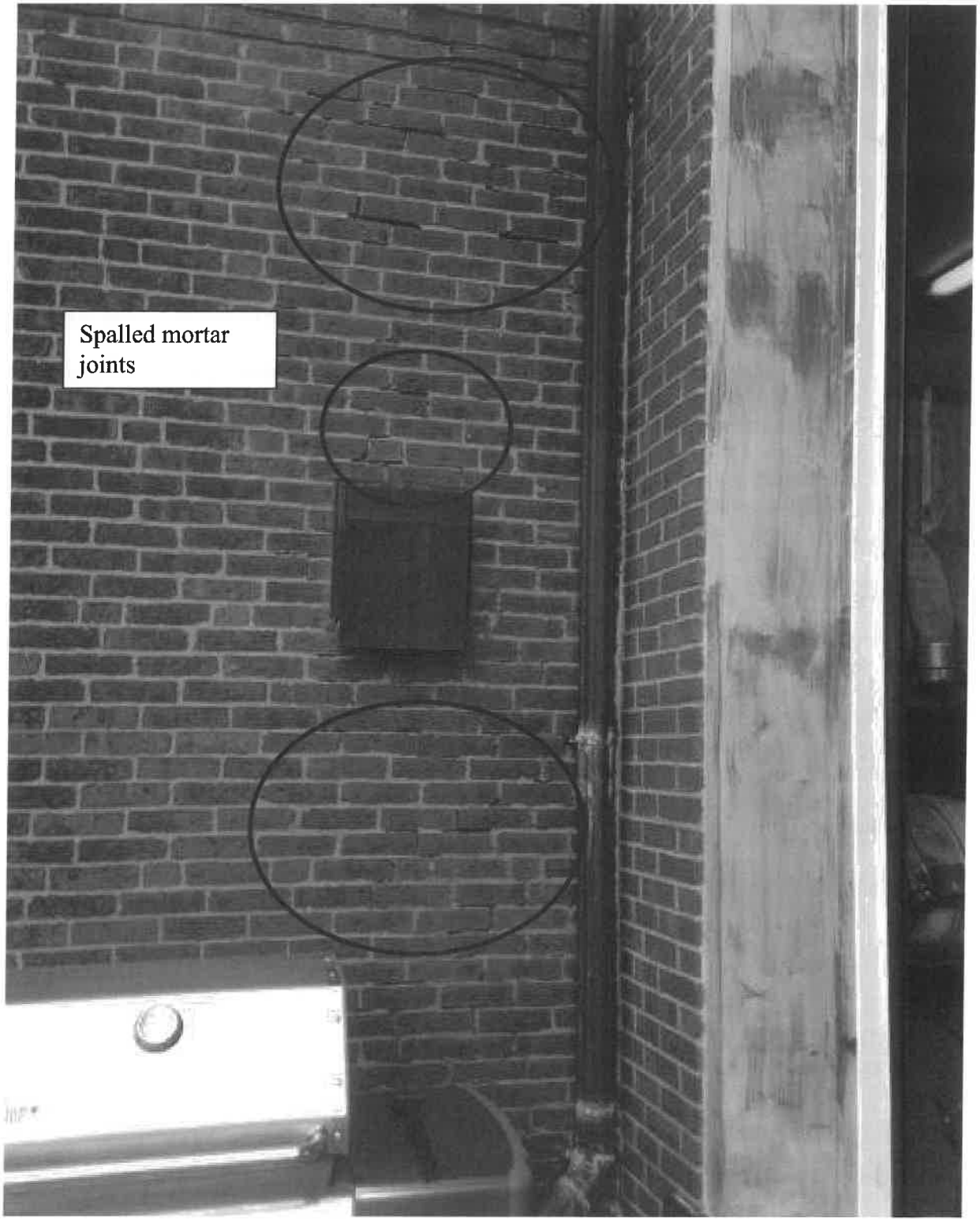


Spalled mortar joint on northwest face of single story addition.

Spalling mortar joints on northwest wall.



Cracks in exterior brick wythe below and between window openings



Spalled mortarjoints.

RECOMMENDATIONS

The following are recommendations to correct the items noted above in the report.

- The first item involves the movement of the stone foundation wall and spalling of the mortar joints. It appears that some of the damage was caused by water infiltration and possible utility excavations. The foundation wall must be repaired as it supports the masonry bearing above. The repair would consist of forming, installing reinforcing steel and pouring concrete on the exterior and interior of the wall to provide stabilization of the wall.
- The movement observed in the stair tower must be further investigated to determine the cause of the movement. Solutions to repair the condition will be developed from the investigation.
- Repoint the mortar joints to prevent further water damage to the mortar joints and brick should be scheduled next spring to prevent further damage to the walls.
- The masonry on the front of the building adjacent to the overhead doors on the original building will require further investigation to determine the cause and repair solutions. One cause is the infiltration of rain water into the wall and corrosion of the existing steel lintel which will displace the brick and mortar. An investigation of the damage will identiy the condition of the steel lintels and damage to the masonry due to movement and water.
- Repointing of the entire building after the other repairs are completed. This will seal the mortar joints, remove all deteriorating mortar and replace any damaged bricks in the process.

SUMMARY

The unreinforced bearing walls which support the Upper Floor, Attic and roof sstructure do not meet the current Commonwealth of Massachusetts Building Code requirements for seismic design. The building structure would sustain devastating damage during a seismic event. Due to the fact that the unreinforced walls will not sustain the lateral forces generated by seismic events, this building would not be able to function to provide emergency services.
Our structural review of the building is based only on the areas which were not concealed by exterior grades, slabs, interior finishes or other obstructions. Other recommended repairs and maintenance procedures should be implemented to eliminate possible future damage to the structure.

– EXISTING CONDITIONS ANALYSIS –

ARCHITECTURAL

BUILDING OVERVIEW

The building appears to be a type "2-B" multi-story building. The main building was originally constructed in 1878. There appears to have been two additions to the building: the first a one story addition extending the building to the rear (unknown date) and the second added a single story, slab on grade, drive through apparatus bay (constructed in 1987). The basement of the main building is constructed of stone foundation walls with elevated concrete slab for the main floor. The main level slab in the original building appears to have been re-cast and supported with cast-in-place concrete columns and beams, to accommodate newer heavier apparatus. We were not able to determine the dated the re-casting took place.

The foundation in the 1987 addition is believed to be reinforced concrete type walls and a reinforced concrete slab on grade. The main level is believed to consist of, exterior walls multi-wyth masonry with brick veneer, and interior walls are a mix of wood framed gypsum wall board or concrete masonry. There is an attic which is accessed through a residential type pull down stair. The attic is constructed within the wood roof trusses. The roof system appears to be slate shingles on wood sheathing on the wood roof trusses.

The building does not have a fire suppression system, there is not a second egress from the upper levels, nor is it handicapped accessible. The finishes are in poor condition and are far beyond their useful life span. The Heating system has recently been replaced (2015), while the air circulation and overall quality of air in the building is questionable.

EXTERIOR ENVELOPE

Exterior Walls
Basement level (foundation): mortared stone at the main building and reinforced concrete at addition
Main and Upper Levels – main building: appears to be multi wyth masonry - brick veneer on masonry back up with lath and plaster on interior face.
Main level – addition: multi-wyth masonry wall – brick veneer with CMU backup. It is unknown if there is insulation in the cavity.

The brick is generally in good condition with the exception of minor spawling at overhead door openings.

The down spouts and gutters are copper and appear to be in good condition. Reattachment to the wall is required in a number of locations. Down spouts are not tied into a storm water drainage system nor do they have splash blocks.

Exterior Doors
The entrance doors are hollow metal with insulated glass vision panels in hollow metal frames. Doors and frames are painted and are generally in fair condition, but exhibit considerable wear. The thresholds are worn. The seals and caulking are in fair condition.

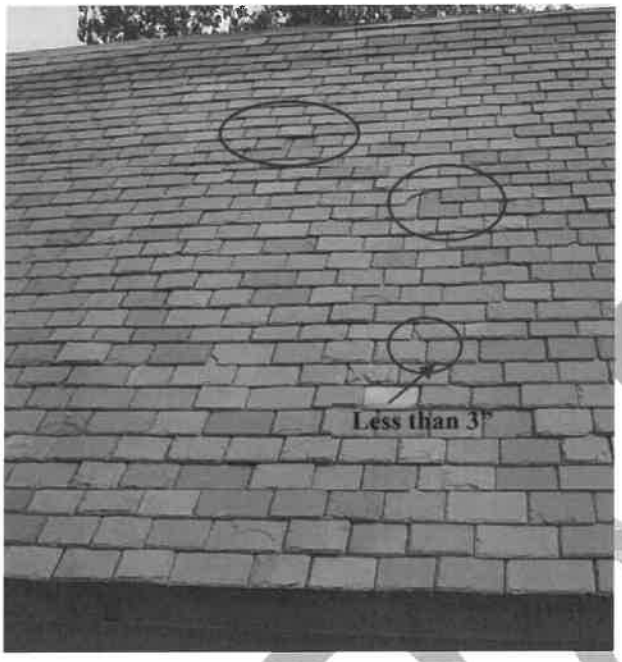
None of the doors have been outfitted with a "crash-bars"; though many of the doors are typically equipped with lever handles.

Exterior Windows

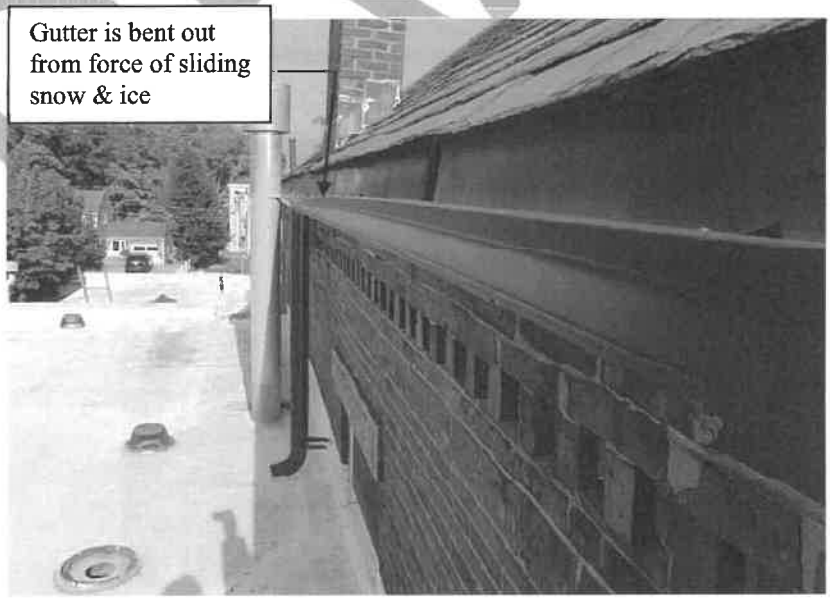
The windows aluminum replacement double/single hung units with a insulated glass and insect screens, set into existing wood frames. The windows were installed in 2003 and are in excellent condition. The existing wood frames need to be scraped, repainted and the perimeter caulking needs to be replaced.

Roof

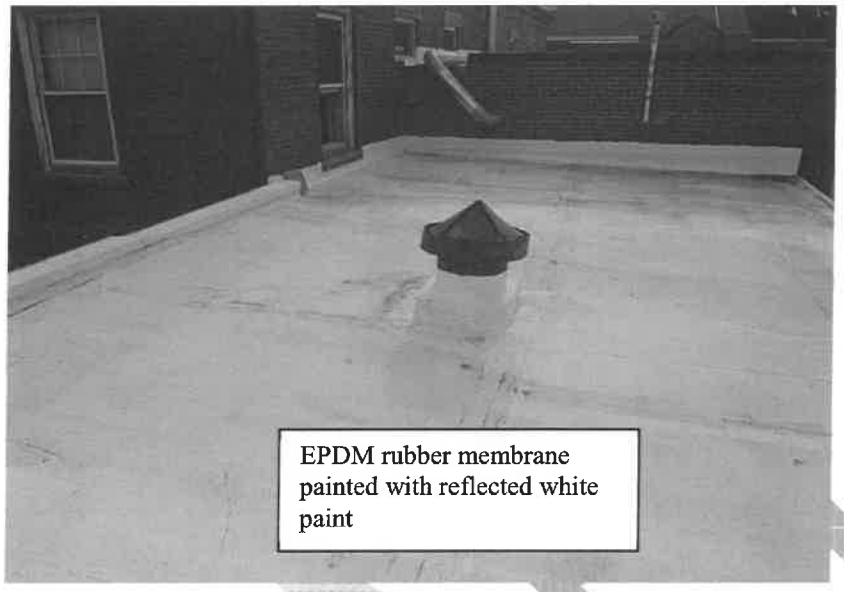
The roof on the original construction consists of a slate tiles on steep slope woof plank decks. The slate roof is generally in good condition although several broken and missing slate were observed which could be replaced off of a lift since foot traffic is not recommended on slate tiles. All broken or cracked tiles that have a split edge located within 3" of an adjacent keyway (joint) should be replaced.



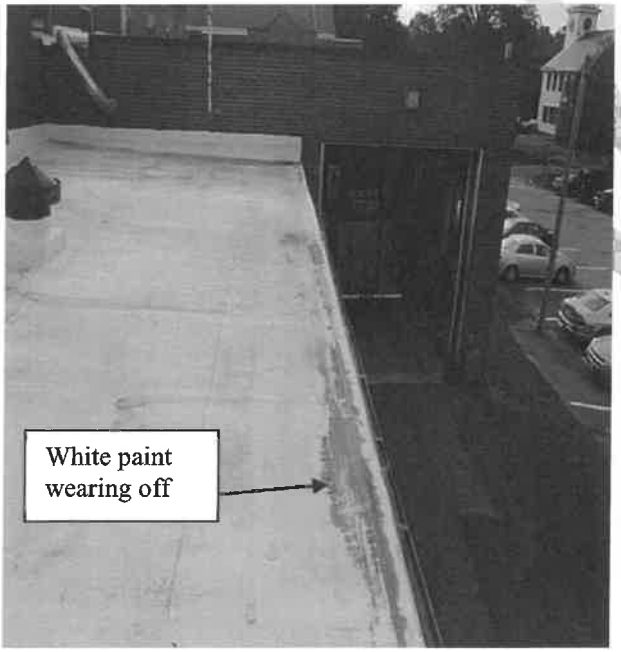
The gutters and downspouts are fabricated in copper. A section of gutter was observed to be bend out, most likely this occurred from the force of sliding ice and snow. This should be repaired before further damage occurs.

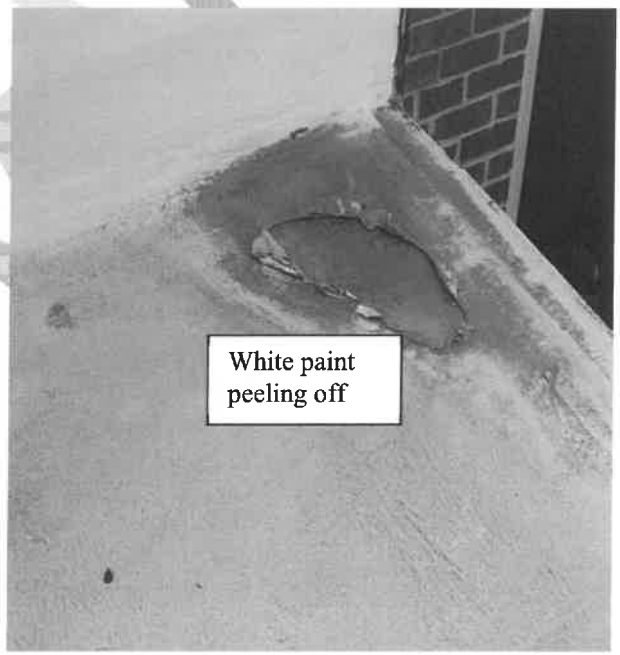


The roof on the addition consists of a single ply EPDM rubber membrane on a sloped deck which has been coated with a reflective white paint.

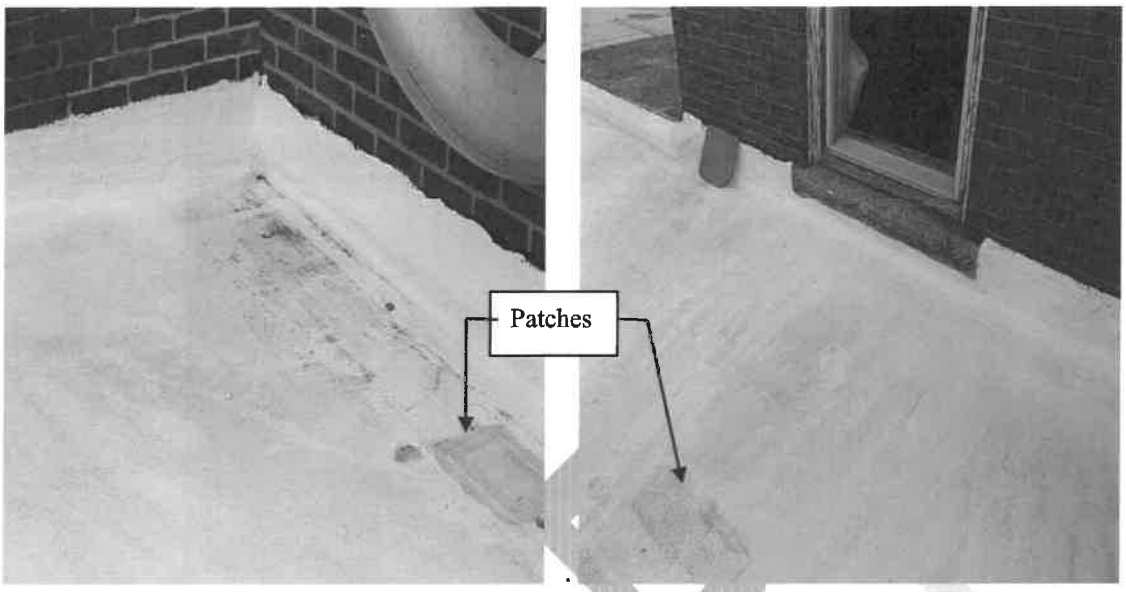


The reflective paint was applied a number of years ago and the paint is wearing and peeling off.



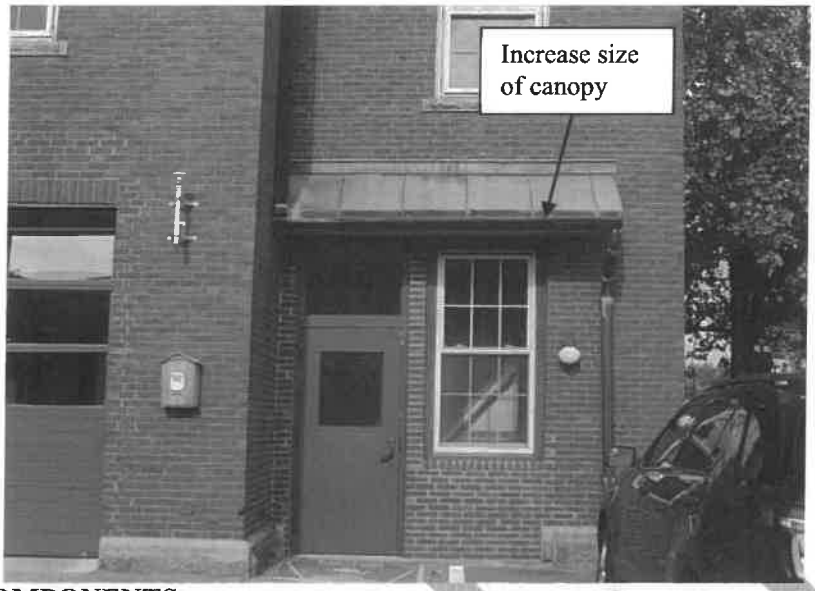


Patches were observed under the painted surface and the roof was soft and spongy indicating water saturated insulation trapped beneath the membrane. The moisture is a problem which could lead to the growth of mold and mildew. The roof on the addition should be removed down to deck and replaced with a new single ply membrane roof with a 20 or 30 year warranty on new insulation that meets current energy code requirements.



The wood frame windows show evidence of years of neglect. They are soft and spongy indicting water infiltration. They should be wrapped in aluminum break metal before it is too late to save them.

The small standing seam canopy roof over the main entrance is too small to protect pedestrians from falling ice and snow coming off the high roof. It should be removed and replaced with a larger canopy in order to offer greater protection.



BUILDING COMPONENTS

Interior Walls

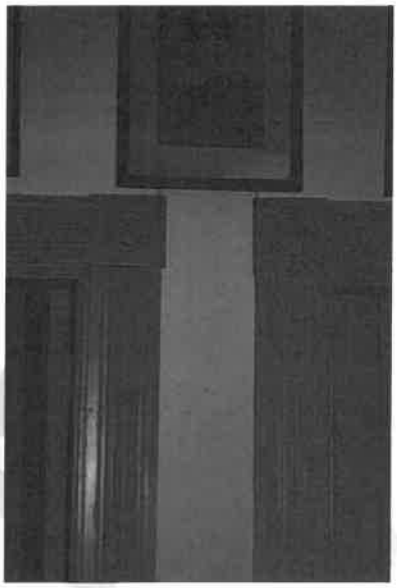
The main level utilizes painted stud and gypsum wall board in most areas with CMU in fire support areas, while the upper level utilizes wood studs with wood paneling that is painted.

The interior masonry walls are generally in good condition but need minor repairs and repainting. The gypsum walls appear to generally be in fair to poor condition. Due to water infiltration, many of the walls are exhibiting peeling paint, cracks or spawling plaster, and will require much patching and repainting. The wood paneling is dated and needs to be repainted

Interior Doors

The interior doors vary in material (solid stile and rail wood and metal) and size (30"- 36" wide). Doors frames vary in material as well (wood frame with trim or hollow metal). Most of the doors have not been

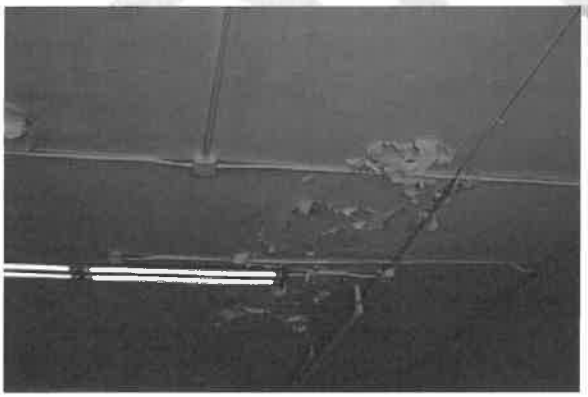
outfitted with ADA compliant lever-style handles. The doors/frames and trim are worn and will require new hardware and refinishing.



Ceilings Systems

The predominant ceiling system throughout the building is a lay-in acoustic ceiling tile (ACT) in a 2'x 4' suspended grid system with recessed fluorescent light fixtures. There is a fair amount of gypsum wall board ceiling (primarily in the apparatus bays and adjoining support areas).

In general, all ceiling grids exhibit signs of rust, and tiles exhibit physical damage from water/moisture. Moisture problems and/or leaks from the roof system may be the cause or contribute to this damage. Many areas of peeling paint and spawling plaster were observed in the apparatus bays.



The lighting seems inadequate in general and the light fixtures are in poor condition. Refer to the electrical section of this report for more information.

Floors Finishes

The flooring materials in the building are a combination of vinyl composite tile (VCT), vinyl asbestos tile (VAT), ceramic tile and painted concrete.
The vast majority of the flooring is VCT, which is utilized in the corridors, work rooms, bunk rooms, kitchen and day room. In general, the VCT is in poor condition and near the end of its useful life and needs be replaced.

VAT was observed in the attic area and needs to be abated. It is suspected that VAT was covered over with VCT on the lower levels. Further investigation is required.

Ceramic tile, primarily located in the toilet rooms, appears to be in fair condition, showing obvious signs of wear.

The painted concrete floor in the apparatus bays is mostly worn away leaving exposed concrete.

Stairs
There is one winding stair that provides access to all levels. The stair is wood framed with wood treads and risers. Treads and risers to the basement are rough framed; to the upper level are rubber clad; and to the attic are exposed stained wood. The stairs appear to be structurally sound. Wooden handrails are provided on one side only and are not continuous as required by code. It has non-complaint treads and risers and requires a second handrail to be installed. The stair is not enclosed in a fire rated enclosure as required by code.



Elevator
There is not an elevator in the building to allow for handicapped access to the multiple levels. Any addition or renovation to the building would require installation of one to comply with ADA.

Signage, Miscellaneous Accessories and Equipment
The room signage is almost nonexistent. Where provided, signs are typically a room name printed on a piece of paper and taped on or adjacent to the room doors. Any addition or renovation would require the installation signage with braille to comply with ADA.

Fire extinguishers are located sporadically throughout the building, but appear to be inadequate in number

Window treatments in the building consist of manually operated horizontal blinds, shades and curtains or none at all. All are in fair to poor condition and need to be replaced.

Kitchen
The kitchen is located on the main level and utilizes painted gypsum walls, with vinyl composition tile flooring and suspended acoustical tile ceiling with recessed 2x4 lights. All finishes are in poor condition and need to be replaced. Cabinets and countertops exhibit excessive wear. Appliances appear to be in fair condition. There is no emergency gas shutoff to the gas oven/stove.

Toilet Rooms

The toilet room on the main level utilizes painted gypsum walls, with vinyl composition tile flooring and suspended acoustical tile ceiling.

The toilet/shower room on the upper floor utilizes ceramic tile wainscoting and painted gypsum walls, with ceramic tile flooring. Shower compartments have ceramic tile walls and ceilings with acrylic bases. All of these finishes are worn and are at the end of their useful life.

The fixtures do not meet ADA requirements. The sinks do not have insulated drain piping or approved lever style faucets handles and thus are non-complaint. The toilets do not have proper grab bars and or clearances. Additionally there are no separate toilet/shower facilities for male and female use.

Our recommendation would be to execute a total renovation of these spaces. The fixtures, partitions and accessories should be replaced with new.

Hazardous Materials
It is our recommendation that a comprehensive survey of hazardous materials be conducted as vinyl asbestos tile flooring was observed in the attic areas. The scope of the survey should include asbestos, lead paint, mercury and PBC's.

PROGRAM COMPONENTS

Communications Center
The dispatch center does not comply with NFPA 1221 which sets the design standard for emergency dispatch centers. This code requires two-hour fire separation from the remainder of the building, protection against civil unrest and an isolated air handling system among many other requirements. Neither an isolated air handling system nor two-hour fire separation assemblies were not evident. Additionally, this room appears to be used for a variety of other programmatic functions including report preparation and multi-purpose room. These functions are not conducive to providing an appropriate environment for dispatchers to communicate with citizens in emergency circumstances.

Bunk Rooms
There are eight (8) private bunk rooms located on the upper level. they utilize painted wood paneled walls, suspended 2x4 acoustical tile ceiling in a metal ceiling grid with recessed lights and VCT floor tile. All the finishes are in poor condition and need to be replaced.

Head End Room

The stations computer network head equipment is located in the basement. The space is not secured nor is it climate or dust controlled.

Apparatus Bays

The apparatus bays utilize painted cmu and gypsum board walls, plaster ceiling and stained/painted concrete floors. All of the finishes are in fair to poor condition. The ceiling exhibits signs of water damage, most likely the result of current and/or past roof leaks. The overhead door openings are too narrow & short and barely allow passage of the current apparatus. The circulation space around the apparatus is too narrow per recognized fire station facility design standards.

The apparatus doors are insulated metal clad pre-finished sectional overhead doors, which were installed in 1987 and are in good condition.

The vehicle exhaust system is installed within the last 10 years and is in excellent condition.

There is a fire pole from an upper level corridor. that has been abandoned.

Additionally the bays house the turnout gear lockers, SCAB fill station, fitness area, decontamination area, laundry, hose/supply storage and work areas. All of these spaces should be in their own spaces

Storage Facilities

There appears to be inadequate storage facilities for archival records, training materials, department equipment, and supplies.

– EXISTING CONDITIONS ANALYSIS –

PLUMBING

Plumbing:

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent system, storm drain piping & natural gas. Garage waste and vent systems serve the Apparatus areas. The building is serviced by Town Water and Sewer.

In general, the fixtures do not meet current water conservation requirements. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require the fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water-conserving type fixtures. All new fixtures are recommended.

In general, the drainage piping can be reused where buried underground and where adequately sized for the intended new use. Video inspection of any existing piping to be re-used is recommended.

Fixtures:

Water closets are floor mounted vitreous china tank type with elongated bowls.

Urinals are wall mounted vitreous china with exposed manual flush valves.

Lavatories are a mix of wall hung & counter mounted vitreous china with hot & cold handle faucets.

Showers are tiled units with an acrylic base equipped with a shower head and single lever balancing valve.

Janitor's sink is a wall hung, cast iron unit with exposed trap standard. Faucet is not equipped with vacuum breakers.

Laundry sink is a wall hung thermoplastic unit with a deck mounted faucet.

Kitchen sink is a stainless steel undermount unit with a single lever deck mounted faucet.

Water Closet

Urinal

Wall Hung Lavatory

Counter Mounted Lavatory

Shower Stall

Janitor's Sink

Laundry Sink

Kitchen Sink

Sanitary Drainage System:

Sanitary, waste and vent piping is generally cast iron bell and spigot with areas of new work having no-hub cast iron pipe. The piping appears to be in good condition.

Apparatus garage floor drains are directed through an oil/sand separator.

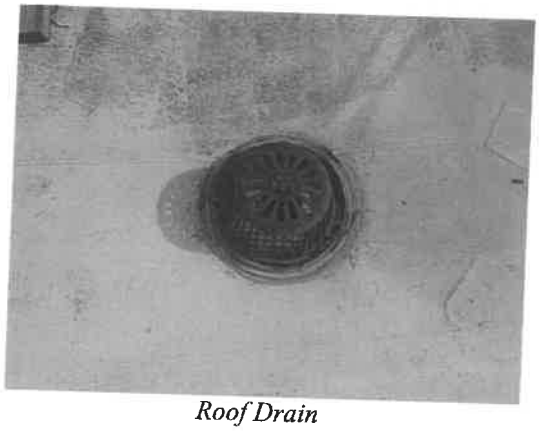
Cast Iron Bell & Spigot

Cast Iron No-Hub

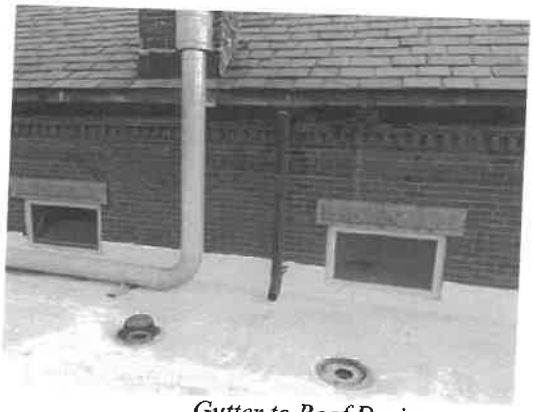
Copper Waste Piping

Storm Drainage System:

Storm drainage from pitched roofs are collected by a gutter system and either spill onto; flat roofs, grade or to a below grade storm drainage system. Storm drainage from flat roof areas is disposed of by a system of roof drains and rain water conductors which discharge to a piped storm drainage system.



Roof Drain



Gutter to Roof Drain

Below Grade Storm Drain

Onto Grade Storm Drainage

Domestic Cold Water System:

The water service enters the building in the basement level.

Domestic water piping is copper tubing with sweat joints. The majority of the copper piping is not insulated.

Domestic water service is 2" in size and splits to (2) water meters.

Water Service & Meters

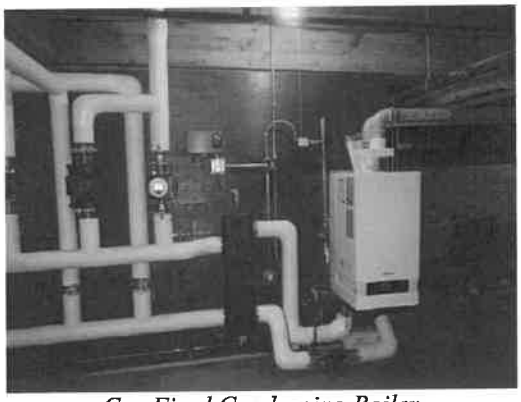
Domestic Hot Water System:

Domestic hot water is generated through a gas-fired condensing boiler. There is a 80 gallon hot water storage tank.

The hot water system is circulated through the building.

The system includes a thermostatic mixing valve and expansion tank.

The domestic hot water system was just recently installed (2015).



Gas Fired Condensing Boiler

Domestic Hot Water Storage Tank

Hot Water Circulation Pumps

Thermostatic Mixing Valve

Gas System:

Natural gas is provided for to the building. Gas meter is located on the exterior of the building.

Gas service is 2" in size.

Gas is provided to the boiler, clothes/gear dryer & cooking range.

In general piping is schedule 40 black steel with welded fittings.

Gas Meter

Gas Piping

Compressed Air System:

Compressed air piping is copper tubing with sweat joints. Compressed air serves the Plymovent system and compressed air outlets in the Apparatus Garage.

Air Compressor

Plymovent System

Plumbing Recommendations:

Provide new high efficiency water conserving plumbing fixtures.

Provide fixtures for code compliant accessibility.

In general, existing cast iron drainage piping can be re-used and is sized appropriately. We recommend video inspection of existing drains to confirm integrity.

Maintenance to the oil/sand separator will be required.

Insulate all domestic water piping.

– EXISTING CONDITIONS ANALYSIS –

FIRE PROTECTION

Fire Protection:

The Building does not contain an automatic sprinkler system.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area or in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available. A major alteration is 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, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of M.G.L., any work performed, even if under separate contracts or building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

A hydrant flow test will be required to determine if adequate Municipal water supply is available.

– EXISTING CONDITIONS ANALYSIS –

HVAC

HVAC:

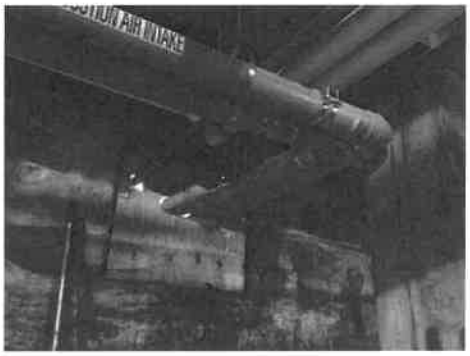
Executive Summary:

The primary heating, ventilation and air conditioning equipment within the Milton Fire Station Headquarters Building has received fair to poor maintenance with the exception of the new boiler heating system that was just recently installed (2015). With the exception of the heating hot water boiler system it appears that the heating system presently installed is antiquated. Overall the system is lacking ventilation and exhaust air and thermal comfort, creating hot and cold spots throughout the building. We recommend a complete upgrade of all terminal heating equipment and control system to achieve higher system efficiencies, reduce energy consumption, provide code required ventilation and provide quality temperature control.

Heating Plant:

The building is heated by one (1) wall mounted gas-fired high efficiency condensing boiler located in the basement of the building. This boiler along with four inline pumps and expansion tank was just recently installed (2015) and in excellent condition. The boiler is manufactured by Viessmann (Model Vitodens 200, 262 MBH output for hot water and 285 MBH max input). The boiler is provided with a direct vent option which utilizes separated combustion flues. One flue is utilized for combustion air and the other is for the combustion gases. Each system utilizes polypropylene material and exits the building through an exterior wall where it terminates with an elbow and screen. The boiler has its own burner management control system which utilizes outdoor air reset and high turn down modulation for high efficiencies.

High Efficiency Boiler



Direct Vent for Boiler

The hot water circulates throughout the building through the use of three inline pumps manufactured by Grunfos, these pumps are of the self-sensing type which allows the pump speed to modulate based on the buildings demand. One inline pump is utilized just for the unit heaters located in the basement, the other two operate as a primary/standby system. There is one more inline pump associated with the heating hot water system and this pump is utilized for the indirect domestic water storage tank. Currently the heating hot water system is used to provide domestic hot water for the building. Control of all these pumps is performed by a three zone switch relay manufactured by Taco, model SR503.

Inline Pumps

Zone Switch Relay

The piping system associated with the heating hot water boilers and pumps is all new and recently installed. The material is schedule 40 black steel with Victaulic fittings. The boiler utilizes a low loss header system which was provided by the boiler manufacture. This allows multiple independent zones to be circuited to the boiler plant. All the piping located near the boiler itself is insulated with new fiberglass insulation with PVC fitting covers. The piping throughout the rest of the building is original and is not insulated completely, some locations are exposed and have no insulation or the fiberglass insulation is damaged. The piping from an outwards appearance seems to be in fair condition however, a section of piping should be removed to examine the internal condition of the piping system and ensure that there is no corrosion or scaling.

Typical Piping with No Insulation

Typical Insulated Piping

Hot water expansion is completed through the use of a vertical non-insulated bladder style expansion tank. This tank was also recently replaced and in excellent condition. However, it is not insulated and should be to help reduce the systems heat loss.

Expansion Tank

Air Conditioning And Ventilation:

There is no central air conditioning system in the Fire Station. Window air conditioning units are located throughout the fire station mostly located in windows however, the break room does have one installed in an interior partition wall which has the apparatus bay garage on the other side. As for ventilation air, there are no mechanical ventilation units. The building utilizes operable windows as its means for ventilation, this is allowed by code however the actual requirements required by the code do not appear to be achieved with the current windows. A review of the current windows and square footage would need to occur to ensure that the operable portion of the window equals four percent of the floor area.

Window/Wall Air Conditioner

Automatic Temperature Controls:

Automatic temperature controls for the building is minimal, some equipment such as the unit heaters in the apparatus bay and the wall mounted fin tube in the office area are controlled with standalone electronic thermostats. These standalone thermostats are tied directly into each unit and are antiquated. These thermostats were provided by the equipment manufacturer. Other areas of the building that are heated with cast iron radiators and are equipped with thermostat control valves. However many of them are not functional, and in some cases missing. The overall control system appears to be malfunctioning and the controllability of the system is less than desirable. We would recommend removing the stand alone electronic systems and replacing them with a direct digital control system throughout.

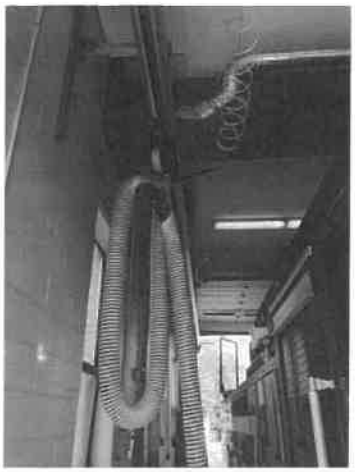
Standalone Thermostat

Electronic Standalone Thermostat

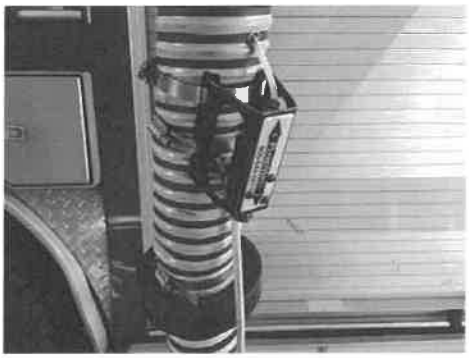
Apparatus Bay

A vehicle exhaust air capture system is installed in the apparatus bay. The system is manufactured by Plymovent and consists of vent-set exhaust fan and filter. All the components are located in the apparatus bay. The ducted system consists of a track system which has flexible hoses which attach to the vehicle exhaust pipe, from there it goes to the main ductwork located high within the apparatus bay and then exits the exterior of the building and discharges high above the roof. The system utilizes a galvanized steel sheet metal distribution system and rubber flex hoses which have compressed air associated with them for easy connection and disconnection of the tail pipe connector. In general, the vehicle exhaust air system appears to be in good condition. The apparatus bay is also equipped with an inline exhaust fan for general exhaust which is activated through a wall switch. The exhaust system is associated with a galvanized sheet metal duct system which discharges to a wall louver in the exterior wall. Hot water unit heaters are utilized to heat the apparatus bay. The apparatus bay unit heaters are antiquated and currently do not provide sufficient heat for the three bay garage. Controllability of these unit heaters is through standalone wall mounted thermostats.

Plymovent Track System



Rubber Flexible Hoses



Pneumatic Air Tubing for Clamping

Tail Pipe Connection

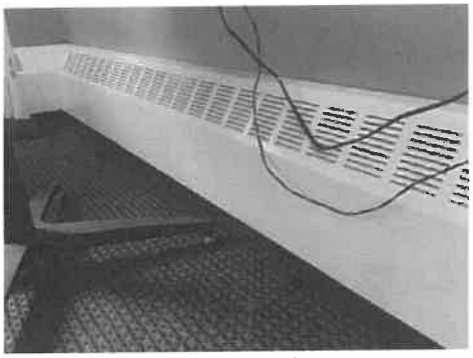
Inline Exhaust Fan

Filter & Fan for Plymovent System

Typical Garage Unit Heater

Office Areas and Sleeping Quarters

The office area, break room and sleeping quarters utilize a mix of heating equipment. The office and dispatch area on the first floor utilizes wall mounted hot water fin tube radiation which is controlled via a wall mounted standalone thermostats. The breakroom and the rooms in the rear of the building on the first floor have hot water cast iron radiators which do not have any means of temperature control associated with them. These pieces of equipment run wild and generally overheat the spaces. The second floor sleeping quarters also utilizes hot water cast iron radiators for the hall way and general lounge area. There is one wall mounted standalone thermostat located in the main corridor. This thermostat controls several cast iron radiators in the main hall and general lounge area. Each individual room is heated through wall mounted fin tube radiation and is controlled with an individual wall mounted standalone thermostat. Overall the cast iron radiators and wall mounted fin tube radiation is damaged, missing components, and antiquated. The systems require a complete replacement.



Office Fine Tube

Typical Cast Iron Radiator

Shower and Toilet Rooms

There is no mechanical exhaust system for the shower or toilet rooms which is not code compliant. Operable windows provide natural ventilation to these spaces. Floor mounted convectors are located in the bathrooms on the second floor. The convectors are antiquated and are in need of replacement.

Typical Cast Iron Convector

HVAC Recommendations:

Provide heating, ventilation and air conditioning requirements throughout the building through the use of new gas-fired rooftop units and supplemental terminal heating equipment such as radiant ceiling panels or wall mounted fin tube radiation.

Provide new code required galvanized sheet metal ductwork with fiber glass insulation.

Provide tempered make up air system for the apparatus bay.

Provide new exhaust system throughout the building for general exhaust with new roof-mounted exhaust fans.

Provide individual space temperature control for office areas through the use of variable air volume diffusers.

Provide a new direct digital control system with web access providing full building control of every component and piece of equipment, alarm notifications, trending capabilities for trouble shooting and optimal start/stop of cooling and heating modes for increased energy savings.

The existing boiler plant should be re-used since it is a high quality condensing boiler and recently installed in 2015.

– EXISTING CONDITIONS ANALYSIS –

ELECTRICAL

ELECTRICAL

Executive Summary:

In general, the existing Electrical systems, although functioning, are at the end of or have exceeded their useful life, with exception to the emergency generator. The entire Power Distribution System, Lighting, and Tel/Data Systems should be replace with new systems under a renovation program. Most systems are marginally sized and are no longer code compliant.

Electrical Distribution System:

Three phase primary power runs overhead on Walnut Street to the building from a 112.5 kVA, 3 phase, pole mounted transformer on Pole 117-2. The meter is mounted to the outside of the building, Meter #5056671.

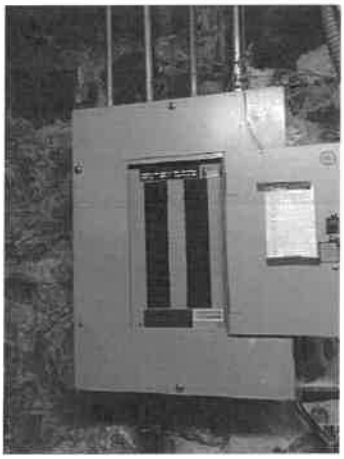
Utility Transformer

Service Entrance

Meter

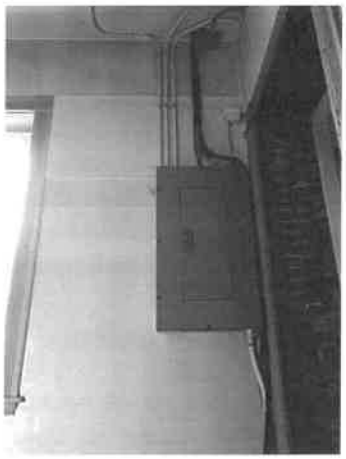
The service is rated at 200 amperes at 120/208 volt, 3 phase, 4 wire service.

There is a step down transformer to service 120/240 volt, single phase loads in the building. The Distribution System is in poor condition and inadequately sized for a renovation program.



Sub-panel

Sub-panel



Sub-panel

Emergency Power System:

An exterior diesel generator has been recently installed. The generator is manufactured by Cummings Onan, rated at 60 kW, 75 kVA @ .8 PF, serial number 5088230-03. It is mounted in a weatherproof sound attenuated enclosure. The generator feeds a single automatic transfer switch located in the Main Electrical Room. It is unclear as to what is fed from the emergency generator.

The emergency generator and the automatic transfer switch are in good condition; however, the life safety lighting is fed from the generator and is not compliant with today's codes. Exit signs are in fair condition; however, are not installed in all required locations.

Generator

Automatic Transfer Switch

Exit Sign

Fire Alarm System:

The building has a 10 zone microprocessor based fire alarm control panel manufactured by Silent Knight by Honeywell, Model SK-5208. The panel seems to be in good condition however the notification devices and detection devices vary from poor to good depending upon when they were installed.

There are a combination of heat detectors and smoke detectors located throughout the building. The Dorms do not meet the latest codes with respect to notification, they do not have low-frequency horns in sleeping areas. Self-contained Kidde wall mounted CO detectors are located in the Corridor outside the Dorms. Horn strobe coverage is inadequate.

FACP

Heat Detector

C.O. Detector

Exterior Lighting System:

Exterior lighting consists of building mounted halogen lamps with integral motion sensors. Fixtures are in poor condition and are not dark sky compliant.

Exterior Lighting

Interior Lighting:

The interior lighting consists mainly of fluorescent wraparound fixtures and recessed 2x4 acrylic troffers with T8 lamps.

Apparatus Bays have 8' utility strips with T12 lamps.

Some Corridors contain surface mounted round fluorescent fixtures with three (3) twin tube compact fluorescent lamps.

Lighting in general is in poor condition, lacks proper controls, and light levels are too low in most spaces.

All lighting should be replaced in a renovation program.

Recessed 2x4 Fixtures

Ceiling Compact Fluorescents

Basement Lighting

Wraparound – General Fixtures

Surface Utility Fixture

Apparatus Bay Lighting

Branch Circuitry:

Receptacle coverage is minimal and inadequate in various spaces. Extension cord use was noted due to scarcity of the outlets.

Kitchen receptacles and Boiler Room do not have ground fault protection. The general wiring method is pipe and wire.

Extension Cords

Kitchen Receptacles

Communication Systems:

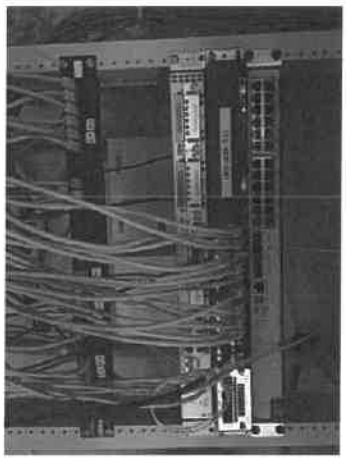
The telephone service, CATV, and town fiber run overhead in the street and enter the building underground in the basement. The fiber is terminated on a wall mounted fiber optic cabinet in the basement and connects to the building's data rack. The data rack is located in poor environmental conditions in the basement which will lead to shortened life of the equipment.

The telephone service also enters the basement. The wiring has been modified many times over the years leaving lots of dead wiring making it difficult to follow.

The building data/phone infrastructure consists of a single 24 port Cat5e patch panel in the basement connecting to Cisco switches that are plugged into a local APC UPS.

Fiber and Cable Service

Telephone Service



Tel/Data Rack

UPS

Fiber Enclosure

Micellaneous:

The facility does not have a Lightning Protection System.

Plymovent Vehicle Exhaust System exists; control panel is located in the Apparatus Bay and is in good condition.

Zetron Model 6 for incoming alarms is located outside the Watch Room and is in good condition.

Plymovent Control Panel

Zetron Model 6

Recommendations:

In general, the electrical systems will require full replacement under a renovation program. Under a renovation program, due to the inability to conceal raceways, we recommend the use of a surface metal raceway system in finished spaces equal to wiremold. Mechanical Rooms, Apparatus Bays, etc. will require surface conduits.

Power Distribution:

- The electrical service is marginal for this facility and the voltage and phase is not suitable for a public safety facility. The entire service should be replaced with a 120/208V, 3Ø, 4W service adequately sized and housed in a code compliant space.

- Electrical power will be brought into the site via underground medium voltage cables from the utility company network. A pad mounted step-down transformer will be located at grade adjacent to the building. Service entrance and distribution switchgear will be located in the Electrical Room near the Mechanical Room, along with lighting and power distribution panels.

Emergency Power System:

- The Emergency Power System should be modified to comply with current code for optional standby and life safety. A second transfer switch and breaker should be added, as well as, a 2-hr rated life safety closet. Size should be reviewed to confirm adequate capacity for emergency loads and other critical stand-by loads.

- The generator is housed in a sound attenuating weather proof enclosure with critical grade exhaust silencer, and automatic starting and safety controls. The generator shall include two (2) service breakers and transfer switches: one (1) for life safety equipment, one (1) for other than life safety equipment. The generator will be sized for 100% of all lighting and power loads. All air-handling units will be provided with emergency power to maintain ventilation and heating for the duration of 48 hours.

- Exit signs will be replaced with energy efficient, long life LED type.

Interior Lighting System:

- General office lighting fixtures will consist of a combination of recessed and pendant mounted indirect LED luminaries and electronic drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also wired for multi-level switching. Corridors and other functional lighting fixtures will consist of acrylic recessed direct fixtures with LED and electronic drivers. Storage, Mechanical, Apparatus, etc. will be industrial LED fixtures with acrylic lens.

- Lighting in the Communications/Watch Room will be direct-indirect dimmable LED with consideration of dimmable down-lights over console.

- Each area will be locally switched and designed for multi-level controls. Each Office space and Toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in space with daylight for dimming of light fixtures.

- The entire facility will be controlled with an Automatic Lighting Control System for programming lights on & off.

- Lighting in the Dorm Rooms, Corridors, and Apparatus Bay will be interfaced with the Zetron System to automatically turn on during an alarm then timed off.

Exterior Lighting:

- Fixtures for area lighting will be pole mounted LED luminaries in the parking area and roadways. The exterior lighting will be connected to the automatic lighting control system for photocell on and timed off operation.

- Building perimeter fixtures will be wall mounted over exterior doors.

- All fixtures will be of the cut-off type and dark sky compliant.

Wiring Devices:

- Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided. Corridors will have a cleaning receptacle at approximately 30-40 foot intervals. GFI receptacles will be provided in Apparatus Bays. Exterior weatherproof receptacles will be installed at exterior doors. A system of computer grade panelboards with double neutrals and surge protective devices will be provided for receptacle circuits.

Fire Alarm System:

- Fire Alarm System should be replaced with an addressable, ADA compliant system with full coverage.
- A Fire Alarm and Detection System will be provided with 60 hour 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.
- Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways.
- The Sprinkler System will be supervised for water flow and tampering with valves.
- Horn/strobes will be provided in egress ways, open areas, and other large spaces. Strobe only units will be provided in single Toilet and Conference Rooms.
- Manual pull stations will be provided at Exit discharge doors.
- The system will be connected to automatically report alarms to a remote location.
- Dorm Rooms will be provided with local detectors with low frequency sounder base.
- CO detection will be provided per code.

Uninterruptible Power Supply (UPS):

- A three phase centralized UPS System will be provided. The system will provide conditioned power to sensitive electronic loads for Communications Equipment Room and Communications/Watch Room. The UPS will bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage. The UPS System will also be connected to the stand-by generator.

Lightning Protection System:

- A system of lightning protection will be provided. The system will be installed in compliance with the provisions of the latest "Code for Protection Against Lightning" for buildings as adopted by the National Fire Protection Association and the Underwriters' Laboratories, Inc. for UL Master Label System.

- The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors, ground rods, etc.

Technology:

- The Data System infrastructure to be located in a properly designed space, and should be updated to include Category 6A UTP cabling for the both Data and Telephone Systems for gigabit connectivity at the work station. Each office should have 1 voice and 2 data outlets.

- A Central Paging System should be provided and integrated with the Telephone System.

CCTV:

- A Closed Circuit TV System should be installed and include computer servers with image software, computer monitors, and IP based closed circuit TV cameras. The head end server should be located in a properly designed head end MDF Room and will be rack mounted. The system should have accessibility from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (NVRs) should record all cameras and store this information for 21days at 30 images per second. The location of the cameras should generally be in corridors and exterior building perimeter.

- The system should fully integrate with the Access Control System if provided to allow viewing of events from a single alarm viewer. Camera images and recorded video should be linked to the access system to allow retrieval of video that is associated with an event.

Card Access:

- A Card Access System should be considered and include a card access controller, door controllers, and proximity readers/keypads. Proximity readers should be located at various locations. Each proximity reader should have a distinctive code to identify the user and a log will be kept in memory. The log within the panel should be accessed through a computer. The alarm condition should also initiate real time recording on the integrated CCTV System.

– SPACE NEEDS –

MITCHELL ASSOCIATES ARCHITECTS
• EMERGENCY SERVICES FACILITIES •

Milton Fire HQ Program

Project Name: Milton

1st Program Meeting Date: **October 14, 2015**

Printout Date: **November 17, 2015** Filename: Milton Fire Program

This document is not meant to be limited to an inventory of what you currently have.

Indicate what you currently need for proper operations and try to forecast what you will need for the future.

A General Information

A1. Number of Members: total: **56** active: **56** female: **2 career plus 2 administrative**

A2. Typical Turnout: **11-14**

A3. On-Call: **None**

A4. Firefighting Staffing:**56**

A5. Number of calls/year: **4000 80-85% medical**

A6. Administrative Staffing:**1**

A7. Building Committee:

Meeting Attendance: Date: **10/14/15**					
A5.1. **Steve Morash**	☐	☐	☐	☐	☐
A5.2. **Tom Hess**	☐	☐	☐	☐	☐
A5.3. **Brian Touhy**	☐	☐	☐	☐	☐
A5.4. **Tom Kelly**	☐	☐	☐	☐	☐
A5.5. **Chief**	☐	☐	☐	☐	☐

A8. Type of entity:

A8.1. Municipality: **Town of Milton** Type: **Paid full time fire department**

A9. Describe Business & Social Structure: **The Milton Fire Department is a paid full time fire Department conducting typical fire department business. There are no social activities that take place on Department grounds.**

B Functional Activities in Building

B1. Types of response:

B1.1. Fire: **Yes**

B1.2. EMS: **Yes**

(BLS Engine Co's)

B1.3. Heavy Rescue: **No**

B1.4. HAZ MAT: **No**

B1.5. Water Rescue: **Yes**

B1.6. Ambulance: **No**

B1.7. Other: **UTV (Off road rescue)**

B2. Training activities in building:

B2.1. **TBD**

Training activities on site:

B2.2. **Most in service training exercises are conducted at E1 (HQ)**

B3. Fuel Filling Station: **No**

B4. Other uses of apparatus bay:

B4.1. Social events: **No**

B4.2. Craft fairs: **No**

B4.3. Other: **None**

B5. Sleeping Over:

B5.1. Now

.5.1.1. Long term: **Yes**

B5.2. Future

.5.2.1. Intermittent, short duration: **Storm coverage**

.5.2.2. Long term: **Yes**

B6. Standing by: **Mutual Aid**

.6.1.1. Will other fire companies park their apparatus in the bay under certain circumstances: **Yes**
Describe: **Mutual Aid backfill companies will park in the bays**

.6.1.2. Is their access to the building to be limited: **Maybe**

B7. Emergency Shelter:

B7.1. Who stays in building: **No**

B8. Firematic Business:

B8.1. Describe: **?????**

B9. Meetings:

B9.1. Type: **Local Union** ; size: **30** ; frequency: **Quarterly**

B9.2. Type: **Staff** ; size: **4-13** ; frequency: **Varies**

B10. Social Life:

B10.1. Daily recreation – describe: **Physical fitness activities by the on duty firefighters, Day Room w/ t-v**

B10.2. Periodic recreation – describe: **None**

B10.3. Outdoor recreation – describe: **None**

B11. Misc. Activities

B11.1. **Fire Prevention Week school visits**

B11.2. **Weekly visits by parents and children**

B11.3. **Medical walk-ins at Engine 2 (East Milton Square) maybe 6/year**

B12. Access control:

B12.1. Electronic access: **Yes**

B12.2. Vendor's access to drop off material: **No**

C Site

C1. Who owns the road at apron: **State, County, Town**

C1.1. **Town**

C2. Number of primary responder parking spaces needed : **9**

C3. Number of other parking spaces needed: **5**

C4. Number of spaces needed for visiting apparatus: **0; Parking space for training trailers on loan**

C5. Number of spaces needed for visiting firefighter parking: **TBD**

C6. Recreation requirements (Pavilion, grill, patio, etc.): **None**

C7. Training requirements: **Headquarters (E1) is used for in service training and any classroom activities required.**

C8. Site signage requirements: **No**

C9. Dumpster: **No**

APPARATUS

1 Apparatus Bays

1.1 Number of vehicles: **10** ; # of bays: **7**

Front Line Vehicles

1.1.1	Name: **Ladder 1**	type: **E- One**	length: **40'**	weight: **64,000lbs**
1.1.2	Name: **Engine 1**	type: **E-One**	length: **31' 6";**	weight: **40,000lbs**
1.1.3	Name: **Engine 3**	type: **E- One**	length: **30'**	weight: **39,200lbs**
1.1.4	Name: **Car 8**	type: **SUV**	length: **17'**	weight: **7500lbs**
1.1.5	Name: **Car 6**	type: **SUV**	length:**16**	weight: **6300lbs**

May have an ambulance in the future

Any vehicles in an accessory structure?

1.2 Type of bays:

1.2.1 Drive-through: **One for ladder**

1.2.2 Double deep: **None**

1.2.3 Single deep: **Three**

1.3 Wash bay: **No, will wash in place**

1.4 Plan for future expansion of bays: **Yes** ; # **1**

1.5 Overhead doors:

1.5.1 Front:

1.5.1.1 Number: **4**

1.5.1.2 Width/Height: **(use 13'-4" W x 14'-0" H)**

1.5.1.3 Windows: **Yes**

1.5.2 Rear:

1.5.2.1 Number: **1**

1.5.2.2 Width: **11'9"**; Height: **13'11" (use 13'-4" W x 14'-0" H)**

1.5.2.3 Windows: **Yes**

1.6 Signage requirements: Plan for future digital display of fire information

1.7 Trench drains: **Yes** ; Layout: **Centerline of trucks**

1.8 Wall mounted water hose reels: **Yes** ; Quantity: **1 per two trucks**; Tempered: **No**

1.9 Fume exhaust: **Yes** ; Type: **Plymovent** ; Later: **Same**

1.10 Truck fills:

1.10.1 Overhead: **No**

1.10.2 Wall hydrant: **Yes** ; Quantity: **TBD**

1.10.3 Outdoor hydrant: **TBD**

1.11 Overhead electrical drops: **Yes** ; Quantity: **6**

1.12 Overhead airdrops: **Yes** ; Quantity: **5**

1.13 Compressed air for tools: **Yes**

1.14 Wall mounted air hose reels: **currently no, moving forward yes;** Quantity: **3, 1 per station**

1.15 Utility sinks: **Locate in adjacent room**

1.16 Hand wash sinks: **Yes**; Where: **At door to balance of building**

1.17 Water fountain/bottle filling station: **No**

1.18 Ice machine: **Future** ; Location: **Near the bay**

1.19 Storage of Diesel Exhaust Fluid: **No**

1.20 Epoxy flooring: **Currently No moving forward possibly**

1.21 Wall construction type: **Currently Dry Wall & Masonry**

1.22 Size: **3,574** sq ft

FIREMATIC SUPPORT

1A Mezzanine

1A.1 Use: **Currently we do not have a mezzanine – locate only in HQ**

1A.2 Training Features:

1A.2.1 **Ladder evolutions, bail out, confined extrication, mask confidence, etc.**

1A.2.2 Manhole size/type: _____

1A.3 Storage for: **Forcible entry, (2) window props, drag dummy**

1A.4 Comments: **Plausible location for compressor room, locked cage, etc.**

1A.5 Size: **684** sq ft

2 Storage Room #1

2.1 Use: **Equipment storage**

2.2 Items to be stored: **Back up fire service items- axes, haligans, valves, etc.**

2.3 Location: **currently we have no storage rooms**

2.4 Security: **Yes**

2.5 Adjacencies: **Apparatus bay**

2.6 Comments: **heavy duty shelving**

2.7 Size: **203** sq ft

3 Storage Room #2

3.1 Use: **Future potential for EMS**

3.2 Security: **Yes**

3.3 Adjacencies: **Apparatus bay**

3.4 Comments: **Firematic storage in short term, converted to EMS storage when needed in future**

3.5 Size: **301**

4 Storage Room #3

4.1 Use: **Caged area on Mezzanine**

4.2 Items to be stored:

3.2.1

4.3 Location:

4.4 Security:

4.5 Adjacencies:

4.6 Comments:

4.7 Size: **115** sq ft

29 Thacher Park Road Voorheesville, NY 12186 (518) 765-4571 Fax (518) 765-2950
E-mail: Bob@Mitchell-Architects.com

Web Site: Mitchell-Architects.com

5 Turnout Gear Storage Room

5.1 Operational Comments: **We currently store turn out gear in lockers on the apparatus floors.**
- 5.1.1 Response pathway
  - 5.1.1.1 **Turnout gear get placed at truck at start of shift**

5.2 Quantity of Lockers: **now: E1-50, E2-20, E4- later: E1-40, E2 & E4- 20 each**

5.3 Describe Lockers: **Metal mesh lockers**

5.4 Locker Size: **20" x 20" x 74"**

5.5 Location: **apparatus floor**

5.6 Adjacencies: **Ideally near decon laundry**

5.7 Comments: **Enclosed, with dehumidification and heat recovery ventilation**

5.8 Size: **303 sq ft**

6 Hose Storage

6.1 Operational Comments:
- 6.1.1 **Storage of modest quantity of spare hose**

6.2 A room, or on the floor: **Currently Stored on apparatus floor**

6.3 Hose racks: **1** ; Size: **10 ft**

6.4 Hose drying: **No**

6.5 Hose washer: **No**

6.6 Hose winder: **No**

6.7 Inventory:
- 6.7.1 5" suction: **0**
- 6.7.2 5" LDH: **5 lengths at each station @ 100'** [7 ½" footprint]
- 6.7.3 4" LDH: **0**
- 6.7.4 2 1/2" LDH: **5 lengths in each station @ 50'** [4" footprint]
- 6.7.5 1 3/4" LDH: **4 lengths in each station @ 50'** [3" footprint]
- 6.7.6 1 1/8" LDH: **4 lengths in each station @ 50'** [2" footprint]

6.8 Items to be located in this space (from current inventory):
- 6.8.1 **same as above**

6.9 Additional items (not in current inventory):
- 6.9.1 **None**

6.10 Adjacencies**: Apparatus floor**

6.11 Comments: **Two tier rack, not three**

6.12 Size: **29** sq ft

7 Work Room

7.1 Use: **We currently do not have a work storage room**

7.2 Mechanic: **No**; Type of work: **Minor repairs by working group, and training officer assembling a prop**

7.3 Workbench: **Yes**

7.4 Tool storage: **Yes**

7.5 Stationary power tools: **No**

7.6 Air: **Yes**

7.7 Water/Sink: **Yes**

7.8 Flammable Storage : **Yes**

7.9 Security: **Lockable**

7.10 Adjacencies: **Apparatus bay**

7.11 Comments: **CMU walls**

7.12 Size: **261** sq ft

8 DeCon/Laundry

8.1 Operational Comments: **Allow for decon of personal and gross decon of equipment**

8.2 **Currently in the apparatus bay**

8.3 Sink: **Yes** ; Foot Pedal: **No** ; Number of sink chambers: **two**

8.4 Gear washer/extractor: **Yes, 60 lb capacity**

8.5 Gear dryer: **Yes – DryGear Pro 3**

8.6 Ventilated gear racks: **No**

8.7 Residential type clothes washer & dryer: **Yes**

8.8 Drench shower: **Yes**

8.9 Backboard/Etc. cleaning: **Yes**

8.10 Holding tank: **No**

8.11 Adjacencies: **bay, and near an exterior door**

8.12 Comments: **Incorporate future EMS Decon**

8.13 Size: **294** sq ft

9 Hazardous Waste Storage

9.1 Operational Comments: **Currently none**

9.2 Location: **Under mezzanine staircase**

9.3 Comments: **Containment floor, polymer door & frame**

9.4 Size: **12** sq ft

10 SCBA Compressor Room (Split Design) (see 01A for plan)

10.1 Air compressor size: **TBD**

10.2 Sound attenuation panels: **No**

10.3 External feed lines: **Yes**

10.4 Cascade: **Yes**

10.5 Oxygen Generator: **No**

10.6 House Air Compressor: **Yes**

10.7 Location: **On Mezzanine**

10.8 Security: **N/A**

10.9 Adjacencies: **N/A**

10.10 Comments: **Needs adequate ventilation to dissipate heat**

10.11 Size: **143** sq ft

11 SCBA Fill Station Room

11.1 "Public" access: **No**

11.2 Sink: **_Yes**

11.3 Filling station: **Yes**

11.4 SCBA storage: **Yes**

11.5 SCBA repair: **SCBA repair is done by an outside vendor**

11.6 Air Bottles – Size & Quantity: **20, 4500psi -**

11.7 Back Packs – Size & Quantity: **6**

11.8 Oxygen Generator: **No**

11.9 Oxygen Fill Station: **Yes**

11.10 Oxygen Bottles – Size & Quantity: **5 cylinders**

11.11 Items to be located in this space (from current inventory):

11.11.1 **5 cylinders**

11.12 Additional items (not in current inventory):

11.12.1 **SCBA pack storage**

11.13 Security: **No**

11.14 Adjacencies: **Not critical**

11.15 Comments: **Sanitary**

11.16 Size: **142** sq ft

12 Janitor's Closet

12.1 Mop Receptor: **Yes**

12.2 Slop Sink: **Yes**

12.3 Floor Machine: **Yes**

12.4 Shelving: **Yes**

12.5 Mop/Broom Rack: **Yes**

12.6 Adjacencies: **Apparatus bay**

12.7 Comments: **currently we do not have dedicated janitors closets**

12.8 Size: **80** sq ft

13 Apparatus Floor Rest Rooms

13.1 Quantity: **One per station**

13.2 Fixture: Sink, toilet & urinal? **Yes**

13.3 Shower: **No**

13.4 Lockers: **No**

13.5 Adjacencies: **Apparatus bay**

13.6 Comments: **We will need a men's, & ladies room on the 1st floor of each building**

13.7 Size: **62** sq ft

14 Patrol Room

14.1 View control: **Apron & bay**

14.2 Operational Comments:

14.2.1 **Receiving calls from police or public. Communications.**

14.3 Seating for how many: **4**

14.4 **Bunking for one**

14.5 Items:

14.5.1 Door operator switches: **yes**

14.5.2 Traffic device control: **DNA**

14.5.3 Light switches for app bay: **yes** ; Outside: **no**

14.5.4 Internal paging system: **yes**

14.5.5 Siren trigger: **no**

14.5.6 Computer equipment: **Work stations**

14.5.7 Closed Circuit TV, Phones, Weather Station: Describe: **no**

14.5.8 File cabinets: **no**

14.5.9 Wall mounted items: **television**

14.5.10 Rechargeable items (flashlights, pagers): **no**

14.5.11 Lockable storage: **no**

14.6 Items to be located in this space (from current inventory):

14.6.1 **3 ring binders, 1 map of town**

14.7 Security: **Open to personnel**

14.8 Adjacencies: **Apparatus bay**

14.9 Size: **334** sq ft

15 Training Tower

15.1 Describe: **For training**

15.2 Size: **150** sq ft for each of 2 elevations

ADMINISTRATION

16 Conference Room

16.1 Uses:

16.1.1 **Subdivision plan multi-party review**

16.1.2 **Small staff meetings**

16.2 Seat how many: **6** at table

16.3 Is there a workstation with a computer to be shared by all users: **Yes**

16.4 Items to be located in this space:

16.4.1 **Work station**

16.4.2 **Casework**

16.4.3 **White board**

16.5 Location: **Administrative area**

16.6 Security: **No**

16.7 Size: **216** sq ft

17 Administrative Assistant, Work Area & File Storage

17.1 Seat how many: **1**

17.2 Use: **Administration**

17.3 Location: **Currently on the main floor behind the patrol room**

17.4 Security: **Yes**

17.5 Adjacencies: **Entry & Chief's Office**

17.6 Comments: **Should remain accessible to the public & adjacent to Chief's Office point of public contact once they are ushered in by staff at patrol room. Locate copier, paper shredder, work surface pare down the support staff pool.**

17.7 Size: **415** sq ft

18 Chief's Office

18.1 Seat how many: **4**

18.2 Use: **Fire Chief's Office – Administration & meetings**

18.3 Location: **Main floor rear**

18.4 Security: **Yes**

18.5 Adjacencies: **Administrative assistant, and near conference room**

18.6 Comments: **accessible to the public**

18.7 Size: **187** sq ft

19 Deputy Chiefs' Office

19.1 Seat how many: **1 at desk, 2 opposite in chairs**

19.2 Use: **Manage daily shift activities. Total of 4 deputies, only one on duty at a time**

19.3 Location: **currently on the 2nd floor**

19.4 Security: **Yes**

19.5 Adjacencies: **Not critical**

19.6 Comments: **Shared by 4 deputies**

19.7 Size: **147** sq ft

20 Training Officer

20.1 Seat how many: **1**

20.2 Use: **Keep records of training and plan training evolutions**

20.3 Location: **currently doesn't exist**

20.4 Security: **Yes**

20.5 Adjacencies: **Not critical**

20.6 Size: **100** sq ft

21 Local Union Office

21.1 Seat how many: **4**

21.2 Use: **Keep Union records and conduct Executive Board meetings**

21.3 Location: **currently they function in an unused bunk room at HQ**

21.4 Security: **Yes**

21.5 Adjacencies: **Not critical**

21.6 Size: **148** sq ft

22 EMS Office

22.1 Name of Occupant: **EMS office**

22.2 Seat how many: **One**

22.3 Use: **Record keeping (hippa compliant), medical inventory control**

22.4 Security: **Yes**

22.5 Adjacencies: **Not critical**

22.6 Size: **100** sq ft

23 Fire Prevention Office and Storage

23.1 Name of Occupant: **Fire Prevention**

23.2 Seat how many: **1 at desk, w/ visitor opposite**

23.3 Is there a workstation with a computer: **Yes**

23.4 Items to be located in this space:

23.4.1 **Flat & tube files for drawings**

23.4.2 **Shelving for code books, etc.**

23.4.3 **File cabinets**

23.5 Security: **Yes**

23.6 Adjacencies: **Entry**

23.7 Comments: **Accessible to the public**

23.8 Size: **175** sq ft

24 Parade Storage

24.1 Size: **2'x 5'; or 10** sq ft

FIREFIGHTERS

25 Day Room

25.1 Uses:

25.1.1 **Cooking & eating**

25.1.2 **Relaxation & watching television**

25.2 Number of chair seating: **E1- 4, E2 & 4 - 2**

25.3 Couch: **Yes** ; seats how many: **E1 & 4 -3 E2 - No**

25.4 TV: **Yes** ; Size: **42"**

25.5 Bulletin board: **Yes**

25.6 Kitchen: **Yes**

25.7 Dining/Eating: **Shift size at HQ=7, seat 10**

25.8 Living/T-V: **Yes**

25.9 Location:2nd floor near bunking

25.10 Size: **902** sq ft

26 Firefighters' Rest Rooms

26.1 Quantity: **Two**

26.2 Showers: **No**

26.3 Lockers: **No**

26.4 Adjacencies: **Day Room**

26.5 Comments: **Sanitary, durable finishes**

26.6 Size: **68** sq ft

27 Physical Training

27.1 Equipment:

27.1.1 Cardio: **Yes**

27.1.2 Weights: **Yes**

27.1.3 Weight Machines: **Yes**

27.2 Location: **currently they are fit into each station where space allowed**

27.3 Security: **No**

27.4 Adjacencies: **Not critical**

27.5 Comments: **Integral one-person changing room**

27.6 Size: **805 sq ft @ HQ, 500 sq ft at outside houses, plus a single occupant changing room with a few ½ high lockers**

28 Bunkers Bed Rooms

28.1 Number of rooms: **9**

28.2 Beds per room: **1**

28.3 Storage: **Yes**

28.4 Desks: **Yes**

28.5 Location: **all on second floor**

28.6 Security: **access control**

28.7 Comments: **Single bed w/ 4 exterior lockers @ 20"w x 24" d x 72" h**

28.8 Size: **98** sq ft

29 Bunker's Bathrooms

29.1 Quantity: **currently 1 in each station**

29.2 Details: **Toilet, urinal sink, shower & bench**

29.3 Location: **all on second floor**

29.4 Security: **Privacy latch**

29.5 Adjacencies: **Bunking**

29.6 Comments: **Single occupant, uni-sex**

29.7 Size: **3 @ 91** sq ft

30 Bunker's Area Laundry Room

30.1 Location: **Currently None**

30.2 Adjacencies: **Near bunking**

30.3 Comments: **Front load machines**

30.4 Size: **59** sq ft

TRAINING SPACE

31 Entry Area

31.1 Trophy case: **No**

31.2 Bulletin board: **Yes**

31.3 Plaque: **Yes**

31.4 Museum Display: **Antique hand pumper**

31.5 Display Case: **Yes**

31.6 Items to be located in this

31.6.1 **Historic items**

31.7 Location**: No real public entry areas currently exists**

31.8 Size: **600+** sq ft

32 Meeting/Training Room

32.1 Intended population: **20**

32.2 Public access: **No**

32.3 Uses:

32.3.1 Department meetings: **Yes**

32.3.2 Training: **Yes**

32.3.3 Fundraising dinners: **No**

32.3.4 Political/Municipal: **No**

32.3.5 Boy Scouts or other similar groups: **No**

32.3.6 Rental: **No**

32.4 Population

32.4.1 Avg. people: **12 -16**

32.4.2 Max people: **20**

32.4.3 Frequency: **once or twice per month**

32.4.4 Seating: **At training tables**

32.5 Number of tables & size: **7**

32.6 Number of chairs: **30**

32.7 Whiteboard: **Yes** ; Size **5' x 10'**

32.8 Bulletin board: **Yes** ; Size **4' x 6'**

32.9 Projector & screen: **Yes**

32.10 Coat rack: **Yes**

32.11 Location: **Not critical**

32.12 Adjacencies: **Lobby**

32.13 Size: **460** sq ft

33 Meeting/Training Room Table & Chair Storage

33.1 Table rack quantity: **1**

33.2 Chair rack quantity: **2**

33.3 Adjacencies: **Meeting/training**

33.4 Comments: **Hard walls**

33.5 Size: **51** sq ft

34 Meeting/Training Room A/V Equipment & Training Prop Storage

34.1 Items to be located in this space

34.1.1 **Adult & infant ems dummy**

34.2 Adjacencies: **Meeting/training**

34.3 Size: **80** sq ft

MISCELLANEOUS SPACES

35 Entry Vestibules (2)

35.1 Size: **(2) @ 50** sq ft

36 House Keeping Storage

36.1 Location: **One on each floor**

36.2 Size: **(2) @ 25** sq ft

37 Janitors Closet

37.1 Mop Receptor: **Yes**

37.2 Slop Sink: **No**

37.3 Floor Machine: **Yes**

37.4 Shelving: **Yes**

37.5 Mop/Broom Rack: **Yes**

37.6 Comments: **Will also store bathroom supplies**

37.7 Size: **64** sq ft

38 File Server

38.1 Location: **No – runs off Town server**

39 Mechanical, Electrical, Plumbing, HVAC, Sprinkler, Alarm, etc.

39.1 Fuel type at site: **Gas**

39.2 Heating type in apparatus bay: **In-floor radiant**

39.3 Heating type elsewhere: **Ducted HVAC**

39.4 Building to be sprinklered: **Yes**

39.4.1 Adequate water pressure: **Yes**

39.5 Hose bibs for exterior: **Yes**

39.6 Bay lighting type: **LED**

39.7 Site lighting type: **LED**

39.8 Generator: **Yes**

39.8.1 Fuel: **TBD**

39.8.2 Location of generator: **Exterior**

39.8.3 Circuits on generator: **All**

39.9 Describe Security Type (fob?): **Yes**

39.10 Alarm: **Yes**

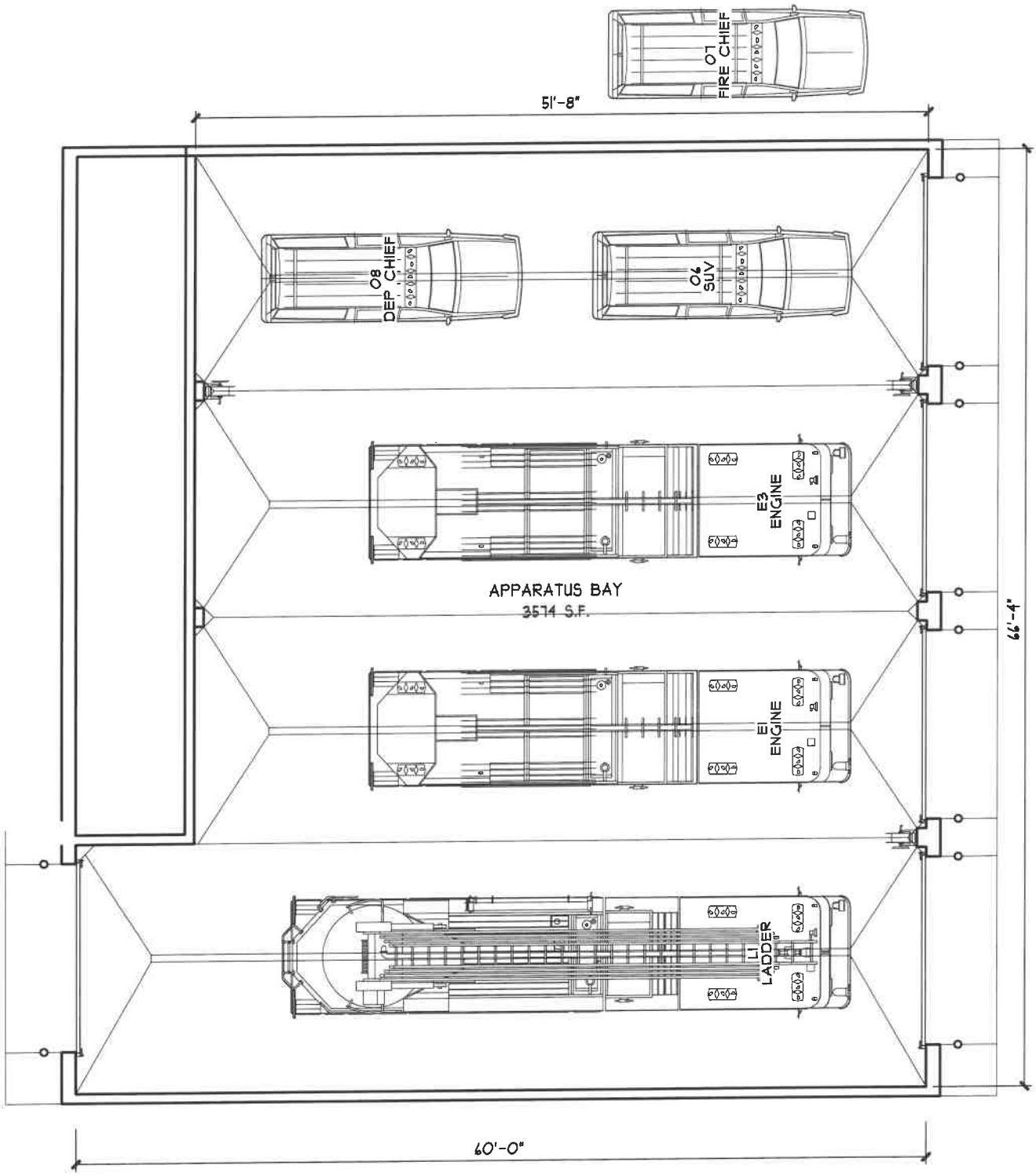
39.11 Siren: **No**

39.12 Location: **Not critical**

39.13 Size: **350** sq ft

Milton Fire HQ Space/Usage Analysis

Program Item	Room Name	Proposed Floor Area		Existing Floor Area		Area To Demolish		Floor Area To Renovate		New Construction Area	
		1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor
	Apparatus Ba										
1	Apparatus Bay	3,574		0		0		0		3,574	
	Subtotal - Apparatus	**3,574**		**0**		**0**		**0**		**3,574**	
	Firematic Support										
1.1	**Mezzanine**	**684**		**0**		-		-		**684**	
2	Storage Room #1	203		0		0		0		203	
3	Future EMS Storage	301		0		0		0		301	
4	Storage Cage on Mezzanine	~~0~~		~~0~~		~~0~~		~~0~~		~~0~~	
5	Turnout Gear	303		0		0		0		303	
6	Hose Storage	29		0		0		0		29	
7	Work Room	261		0		0		0		261	
8	DeCon Laundry	294		0		0		0		294	
9	Hazardous Waste	12		0		0		0		12	
10	SCBA Compressor on Mezzanine	~~0~~		~~0~~		~~0~~		~~0~~		~~0~~	
11	SCBA Fill Station	142		0		0		0		142	
12	Janitors Closet	80		0		0		0		80	
13	Apparatus Floor Uni-Sex ADA Rest Room	62		0		0		0		62	
14	Patrol Room	334		0		0		0		334	
15	Training Tower	150	150	0		0		0		150	
	Subtotal - Firematic Support	**2,171**		**0**		**0**		**0**		**2,171**	
	Administration										
16	Conference Room	0	216	0	0	0	0	0	0	0	216
17	Admin Assistant, Work Area & File Stor	0	415	0	0	0	0	0	0	0	415
18	Chief	0	187	0	0	0	0	0	0	0	187
19	Deputy Chiefs	0	147	0	0	0	0	0	0	0	147
20	Training Officer	0	100	0	0	0	0	0	0	0	100
21	Union	0	148	0	0	0	0	0	0	0	148
22	Future EMS	0	100	0	0	0	0	0	0	0	100
23	Fire Prevention & Storage	0	175	0	0	0	0	0	0	0	175
24	Parade Storage	0	10	0	0	0	0	0	0	0	10
	Subtotal - Administration	**0**	**1,498**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,498**
	Firefighters										
25	Day Room	0	902	0	0	0	0	0	0	0	902
26	Firefighter's Rest Rooms (2 @ 68 sf)	0	136	0	0	0	0	0	0	0	136
27	Physical Training	0	805	0	0	0	0	0	0	0	805
28	Bunkers Bedrooms (9 @ 98 sf)	0	882	0	0	0	0	0	0	0	882
29	Bunkers Bathrooms (3 @ 91 sf)	0	273	0	0	0	0	0	0	0	273
30	Bunkers Area Laundry	0	59	0	0	0	0	0	0	0	59
	Subtotal - Firefighters	**0**	**3,057**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,057**
	Training										
31	Entry Area	600	150	0	0	0	0	0	0	600	150
32	Meeting/Training Room	0	460	0	0	0	0	0	0	0	460
33	Meeting/Training Room Table & Chairs	0	51	0	0	0	0	0	0	0	51
34	Meeting/Training Room A/V & Props	0	80	0	0	0	0	0	0	0	80
	Subtotal - Training	**600**	**741**	**0**	**0**	**0**	**0**	**0**	**0**	**600**	**741**
	Miscellaneous Space										
35	(2) Entry Vestibules	100	0	0	0	0	0	0	0	100	0
36	Housekeeping Storage	50	50	0	0	0	0	0	0	50	50
37	Janitors Closet	64	64	0	0	0	0	0	0	64	64
38	File Server	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	0
39	Mechanical/Electrical	350	50	0	0	0	0	0	0	350	50
	Subtotal - Miscellaneous Spaces	**564**	**164**	**0**	**0**	**0**	**0**	**0**	**0**	**564**	**164**
	Vertical Circulation										
40	(2) Stairwells (area per floor)	356	364	2	2	1	1	1	1	355	363
41	Elevator (area per floor)	58	58	0	0	0	0	0	0	58	58
42	Elevator Equipment Room	52	0	0	0	0	0	0	0	52	0
43	Elevator Foyer	80	80	0	0	0	0	0	0	80	80
	Subtotal - Vertical Circulation	**546**	**502**	**2**	**2**	**1**	**1**	**1**	**1**	**545**	**501**
	Area Subtotals										
	Bay	**3,574**		**0**		**0**		**0**		**3,574**	
	Firematic Support	**2,171**	**150**	**0**		**0**		**0**		**2,171**	
	Mezzanine	**684**		**0**		**0**		**0**		**684**	
	Office & Living	**1,710**	**5,962**	**2**	**2**	**1**	**1**	**1**	**1**	**1,709**	**5,961**
	Walls & Circulation										
	Apparatus Bay Walls @ 5%	179		0		0		0		179	
	Firematic Support Walls @ 15%	326		0		0		0		326	
	Firematic Support Circulation @ 15%	326		0		0		0		326	
	Office Area Walls @ 15%	257	894	0	0	0	0	0	0	256	894
	Office Area Circulation @ 20%	342	1,192	0	0	0	0	0	0	342	1,192
	As-Built Adjustment			0	0						
	Subtotal - Walls & Circulation	**1,429**	**2,087**	**1**	**1**	**0**	**0**	**0**	**0**	**1,428**	**2,086**
	Total By Floor>>	**10,114**	**8,701**	**2**	**2**	**2**	**2**	**2**	**2**	**10,111**	**8,548**
	Total By Category>>	**18,814**		**4**		**5**		**5**		**18,159**	
	Footprint>>	**9,430**		**2**		**2**		**2**		**9,427**	



MITCHELL ASSOCIATES ARCHITECTS

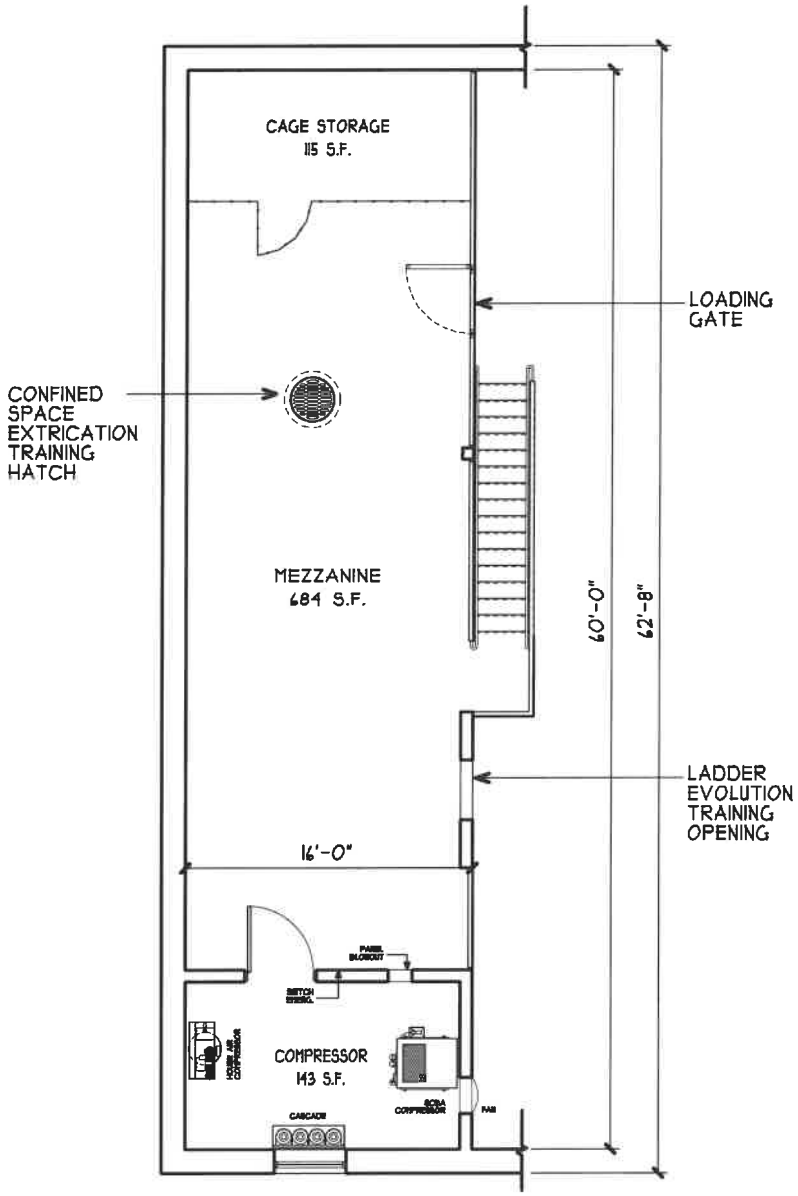
HQ APPARATUS BAY

SCALE: 3/32" = 1'-0" | DATE: 11/12/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\1 - Apparatus Bay\01 - HQ Apparatus Bay

01

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

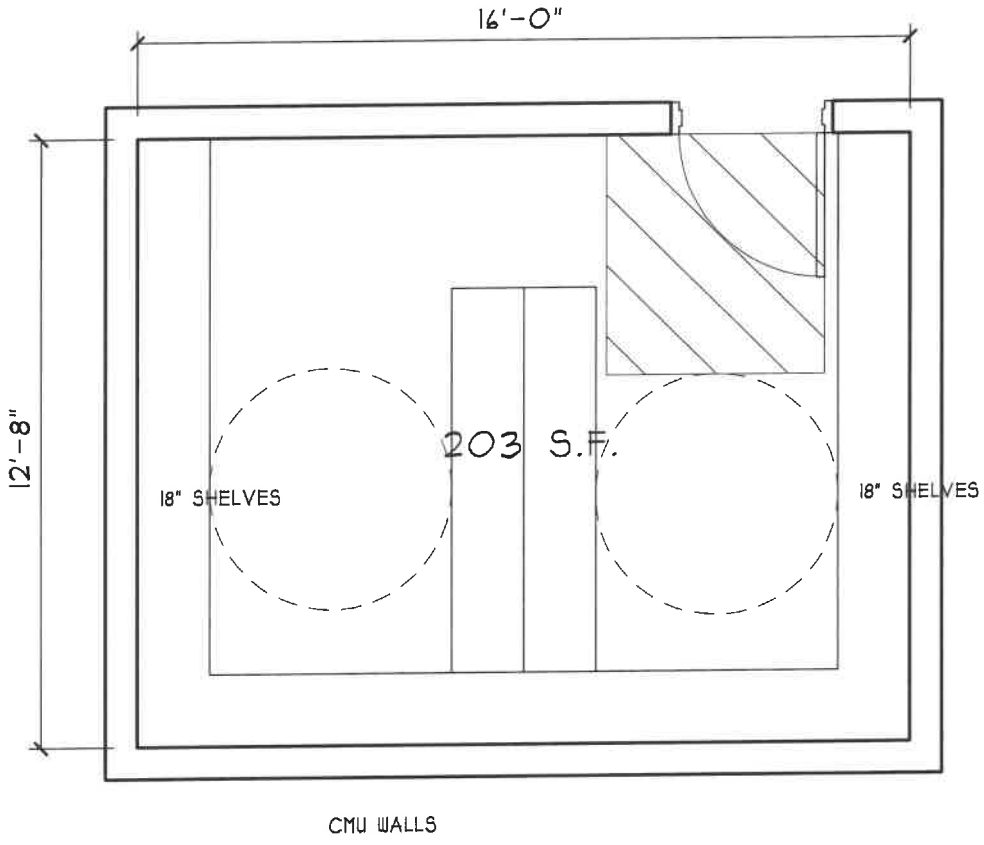
MEZZANINE w/ COMPRESSOR RM

SCALE: 3/32" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\1 - Apparatus Bay\1A - Mezzanine w Compressor Room

1A

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

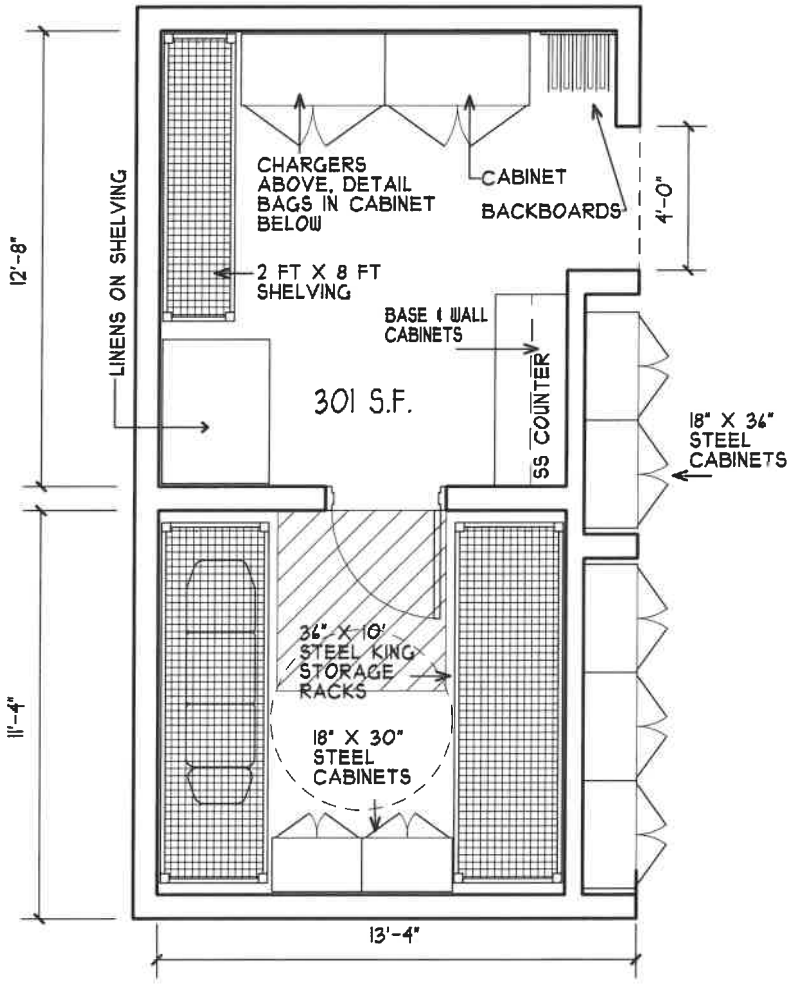
STORAGE ROOM #1

SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\2 - Storage Room #1

02

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

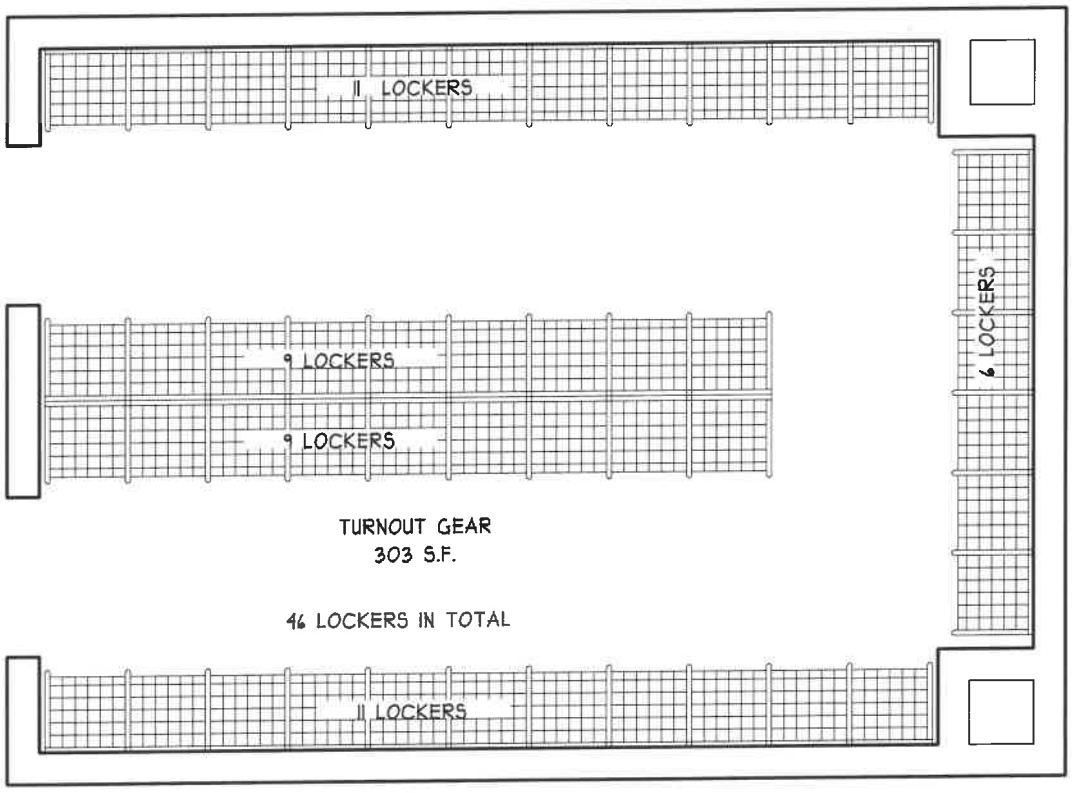
STORAGE ROOM #2

SCALE: 3/16" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\Storage Room #2

03

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

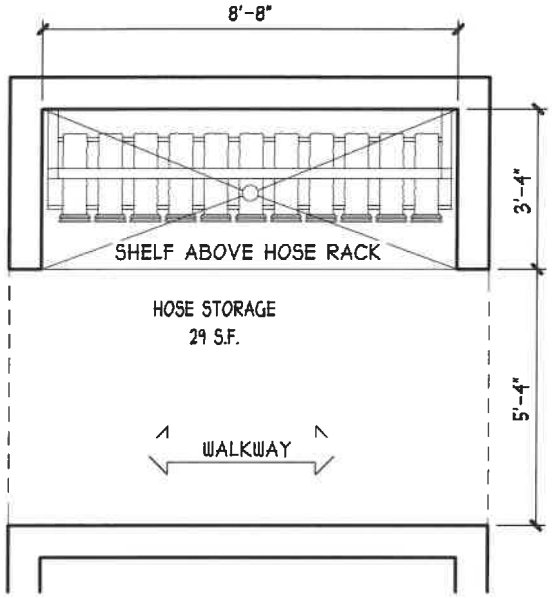
TURNOUT GEAR FOR 46

SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\05 - Turnout Gear - Main Station

05

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

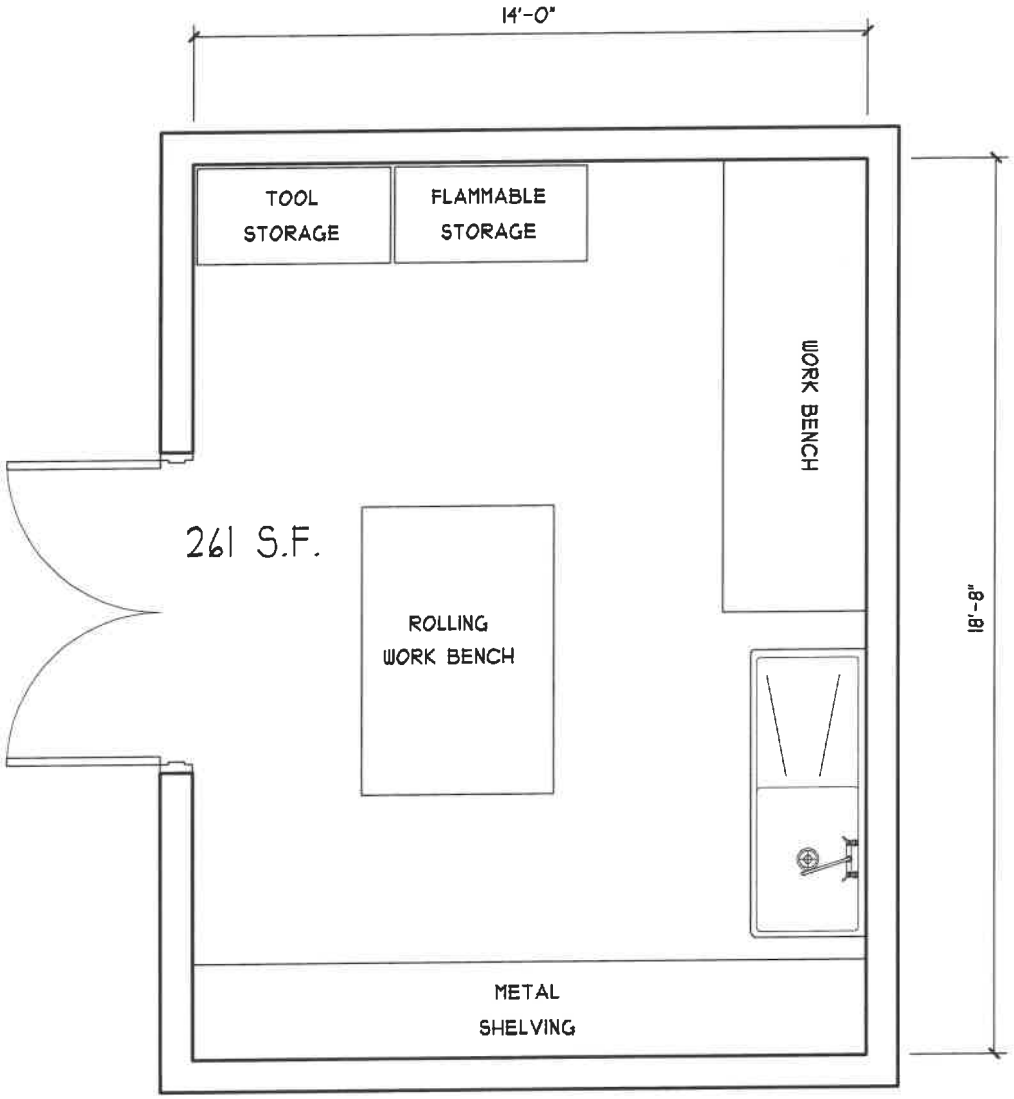
HOSE STORAGE

SCALE: 1/4" = 1'-0" | DATE: 10/20/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\06 - Hose Storage

06

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

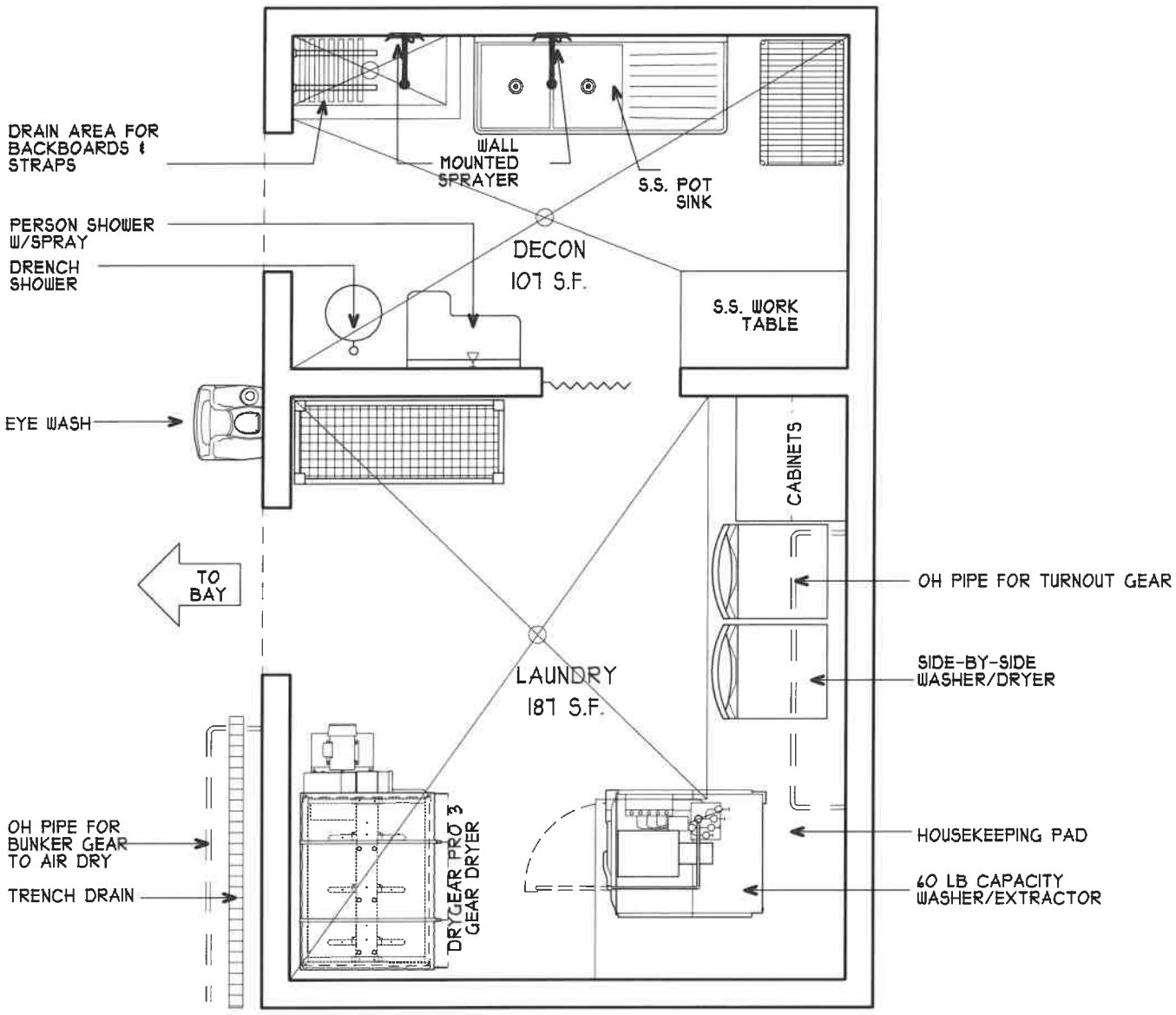
WORKROOM

SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firesatic Support\1 - Work Room 261

07

ROOM #



TOTAL AREA = 294 S.F.

MITCHELL ASSOCIATES ARCHITECTS

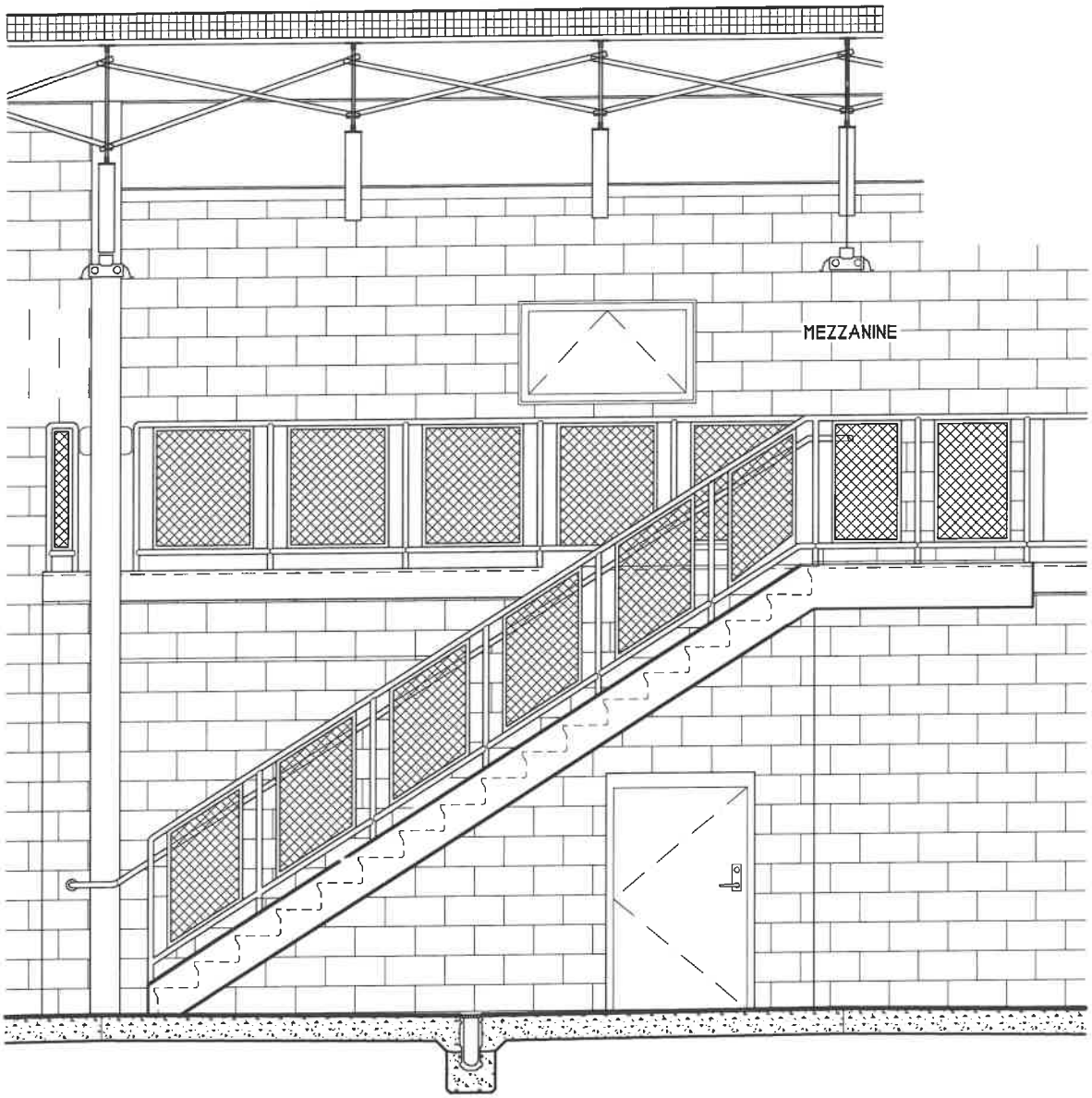
DECON / LAUNDRY

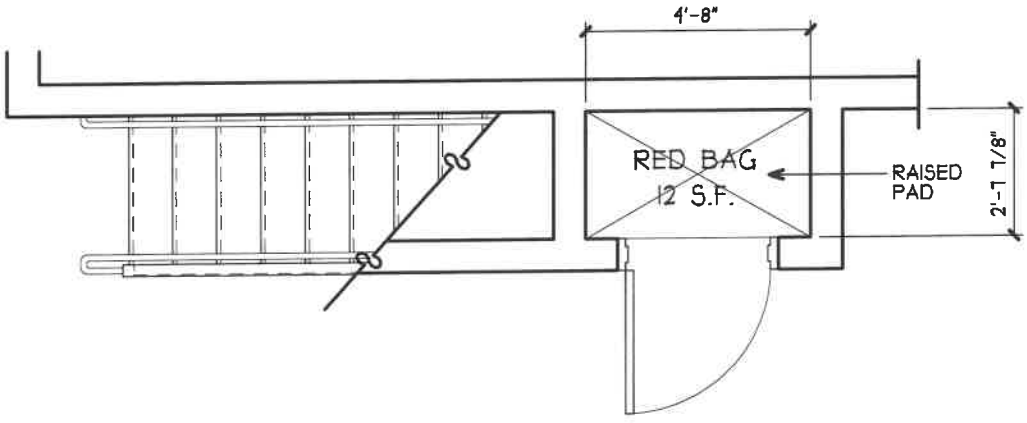
SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\08 - Decon Laundry

08

ROOM #





MITCHELL ASSOCIATES ARCHITECTS

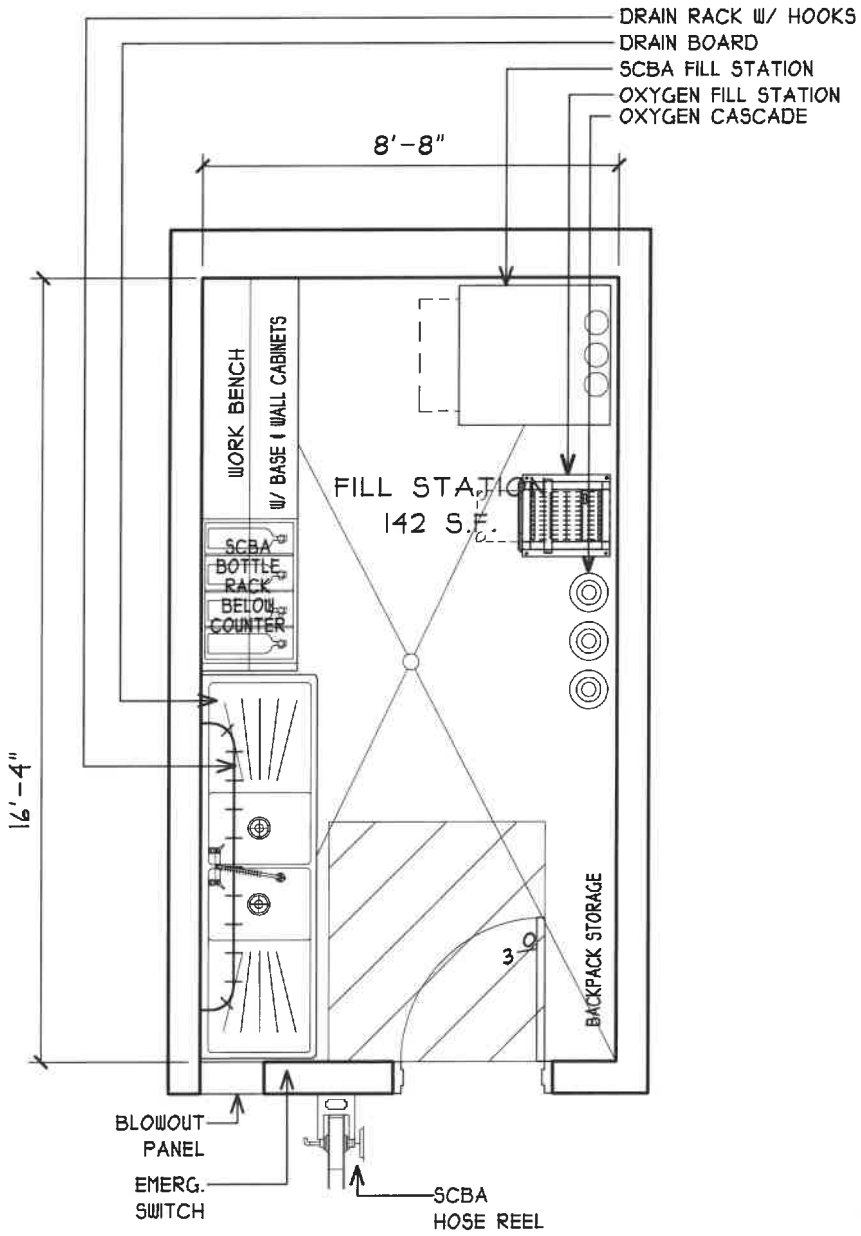
HAZARDOUS WASTE STORAGE

SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\9 - Hazardous Waste Storage

09

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

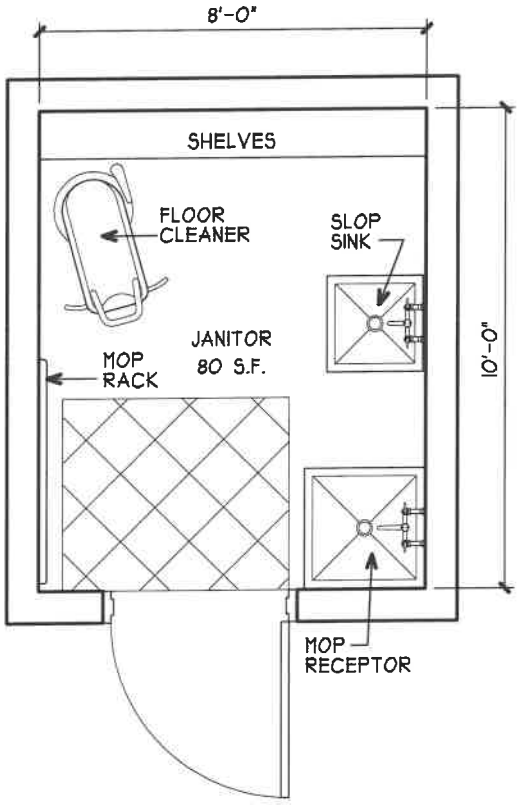
SCBA FILL STATION

SCALE: 1/4" = 1'-0" | DATE: 10/20/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\11 - SCBA Fill Station

11

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

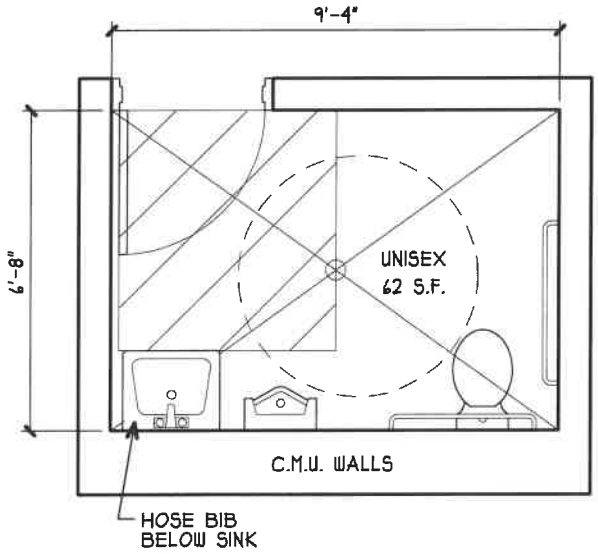
JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 10/20/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\12 - Janitor

12

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

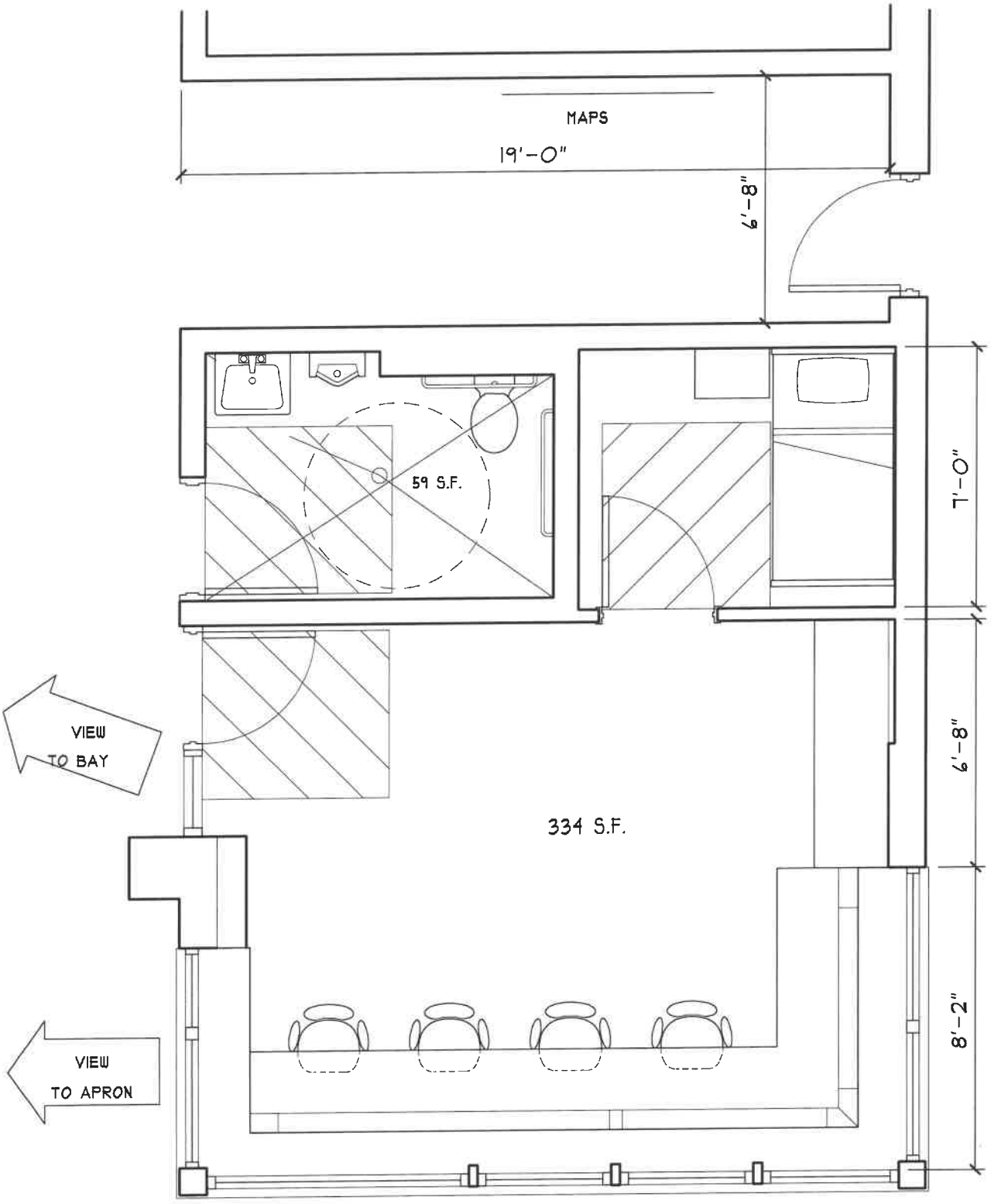
ADA UNISEX BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 10/19/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Frematic Support\15 - Bathroom

15

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

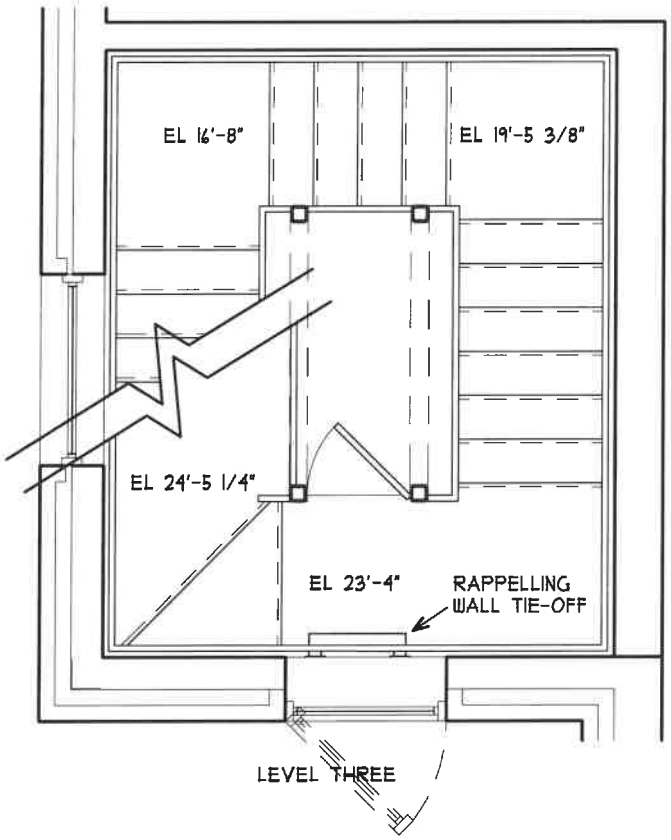
PATROL ROOM

SCALE: 1/4" = 1'-0" | DATE: 10/20/2015

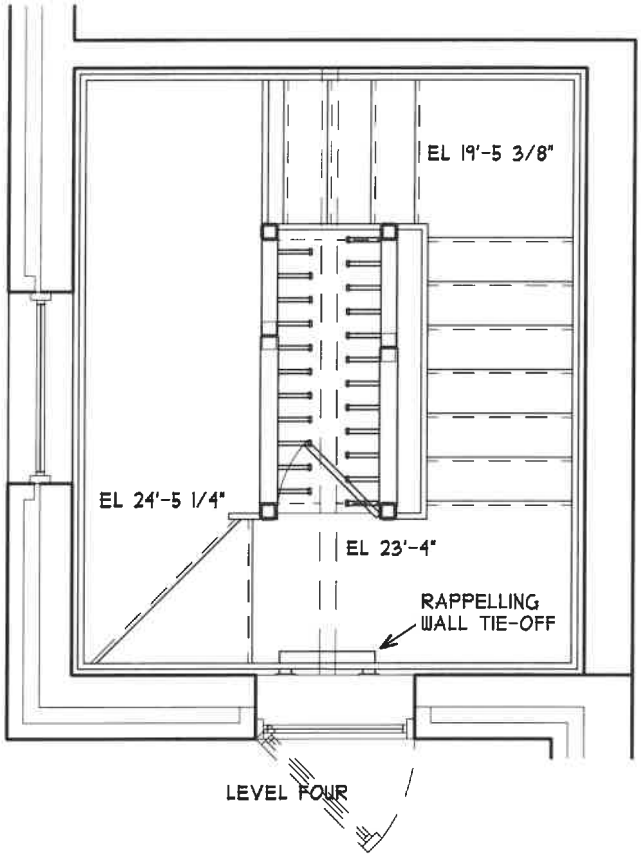
S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firestatic Support\14 - Patrol Room

14

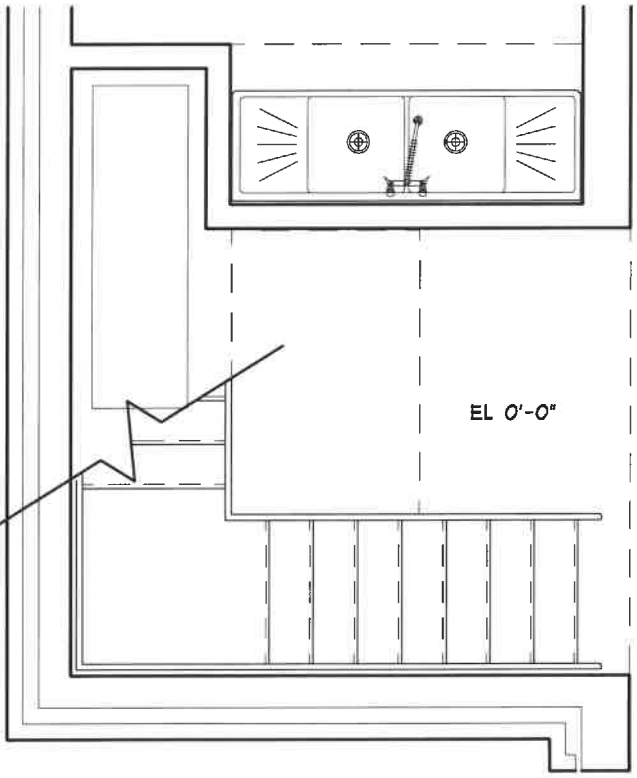
ROOM #



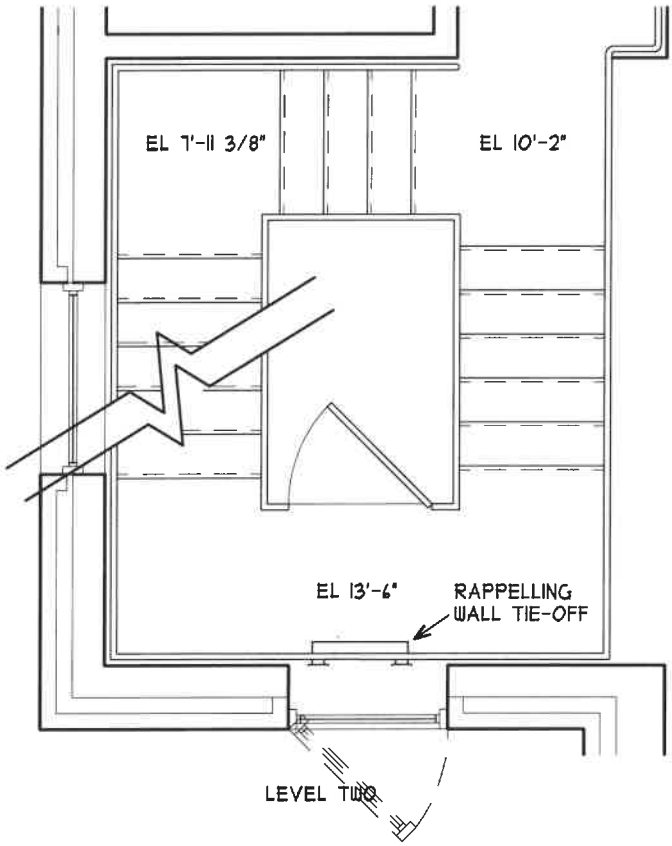
LEVEL THREE



LEVEL FOUR



LEVEL ONE



LEVEL TWO

MITCHELL ASSOCIATES ARCHITECTS

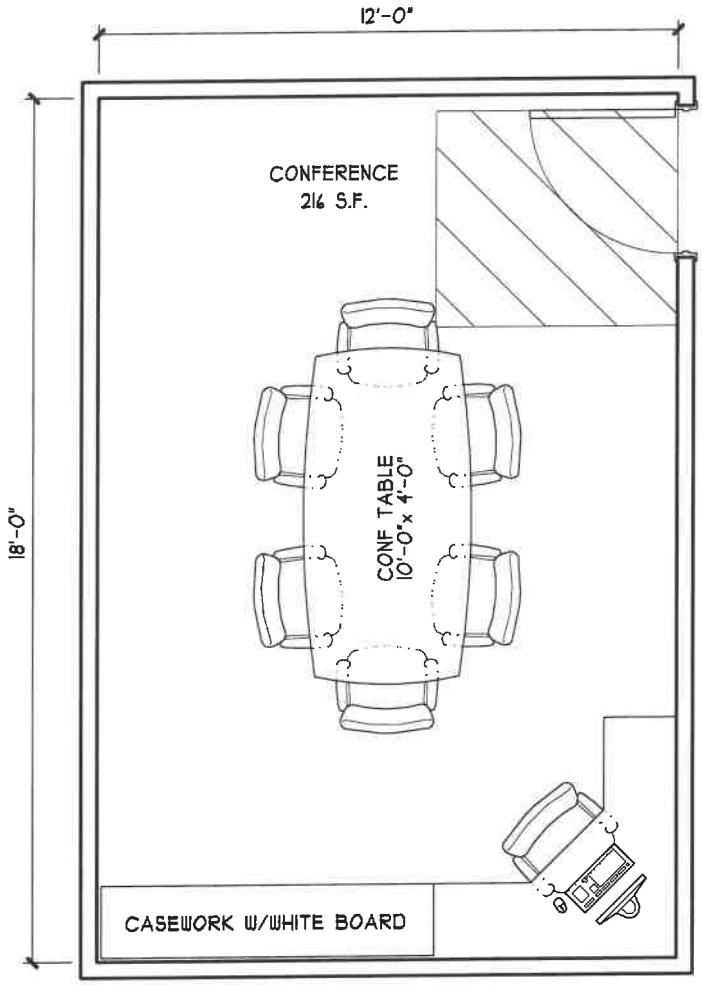
TRAINING TOWER

SCALE: 1/4" = 1'-0" | DATE: 11/12/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\2 - Firematic Support\15 - Training Tower

15

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

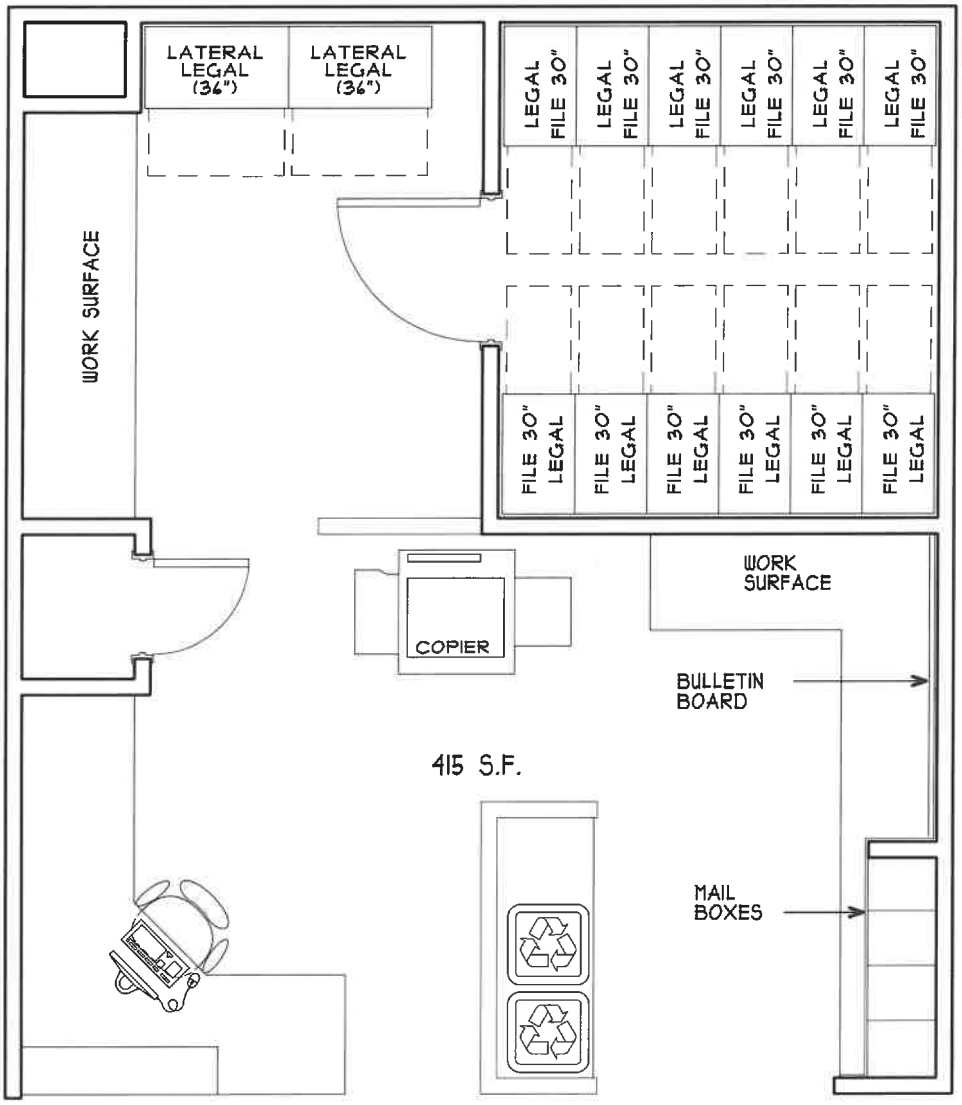
CONFERENCE ROOM

SCALE: 1/4" = 1'-0" | DATE: 10/28/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\16 - Conference

16

ROOM #



MA MITCHELL ASSOCIATES ARCHITECTS

ADMIN ASSISTANT & FILE STOR

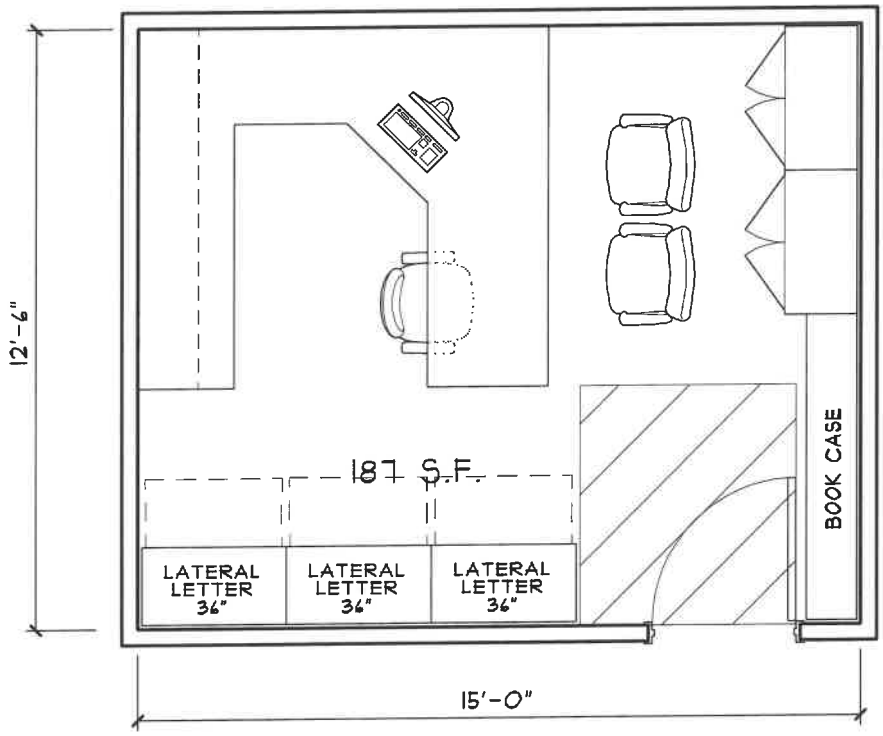
SCALE: 1/4"

DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\17 - Administrative Assistant

17

ROOM #



MA MITCHELL ASSOCIATES ARCHITECTS

CHIEF

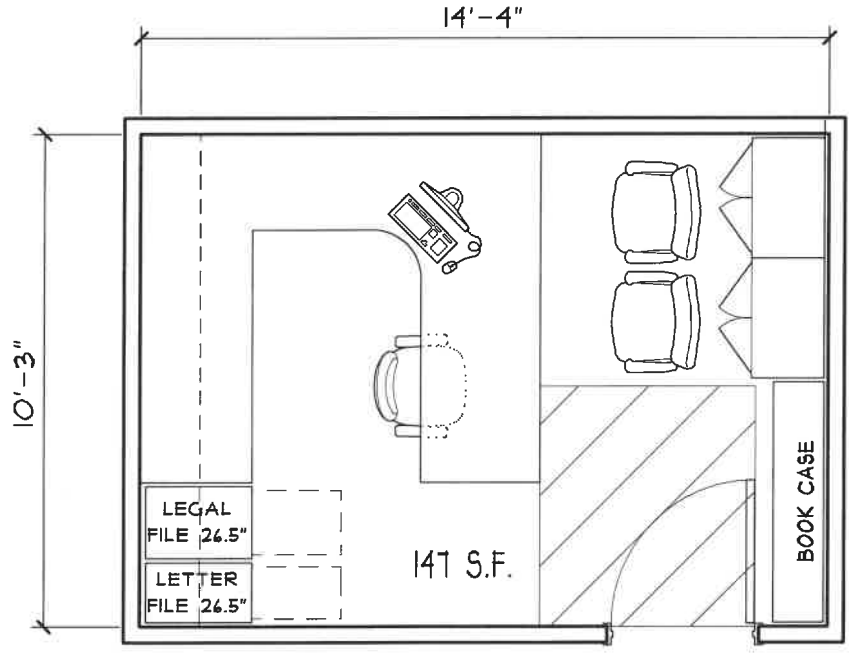
SCALE: 1/4"

DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\18 - Chief

18

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

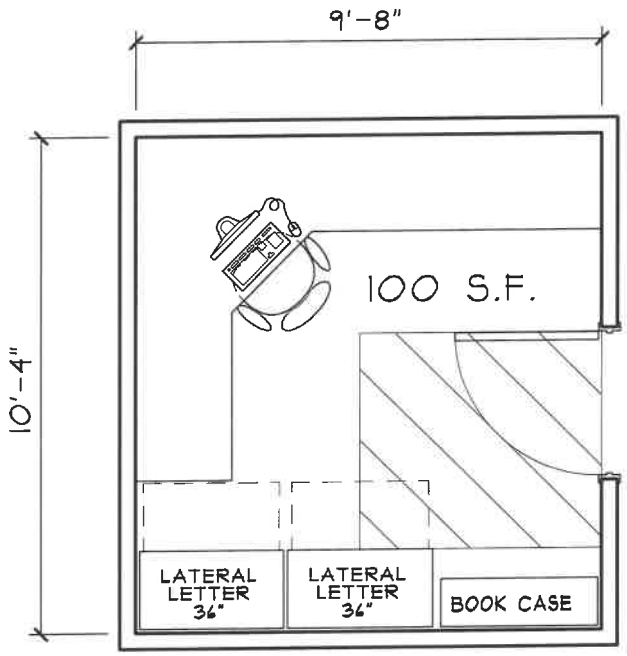
DEPUTY CHIEFS

SCALE: 1/4" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\19 - Deputy Chiefs

19

ROOM #



MA MITCHELL ASSOCIATES ARCHITECTS

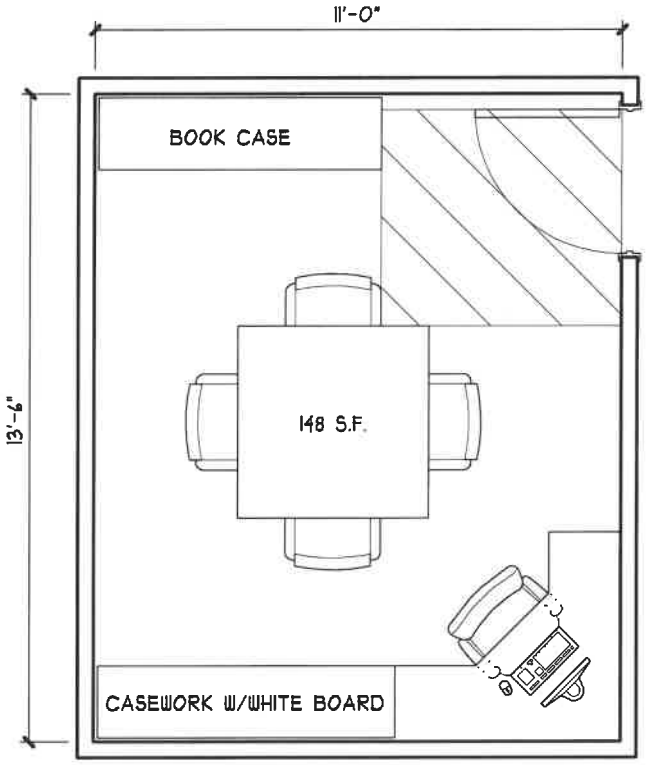
TRAINING OFFICER

SCALE: 1/4" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\20 - Training Officer

20

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

LOCAL UNION OFFICE

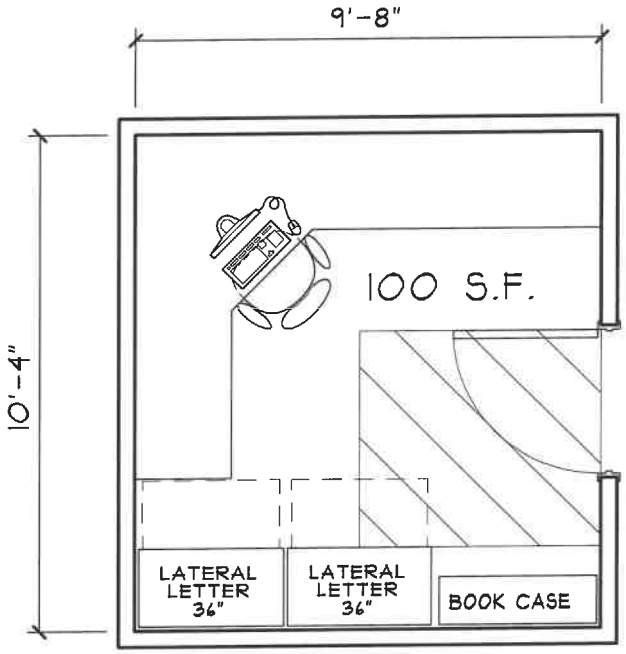
SCALE: 1/4" = 1'-0"

DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\21 - Union Office

21

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

EMS OFFICE

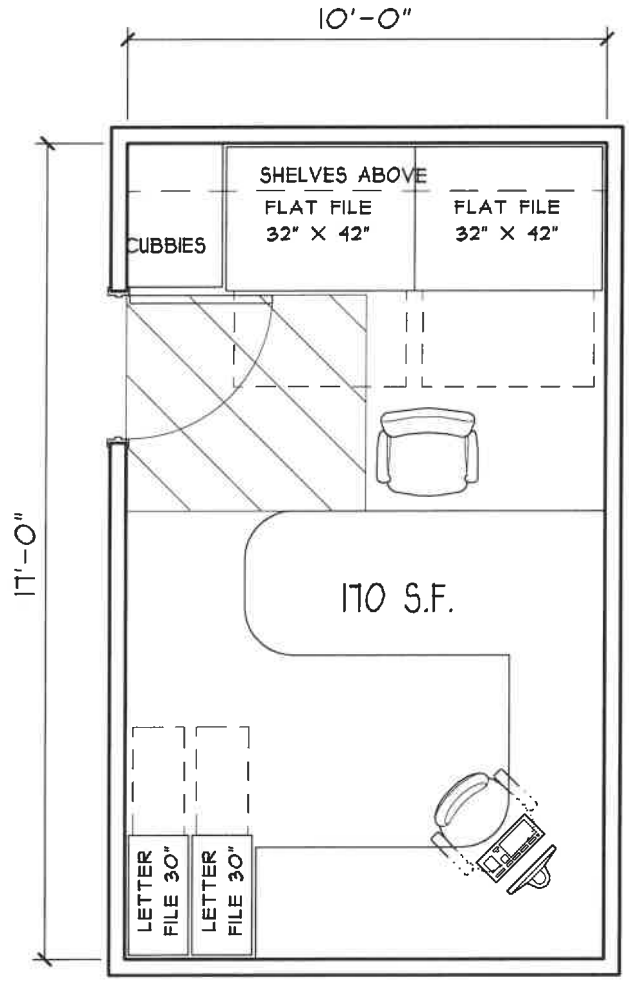
SCALE: 1/4"

DATE: 10/28/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\22 - EMS Office

22

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

FIRE PREVENTION

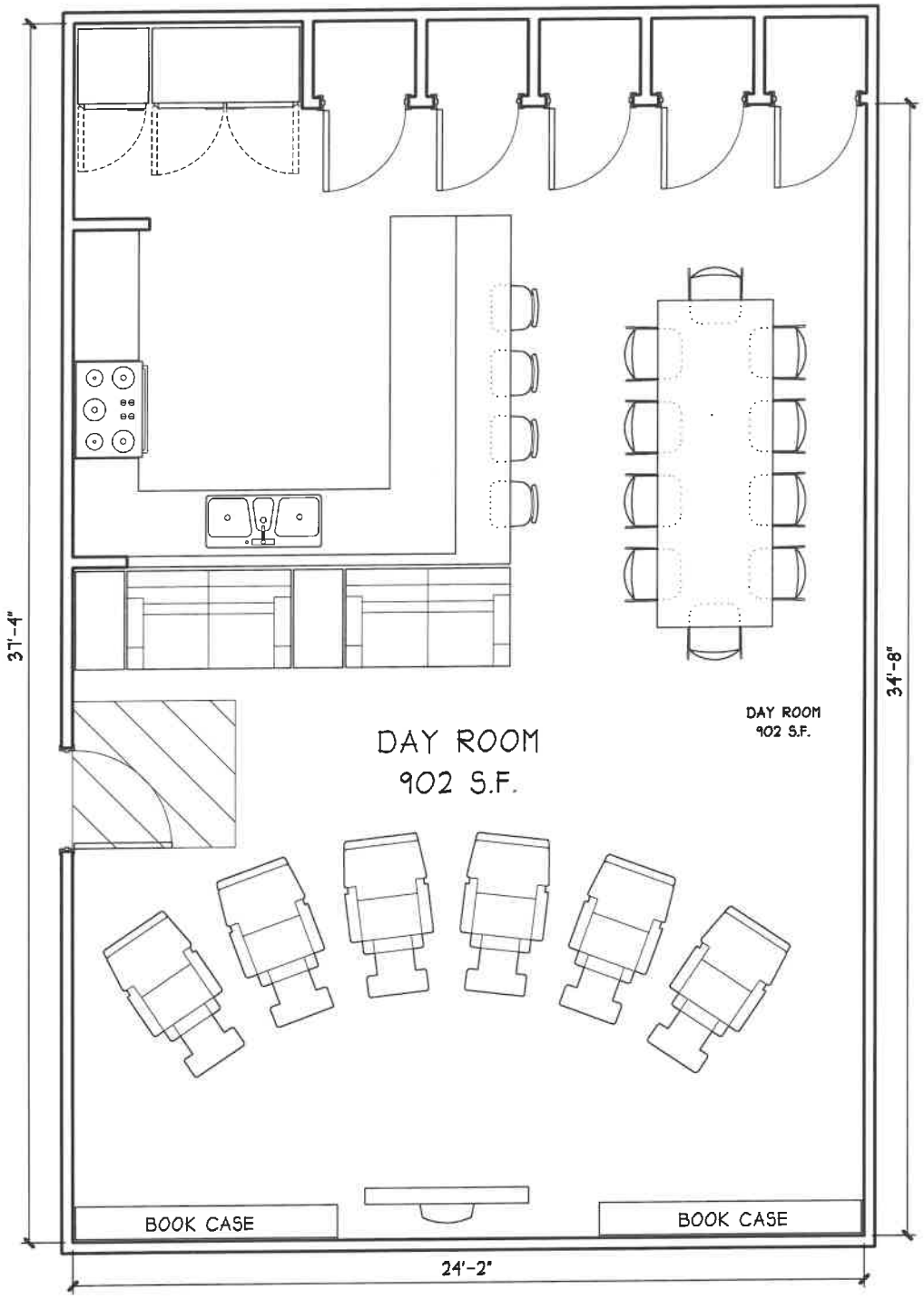
SCALE: 1/4"

DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\3 - Administration\23 - Fire Prevention

23

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

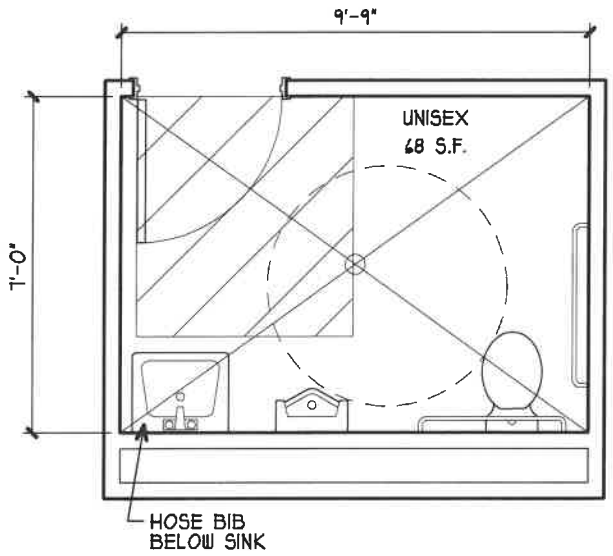
DAY ROOM

SCALE: 3/16" = 1'-0" | DATE: 11/12/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\4 - Firefighters\25 - Day Room

25

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

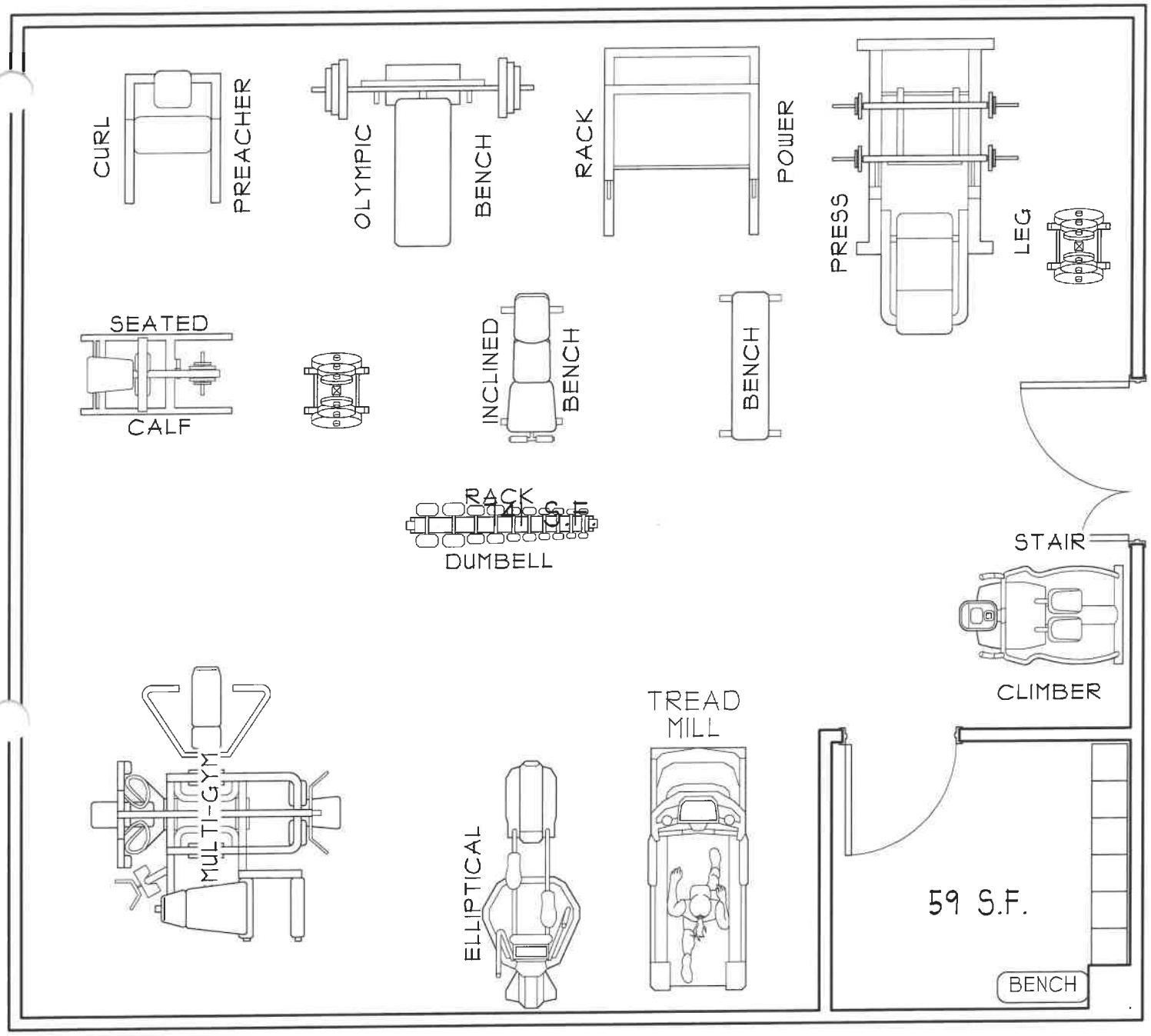
FIREFIGHTER'S REST ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/12/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\4 - Firefighters\26 - Firefighter's Rest Room

26

ROOM #



TOTAL W/ LOCKER ROOM
805 S.F.

MITCHELL ASSOCIATES ARCHITECTS

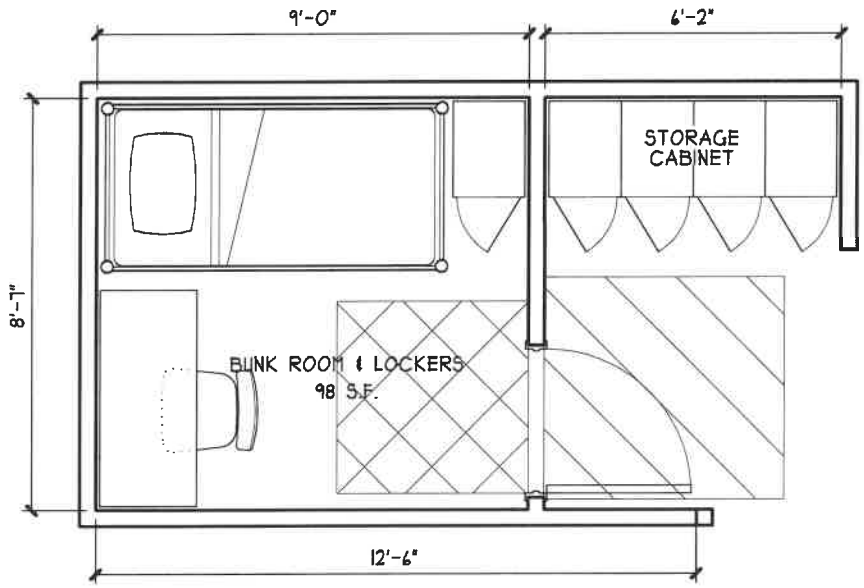
PHYSICAL TRAINING

SCALE: 1/4" = 1'-0" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\1 - Firefighters\21 - Physical Training

21

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

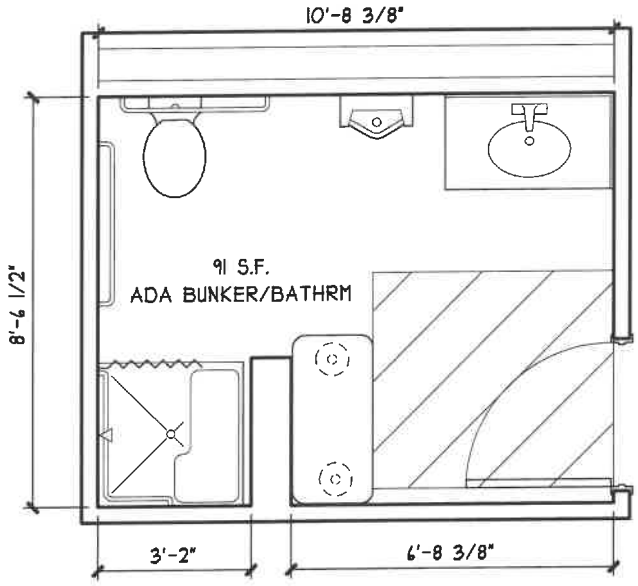
BUNK ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\HQ\Individual Rooms\1 - Firefighters\28 - Firefighters Bedroom

28

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

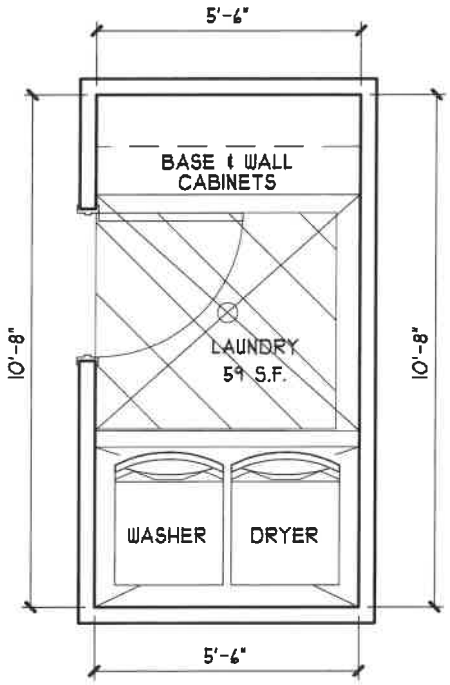
BUNKER'S BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\1 - Firefighters\29 - Bunker's Bathroom

29

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

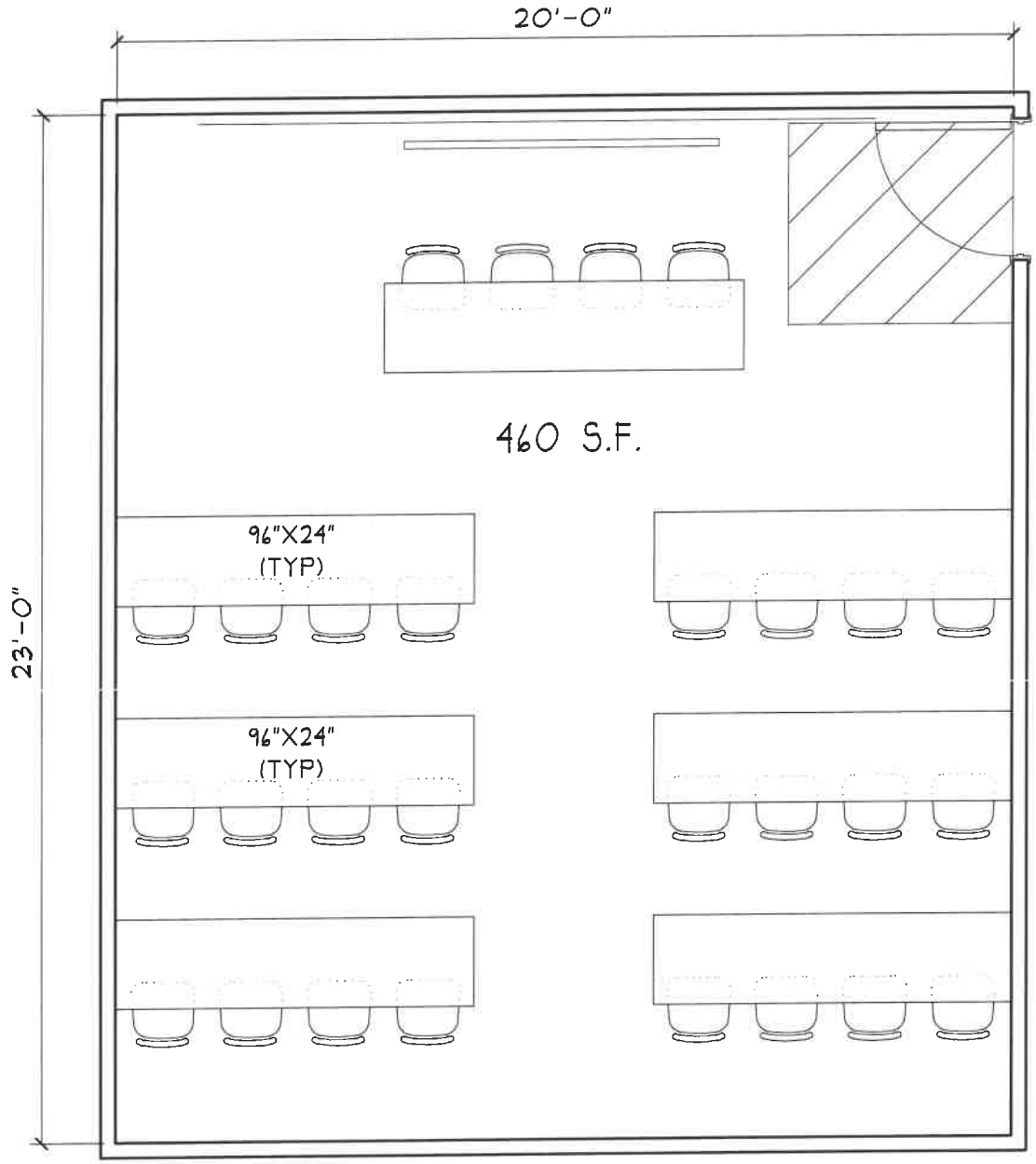
BUNKERS' LAUNDRY

SCALE: 1/4" = 1'-0" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\4 - Firefighters\30 - Bunker's Laundry

30

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

MEETING/TRAINING

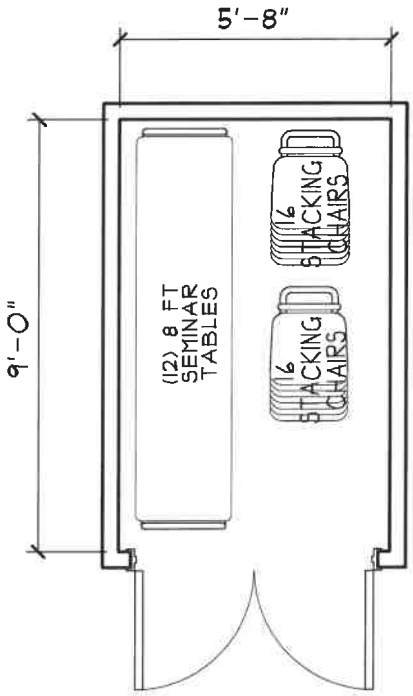
SCALE: 1/4" = 1'-0" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\5 - Training\32 - Meeting-Training

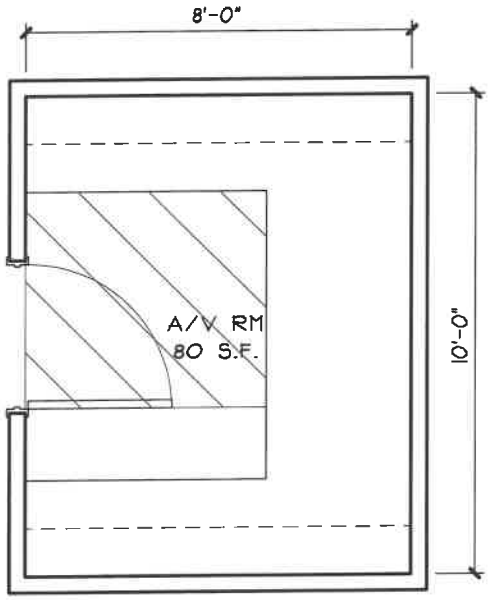
32

ROOM #

51 S.F.



MITCHELL ASSOCIATES ARCHITECTS	TABLE AND CHAIR STORAGE	33
	SCALE: 1/4" = 1'-0" | DATE: 11/2/2015	
	S:\J Drive\Kaestle Boos\Milton\Individual Rooms\5 - Training\33 - Tables & Chairs	ROOM #



MITCHELL ASSOCIATES ARCHITECTS

A/V & TRAINING PROPS

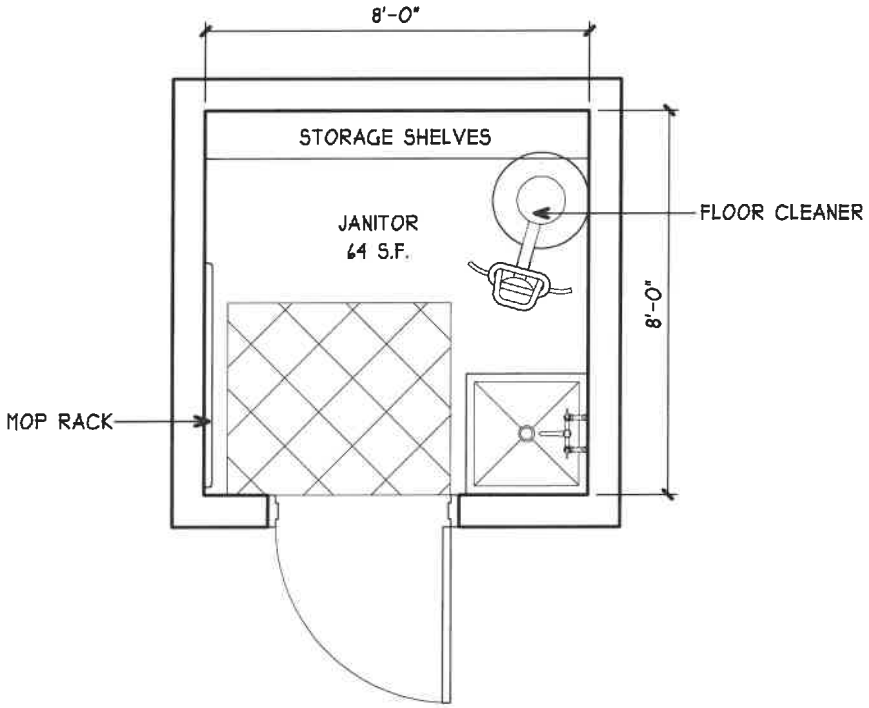
SCALE: 1/4" = 1'-0"

DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\5 - Training\34 - AV & Training Props

34

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 11/2/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\6 - Miscellaneous\31 - Janitor

31

ROOM #

– BUILDING CODE ANALYSIS –

APPLICABILITY

This analysis reviews the existing Milton Fire Department – Engine #2 located at 525 Adams Street in Milton, MA, with regard to the Massachusetts State Building Codes ("Code") for new construction. The 8th Edition of the State Building Code consists, in part, of the 2009 International Building Code (IBC) and the 2009 International Existing Building Code (IEBC) with Massachusetts Amendments to these codes. Codes used in this analysis are:

International Building Code (IBC, 2009)
International Existing Building Code (IEBC, 2009)
International Energy Conservation Code (IECC, 2012)
Massachusetts State Building Code Amendments (780 CMR 8th Edition)
Architectural Access Board Rules and Regulations (AAB, 521 CMR, 2006)
Uniform State Plumbing Code (248 CMR)

Code compliance with regard to mechanical systems, including electrical, plumbing, fire protection systems and sitework are reviewed in separate sections of this study.

Upgrades and corrections to existing structures undergoing renovations are limited to specific items under the IEBC. During renovations, not all existing safety issues and non-compliant conditions are required to be corrected; typically only items within each renovated area are required to be corrected. However, non-compliant conditions at stairs and egress elements, fire rating separations, accessibility, and fire protection (sprinklers) are required to be corrected or provided new as required by the IBC. Because the building was constructed 1952, existing conditions which may be allowed to remain under the requirements of the IEBC may also be in conflict with current life safety codes and standards. Over time, since the original construction of this building, life safety standards have been improved in reaction to tragic events. *In order to evaluate life safety conditions in accordance with the most current intent of these codes, the current IBC and Fire Safety codes and regulations are used as a basis for judging compliance.*

Correcting existing conditions to comply with current Accessibility and Fire Protection requirements is required when the value of the work exceeds the cost or scope triggers stated in the AAB and the Fire Code.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area *or* in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available. A major alteration is 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, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of M.G.L., any work performed, even if under separate contracts or building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 33% limit.
- Cost of future building projects requested for permit within 5 years, before or after the permit date for this project, will be considered part of the project costs and may trigger compliance.

Accessibility in public buildings is regulated by 521 CMR, which is enforced by the Massachusetts Architectural Access Board (MA AAB) and the Building Inspector of the municipality. 521 CMR, as issued in 2006, is used for this review.

MA AAB 5.1 Definitions states:

> "Public Buildings: A building privately or publicly financed that is open to and used by the public",

MA AAB 11.1 Commercial Buildings states:

> "The design of commercial *buildings* shall comply with 521 CMR, except as specified or modified in 521 CMR 11.00. Commercial *buildings* are *public buildings* … as well as city and town … *facilities*."

The Fire Facility is considered a public and commercial building and so is required to be accessible in accordance with 521 CMR.

Currently, the AAB regulates only areas and conditions accessed by the "public"; areas occupied solely by staff are not included in the regulation. Staff areas are included in the ADA Accessibility Guidelines as part of federal law, but these are not directly enforceable as part of the Building Code. However, in an effort to unify compliance requirements with the recently adopted IBC as the State Building Code, the AAB will be revising the regulation to include staff areas as well as public areas. In anticipation of the release of the revised AAB regulations, all discussions below regarding accessibility will include compliance of staff areas.

Applicability of the AAB Regulations for renovations of existing buildings is based on the value of the renovations as a percentage of the current assessed value of the building (100% valuation). According to AAB 3.3, partial compliance is required when the value of the renovations exceeds $100,000 and full compliance of the entire facility is required when the value of the renovations exceeds 30% of the assessed value of the building. An exception to this rule is for maintenance work on MEP systems, sprinkler systems, roofs, replacement windows, masonry repair, site utilities, landscaping, and septic system which in aggregate is less than $500,000.

As stated in AAB 3.3 (paraphrased):

> "3.3 EXISTING BUILDINGS
> All additions to, reconstruction, remodeling, and alterations or repairs of existing public buildings or facilities …shall be governed by all applicable subsections in 521 CMR.

3.3.1…,

a. if the work costs less than $100,000, then only the work being performed is required to comply with 521 CMR…,

b. if the work costs $100,000 or more, then the work being performed is required to comply with 521 CMR. In addition, an accessible public entrance and an accessible toilet room, telephone, drinking fountain (if toilets, telephones and drinking fountains are provided) shall also be provided in compliance with 521 CMR…,

3.3.2 If the work performed, including the exempted work, amounts to 30% or more of the full and fair cash value (see 521 CMR 5.00) of the building the entire building is required to comply with 521 CMR. "

Also, according to AAB 3.5, any work performed, even if under separate contracts or building permits, within a 3 year period must be included in the aggregate construction cost. This includes sitework and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 30% limit.
- Cost of future building projects requested for permit within 3 years of the permit date for this project will be considered part of the project costs and may trigger compliance.

The building and site must be reviewed together and may affect compliance in areas not anticipated to be updated to comply.

- If a building's renovation cost exceeds 30% of the building assessed value, then the *entire building and site* must be made to comply;

Energy conservation, as required by the IECC for new construction, is not required for renovations to existing structures under the IEBC. However, any new elements or alterations to the exterior building envelope, such as new windows or new roofing, must comply to the greatest degree possible. As stated in the IEBC Alteration Level 3 Section 808 Energy Conservation "*Essentially, the entire building is not require to meet the energy provisions, but only improvement in the energy performance of the building is intended to be achieved by making the new elements meet the IECC...*". Overall upgrade of the exterior envelope of this building is not required or recommended and so is not reviewed as part of this study, except for elements recommended to be replaced.

General Information

According to the Town of Milton Assessors Department, the East Fire Station – Engine 2, is located at 525 Adams Street; construction of the facility completed in 1952. The area of the building is listed on the Assessor's Card as 3,514 total gross square feet (GSF).

The current assessed value of the Adams Street Station (structure only) is $175,000.

- The threshold value of the cost trigger for accessibility (full compliance) is 30% of this value less the cost of permitted work within the last 3 years.
- The threshold value of the cost trigger for fire protection is 33% of this value less the cost of permitted work within the last 5 years.

These cost thresholds are shown below. The cause of the renovation or the source of the funding is not relevant, only the total value of cost for renovations, including demolition. Any work within these time limits which exceed these cost triggers will require that the entire structure and site be modified to be compliant. Because each threshold is based on the aggregate value of recent work (requiring a building permit) over the most recent 3 or 5 years, respectively, these threshold values are dynamic and will

change based on the aggregate value of recent projects over time. The values below are only a guide and should be recalculated when a new renovation project is considered.

COST THRESHOLDS FOR ACCESSIBILITY AND FIRE SUPPRESSION COMPLIANCE	
Assessed Value (Structure Only)	$175,000
30% Cost Trigger for Accessibility Compliance	$ 52,500
33% Cost Trigger for Fire Protection	$ 58,333

AGGREGATE TOTAL VALUE OF RECENTLY COMPLETED WORK		
Date	Description	Approximate Value
8/2015	Fire Alarm Upgrades	$ 3,500
9/2015	Boiler Replacement	$ 44,000
3 year aggregate total value for accessibility compliance		$ 47,500
5 year aggregate total value for fire protection compliance		$ 47,500

ACCESSIBILITY UPGRADE REQUIREMENT	
30% of Assessed Building Value	$52,500
Less the Aggregate Cost of Projects Completed in the Past 3 Years	$47,500
Current Value for Renovation Work to the Cost Trigger for Full Accessibility Compliance	$5,000

Fire Protection Upgrade Requirement	
33% of Assessed Building Value	$58,333
Less the Aggregate Cost of Projects Completed in the Past 5 Years	$47,500
Current Value for Renovation Work to the Cost Trigger for Full Fire Protection Compliance	$10,833

There are two building permits on file with the Inspectional Services Department dated within the last three years.

BUILDING CODE COMPLIANCE ANALYSIS (IEBC / 780 CMR - IBC)

Although the Adams Street Station would be regulated under the IEBC for the purposes of a renovation of the existing building, this analysis reviews compliance with regard to requirements of the new IBC. This is to ensure that existing conditions which do not meet the current intent for life safety, and which may be allowed to remain as part of a renovation under the IEBC, are identified for correction. In the discussion below, references to specific code sections are noted before each paragraph with parentheses.

(IEBC 101.4.2) Applicability: Under this definition, as a building that has been previously occupied prior to the issuance of the Code, this building is considered an existing building and regulated under the IEBC.

(IEBC 101.5.2) IEBC offers three methods for compliance analysis and four levels of work classification. For the purposes of this study, the *Work Area Compliance* method will be used and future renovations will be considered as an *Alteration Level 3* work classification.

(IEBC 701.3) Compliance: All new elements must comply with IBC.

**The following discussions regarding Type of Construction, Use Group Classification, and Height and Area Limitations are provided to document the existing facility classification only. These characteristics are not regulated by the IEBC and existing buildings are not required to be modified to comply as a result of renovations. Additions to an existing building, however, must conform to current limitations of allowable height and area and are regulated by the IBC. Determination of the allowable height and area of the existing structure provides guidance for the extent of any new additions that may be planned.*

(IBC Ch. 3 – Use and Occupancy)

(IBC 305.1) Primary Use Group:	Group B - Business
(IBC 305.1) Mixed Use Areas:	Group R-2 Residential (Bunk Area)
(IBC 305.1) Mixed Use Areas:	Group S-1 Storage (Apparatus Bays)

(IBC Ch. 5 – General Building Limitations)

Height and area limitations for the existing building are presented below to show the allowable area for the uses within the building and possible expansion of the existing building. As stated above, the aggregate area of any new additions and renovations that exceed 7,500 square feet or that exceed 33% of the assessed value of the existing building will require sprinklers to be installed throughout the new and existing structure. The allowable floor area calculations below include increases permitted for fire protection sprinkler system, however the increase for existing building frontage accessible to emergency vehicles, is not. This allowable increase in area for accessible frontage may be affected by additions to the building.

According to information from the Milton Assessing Department, the current building area is listed at 3,514 gross square feet (occupied space) for all floors combined. Storage uses and Assembly uses are

believed to occupy less than 10% of the gross area of the relative floor levels and so are considered to be accessory to the Business Use on each floor.

(Table 503) Based on the presumption that any renovation or new construction for this building will require the installation of a new sprinkler system, the allowable height may be increased by one story and the allowable area may be increased by 200%. Additionally, there is a provision to increase the allowable area due to the accessibility of the building perimeter. Since no plans were available to determine the length of the accessible vs. inaccessible perimeter, this increase will not be calculated.

- The allowable area increase for a sprinkler system will allow a total increase in area of 200% in addition to the limitations stated in Table 503. This total allowable area is shown in the last column of the table below.
- The total area of the building cannot exceed the allowable area used for the primary Residential ("R-2") Use Group. Other uses within the mixed use building cannot exceed an area proportional to the percentage of the area that Use Group occupies in the building. Because this ratio of allowable areas between uses may vary based of differing layouts, it is impossible to provide an allowable area for all uses in every possible combination. As such, the allowable area for Use Group R-2 is calculated as a baseline and further calculation will be required to confirm if future renovations are within Code requirements.

(Table 503) The allowable height and area for each Use Group under Type V-B (5-B) Construction is:

USE GROUP	Total Allowable Height (+1 Story Increase for Sprinkler System	Allowable Area per Story Plus Increase for Sprinkler System and Accessible Perimeter			
		Allowable Area (Table 503)	Sprinkler System Area Increase (+200%)	Accessible Perimeter (Not taken)	Total Allowable Area per Floor with Allowable Increases
R-2	4 Stories	7,000 sf.	+ 14,000 sf.	+ 0 sf.	21,000 sf.

(IBC 508.3 & 508.4) Buildings with multiple Use Groups are called mixed-use buildings. Buildings are further classified as a 'separated' mixed use or a 'non-separated' mixed use. If classified as a 'separated' mixed-use building, the different use groups within the building must be separated by fire rated construction as required in Table 508.4. If classified as a 'non-separated' mixed-use building, then fire rated separations are not required BUT the most restrictive use group is used to calculate the allowable height and area. This building is assumed, based on field observations, to be a non-separated mixed-use building. (IBC 508.2.4 and Table 508.4) In table 508.2.4, rooms used for storage and assembly may be considered to be accessory to the primary Use Group if the aggregate area of these rooms is less than 10% of each floor area and smaller than the area allowed by Table 503. Spaces considered to be accessory to

the primary use are not required to be separated from the primary use by fire rated partitions. This report assumes that all Storage and Assembly uses are considered to be accessory and so not separated.

IBC Ch. 6 – Types of Construction

(IBC Table 601) No information is provided by the Milton Assessing Department with regard to the type of construction of the building. As observed in the field, the building is constructed with multi wythe masonry bearing walls supporting Main Level concrete floor slab. Upper Level floor framing was concealed by finishes but appears to consist of wood joists and wood decking, with punched windows and brick veneer.

As the existing construction system is as noted above, this generally conforms to the requirements for Type V-B (Roman numeral 5 - B, unprotected) construction in the current IBC. The structure does not appear to be protected with spray fireproofing or other rated construction. Interior partitions are non-load bearing metal stud / drywall construction. The Use Group is assumed to be Residential (R-2) with accessory or mixed use areas for Assembly and Storage.

Type V-B Construction Type Min. Fire Resistance Rating Requirements (780 CMR Table 601)

Building Elements	Required Fire Resistance Rating (Hrs)
Structural Frame (including columns, girders, and trusses)	0
Exterior Bearing Walls	0
Interior Bearing Walls	0
Exterior Non-Bearing Walls and Partitions (See Table 602)	0
Interior Non-Bearing Walls and Partitions	0
Floor Construction (including support beams and joist)	0
Roof Construction (including support beams and joist)	0

Table 601 establishes the required minimum fire rating of construction elements and is related to the allowable height and area discussed in Table 503 below. Type V-B (5-B) construction allows the building structural members to be unprotected (not fire rated). The tradeoff for not protecting the building structure is a reduction in the allowable height and area that can be built; essentially, the greater the fire protection of building structural elements, the larger the building height and area which is allowed.

(IBC Chapter 10 - Means of Egress)

Occupancy load in the existing facility is determined by the functions in each area of the building and not the primary use group. According to the IBC Table 1004.1.1, Business functions require an occupant load calculated at 100 GSF per person, Residential sleeping areas (bunks) are calculated at 120 GSF per person, Locker rooms are calculated at 50 GSF per person, and Mechanical/Storage areas are calculated at

300 GSF per person, and Assembly spaces are calculated at 5, 7, or 15 GSF per person dependent upon whether the persons are standing, sitting, or at tables. As the functions and areas for each may change over time, areas with lesser occupancy rates may be renovated for a use with a higher occupancy rate. This summary will not break out each function separately; as a preliminary determination of occupancy, a rate of 100 GSF per person will be used as an overall general occupancy rate for this building as this will be the predominant occupancy for any renovation of the building:

- 3,514 GSF (All Floors) / 100 sf. per occupant = 36 occupants on all floors

The egress capacity (0.3"/per occupant for non-sprinklered buildings) for a minimum 44-inch wide stairway is approximately 146 occupants. The egress capacity (0.2"/per occupant for non-sprinklered buildings) for a typical single 36-inch wide egress doorway is approximately 170 occupants.

IEBC 102.2.2.1 is an amendment by the State of Massachusetts and supersedes other less restrictive paragraphs in the IEBC. This amendment requires that all existing stairs comply with current requirements of the IBC with regard to the quantity of exit ways on each floor, the width of all exit ways, fire rating, handrails, continuity, etc., to "provide safe and adequate means of egress".

- The existing egress stair in the building is not enclosed in required fire rated construction, does not have risers and treads of required dimensions, does not have railings and guards on both sides of the stair, does not have railings and guards with required height and spacing, does not have required rail extensions, and does not have fire rated doors which comply. All stair conditions must be corrected in accordance with current egress requirements as part of any renovation project.

(IEBC 703.2.1 Existing Vertical Openings)
All existing vertical openings connecting 2 or more floors must have an enclosure with a fire-resistive rating of 1 hour minimum.

- The stair connecting the basement, main and upper levels is a vertical opening. This opening is not separated from adjacent areas by fire rated construction. This stair cannot be used as an exit in its current configuration.

(IBC Table 1016.1 Exit Access Travel Distance)

- The greatest travel distance to an exit enclosure occurs on the 2nd floor and is approximately 100 feet. This is far less than the allowable travel distance of 200 feet.

(IBC 1014.3) In buildings of a Business Use with a sprinkler system, the allowable length of a common path of travel is 100 feet.

- All locations appear to be compliant.

(IBC 1018.4) In buildings of a Business Use without a sprinkler system, the allowable length of a dead end corridor is 20 feet.

- Far end of the upper level corridor appears to be non-compliant.

(IBC 1015.2) When multiple exits are required, the exits must be separated by a minimum distance equal to 1/3 of the longest diagonal distance of the floor plate.

- There is only one non-compliant Exit from the basement, main and upper floors. As a result separation distance is not applicable.

(IBC 1021.1) All stories are required to provide a minimum of 2 means of egress, except when serving a maximum of 4 dwelling units. As this building is classified as a Business B Use Group with more than 4 dwelling units on the second floor, a minimum of 2 means of egress must be provided.

ACCESSIBILITY CODE COMPLIANCE ANALYSIS (521 CMR AAB)

AAB 11 – Commercial Buildings (Municipal Facilities)

(521 CMR 11.1)

Public Areas, Toilet rooms, transaction counters and other work areas are required to be accessible.

- Accessible transaction counter at First Floor Public Lobby is not provided.
- Accessible male and female toilet rooms are not provided for public use near the First Floor Lobby.

AAB 14 – Places of Assembly

(AAB 14.2) Places of assembly are not provided in the existing building.

AAB 19 – Recreational Facilities (Fire Only)

(AAB 19.4) Locker rooms are provided for male and female Fire staff and officers. These lockers and associated toilet rooms are not required to be accessible.

AAB 20 - Accessible Routes

(AAB 20.1) Accessible routes within the building generally comply with requirements for width, passing space, protruding objects, headroom, etc.

- Access to all floors is not provided for public and administrative staff. A compliant elevator is required to provide access to all floor levels and activities.
- Many doorways reviewed do not provide required clearance for accessibility.

(AAB 20.6.1) Objects projecting from walls with their leading edges between 27 inches and 80 inches above the finished floor must not protrude more than 4 inches into walks, halls, corridors, passageways or aisle and must not have sharp edges.

- There does not appear to be any non-compliant conditions.

(AAB 20.12) Areas of rescue assistance at stairways and means of egress are not required in accordance with Exception a. Existing Buildings.

AAB 24.00 - Ramps

There are no ramps required on the interior of the building.
Please refer to the Landscape section of this study for information regarding site accessibility.

AAB 25.00 – Entrances

(AAB 25.1) All public entrances to the building must be accessible and be on an accessible route.

- Access to the building from the exterior is non-compliant at the Ground Level public entrances.

AAB 26.00 – Doors and Doorways

(AAB 26.6 – Maneuvering Clearances)
Most doors in the building do not provide required pull and push clearances for accessible doors. In public areas or areas accessed by civilian staff, modify these doorways to provide accessible clearances.

(AAB 26.11 - Door Hardware)
Existing hardware throughout building is not compliant and replacement with lever-type hardware at all doors is recommended.

AAB 27.00 – Stairs

(AAB 27.3 – Nosings)

Stair nosings are required to be angled or radiused and not abrupt. Existing wood stair nosings at the connecting stair between the Garage Level and the First Floor have a protruding lip at each tread.

- The stair treads need to be modified to comply. Modification of the treads with tread covers is necessary to reduce the abrupt nosing.

AAB 28.00 – Elevator

(AAB 28.1) Multistory buildings are required to be served by an elevator.

- The building must be modified to provide an elevator to access all floors of the building.

AAB 30.00 – Public Toilet Rooms

The existing male and female toilet rooms off of the public lobby on the main level does not comply with accessibility requirements and must be modified if civilian staff or disabled staff is allowed to use these facilities.

AAB 31.00 – Public Bathing Rooms

(AAB 31.7) A single unisex toilet/shower room is accessed from the common bunk room and a private toilet/shower room accessed through the shift commanders bunk room is provided for able-bodied staff only on the upper level, where compliance is not required. However, the plumbing code requires separate toilet/shower rooms for men and women; although unisex rooms are allowed for compliance with AAB, this is not compliant with the plumbing code.

AAB 32.00 - Kitchens

(AAB 32.1) Commercial kitchens are not regulated by the AAB.

AAB 36.00 – Drinking Fountains

(AAB 36.1.1)

A non-compliant drinking fountain is provided on the main level only.

- Please refer to the plumbing section of this report for discussion about requirements for drinking fountains

AAB 41.00 – Signage

(AAB 41.00)

Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage.

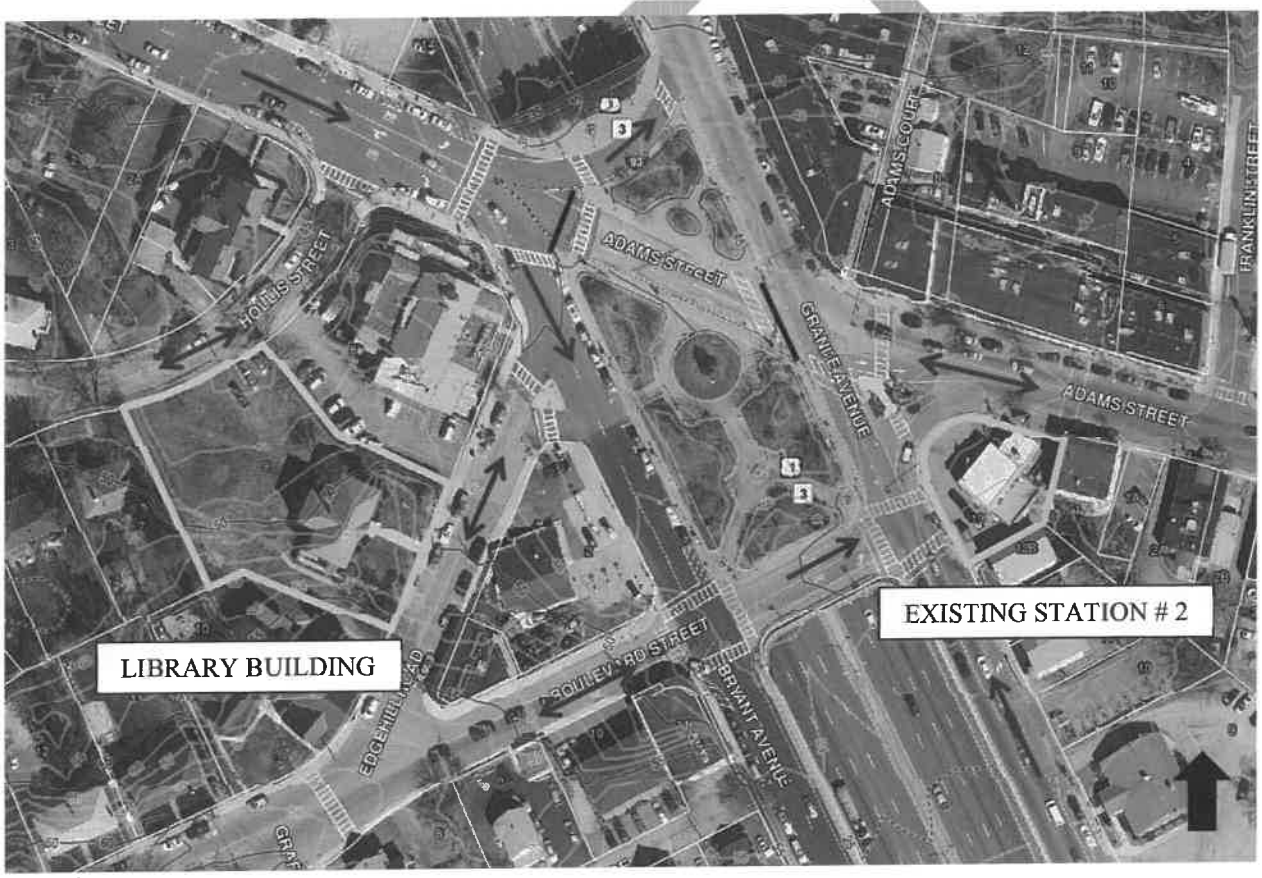
- Compliant signage and Symbols of Accessibility are missing throughout the building. Where exit signs indicate an accessible route, if all routes are not accessible, these signs shall include the symbol of accessibility.

– EXISTING CONDITIONS ANALYSIS –

LANDSCAPE ARCHITECTURE

Site Overview

The East Milton Station - Engine #2 is located at the intersection of Granite Avenue and Adams Street, east of the Southeast Expressway. It is a two story brick & concrete building on a flat site. The building has very little green space, with most of the site taken up by the building, parking, fire apron and sidewalks. A small lawn to the right of the apparatus bay has an historic bell mounted on a concrete base. There is one street tree at the building's northeast corner. This site is a total of 0.161 acre, making it too small for a modern fire station building. If the fire department moves, it is understood that it would move to the now vacant library site at 334 Edge Hill Road. This site is 0.607 acres, and is currently owned by the Town of Milton Library Department. This site is bordered by a residence to the northwest, a church to the south and a Post Office building to the northeast. Station #2 is surrounded by businesses. It serves the eastern portion of the town and can respond to calls on the Southeast Expressway.



Site plan

The library site has an earthwork berm (approximately 6' high) around the front of the building. As a result, the library has basement and first floor access to grade. The grade change from Hollis Street, at the rear of the property to Edge Hill Road at the front is an average of six feet (6'). Since the library site has frontage on two roads, there is the possibility of designing drive through bays for the fire apparatus on

this site, though with parking on both sides of Edge Hill, maneuvering fire vehicles would be difficult. This could be changed by modifying the striping and removing some on street parking.

Aprons and pavement at front of building

Bell at front of existing building

Proposed location for the new station.

Rear of library building

Front of library building

Zoning

Municipal buildings are exempt from the Zoning Bylaws

The Fire property is in the Business district. Property ID is H 6 13
Maximum Height: 2 ½ stories or 35'
Minimum Frontage: 100'
Minimum Front yard: 25'
Minimum Side yard: 6' or within 24' of adjacent building
Minimum Rear yard setback: 12'

The library property is in the Residential C District. Property ID is H 12 9
Maximum Height: 2 ½ stories or 35'
Minimum Frontage: 150'
Minimum Front yard: 20'
Minimum Side yard: 15' or within 30' from building on adjacent lot.
Minimum Rear yard setback: 8'
Maximum building coverage: 30% or 2,250 sf whichever is greater. GFA shall not exceed 50% or 3,750 sf, whichever is greater.
Minimum Open Space requirements: 75% of lot. (Building and parking included)
Parking requirements: Section VII. 5. Sufficient parking for employees and users under normal conditions.

There are no Wetlands on either site, or Water or Natural Resource Protection restrictions on the properties.

Utilities

The buildings are served by natural gas (National Grid), town water, town sewer and electric (Eversource).

– EXISTING CONDITIONS ANALYSIS –

STRUCTURAL

525 ADAMS STREET – ENGINE#2

DISCRIPTION

The 525 Adams Street Fire Station is a multi-story building with a basement, Main Level and Upper Level floors. The building is constructed with multi wythe masonry bearing walls supporting Main Level concrete floor slab. Upper Level floor framing was concealed by finishes but appears to consist of wood joists and wood decking. The foundation walls are constructed with reinforced concrete walls and footings. Additional concrete beams and columns were added in the basement to provide reinforcing of the existing Apparatus Bay slab due to heavier equipment.

South face of the Addams Street Engine #2 building.

Ivy covered north wall.

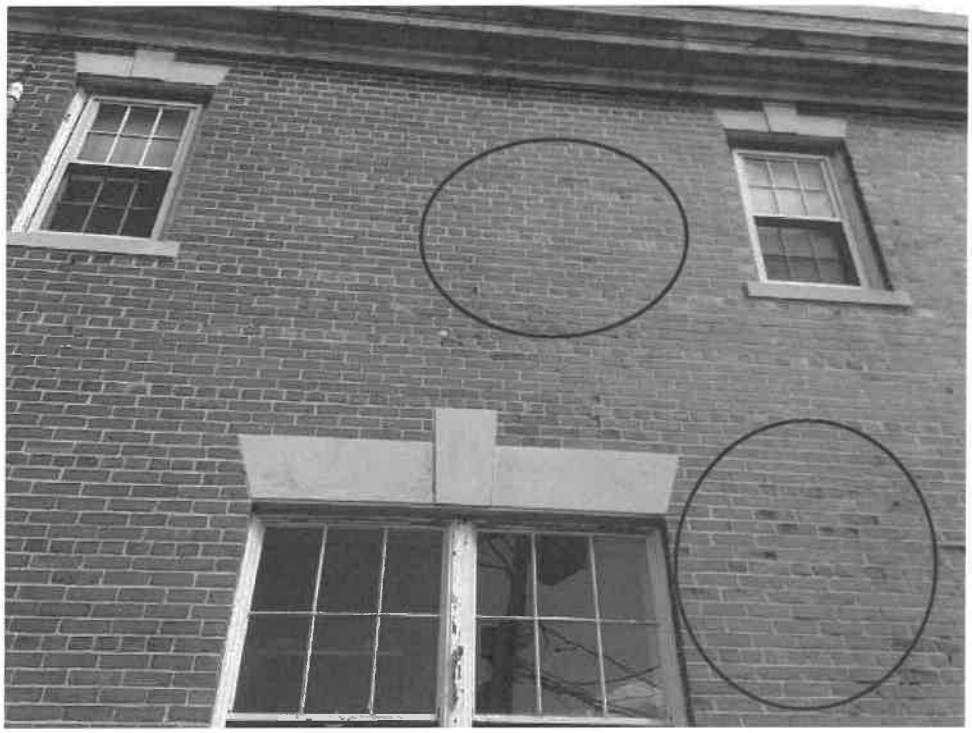
OBSERVATIONS

The following is a list of structural items which were documented during the site visit.

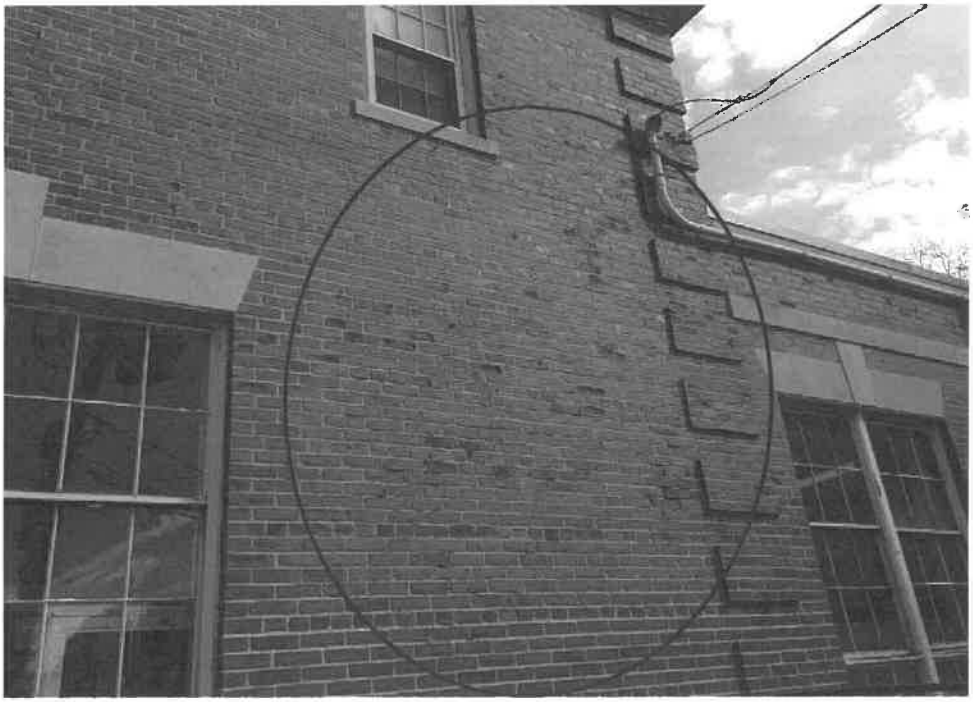
- Considerable spalling and cracking of the exterior brick around the entire building but especially on the south face.

Spalling brick on the southeast corner of the building.

Close up of spalling of bricks on south face.



Areas of spalling on south face



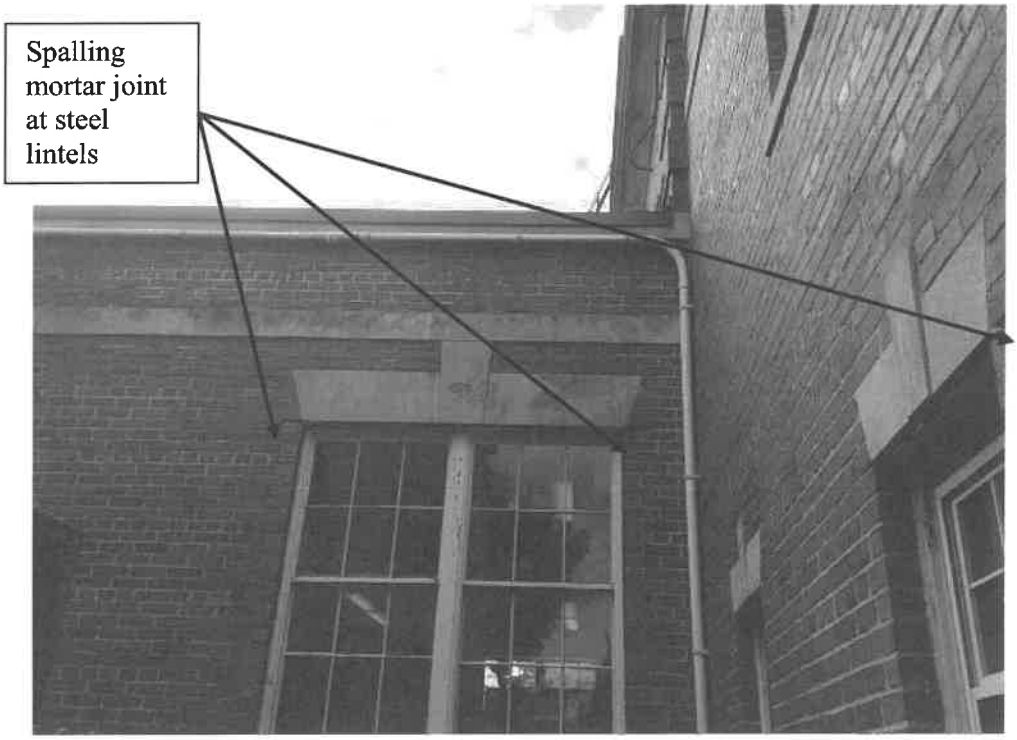
Large spalling brick surface

Spalling brick

- Corrosion of the steel lintels is visible along with cracking and movement of the exterior brick and spalling of mortar joints above the overhead doors on the front (west) side of the building. A similar condition is present above the windows on the north face of the fire station.

Spalled mortar and lack of weep holes to provide drainage of the masonry.

Downward rotating steel lintel indicating corrosion damage.

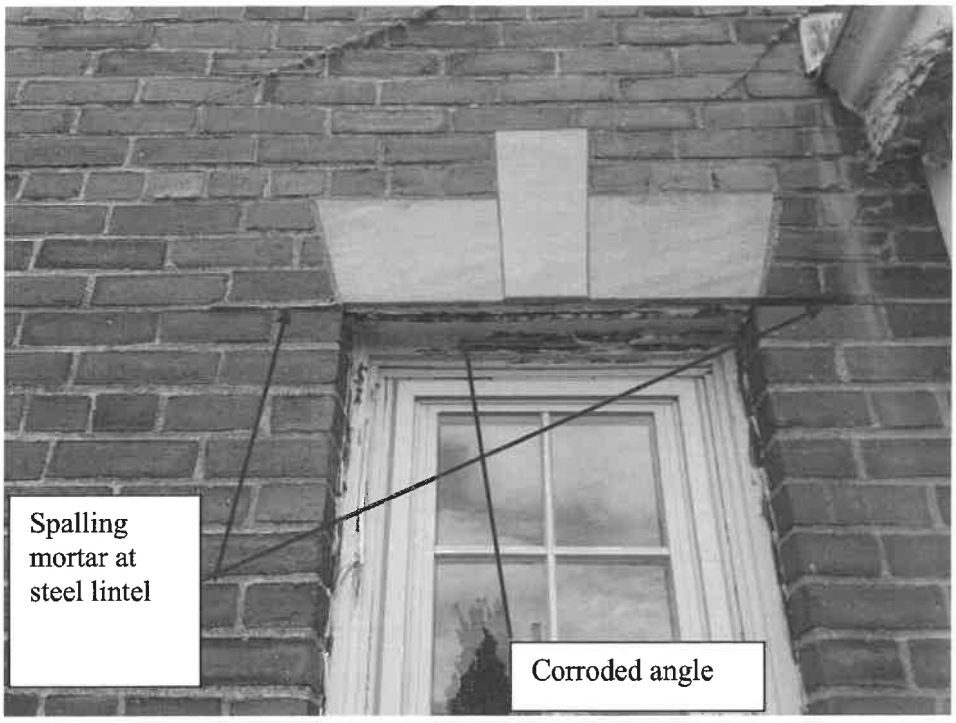


Corroding steel lintels supporting masonry above window openings.

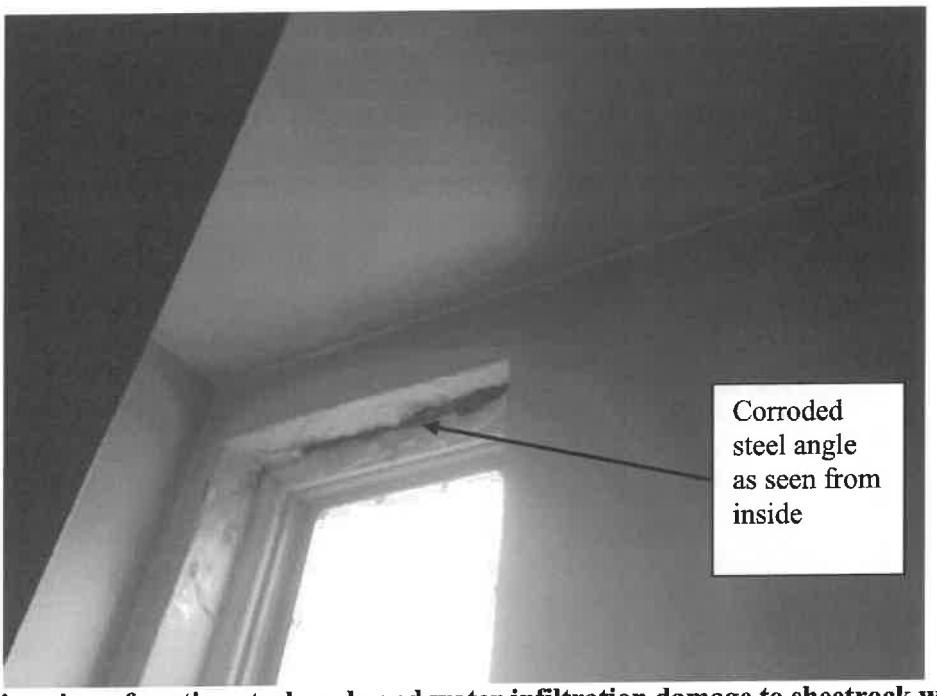
Spalled mortar joint above window opening.

Ivy attached to mortar joints and brick damages the materials.

Close up of outward and upward movement due to corroded steel angle

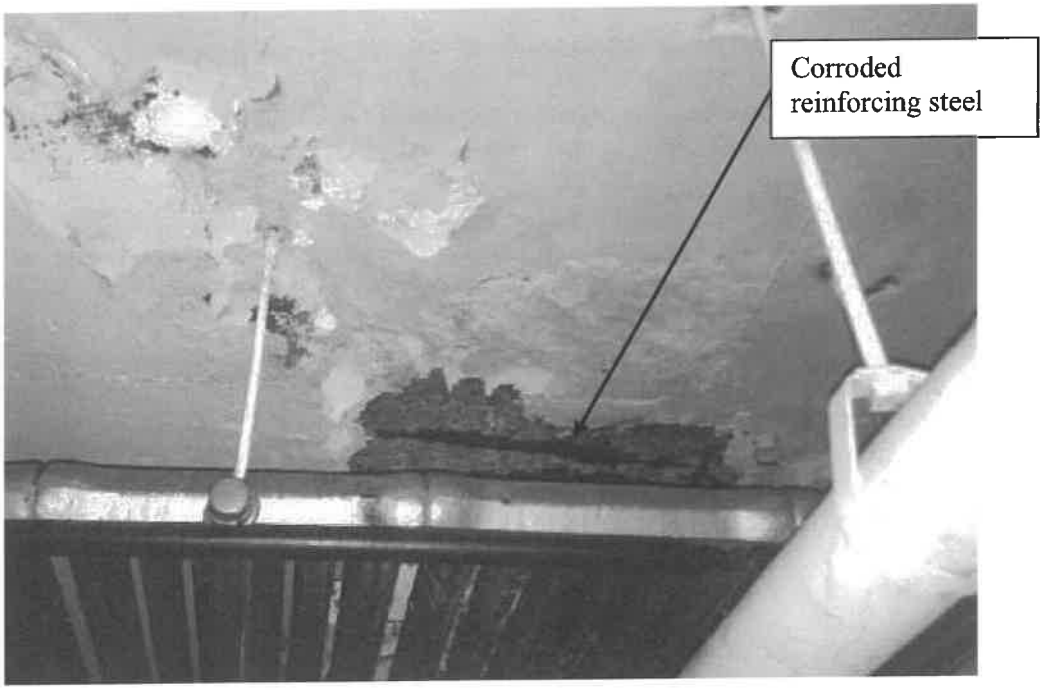


Corroded steel lintel lifting brick and limestone header off lintel.

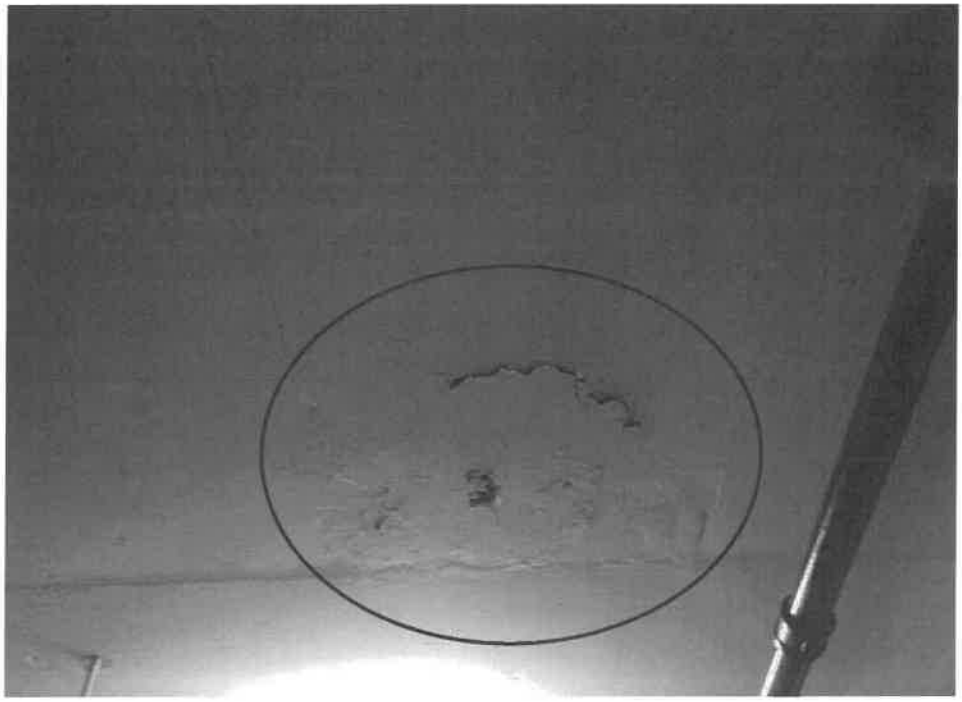


Interior view of rusting steel angle and water infiltration damage to sheetrock walls.

- Spalled concrete is visible on the underside of the Apparatus Bay concrete slab. The majority of the spalls are ¼" deep but in some instances they are deeper exposing reinforcing steel.



Exposed rebar in the slab and extensive cracking of the slab beyond the spalled concrete.



Underside surface of the spalled concrete slab.

RECOMMENDATIONS

The following are recommendations to correct the items noted above in the report.

- The first item, which involves the repairs to the exterior spalled brick. All of the brick, which has exhibited the surface to be spalled, must be removed and replaced. All spalled mortar joints must be repointed.
- Further investigation of the existing masonry above the overhead doors and at least one punched window on the north side of the building should be performed. This will enable us to know the extent of deterioration of the angles and identify flashing and weep holes so that a repair procedure can be developed.
- Remove all ivy from face of building to stop additional damage to the mortar joints, which will allow infiltration of water into the walls causing damage to the interior surfaces and spalling of the exterior brick.
- Further, investigate the amount of damage to the Main Level slab where cracking and / or spalling has or is occurring. This will involve us sounding the slab for delamination due to corrosion of the reinforcing steel.

SUMMARY

The unreinforced bearing walls (masonry and wood) which support the Upper Floor and roof sstructure do not meet the current Commonwealth of Massachusetts Building Code requirements for seismic design. The building structure would sustain devastating damage during a seismic event. Due to the fact that the

unreinforced walls will not be able resist the lateral forces generated by seismic events, this building would not be able to provide emergency services.
Our structural review of the building is based only on the areas which were not concealed by exterior grades, slabs, interior finishes or other obstructions. Other recommended repairs and maintenance procedures should be implemented to eliminate possible future damage to the structure.

– EXISTING CONDITIONS ANALYSIS –

ARCHITECTURAL

Building Overview

The building appears to be a type "2-B" multi-story building. The building was originally constructed in 1952. The basement of the building is assumed to be constructed of reinforced cast in place concrete foundation walls with an elevated concrete slab supported by cast in place concrete columns and beams.

The main level exterior walls are believed to be multi-wyth masonry (brick veneer exterior and glazed block interior at apparatus bays), and interior walls are a mix of stud framed gypsum wall board or concrete masonry. The upper level interior walls are believed to be stud framed gypsum wall board. The roofing systems are built-up asphalt roof membrane with gravel surfacing and single-ply EPDM rubber roof coated with a white reflective paint

The building does not have a fire suppression system, there is not a second egress from the upper levels, nor is it handicapped accessible. The finishes are generally in poor condition and are far beyond their useful life span. The Heating system has recently been replaced (2015), while the air circulation and overall quality of air in the building is questionable.

Exterior Envelope

Exterior Walls

The basement level (foundation walls) are reinforced poured in place concrete, while the main and upper levels are believed to be multi wyth masonry - brick veneer on masonry back up with lath and plaster on interior face.

Ivy covers a fairly large amount of the north and east elevations, limiting the review of these elevations. However it was observed there is are cracks in the mortar in a number of locations (see structural review) for additional comments. Overall, the brick appears to generally be in good condition with the exception of the south elevation which is exhibiting a fair amount spawling (see structural review).

There are a number of surface mounted conduits and wires mounted to the exterior. As this is a public safety facility, it is recommended that these be reviewed and re-routed within the building to ensure they are not subject to vandalism.

Exterior Doors

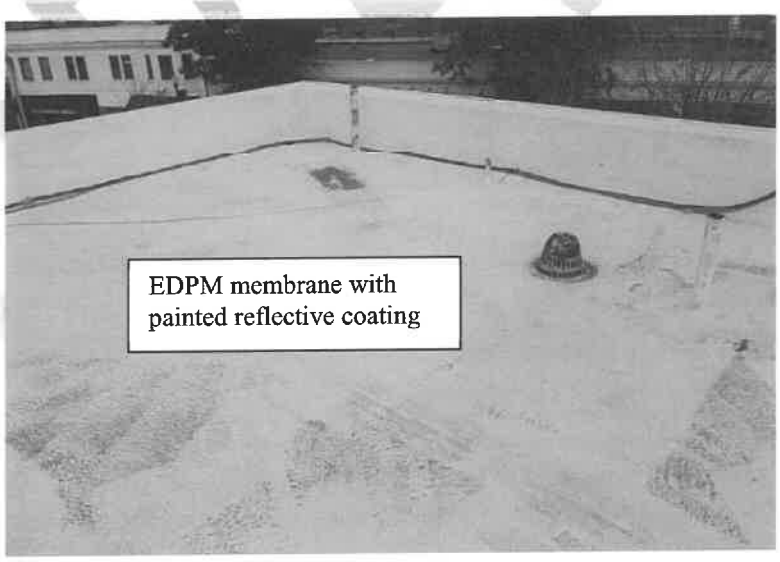
The entrance door is painted wood stile and rail door with true divided lites, with an aluminum storm door. Doors and frames are generally in poor condition, and exhibit considerable wear. The wood threshold is worn and rotting. The seals and caulking are in poor condition. The lock set is failing as is the weather stripping (light visible at door bottom). The door has not been outfitted with a "crash-bars"; or equipped with lever handles.

Exterior Windows

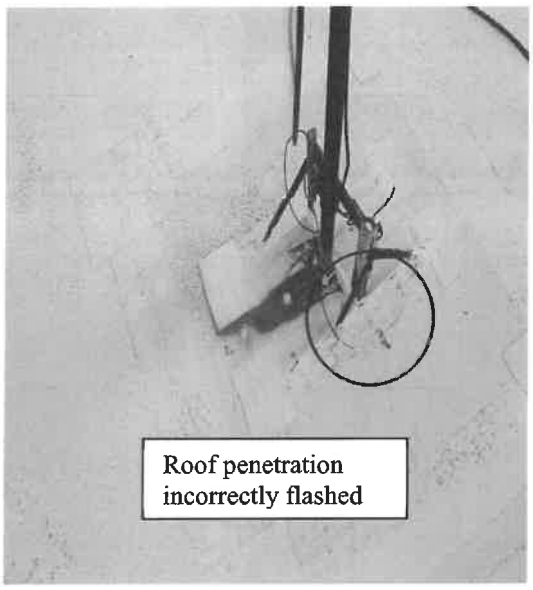
Most of the windows are pre-finished aluminum replacement double hung units with insulated glass and insect screens, set into existing wood frames, and are approximately 10 years old and are in excellent to good condition. The painted wood frames appear to be sound but need to be scraped and repainted, as well as have the perimeter caulking replaced. Many of the steel lintels are displaying what appears to be surface rust and must be refinished. In the basement and apparatus bays the original steel framed single pane windows remain. They exhibit surface rust and falling or missing glazing compound and perimeter caulking need to be repaired/repainted. Typically, this type and age of steel window has asbestos in the glazing compound. This needs to be investigated as part of a thorough hazardous materials survey of the facility.

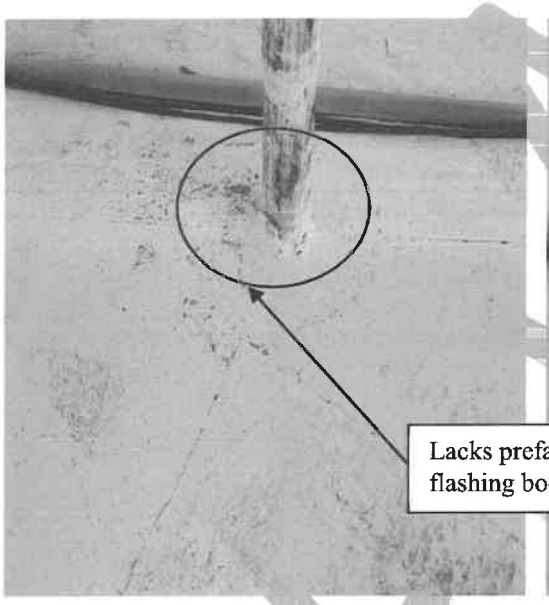
Roof

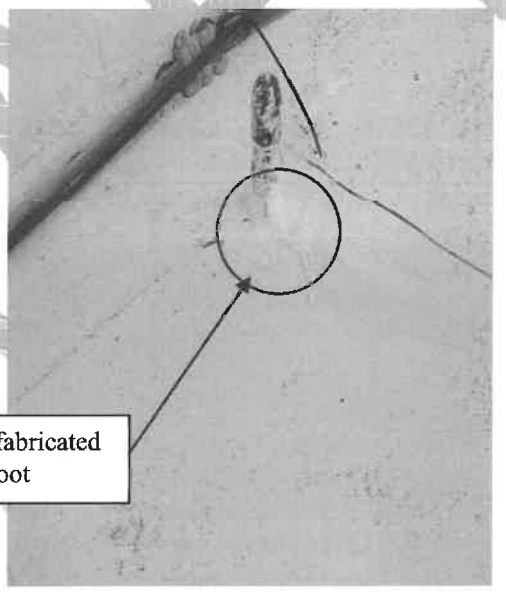
The high roof on the 2 story main building consists of single-ply EPDM rubber roof coated with a white reflective paint which is wearing thin in a number of locations. In addition the roof is soft and spongy indicating a water saturated layer of insulation trapped beneath the membrane. This is an indication of roof leaks and the presents of moisture can become breeding grounds for mold and mildew.



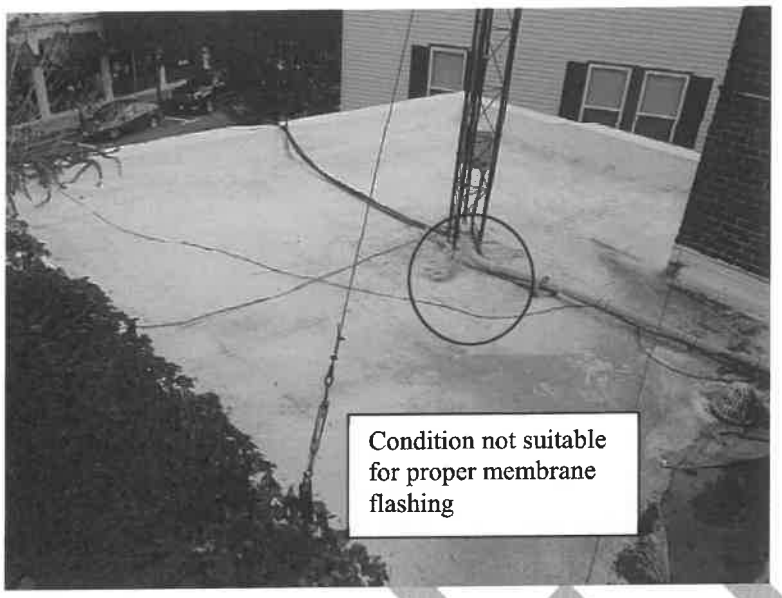
The high roof contains a number of roof penetrations that are incorrectly flashed which are most likely the sources for the water infiltration issues.

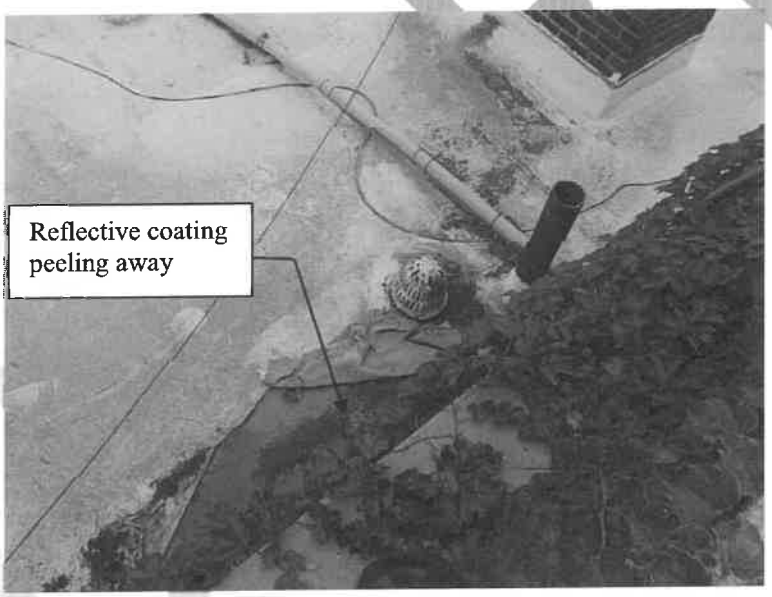




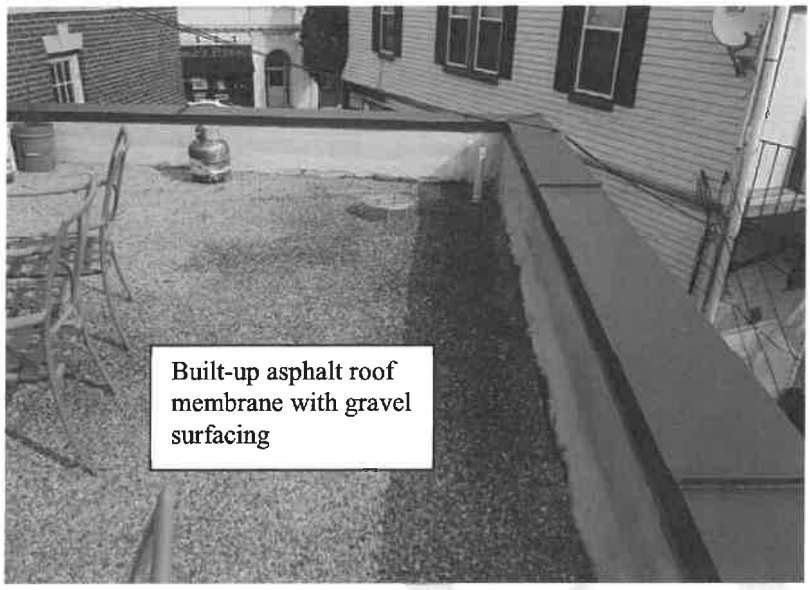


The lower roof off to the side also consists of a single-ply EPDM rubber membrane with a coating of white reflective paint. The roof contains the base for a high antenna which most likely is not flashed correctly. In addition, the white coating was observed to be peeling off the membrane.

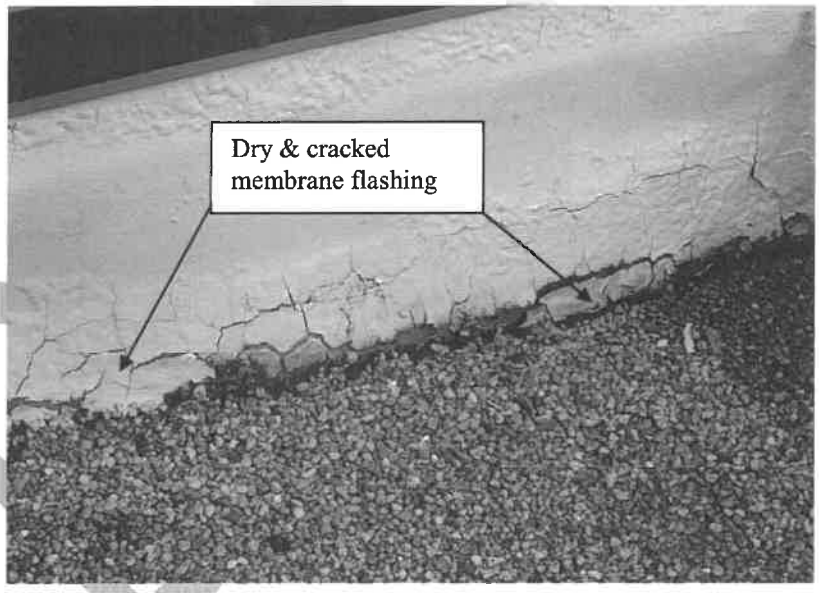




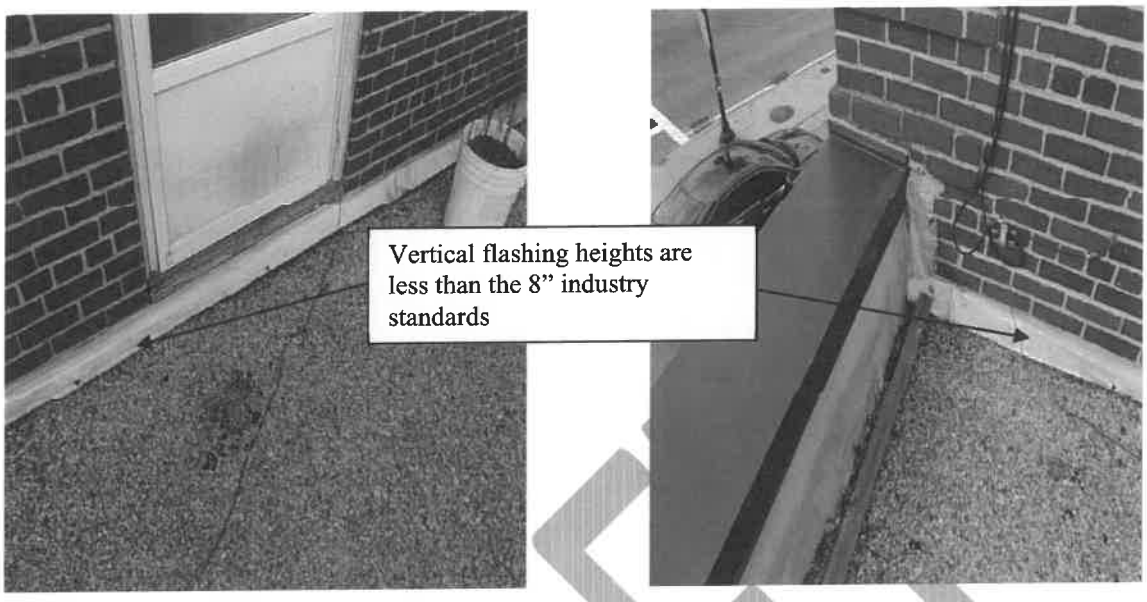
The one story wing at the rear of the facility contains a built-up asphalt roof with gravel surfacing that appears to be more than 20 years old.



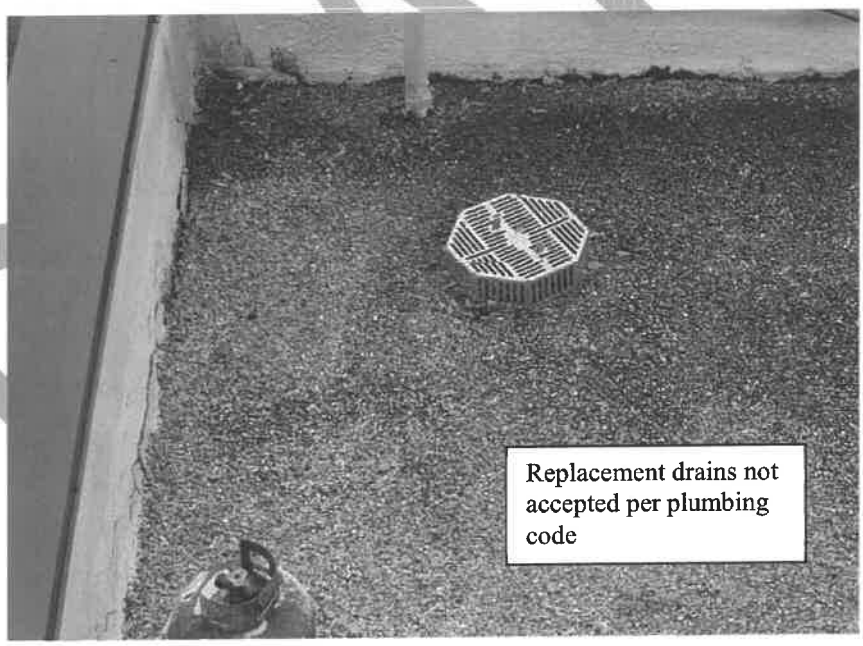
The roof membrane flashings are old cracked due to its age and are most likely leaking.



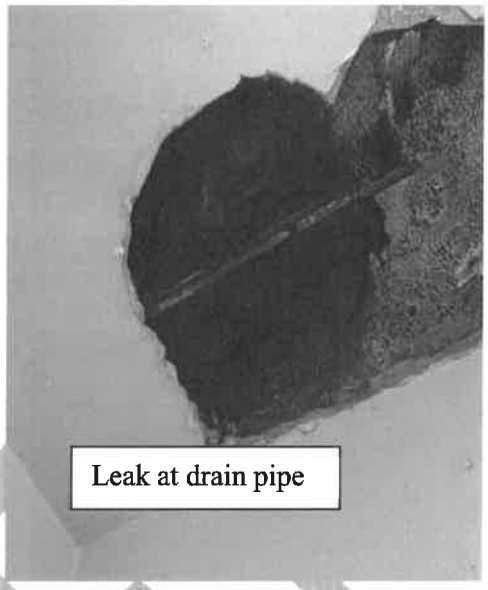
The flashings at the roof to wall transitions are less than the required 8" and are not acceptable roofing flashing details per industry guidelines.

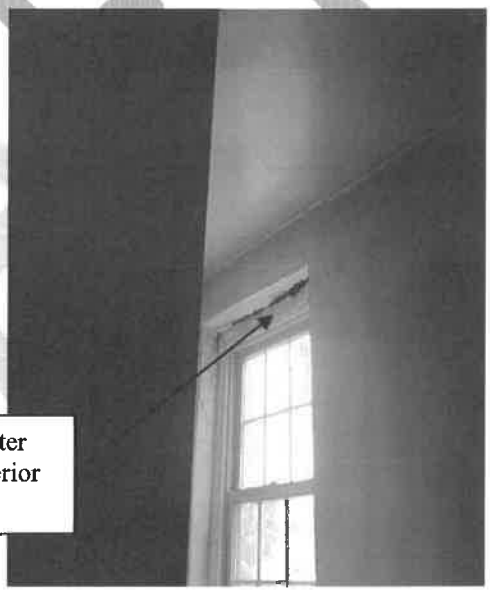


The drains are not the original drain bowl. They are replacement drains that are installed into the drain pipe with a sleeve which reduces the diameter and capacity of the pipe and are not accepted per the plumbing code.



The inside of the facility contains ample evidence of roof leaks due to the numerous failed interior finishes.





Building Components

Interior Walls

The basement level has a combination of concrete, cmu and stud and gypsum walls. Many of the concrete foundation walls exhibit signs of water infiltration. The main level utilizes painted stud and gypsum wall board in most areas with CMU in fire support areas, while the upper level utilizes wood studs with wood paneling that is painted.

The interior masonry walls are generally in good condition but need minor repairs and repainting. The gypsum walls appear to generally be in fair to poor condition. Due to water infiltration, many of the walls are exhibiting peeling paint, cracks or spawling plaster, and will require much patching and repainting.

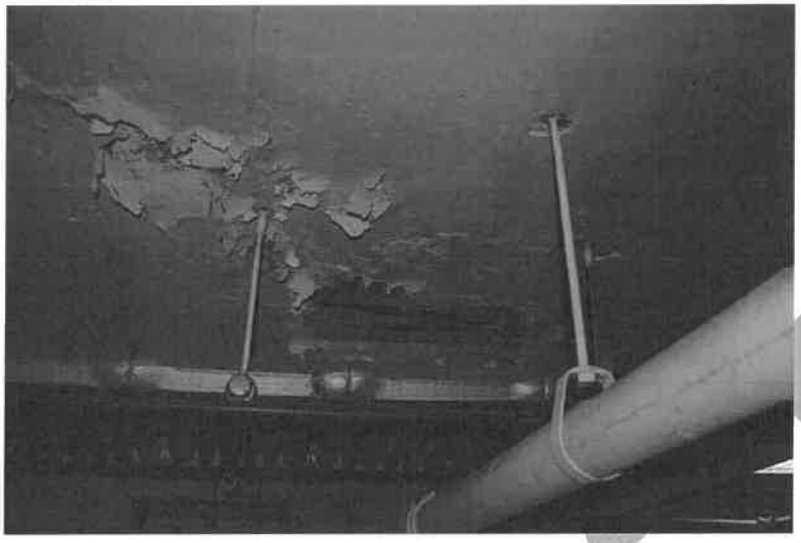
Interior Doors

The interior doors are mainly solid core wood veneer and size 30"- 36" wide. Door frames are mainly wood with wood trim. Most of the doors have not been outfitted with ADA compliant lever-style handles. The doors/frames and trim are worn and will require new hardware and refinishing.

Ceilings Systems

The predominant ceiling system throughout the station is gypsum wall board with a plaster finish.

In general, many ceilings exhibit signs of physical damage from water/moisture. Moisture problems and/or leaks from the roof system may be the cause or contribute to this damage. Many areas of peeling paint and spawling plaster were observed in the apparatus bays.



The lighting fixtures are surface mounted and lighting levels seem inadequate. In general, the light fixtures are in poor condition. Refer to the electrical section of this report for more information.

Floors Finishes

The flooring materials in the building are a combination of vinyl composite tile (VCT), vinyl asbestos tile (VAT), ceramic tile and exposed sealed concrete.

The vast majority of the flooring is VAT, which is utilized in the corridors, work rooms, bunk rooms and day room. In general, the VAT is in poor condition and needs be abated as part of an overall build g hazardous materials abatement plan.

VCT was observed in the kitchen and main level corridor areas and needs to be replace. It is suspected that VAT was covered over with VCT on the lower levels. Further investigation is required.

Ceramic tile, primarily located in the toilet rooms, appears to be in fair condition, showing obvious signs of wear.

Stairs
There is one winding stair that provides access to all levels. The stair is steel framed with concrete filled steel pan treads and steel risers. Treads and risers to the basement and upper level are painted steel and exposed concrete. The risers exhibit some surface rust and need to be refinished. The stairs appear to be structurally sound. Steel pipe handrails are provided on one side only and are not continuous as required by code. It has non-complaint treads and risers, is too narrow and requires a second handrail to be installed. The stair is not enclosed in a fire rated enclosure as required by code.

Elevator
There is not an elevator in the building to allow for handicapped access to the multiple levels. Any addition or renovation to the building would require installation of one to comply with ADA.

Signage, Miscellaneous Accessories and Equipment
The room signage is almost nonexistent. Where provided, signs are typically a room name printed on a piece of paper and taped on or adjacent to the room doors. Any addition or renovation would require the installation signage with braille to comply with ADA.

Fire extinguishers are located sporadically throughout the building, but appear to be inadequate in number

Window treatments in the building consist of shades and curtains or none at all. All are in fair to poor condition and need to be replaced.

Kitchen
The kitchen is located on the upper level and utilizes painted gypsum walls, with vinyl composition tile flooring and gypsum board plastered ceiling with surface mounted lights. It is extremely small to the point f almost being unusable. The electric stove is in fair condition. The refrigerator is located in an old closet which is located off of the dining room. All finishes are in poor condition and need to be replaced. Cabinets and counter tops are minimal and are in poor condition. There is a wood exterior door with an

aluminum storm door from the dining area to the low roof. Wood trim and threshold are deteriorating and need to be refinished or replaced.

Toilet Rooms

There is a male and female toilet room on the main level. They both utilize painted gypsum walls, with ceramic tile flooring and painted plaster ceilings.

There is one toilet/shower room on the upper floor accessed from the large dormitory style bunk room, and one accesses from the lieutenants bunk room. Both toilet/shower rooms utilize ceramic tile wainscoting and painted gypsum walls, with ceramic tile flooring. The shower compartments have

ceramic tile wainscoting (approx. 7' high) and painted gypsum walls, with ceramic tile flooring. All of these finishes are worn and are at the end of their useful life.

The fixtures do not meet ADA requirements. The sinks do not have insulated drain piping or approved lever style faucets handles and thus are non-complaint. The toilets do not have proper grab bars and or clearances. Additionally there are no separate toilet/shower facilities for male and female use.

Our recommendation would be to execute a total renovation of these spaces. The fixtures, partitions and accessories should be replaced with new.

Hazardous Materials

It is our recommendation that a comprehensive survey of hazardous materials be conducted as vinyl asbestos tile flooring was observed in the attic areas. The scope of the survey should include asbestos, lead paint, mercury and PBC's.

Program Components

Watch Room

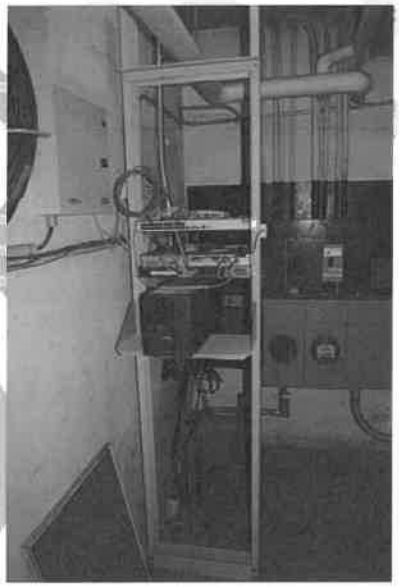
This room appears to be used for a variety of programmatic functions including report preparation and multi-purpose room. These functions are not conducive to providing an appropriate environment for fire fighters to communicate with headquarters in emergency circumstances, nor the walk-in public.

Bunk Room

One unisex dormitory style bunk room (two beds) is located on the upper level. It utilizes painted gypsum board and plaster walls, plastered ceiling and VAT floor tile. All the finishes are in poor condition, especially the VAT flooring which is cracked and missing pieces.

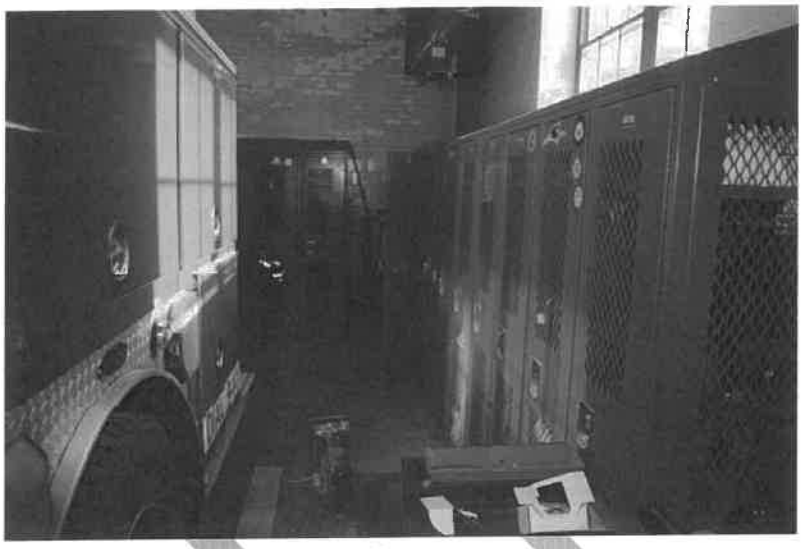
Head End Room

The stations computer network head equipment is located in the basement. The space is not secured nor is it climate or dust controlled.



Apparatus Bays

The apparatus bays utilize glazed cmu wainscoting (approx. 6'-6" high) with painted brick above; exposed concrete beam and slab ceiling and stained/painted concrete floors. All of the finishes are in fair to poor condition. The ceiling exhibits signs of water damage, most likely the result of current and/or past roof leaks.. The overhead door openings are too narrow & short and barely allow passage of the current apparatus. The circulation space around the apparatus is too narrow per recognized fire station facility design standards.



The apparatus doors are insulated metal clad pre-finished sectional overhead doors, which were installed in 1987 and are in good condition.

There is a fire pole that is operational from an upper level corridor. It lacks proper weather seals which would prevent vehicle exhaust and cold air to infiltrate the upper floor from the apparatus bays when the bay doors are open. It also does not have OSHA approved access at the upper level.

The vehicle exhaust system is installed within the last 10 years and is in excellent condition.

The rear of the apparatus bays house the turnout gear lockers, SCAB fill station, decontamination area, laundry, hose/supply storage and work areas (too tight to photograph). All of these spaces should be in their own spaces

Storage Facilities

There appears to be inadequate storage facilities for archival records, training materials, department equipment, and supplies.

– EXISTING CONDITIONS ANALYSIS –

PLUMBING

Plumbing:

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent system, storm drain piping & natural gas. Garage waste and vent systems serve the Apparatus areas. The building is serviced by Town Water and Sewer.

In general, the fixtures do not meet current water conservation requirements. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require the fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water-conserving type fixtures. All new fixtures are recommended.

In general, the drainage piping can be reused where buried underground and where adequately sized for the intended new use. Video inspection of any existing piping to be re-used is recommended.

Fixtures:

Water closets are floor mounted vitreous china with elongated bowls and exposed manual flush valves.

Lavatories are wall hung vitreous china with hot & cold handle faucets.

Showers are tiled units with a shower head and single lever balancing valve.

Janitor's sink is a wall hung, cast iron unit with exposed trap standard. Faucet is not equipped with vacuum breakers.

Utility sink is a wall hung thermoplastic unit with a deck mounted faucet.

Kitchen sink is a stainless steel counter mounted unit with a hot & cold water handle deck mounted faucet.

Electric water cooler is a freestanding cast enameled unit with stainless steel bowl and push button.

Water Closet

Wall Hung Lavatory

Shower

Janitor's Sink

Utility Sink

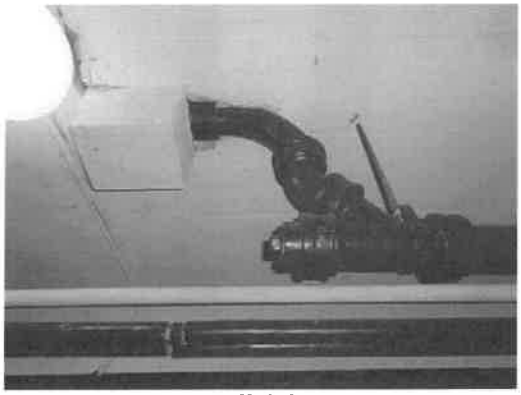
Kitchen Sink

Water Cooler

Sanitary Drainage System:

Sanitary, waste and vent piping is generally cast iron bell and spigot. The piping appears to be in fair condition.

Floor Drain



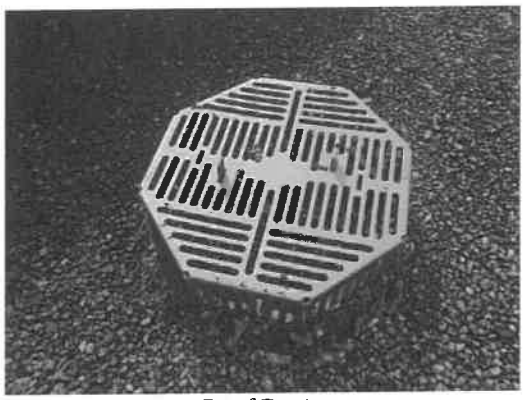
Cast Iron Bell & Spigot

Copper Waste Piping

Vent Piping

Storm Drainage System:

Storm drainage from flat roof areas is disposed of by a system of roof drains and rain water conductors which discharge to a piped storm drainage system.



Roof Drain

Domestic Cold Water System:

The water service enters the building in the basement level.

Domestic water piping is copper tubing with sweat joints. The majority of the copper piping is insulated.

Domestic water service is 2" in size and splits to (2) water meters.

Water Service

Water Meters

Domestic Hot Water System:

Domestic hot water is generated through a 50 gallon gas-fired water heater.

The hot water system is not circulated through the building.

Gas Fired Water Heater

Gas System:

Natural gas is provided for to the building. Gas meter is located on the exterior of the building.

Gas service is 1 ½" in size.

Gas is provided to the water heater & boilers.

In general piping is schedule 40 black steel with welded fittings.

Gas Meter

Gas Piping

Compressed Air System:

Compressed air piping is copper tubing with sweat joints. Compressed air serves the Plymovent system and compressed air outlets in the Apparatus Garage.

Air Compressor

Plymovent System

Plumbing Recommendations:

Provide new high efficiency water conserving plumbing fixtures.

Provide fixtures for code compliant accessibility.

Provide new high-efficiency gas-fired domestic water heater with thermostatic mixing valve and expansion tank.

In general, existing cast iron drainage piping can be re-used if sized appropriately. We recommend video inspection of existing drains to confirm integrity.

Insulate all domestic water piping.

– EXISTING CONDITIONS ANALYSIS –

FIRE PROTECTION

Fire Protection:

The Building does not contain an automatic sprinkler system.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area or in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available. A major alteration is 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, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of M.G.L., any work performed, even if under separate contracts or building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

A hydrant flow test will be required to determine if adequate Municipal water supply is available.

– EXISTING CONDITIONS ANALYSIS –

HVAC

HVAC:

Executive Summary:

The primary heating, ventilation and air conditioning equipment within the East Milton Fire Station Building has received fair to poor maintenance with the exception of the new boiler heating system that was just recently installed (2015). It appears that the heating system presently installed is original to the building with the exception of the boiler system. Overall the system is lacking ventilation and exhaust air and thermal comfort, creating hot and cold spots throughout the building. We recommend a complete upgrade of all terminal heating equipment and control system to achieve higher system efficiencies, reduce energy consumption, provide code required ventilation and provide quality temperature control.

Heating Plant:

The building is heated by one (1) gas-fired fire tube boiler which is located in the basement of the building. The boiler plant utilizes steam to heat the building and has one condensate receiver located in the boiler room to collect all the steam condensate from the system and feed it back into the boiler. All the float and thermostatic traps throughout the building have been recently replaced to help reduce heating issues with the building however, overall temperature comfort is not being achieved. This boiler, breeching and related controls were just recently installed and in excellent condition. The boiler is manufactured by Peerless (323 MBH input). The boiler is provided with a galvanized sheet metal breeching system which exits the building through an existing masonry chimney. The boiler has its own burner management control system which is manufactured by Tekmar, model Steam Control 279. The controller is equipped with outdoor air reset and modulation features for potential energy savings.

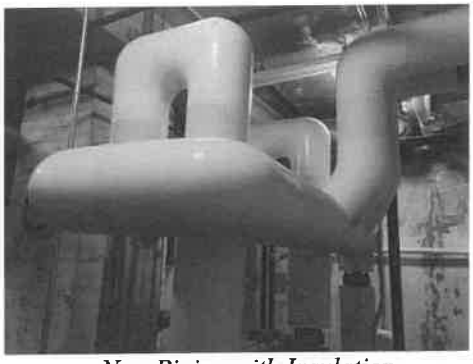
Firetube Steam Boiler

Condensate Receiver

Steam Level Controls

Boiler Breeching

The piping system associated with the boiler is all new and recently installed. The material is schedule 40 black steel with threaded ends. All the piping located near the boiler itself is insulated with new fiberglass insulation with PVC fitting covers. The piping throughout the rest of the building is original and is not insulated completely, some locations are exposed and have no insulation or the insulation is damaged. Piping that is insulated is provided with the original fiberglass installation. The piping from all outwards appearance seems to be in fair condition; however, a section of piping should be removed to examine the internal condition of the piping system and ensure that there is no corrosion or scaling.



New Piping with Insulation

New F&T Traps

Air Conditioning and Ventilation:

There is no central air conditioning system in the Fire Station. Window air conditioning units are located throughout the fire station. As for ventilation air, there are no mechanical ventilation units. The building utilizes operable windows as its means for ventilation, this is allowed by code however the actual requirements required by the code do not appear to be achieved with the current windows. A review of the current windows and square footage would need to occur to ensure that the operable portion of the window equals four percent of the floor area.

Typical Window Air Conditioner

Automatic Temperature Controls:

Automatic temperature controls for the building is minimal, some equipment such as the unit heaters in the apparatus bay are controlled with standalone electronic thermostats. These standalone thermostats are tied directly into each unit and are original to the building. These thermostats were provided by the equipment manufacturer. Other areas of the building that are heated with steam convectors and steam cast iron radiators are equipped with thermostatic control valves, however many of them are not functional and in some cases damaged. The overall control system appears to be malfunctioning and the controllability of the system is less than desirable. We would recommend removing the stand alone electronic system and replacing it with a direct digital control system throughout.

Typical Standalone Thermostat

Typical Thermostatic Control Valve

Apparatus Bay

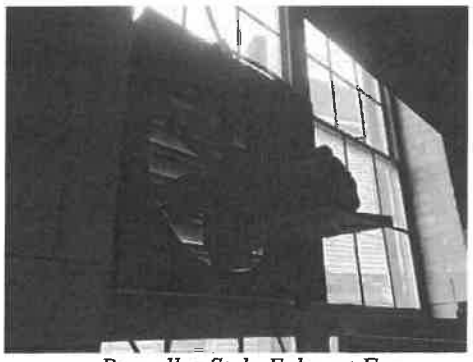
A vehicle exhaust air capture system is installed in the apparatus bay. The system is manufactured by Plymovent and consists of vent-set exhaust fan and filter. All the components are located in the apparatus bay. The ducted system consists of a track system which has flexible hoses which attach to the vehicle exhaust pipe, from there it goes to the main ductwork located high within the apparatus bay and then exits the exterior of the building and discharges high above the roof. The system utilizes a galvanized steel sheet metal distribution system and rubber flex hoses which have compressed air associated with them for easy connection and disconnection of the tail pipe connector. In general, the vehicle exhaust air system appears to be in good condition. The apparatus bay is also equipped with a wall mounted propeller exhaust fan for general exhaust which is activated through a wall switch. Steam unit heaters are utilized to heat the apparatus bay. The apparatus bay unit heaters appear to be original to the building and currently do not provide sufficient heat for the two bay garage. Controllability of these unit heaters is through standalone wall mounted thermostats.

Plymovent Filter System

Plymovent Exhaust Fan

Plymovent Track System

Garage Unit Heaters



Propeller Style Exhaust Fan

Tail Pipe Connection

Office Areas and Sleeping Quarters

The office area and sleeping quarters utilize wall mounted steam convectors and cast iron radiators. Some are controlled via a unit mounted thermostatic control valve while others have no control at all. Majority of these units are damaged, dirty and non-functional. Majority of them do not have any type of control associated with them and those that do utilize thermostatic control valves that are unit mounted. These pieces of equipment run wild and generally overheat or do not provide enough heat for the spaces. Overall the terminal heating system throughout the building is damaged, missing components, and antiquated. The systems require a complete replacement.

Typical Convector

Typical Fan Assisted Convector


Typical Cast Iron Radiator

Shower and Toilet Rooms

There is no mechanical exhaust system for the shower or toilet rooms which is not code compliant. Operable windows provide natural ventilation to these spaces. Floor mounted convectors are located in the bathrooms. The convectors are original to the building and showing signs of corrosion, they are in need of replacement.

Typical Convector in Bathroom

Typical Cast Iron Radiator in Bathroom

HVAC Recommendations:

Provide heating, ventilation and air conditioning requirements throughout the building through the use of new gas-fired rooftop units and supplemental terminal heating equipment such as radiant ceiling panels or wall mounted fin tube radiation.

Provide new galvanized sheet metal ductwork with fiber glass insulation.

Provide tempered make up air system for the apparatus bay.

Provide new code required exhaust system throughout the building for general exhaust with new roof-mounted exhaust fans.

Provide individual space temperature control for office areas through the use of variable air volume diffusers.

Provide a new direct digital control system with web access providing full building control of every component and piece of equipment, alarm notifications, trending capabilities for trouble shooting and optimal start/stop of cooling and heating modes for increased energy savings.

The existing boiler plant can be re-used, however it should be converted to hot water.

– EXISTING CONDITIONS ANALYSIS –

ELECTRICAL

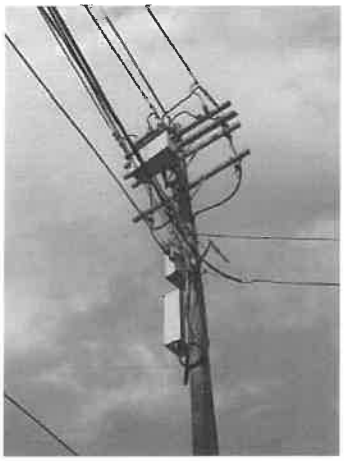
ELECTRICAL

Executive Summary:

In general, the existing Electrical systems, although functioning, are at the end of or have exceeded their useful life, with the exception of the emergency generator. The entire Power Distribution System, Lighting, and Tel/Data Systems should be replaced with new systems under a renovation program. Most systems are marginally sized and are no longer code compliant.

Electrical Distribution System:

Three phase primary power runs overhead on Willard Street then underground to the building from Pole 50-76. There are multiple meters mounted in the building, one that serves the traffic light control box, one for Wires Dept., and one for Fire Dept.



Utility Pole

Meter

Meter

Meter

Traffic Box

The service is rated at 200 amperes at 120/208 volt, 3 phase, 4 wire service.

The Distribution System is in poor condition and inadequately sized for a renovation program.

Main Switch

Sub-panel

Updated Panel

Emergency Power System:

An exterior diesel generator has been recently installed. The generator is manufactured by Cummings Onan, rated at 60 kW, 75 kVA @ .8 PF, machine ID# MO5KO8823006. It is mounted in a weatherproof sound attenuated enclosure. The generator feeds a single automatic transfer switch located in the Main Electrical Room. It is unclear as to what is fed from the emergency generator.

The emergency generator and the automatic transfer switch are in excellent condition. The life safety lighting is accomplished using emergency battery units that are in fair condition. Exit signs are in fair condition; however, are not installed in all required locations.

Generator

Transfer Switch

Emergency Battery Unit

Exit Sign

Fire Alarm System:

The building has a 4 zone microprocessor based fire alarm control panel manufactured by Silent Knight by Honeywell, Model SK-4. The panel seems to be in good condition; however, the notification devices and detection devices range from fair to poor.

There is a combination of heat detectors and smoke detectors located throughout the building. The dorms do not meet the latest codes with respect to notification and they do not have low-frequency horns in sleeping areas. Self-contained Kidde wall mounted CO detectors are located in the Corridor outside the dorms.

FACP

C.O. Detector

Exterior Lighting System:

Exterior lighting consists of building mounted HID flood lights. Fixtures are in poor condition and are not dark sky compliant. There are also decorative fixtures in fair condition.

Exterior Lighting

Interior Lighting:

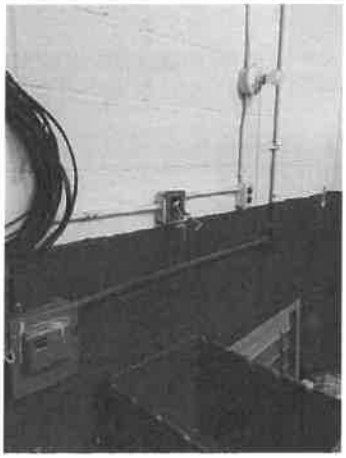
The interior lighting consists mainly of fluorescent wraparound fixtures and recessed 2x4 acrylic troffers with T8 lamps.

Apparatus Bays have 8' utility strips with T12 lamps.

Some corridors contain surface mounted round fluorescent fixtures with three (3) twin tube compact fluorescent lamps.

Lighting in general is in poor condition, lacks proper controls, and light levels are too low in most spaces.

All lighting should be replaced in a renovation program.



Incandescent Light

Corridor Alarm Lighting

Bathroom Lighting

Corridor Lighting

Apparatus Bay Lighting

Branch Circuitry:

Receptacle coverage is minimal and inadequate in various spaces. Extension cord use was noted due to scarcity of the outlets.

The general wiring method is pipe and wire.

Communication Systems:

The telephone service, CATV, and town fiber run overhead in the street and enter the building underground in the basement. The fiber is terminated on a wall mounted fiber optic cabinet in the basement and connects to the building's data rack. The data rack is located in poor environmental conditions in the basement which will lead to shortened life of the equipment.

The telephone service also enters the basement. The wiring has been modified many times over the years, leaving lots of dead wiring making it difficult to follow.

The building data/phone infrastructure consists of a single 24 port Cat5e patch panel in the basement connecting to Cisco switches that are plugged into a local APC UPS.

Tel/Data Rack

Micellaneous:

The facility does not have a Lightning Protection System.

Plymovent Vehicle Exhaust System exists; the control panel is located in the Apparatus Bay and is in good condition.

Zetron Model 6 for incoming alarms is located outside the Watch Room and is in good condition.

Zetron Model 6

Antiquated technology is used to monitor City fire alarms.

Tape Alarm System

Recommendations:

In general, the Electrical Systems will require full replacement under a renovation program. Under a renovation program, due to the inability to conceal raceways, we recommend the use of a surface metal raceway system in finished spaces equal to wiremold. Mechanical rooms, Apparatus Bay, etc. will require surface conduits.

Power Distribution:

- The electrical service is marginal for this facility and the voltage and phase is not suitable for a public safety facility. The entire service should be replaced with a 120/208V, 3Ø, 4W service adequately sized and housed in a code compliant space.

- Electrical power will be brought into the site via underground medium voltage cables from the utility company network. A pad mounted step-down transformer will be located at grade adjacent to the building. Service entrance and distribution switchgear will be located in the Electrical Room near the Mechanical Room, along with lighting and power distribution panels.

Emergency Power System:

- The Emergency Power System should be modified to comply with current code for optional standby and life safety. A second transfer switch and breaker should be added, as well as, a 2-hr rated life safety closet. Size should be reviewed to confirm adequate capacity for emergency loads and other critical stand-by loads.

- The generator is housed in a sound attenuating weather proof enclosure with critical grade exhaust silencer, and automatic starting and safety controls. The generator shall include two (2) service breakers and transfer switches: one (1) for life safety equipment, one (1) for other than life safety equipment. The generator will be sized for 100% of all lighting and power loads. All air-handling units will be provided with emergency power to maintain ventilation and heating for the duration of 48 hours.

- Exit signs will be replaced with energy efficient, long life LED type.

Interior Lighting System:

- General office lighting fixtures will consist of a combination of recessed and pendant mounted indirect LED luminaries and electronic drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also wired for multi-level switching. Corridors and other functional lighting fixtures will consist of acrylic recessed direct fixtures with LED and electronic drivers. Storage, mechanical, apparatus, etc. will be two industrial LED fixtures with acrylic lens.

- Lighting in the Communications Watch Room will be direct-indirect dimmable LED with consideration of dimmable down-lights over console.

- Each area will be locally switched and designed for multi-level controls. Each Office space and Toilet Rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in space with daylight for dimming of light fixtures.

- The entire facility will be controlled with an Automatic Lighting Control System for programming lights on & off.

- Lighting in the Dorm Rooms, Corridors, and Apparatus Bay will be interfaced with the Zetron System to automatically turn on during an alarm then timed off.

Exterior Lighting:

- Fixtures for area lighting will be pole mounted LED luminaries in the parking area and roadways. The exterior lighting will be connected to the Automatic Lighting Control System for photocell on and timed off operation.

- Building perimeter fixtures will be wall mounted over exterior doors.

- All fixtures will be of the cut-off type.

Wiring Devices:

- Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided. Corridors will have a cleaning receptacle at approximately 30-40 foot intervals. GFI receptacles will be provided in Apparatus Bay. Exterior weatherproof receptacles will be installed at exterior doors. A system of computer grade panelboards will double neutrals and surge protective devices will be provided for receptacle circuits.

Fire Alarm System:

- Fire Alarm System should be replaced with an addressable, ADA compliant system with full coverage.
- A Fire Alarm and Detection System will be provided with 60 hour 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.
- Smoke detectors will be provided in open areas, corridors, stairwells, and other egress ways.
- The Sprinkler System will be supervised for water flow and tampering with valves.
- Horn/strobes will be provided in egress ways, open areas, and other large spaces. Strobe only units will be provided in single Toilet and Conference Rooms.
- Manual pull stations will be provided at exit discharge doors.
- The system will be connected to automatically report alarms to a remote location.
- Dorm Rooms will be provided with local detectors with low frequency sounder base.
- C.O. detection will be provided per code.

Uninterruptible Power Supply (UPS):

- A three phase centralized UPS System will be provided. The system will provide conditioned power to sensitive electronic loads for Communications Equipment Room and Communications/Watch Room. The UPS will bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage. The UPS System will also be connected to the stand-by generator.

Lightning Protection System:

- A system of lightning protection will be provided. The system will be installed in compliance with the provisions of the latest "Code for Protection Against Lightning" for buildings as adopted by the National Fire Protection Association and the Underwriters' Laboratories, Inc. for UL Master Label System.

- The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors, ground rods, etc.

Technology:

- The Data System infrastructure is to be located in a properly designed room, and should be updated to include Category 6A UTP cabling for the both Data and Telephone Systems for gigabit connectivity at the work station. Each office should have one (1) voice and two (2) data outlets.

- A Central Paging System should be provided and integrated with the Telephone System.

CCTV:

- A Closed Circuit TV System should be installed and include computer servers with image software, computer monitors, and IP based closed circuit TV cameras. The head end server should be located in a properly designed head end MDF Room and will be rack mounted. The system should have accessibility from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (NVRs) should record all cameras and store this information for 21days at 30 images per second. The location of the cameras should generally be in corridors and exterior building perimeter.

- The system should fully integrate with the Access Control System if provided to allow viewing of events from a single alarm viewer. Camera images and recorded video should be linked to the Access Control System to allow retrieval of video that is associated with an event.

Card Access:

- A Card Access System should be considered and include a card access controller, door controllers, and proximity readers/keypads. Proximity readers should be located at various locations. Each proximity reader should have a distinctive code to identify the user and a log will be kept in memory. The log within the panel should be accessed through a computer. The alarm condition should also initiate real time recording on the integrated CCTV System.

– SPACE NEEDS –

Milton Station 2 Fire Program

Project Name: Milton

1st Program Meeting Date: **October 14, 2015**

Printout Date: **November 17, 2015**

Filename: Milton Station 2 Fire Program.doc

This document is not meant to be limited to an inventory of what you currently have.

Indicate what you currently need for proper operations and try to forecast what you will need for the future.

B Functional Activities in Building

B1. Types of response:

B1.1. Fire: **Yes**

B1.2. EMS: **Yes (BLS Engine Co's)**

B1.3. Heavy Rescue: **No**

B1.4. HAZ MAT: **No**

B1.5. Water Rescue: **Yes**

B1.6. Ambulance: **No**

B1.7. Other: **UTV (Off road rescue)**

B2. Training activities in building:

B2.1. **No**

Training activities on site:

B2.2. **No**

B3. Fuel Filling Station: **No**

B4. Other uses of apparatus bay:

B4.1. Social events: **No**

B4.2. Craft fairs: **No**

B4.3. Other: **None**

B5. Sleeping Over:

B5.1. Now

.5.1.1. Long term: **Yes**

B5.2. Future

.5.2.1. Intermittent, short duration: **Storm coverage**

.5.2.2. Long term: **Yes**

B6. Standing by: **Mutual Aid**

.6.1.1. Will other fire companies park their apparatus in the bay under certain circumstances: **No – only at HQ**

B7. Emergency Shelter: **No**

B8. Firematic Business: **None**

B9. Meetings: **None**

B10. Social Life:

B10.1. Daily recreation – describe: **Physical fitness activities by the on duty firefighters, Day Room w/ t-v**

B10.2. Periodic recreation – describe: **None**

B10.3. Outdoor recreation – describe: **None**

B11. Misc. Activities

B11.1. **Fire Prevention Week school visits**

B11.2. **Weekly visits by parents and children**

B11.3. **Medical walk-ins maybe 6/year**

B12. Access control:

B12.1. Electronic access: **Yes**

B12.2. Vendor's access to drop off material: **No**

C Site

C1. Who owns the road at apron: **TBD**

C2. Number of primary responder parking spaces needed : **4**

C3. Number of other parking spaces needed: **1**

C4. Number of spaces needed for visiting apparatus: **0; Parking space for training trailers on loan**

C5. Number of spaces needed for visiting firefighter parking: **TBD**

C6. Recreation requirements (Pavilion, grill, patio, etc.): **None**

C7. Training requirements: **None, done at HQ**

C8. Site signage requirements: **No**

C9. Dumpster: **No**

APPARATUS

1 Apparatus Bays

1.1 Number of vehicles: **1** ; # of bays: **1**

Front Line Vehicles

1.1.1 Name: **Engine 2** type: **E- One** length: **30'** weight: **39,200lbs**

1.2 Type of bays:

1.2.1 Drive-through: **Would like one for engine**

1.2.2 Single deep: **Could be**

1.3 Wash bay: **No, will wash in place**

1.4 Plan for future expansion of bays: **No**

1.5 Overhead doors:

1.5.1 Front:

1.5.1.1 Number: **1**

1.5.1.2 Width/Height: **(use 13'-4" W x 14'-0" H)**

1.5.1.3 Windows: **Yes**

1.5.2 Rear:

1.5.2.1 Number: **1**

1.5.2.2 Width: **11'9";** Height: **13'11" (use 13'-4" W x 14'-0" H)**

1.5.2.3 Windows: **Yes**

1.6 Signage requirements: Plan for future digital display of fire information

1.7 Trench drains: **Yes** ; Layout: **Centerline of trucks**

1.8 Wall mounted water hose reels: **Yes** ; Quantity: **1**; Tempered: **No**

1.9 Fume exhaust: **Yes** ; Type: **Plymovent** ; Later: **Same**

1.10 Truck fills:

1.10.1 Overhead: **No**

1.10.2 Wall hydrant: **Yes** ; Quantity: **TBD**

1.10.3 Outdoor hydrant: **TBD**

1.11 Overhead electrical drops: **Yes** ; Quantity: **1**

1.12 Overhead airdrops: **Yes** ; Quantity: **1**

1.13 Compressed air for tools: **Yes**

1.14 Wall mounted air hose reels: **currently no, moving forward yes;** Quantity: **1**

1.15 Utility sinks: **Locate in adjacent room**

1.16 Hand wash sinks: **Yes**; Where: **At door to balance of building**

1.17 Water fountain/bottle filling station: **No**

1.18 Ice machine: **Future** ; Location: **Near the bay**

1.19 Storage of Diesel Exhaust Fluid: **No**

1.20 Epoxy flooring: **Currently No moving forward possibly**

1.21 Wall construction type: **Currently Dry Wall & Masonry**

1.22 Size: **889** sq ft

FIREMATIC SUPPORT

2 Storage Room #1

2.1 Use: **Equipment storage**

2.2 Items to be stored: **Back up fire service items- axes, haligans, valves, etc.**

2.3 Location: **currently we have no storage rooms**

2.4 Security: **Yes**

2.5 Adjacencies: **Apparatus bay**

2.6 Comments: **heavy duty shelving**

2.7 Size: **203** sq ft

3 Turnout Gear Storage Room

3.1 Operational Comments: **We currently store turn out gear in lockers on the apparatus floors.**

3.1.1 Response pathway

3.1.1.1 **Turnout gear get placed at truck at start of shift**

3.2 Quantity of Lockers: **E4- 20 each**

3.3 Describe Lockers: **Metal mesh lockers**

3.4 Locker Size: **20" x 20" x 72"**

3.5 Location: **apparatus floor**

3.6 Adjacencies: **Ideally near decon laundry**

3.7 Comments: **Enclosed, with dehumidification and heat recovery ventilation**

3.8 Size: **156** sq ft

4 Hose Storage

4.1 Operational Comments:

4.1.1 **Storage of modest quantity of spare hose**

4.2 A room, or on the floor: **Currently Stored on apparatus floor**

4.3 Hose racks: **1** ; Size: **10 ft**

4.4 Hose drying: **No**

4.5 Hose washer: **No**

4.6 Hose winder: **No**

4.7 Inventory:

4.7.1 5" suction: **0**

4.7.2 5" LDH: **5 lengths at each station @ 100'** [7 ½" footprint]

4.7.3 4" LDH: **0**

4.7.4 2 1/2" LDH: **5 lengths in each station @ 50'** [4" footprint]

4.7.5 1 3/4" LDH: **4 lengths in each station @ 50'** [3" footprint]

4.7.6 1 1/8" LDH: **4 lengths in each station @ 50'** [2" footprint]

29 Thacher Park Road Voorheesville, NY 12186 (518) 765-4571 Fax (518) 765-2950
E-mail: Bob@Mitchell-Architects.com

Web Site: Mitchell-Architects.com

4.8 Items to be located in this space (from current inventory):

4.8.1 **same as above**

4.9 Additional items (not in current inventory):

4.9.1 **None**

4.10 Adjacencies**: Apparatus floor**

4.11 Comments: **Two tier rack, not three**

4.12 Size: **29** sq ft

5 DeCon/Laundry

5.1 Operational Comments: **Allow for decon of personal and gross decon of equipment**

5.2 **Currently in the apparatus bay**

5.3 Sink: **Yes** ; Foot Pedal: **No** ; Number of sink chambers: **two**

5.4 Gear washer/extractor: **Yes, 60 lb capacity**

5.5 Gear dryer: **Yes – DryGear Pro 3**

5.6 Ventilated gear racks: **No**

5.7 Residential type clothes washer & dryer: **Yes**

5.8 Drench shower: **Yes**

5.9 Backboard/Etc. cleaning: **Yes**

5.10 Holding tank: **No**

5.11 Adjacencies: **bay, and near an exterior door**

5.12 Comments: **Incorporate future EMS Decon**

5.13 Size: **258** sq ft

6 Janitor's Closet

6.1 Mop Receptor: **Yes**

6.2 Slop Sink: **Yes**

6.3 Floor Machine: **Yes**

6.4 Shelving: **Yes**

6.5 Mop/Broom Rack: **Yes**

6.6 Adjacencies: **Apparatus bay**

6.7 Comments: **currently we do not have dedicated janitors closets**

6.8 Size: **80** sq ft

7 Apparatus Floor Rest Rooms

7.1 Quantity: **One per station**

7.2 Fixture: Sink, toilet & urinal? **Yes**

7.3 Shower: **No**

7.4 Lockers: **No**

7.5 Adjacencies: **Apparatus bay**

7.6 Size: **62** sq ft

8 Patrol Room

8.1 View control: **Apron**

8.2 Operational Comments:

8.2.1 **Receiving calls from police or public. Communications.**

8.3 Seating for how many: **3**

8.4 Items:

8.4.1 Door operator switches: **yes**

8.4.2 Traffic device control: **DNA**

8.4.3 Light switches for app bay: **yes** ; Outside: **no**

8.4.4 Internal paging system: **yes**

8.4.5 Siren trigger: **no**

8.4.6 Computer equipment: **Work stations**

8.4.7 Closed Circuit TV, Phones, Weather Station: Describe: **no**

8.4.8 File cabinets: **no**

8.4.9 Wall mounted items: **television**

8.4.10 Rechargeable items (flashlights, pagers): **no**

8.4.11 Lockable storage: **no**

8.5 Items to be located in this space (from current inventory):

8.5.1 **3 ring binders, 1 map of town**

8.6 Security: **Open to personnel**

8.7 Adjacencies: **Apparatus bay**

8.8 Size: **134** sq ft

FIREFIGHTERS

9 Day Room

9.1 Uses:

9.1.1 **Cooking & eating**

9.1.2 **Relaxation & watching television**

9.2 Number of chair seating: **2**

9.3 Couch: **Yes** ; seats how many: **3**

9.4 TV: **Yes** ; Size: **42"**

9.5 Bulletin board: **Yes**

9.6 Kitchen: **Yes**

9.7 Dining/Eating: **Shift size=4, seat 6**

9.8 Living/T-V: **Yes**

9.9 Location:2nd floor near bunking

9.10 Size: **432** sq ft

10 Physical Training

10.1 Equipment:

10.1.1 Cardio: **Yes**

10.1.2 Weights: **Yes**

10.1.3 Weight Machines: **Yes**

10.2 Location: **currently they are fit into each station where space allowed**

10.3 Security: **No**

10.4 Adjacencies: **Not critical**

10.5 Comments: **Integral one-person changing room**

10.6 Size: **480 sq ft**

11 Firefighters' Bed Rooms

11.1 Number of rooms: **3**

11.2 Beds per room: **1**

11.3 Storage: **Yes**

11.4 Desks: **Yes**

11.5 Location: **all on second floor**

11.6 Security: **access control**

11.7 Comments: **Single bed w/ 4 exterior lockers @ 20"w x 24" d x 72" h**

11.8 Size: **98** sq ft

12 Lieutenant's Bed Rooms

12.1 Number of rooms: **E1-9, E2-2, E4-3**

12.2 Beds per room: **E1 & E4 – 1, E2 -3, & 1**

12.3 Storage: **Yes**

12.4 Desks: **Yes, small office**

12.5 Location: **all on second floor**

12.6 Security: **access control**

12.7 Comments: **Single bed w/ 4 exterior lockers @ 20"w x 24" d x 72" h**

12.8 Size: 116 sq ft

13 Bunker's Bathrooms

13.1 Quantity: **2**

13.2 Details: **Toilet, urinal sink, shower & bench**

13.3 Location: **all on second floor**

13.4 Security: **Privacy latch**

13.5 Adjacencies: **Bunking**

13.6 Comments: **Single occupant, uni-sex**

13.7 Size: **2 @ 91** sq ft

14 Bunker's Area Laundry Room

14.1 Location: **Currently None**

14.2 Adjacencies: **Near bunking**

14.3 Comments: **Front load machines**

14.4 Size: **59** sq ft

MISCELLANEOUS SPACES

15 Entry Vestibules (2)

15.1 Size: **(2) @ 50** sq ft

16 House Keeping Storage

16.1 Location: **One on each floor**

16.2 Size: **(2) @ 25** sq ft

17 Janitors Closet

17.1 Mop Receptor: **Yes**

17.2 Slop Sink: **No**

17.3 Floor Machine: **Yes**

17.4 Shelving: **Yes**

17.5 Mop/Broom Rack: **Yes**

17.6 Comments: **Will also store bathroom supplies**

17.7 Size: **64** sq ft

18 File Server

18.1 Location: **No – runs off Town server**

19 Mechanical, Electrical, Plumbing, HVAC, Sprinkler, Alarm, etc.

19.1 Fuel type at site: **Gas**

19.2 Heating type in apparatus bay: **In-floor radiant**

19.3 Heating type elsewhere: **Ducted HVAC**

19.4 Building to be sprinklered: **Yes**

19.4.1 Adequate water pressure: **Yes**

19.5 Hose bibs for exterior: **Yes**

19.6 Bay lighting type: **LED**

19.7 Site lighting type: **LED**

19.8 Generator: **Yes**

19.8.1 Fuel: **TBD**

19.8.2 Location of generator: **Exterior**

19.8.3 Circuits on generator: **All**

19.9 Describe Security Type (fob?): **Yes**

19.10 Alarm: **Yes**

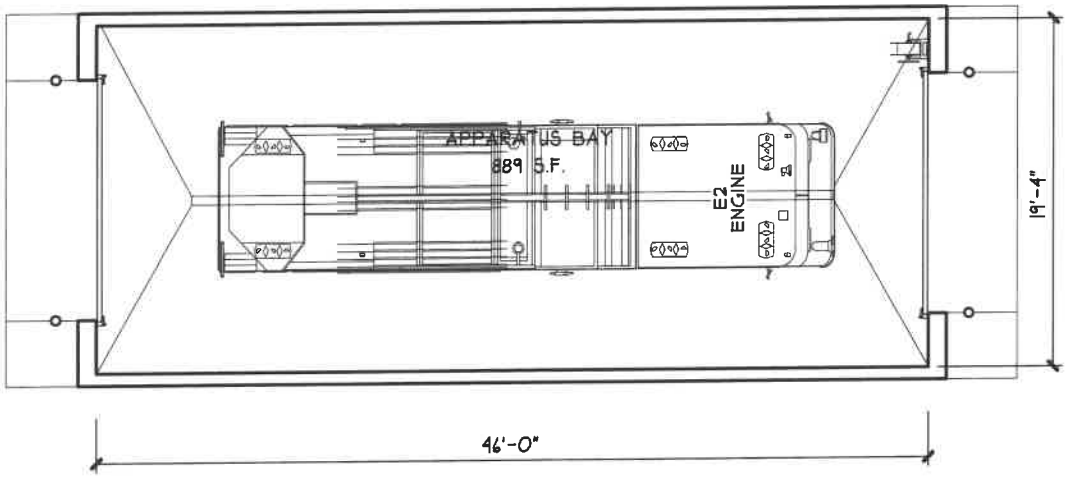
19.11 Siren: **No**

19.12 Location: **Not critical**

19.13 Size: **350** sq ft

Milton Station 2 Space/Usage Analysis

Program Item	Room Name	Proposed Floor Area		Existing Floor Area		Area To Demolish		Floor Area To Renovate		New Construction Area	
		1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor
	Apparatus Ba										
1	Apparatus Bay	889		0		0		0		889	
	Subtotal - Apparatus	**889**		**0**		**0**		**0**		**889**	
	Firematic Support										
2	Storage Room #1	203		0		0		0		203	
3	Turnout Gear	156		0		0		0		156	
4	Hose Storage	29		0		0		0		29	
5	DeCon Laundry	258		0		0		0		258	
6	Janitors Closet	80		0		0		0		80	
7	Apparatus Floor Uni-Sex ADA Rest Room	62		0		0		0		62	
8	Patrol Room	134		0		0		0		134	
	Subtotal - Firematic Support	**922**		**0**		**0**		**0**		**922**	
	Firefighters										
9	Day Room	0	432	0	0	0	0	0	0	0	432
10	Physical Training	0	480	0	0	0	0	0	0	0	480
11	Bunkers Bedrooms (3 @ 98 sf)	0	294	0	0	0	0	0	0	0	294
12	Lieutenants Bedroom	0	116	0	0	0	0	0	0	0	116
13	Bunkers Bathrooms (2 @ 91 sf)	0	182	0	0	0	0	0	0	0	182
14	Bunkers Area Laundry	0	59	0	0	0	0	0	0	0	59
	Subtotal - Firefighters	**0**	**1,563**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,563**
	Miscellaneous Space										
15	(2) Entry Vestibules	100	0	0	0	0	0	0	0	100	0
16	Housekeeping Storage	50	50	0	0	0	0	0	0	50	50
17	Janitors Closet	64	64	0	0	0	0	0	0	64	64
18	File Server	0	0	0	0	0	0	0	0	0	0
19	Mechanical/Electrical	350	50	0	0	0	0	0	0	350	50
	Subtotal - Miscellaneous Spaces	**564**	**164**	**0**	**0**	**0**	**0**	**0**	**0**	**564**	**164**
	Vertical Circulation										
20	(2) Stairwells (area per floor)	356	364	0	0	0	0	0	0	356	364
21	Elevator (area per floor)	58	58	0	0	0	0	0	0	58	58
22	Elevator Equipment Room	52	0	0	0	0	0	0	0	52	0
23	Elevator Foyer	80	80	0	0	0	0	0	0	80	80
	Subtotal - Vertical Circulation	**546**	**502**	**0**	**0**	**0**	**0**	**0**	**0**	**546**	**502**
	Area Subtotals										
	Bay	**889**		**0**		**0**		**0**		**889**	
	Firematic Support	**922**		**0**		**0**		**0**		**922**	
	Office & Living	**1,110**	**2,229**	**0**	**0**	**0**	**0**	**0**	**0**	**1,110**	**2,229**
	Walls & Circulation										
	Apparatus Bay Walls @ 5%	44		0		0		0		44	
	Firematic Support Walls @ 15%	138		0		0		0		138	
	Firematic Support Circulation @ 15%	138		0		0		0		138	
	Office Area Walls @ 15%	167	334	0	0	0	0	0	0	167	334
	Office Area Circulation @ 20%	222	446	0	0	0	0	0	0	222	446
	As-Built Adjustment			0	0						
	Subtotal - Walls & Circulation	**710**	**780**	**0**	**0**	**0**	**0**	**0**	**0**	**710**	**780**
	Total By Floor>>	**4,177**	**3,511**	**0**	**0**	**0**	**0**	**0**	**0**	**4,177**	**3,511**
	Total By Category>>	**7,688**		**0**		**0**		**0**		**7,688**	
	Footprint>>	**4,177**		**0**		**0**		**0**		**4,177**	



MITCHELL ASSOCIATES ARCHITECTS

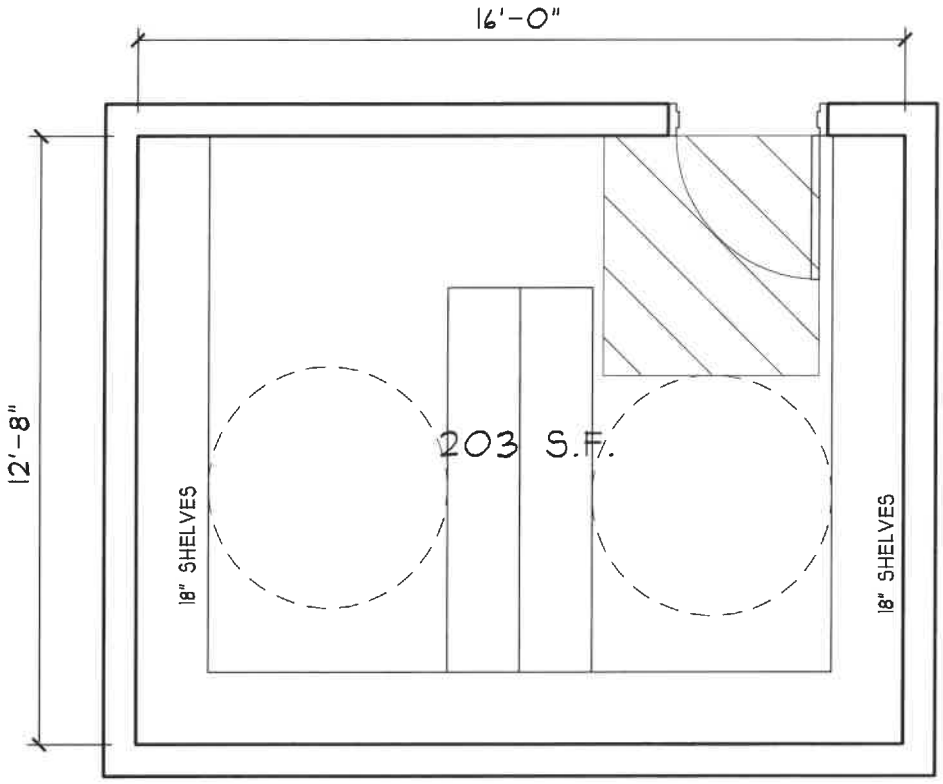
STATION 2 APPARATUS BAY

SCALE: 3/32" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\1- Bay & Firematic Support\01 - Engine 2 Apparatus Bay

01

ROOM #



CMU WALLS

MA MITCHELL ASSOCIATES ARCHITECTS

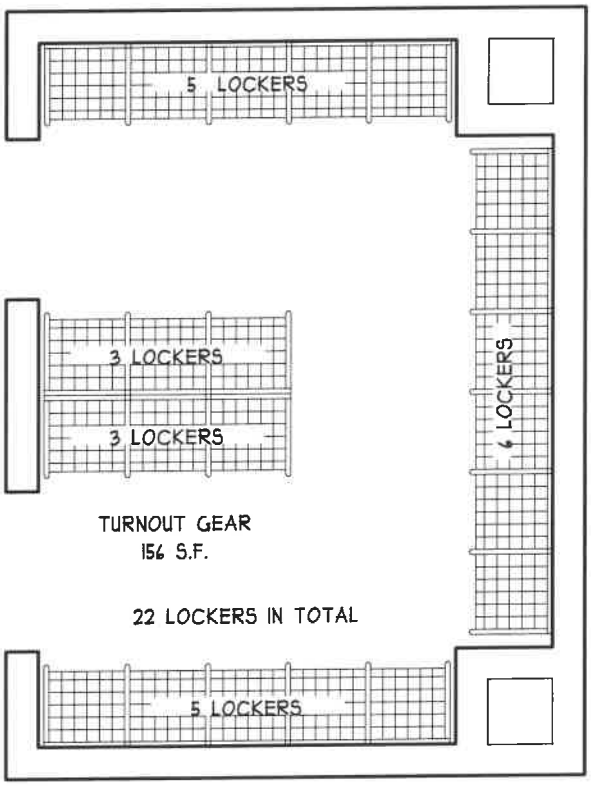
STORAGE ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\1- Bay & Firematic Support\02 - Storage Room #1

02

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

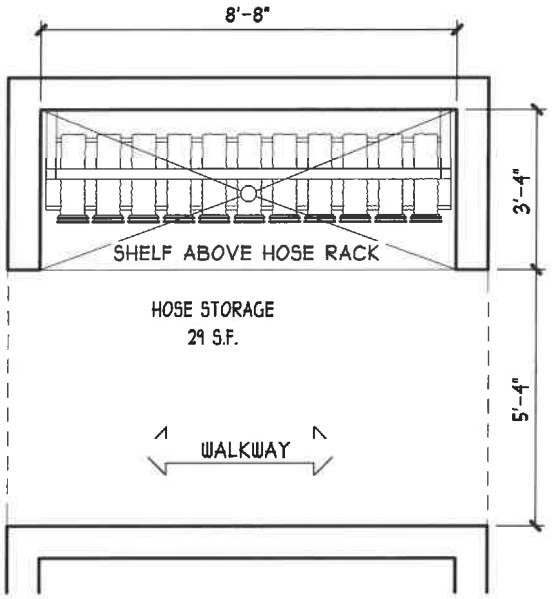
TURNOUT GEAR

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\1- Bay 4 Firematic Support\03 - Turnout Gear - Station 2

03

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

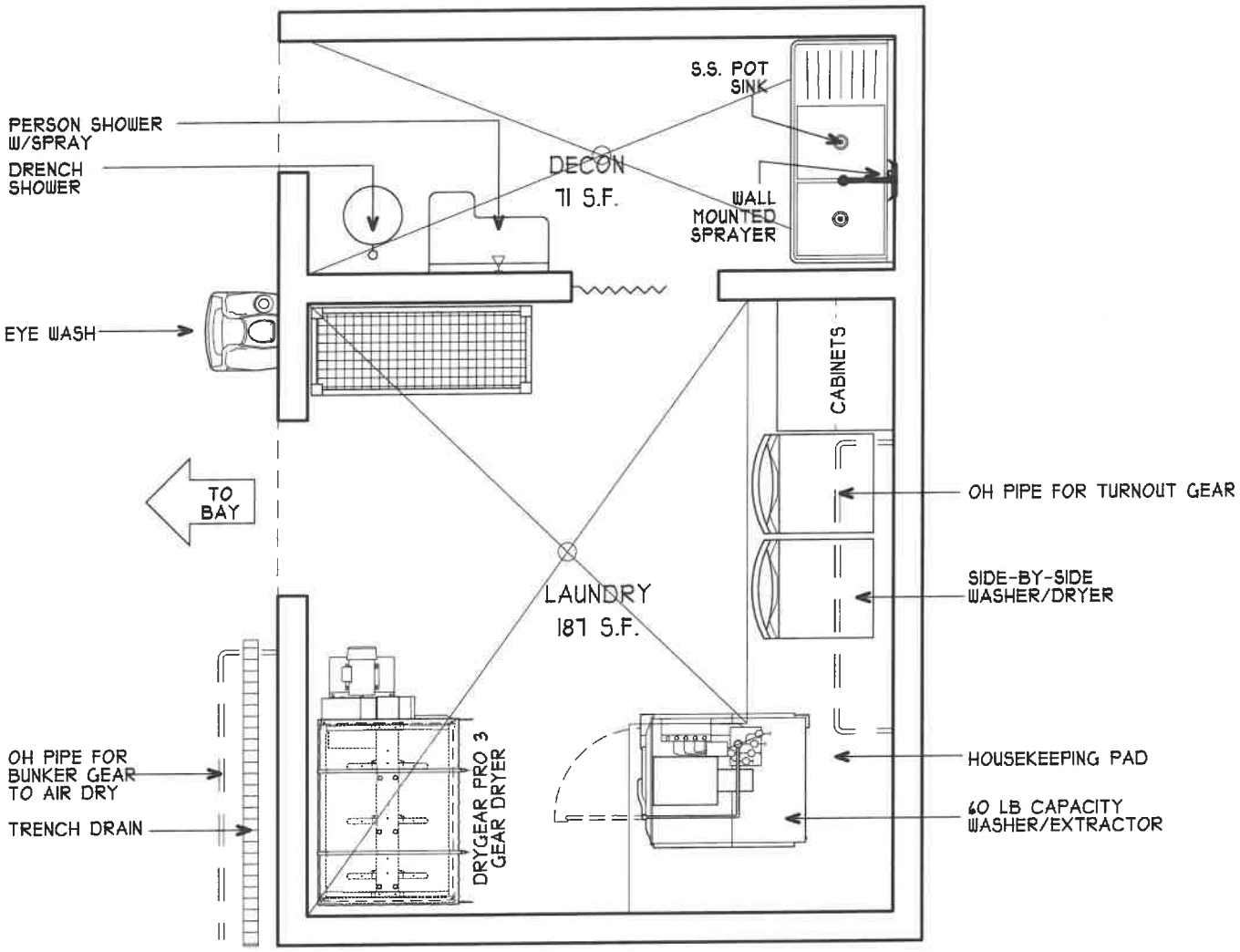
HOSE STORAGE

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\J- Bay 1 Firematic Support\04 - Hose Storage

04

ROOM #



TOTAL AREA = 294 S.F.

MITCHELL ASSOCIATES ARCHITECTS

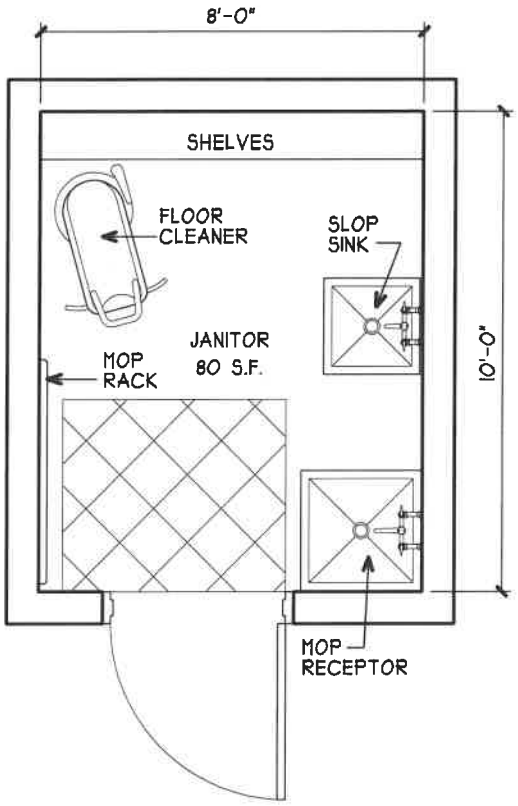
DECON / LAUNDRY

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\1- Bay & Firewatic Support\05 - Decon Laundry at Station 2

05

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

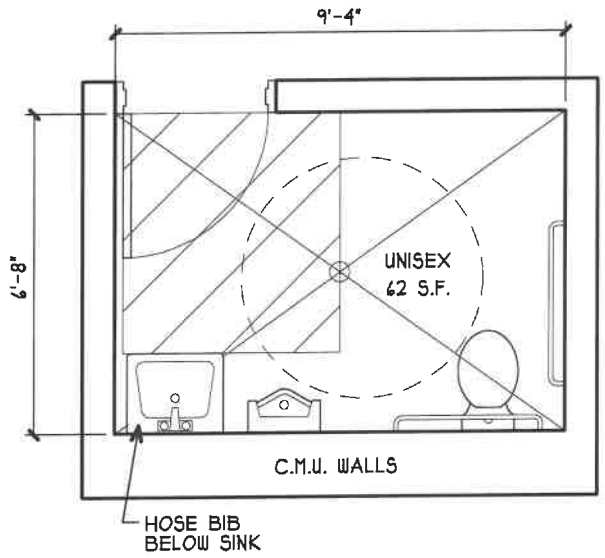
JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\1- Bay 1 Firematic Support\04 - Janitor

06

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

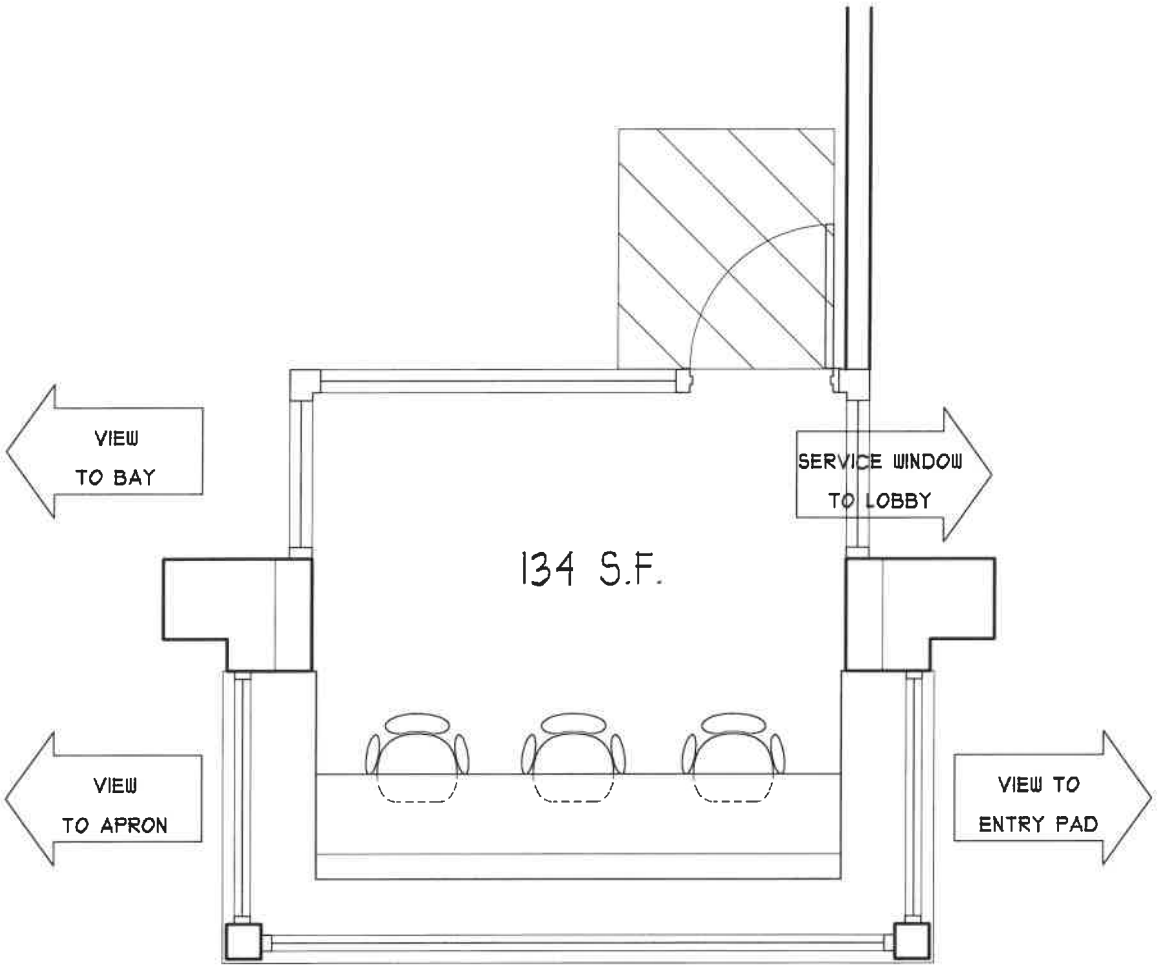
APPARATUS BAY BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\1- Bay 1 Firematic Support\01 - Bathroom

01

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

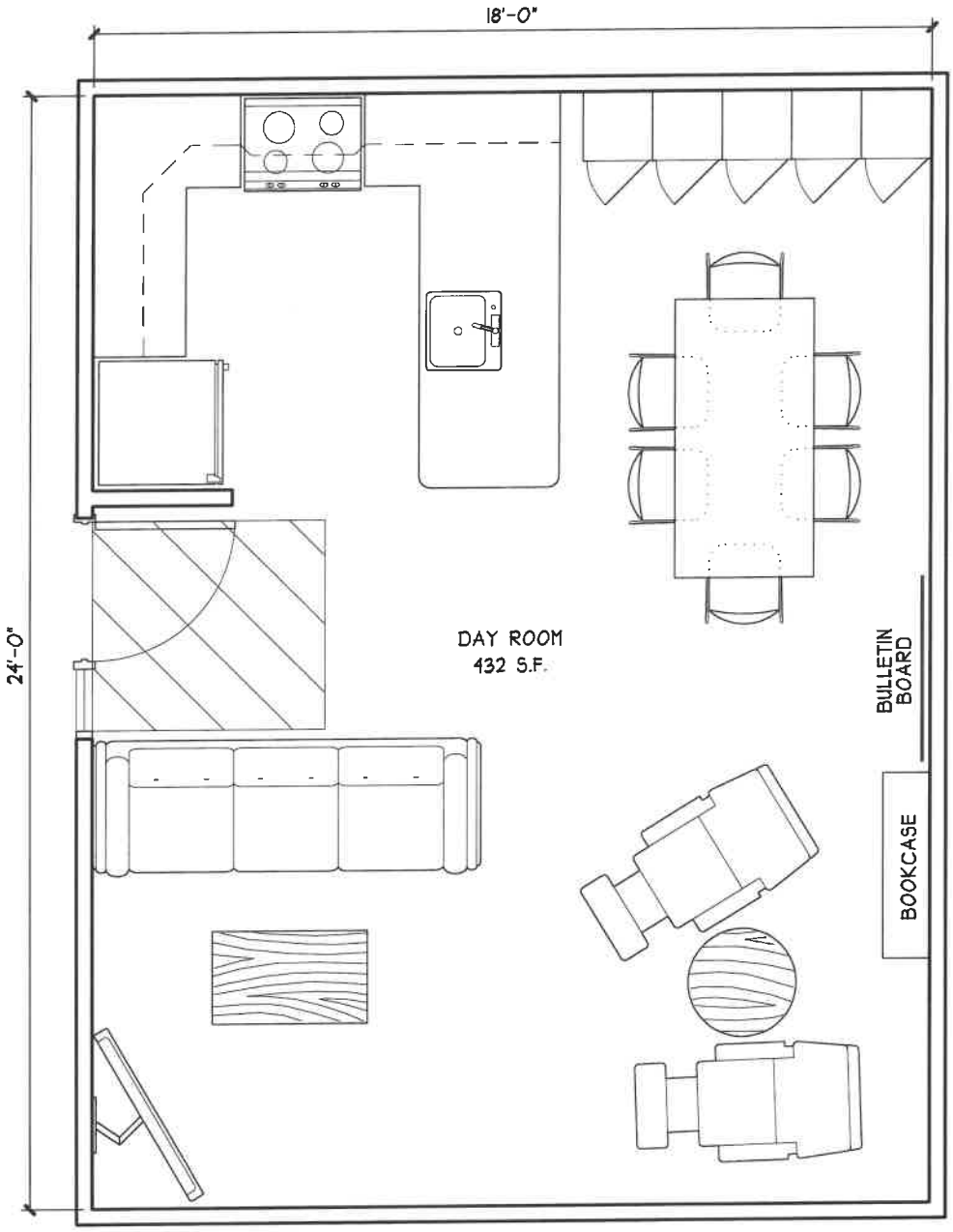
PATROL ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\I- Bay & Firematic Support\08 - Patrol Room

08

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

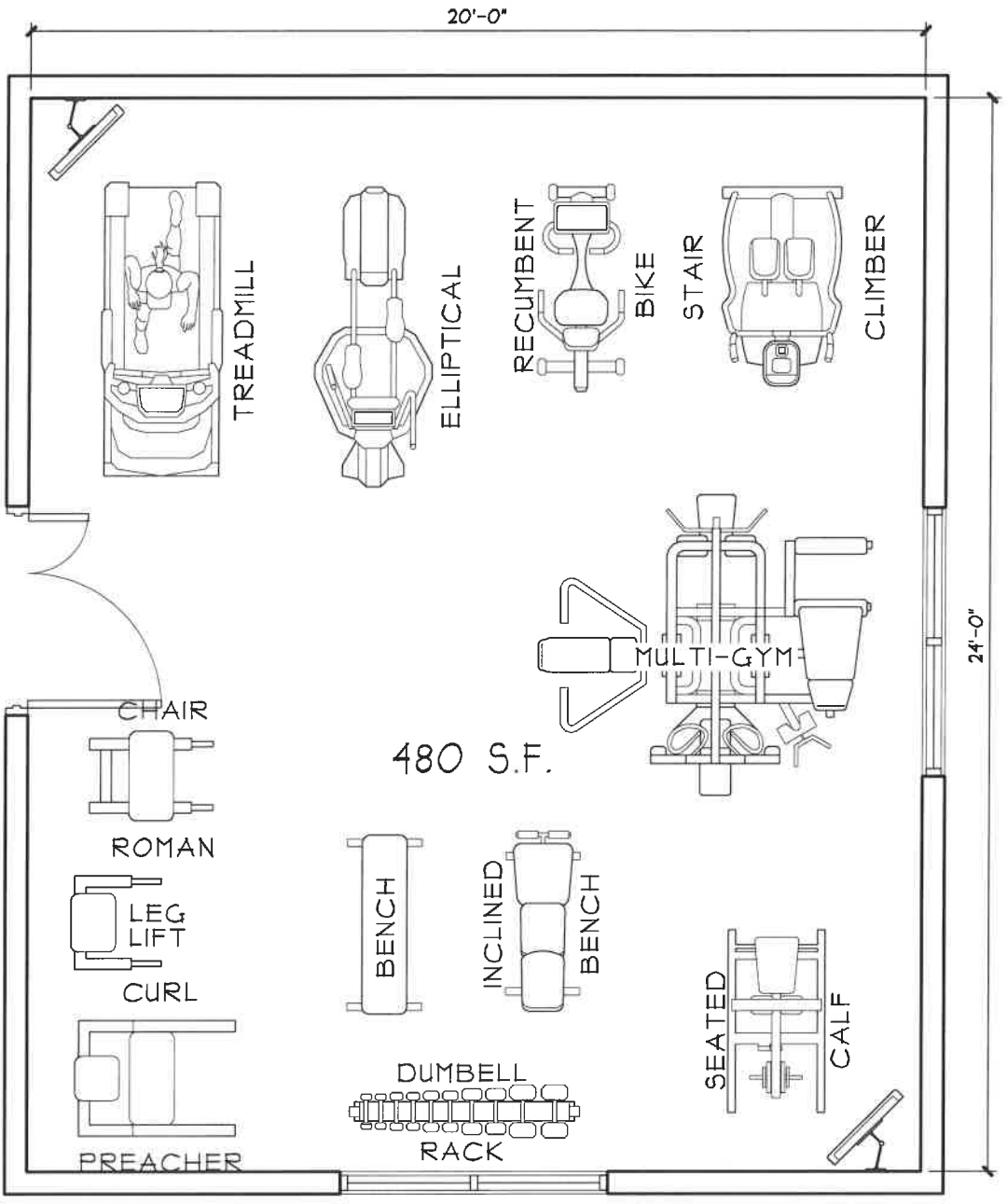
DAYROOM

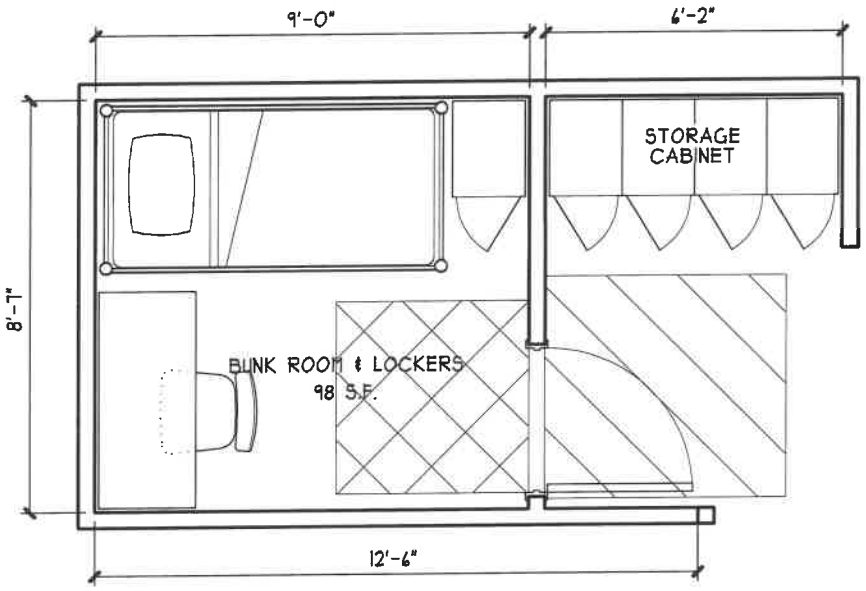
SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\3 - Firefighters\09 - Day Room

09

ROOM #


20'-0"
24'-0"
TREADMILL
ELLIPTICAL
RECUMBENT BIKE
STAIR CLIMBER
MULTI-GYM
480 S.F.
CHAIR
ROMAN
LEG LIFT
CURL
PREACHER
BENCH
INCLINED BENCH
DUMBELL RACK
SEATED CALF



MITCHELL ASSOCIATES ARCHITECTS

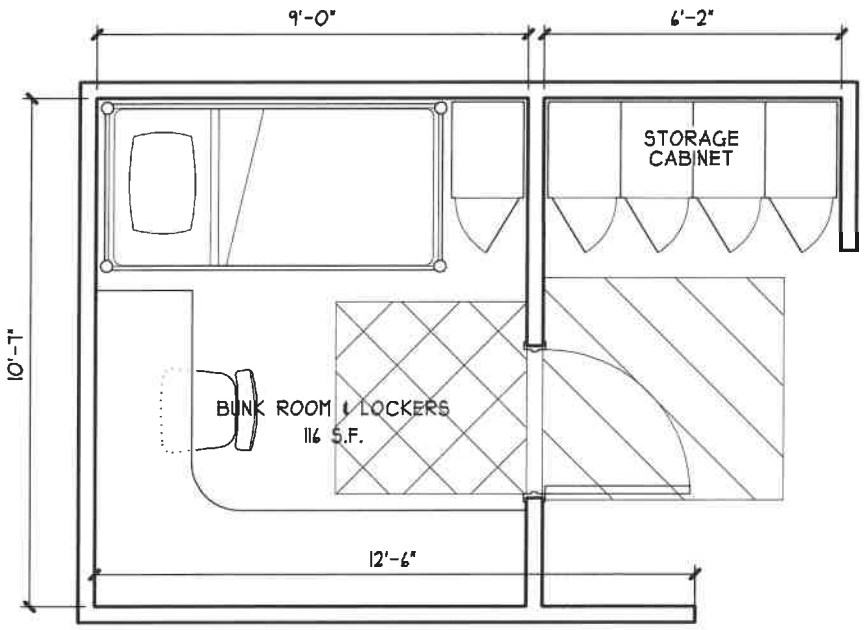
BUNK ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\3 - Firefighters\11 - Firefighters Bedroom

11

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

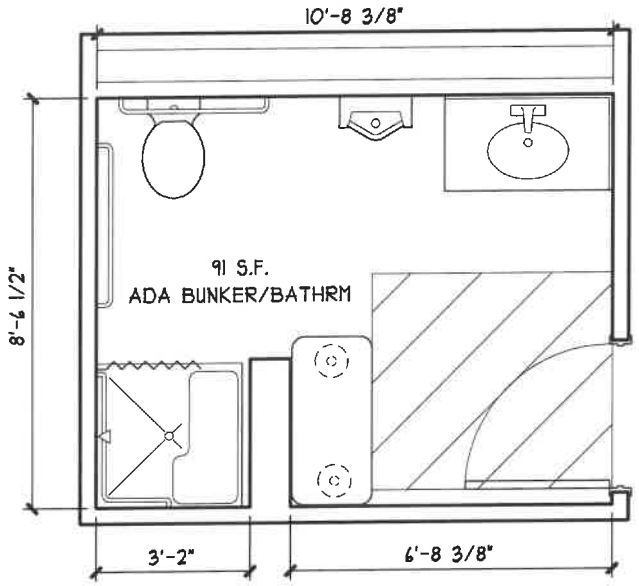
LIEUTENANTS BUNK ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\3 - Firefighters\12 - Lieutenants Bedroom

12

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

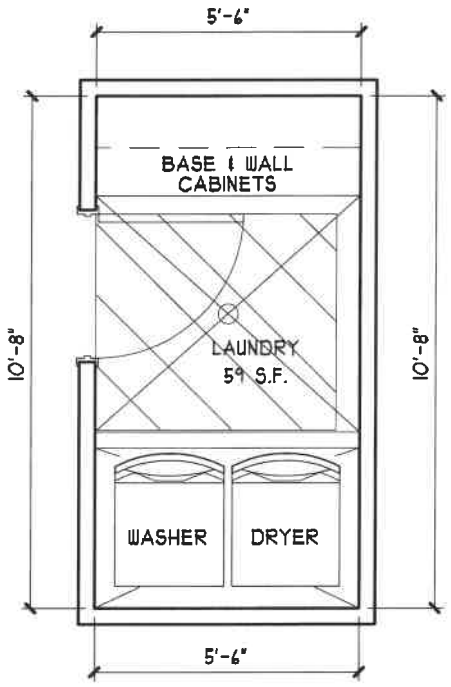
BUNKER'S BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\3 - Firefighters\13 - Bunker's Bathroom

13

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

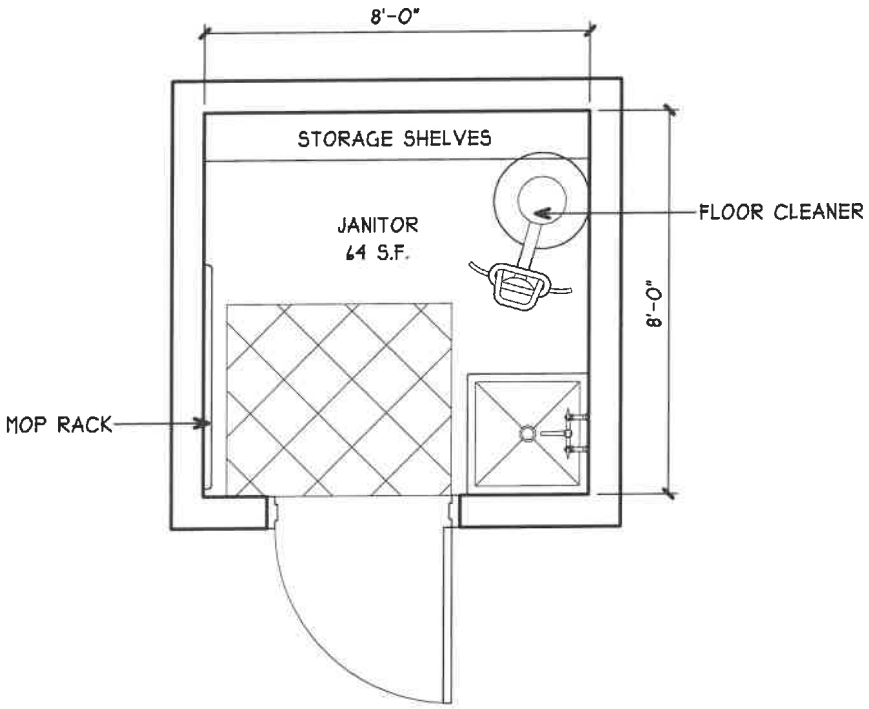
BUNKERS' LAUNDRY

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\3 - Firefighters\14 - Bunker's Laundry

14

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 2\Individual Rooms\5 - Miscellaneous\17 - Janitor

17

ROOM #

– BUILDING CODE ANALYSIS –

APPLICABILITY

This analysis reviews the existing Milton Fire Department Blue Hill Ave Facility in Milton, MA, with regard to the Massachusetts State Building Codes ("Code") for new construction. The 8th Edition of the State Building Code consists, in part, of the 2009 International Building Code (IBC) and the 2009 International Existing Building Code (IEBC) with Massachusetts Amendments to these codes.
Codes used in this analysis are:

International Building Code (IBC, 2009)
International Existing Building Code (IEBC, 2009)
International Energy Conservation Code (IECC, 2012)
Massachusetts State Building Code Amendments (780 CMR 8th Edition)
Architectural Access Board Rules and Regulations (AAB, 521 CMR, 2006)
Uniform State Plumbing Code (248 CMR)

Code compliance with regard to mechanical systems, including electrical, plumbing, fire protection systems and sitework are reviewed in separate sections of this study.

Upgrades and corrections to existing structures undergoing renovations are limited to specific items under the IEBC. During renovations, not all existing safety issues and non-compliant conditions are required to be corrected; typically only items within each renovated area are required to be corrected. However, non-compliant conditions at stairs and egress elements, fire rating separations, accessibility, and fire protection (sprinklers) are required to be corrected or provided anew as required by the IBC. Because the building was constructed almost one hundred and forty years ago, in 1901, existing conditions which may be allowed to remain under the requirements of the IEBC may also be in conflict with current life safety codes and standards. Over time, since the original construction of this building, life safety standards have been improved in reaction to tragic events. *In order to evaluate life safety conditions in accordance with the most current intent of these codes, the current IBC and Fire Safety codes and regulations are used as a basis for judging compliance.*

Correcting existing conditions to comply with current Accessibility and Fire Protection requirements is required when the value of the work exceeds the cost or scope triggers stated in the AAB and the Fire Code.

Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings in which renovations will exceed 7,500 square feet in area or in which major alterations' are planned, as defined by the statute. Under these conditions, an existing building must provide a full sprinkler fire suppression system if sufficient water flow and pressure is available. A major alteration is 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, however, it is assumed that sufficient flow and pressure is available and all code discussions below are based on this building being fully sprinklered.

Also, according to this section of M.G.L., any work performed, even if under separate contracts or

building permits, within a 5 year period must be included in the aggregate construction cost to determine applicability of M.G.L. This includes site work and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 33% limit.
- Cost of future building projects requested for permit within 5 years, before or after the permit date for this project, will be considered part of the project costs and may trigger compliance.

Accessibility in public buildings is regulated by 521 CMR, which is enforced by the Massachusetts Architectural Access Board (MA AAB) and the Building Inspector of the municipality. 521 CMR, as issued in 2006, is used for this review.

MA AAB 5.1 Definitions states:

> "Public Buildings: A building privately or publicly financed that is open to and used by the public",

MA AAB 11.1 Commercial Buildings states:

> "The design of commercial *buildings* shall comply with 521 CMR, except as specified or modified in 521 CMR 11.00. Commercial *buildings* are *public buildings* … as well as city and town … *facilities*."

The Fire Facility is considered a public and commercial building and so is required to be accessible in accordance with 521 CMR.

Currently, the AAB regulates only areas and conditions accessed by the "public"; areas occupied solely by staff are not included in the regulation. Staff areas are included in the ADA Accessibility Guidelines as part of federal law, but these are not directly enforceable as part of the Building Code. However, in an effort to unify compliance requirements with the recently adopted IBC as the State Building Code, the AAB will be revising the regulation to include staff areas as well as public areas. In anticipation of the release of the revised AAB regulations, all discussions below regarding accessibility will include compliance of staff areas.

Applicability of the AAB Regulations for renovations of existing buildings is based on the value of the renovations as a percentage of the current assessed value of the building (100% valuation). According to AAB 3.3, partial compliance is required when the value of the renovations exceeds $100,000 and full compliance of the entire facility is required when the value of the renovations exceeds 30% of the assessed value of the building. An exception to this rule is for maintenance work on MEP systems, sprinkler systems, roofs, replacement windows, masonry repair, site utilities, landscaping, and septic system which in aggregate is less than $500,000.

As stated in AAB 3.3 (paraphrased):

> "3.3 EXISTING BUILDINGS
> All additions to, reconstruction, remodeling, and alterations or repairs of existing public buildings or facilities …shall be governed by all applicable subsections in 521 CMR:
> 3.3.1…,

a. if the work costs less than $100,000, then only the work being performed is required to comply with 521 CMR…,
b. if the work costs $100,000 or more, then the work being performed is required to comply with 521 CMR. In addition, an accessible public entrance and an accessible toilet room, telephone, drinking fountain (if toilets, telephones and drinking fountains are provided) shall also be provided in compliance with 521 CMR…,

3.3.2 If the work performed, including the exempted work, amounts to 30% or more of the full and fair cash value (see 521 CMR 5.00) of the building the entire building is required to comply with 521 CMR. "

Also, according to AAB 3.5, any work performed, even if under separate contracts or building permits, within a 3 year period must be included in the aggregate construction cost. This includes sitework and building renovations, whether done separately or together.

- Future Change Orders and other unanticipated costs could also trigger full compliance if the aggregate value exceeds the 30% limit.
- Cost of future building projects requested for permit within 3 years of the permit date for this project will be considered part of the project costs and may trigger compliance.

The building and site must be reviewed together and may affect compliance in areas not anticipated to be updated to comply.

- If a building's renovation cost exceeds 30% of the building assessed value, then the *entire building and site* must be made to comply;

Energy conservation, as required by the IECC for new construction, is not required for renovations to existing structures under the IEBC. However, any new elements or alterations to the exterior building envelope, such as new windows or new roofing, must comply to the greatest degree possible. As stated in the IEBC Alteration Level 3 Section 808 Energy Conservation "*Essentially, the entire building is not require to meet the energy provisions, but only improvement in the energy performance of the building is intended to be achieved by making the new elements meet the IECC…*". Overall upgrade of the exterior envelope of this building is not required or recommended and so is not reviewed as part of this study, except for elements recommended to be replaced.

General Information

According to the Town of Milton Assessors Department, the Blue Hill Ave – Engine -4 Fire Station is located at 815 Blue Hill Avenue; construction of the facility completed in 1901. The area of the building is listed on the Assessor's Card as 6,768 total gross square feet (GSF).

The current assessed value of the Blue Hill Avenue Fire Station building (structure only) is $198,000.

- The threshold value of the cost trigger for accessibility (full compliance) is 30% of this value less the cost of permitted work within the last 3 years.
- The threshold value of the cost trigger for fire protection is 33% of this value less the cost of permitted work within the last 5 years.

This cost threshold is shown below. The cause of the renovation or the source of the funding is not relevant, only the total value of cost for renovations, including demolition. Any work within these time limits which exceed these cost triggers will require that the entire structure and site be modified to be compliant. Because each threshold is based on the aggregate value of recent work (requiring a building permit) over the most recent 3 or 5 years, respectively, these threshold values are dynamic and will

change based on the aggregate value of recent projects over time. The values below are only a guide and should be recalculated when a new renovation project is considered.

COST THRESHOLDS FOR ACCESSIBILITY AND FIRE SUPPRESSION COMPLIANCE	
Assessed Value (Structure Only)	$198,000
30% Cost Trigger for Accessibility Compliance	$ 59,400
33% Cost Trigger for Fire Protection	$ 65,934

AGGREGATE TOTAL VALUE OF RECENTLY COMPLETED WORK		
Date	Description	Approximate Value
8/2014	Fire alarm Upgrades	$ 1,0000
9/2015	Boiler Replacement	$ 33,500
3 year aggregate total value for accessibility compliance		$ 34,500
5 year aggregate total value for fire protection compliance		$ 34,500

ACCESSIBILITY UPGRADE REQUIREMENT	
30% of Assessed Building Value	$59,400
Less the Aggregate Cost of Projects Completed in the Past 3 Years	$34,500
Current Value for Renovation Work to the Cost Trigger for Full Accessibility Compliance	$24,900

235,605

Fire Protection Upgrade Requirement	
33% of Assessed Building Value	$65,934
Less the Aggregate Cost of Projects Completed in the Past 5 Years	$34,500
Current Value for Renovation Work to the Cost Trigger for Full Fire Protection Compliance	$31,434

There are two building permits on file with the Inspectional Services Department dated within the last three years.

BUILDING CODE COMPLIANCE ANALYSIS (IEBC / 780 CMR - IBC)

Although the Blue Hill Avenue Station would be regulated under the IEBC for the purposes of a renovation of the existing building, this analysis reviews compliance with regard to requirements of the new IBC. This is to ensure that existing conditions which do not meet the current intent for life safety, and which may be allowed to remain as part of a renovation under the IEBC, are identified for correction. In the discussion below, references to specific code sections are noted before each paragraph with parentheses.

(IEBC 101.4.2) Applicability: Under this definition, as a building that has been previously occupied prior to the issuance of the Code, this building is considered an existing building and regulated under the IEBC.

(IEBC 101.5.2) IEBC offers three methods for compliance analysis and four levels of work classification. For the purposes of this study, the *Work Area Compliance* method will be used and future renovations will be considered as an *Alteration Level 3* work classification.

(IEBC 701.3) Compliance: All new elements must comply with IBC.

**The following discussions regarding Type of Construction, Use Group Classification, and Height and Area Limitations are provided to document the existing facility classification only. These characteristics are not regulated by the IEBC and existing buildings are not required to be modified to comply as a result of renovations. Additions to an existing building, however, must conform to current limitations of allowable height and area and are regulated by the IBC. Determination of the allowable height and area of the existing structure provides guidance for the extent of any new additions that may be planned.*

(IBC Ch. 3 – Use and Occupancy)

(IBC 305.1) Primary Use Group:	Group B - Business
(IBC 305.1) Mixed Use Areas:	Group R-2 Residential (Bunk Area)
(IBC 305.1) Mixed Use Areas:	Group S-1 Storage (Apparatus Bays)

(IBC Ch. 5 – General Building Limitations)

Height and area limitations for the existing building are presented below to show the allowable area for the uses within the building and possible expansion of the existing building. As stated above, the aggregate area of any new additions and renovations that exceed 7,500 square feet or that exceed 33% of the assessed value of the existing building will require sprinklers to be installed throughout the new and existing structure. The allowable floor area calculations below include increase permitted for fire protection sprinkler system, however the increase for existing building frontage accessible to emergency vehicles; is not. This allowable increase in area for accessible frontage may be affected by additions to the building.

According to information from the Milton Assessing Department, the current building area is listed at 6,768 gross square feet (occupied space) for all floors combined. Storage uses and Assembly uses are believed to occupy less than 10% of the gross area of the relative floor levels and so are considered to be accessory to the Business Use on each floor.

(Table 503) Based on the presumption that any renovation or new construction for this building will require the installation of a new sprinkler system, the allowable height may be increased by one story and the allowable area may be increased by 200%. Additionally, there is a provision to increase the allowable area due to the accessibility of the building perimeter. Since no plans were available to determine the length of the accessible vs. inaccessible perimeter, this increase will not be calculated.

- The allowable area increase for a sprinkler system will allow a total increase in area of 200% in addition to the limitations stated in Table 503. This total allowable area is shown in the last column of the table below
- The total area of the building cannot exceed the allowable area used for the primary Residential ("R-2") Use Group. Other uses within the mixed use building cannot exceed an area proportional to the percentage of the area that Use Group occupies in the building. Because this ratio of allowable areas between uses may vary based of differing layouts, it is impossible to provide an allowable area for all uses in every possible combination. As such, the allowable area for Use Group B is calculated as a baseline and further calculation will be required to confirm if future renovations are within Code requirements.

(Table 503) The allowable height and area for each Use Group under Type V-B (5-B) Construction is:

USE GROUP	Total Allowable Height (+1 Story Increase for Sprinkler System	Allowable Area per Story Plus Increase for Sprinkler System and Accessible Perimeter			
		Allowable Area (Table 503)	Sprinkler System Area Increase (+200%)	Accessible Perimeter (Not taken)	Total Allowable Area per Floor with Allowable Increases
R-2	4 Stories	7,000 sf.	+ 14,000 sf.	+ 0 sf.	21,000 sf.

(IBC 508.3 & 508.4) Buildings with multiple Use Groups are called mixed-use buildings. Buildings are further classified as a 'separated' mixed use or a 'non-separated' mixed use. If classified as a 'separated' mixed-use building, the different use groups within the building must be separated by fire rated construction as required in Table 508.4. If classified as a 'non-separated' mixed-use building, then fire rated separations are not required BUT the most restrictive use group is used to calculate the allowable height and area. This building is assumed, based on field observations, to be a non-separated mixed-use building. (IBC 508.2.4 and Table 508.4) In table 508.2.4, rooms used for storage and assembly may be considered to be accessory to the primary Use Group if the aggregate area of these rooms is less than 10%

of each floor area and smaller than the area allowed by Table 503. Spaces considered to be accessory to the primary use are not required to be separated from the primary use by fire rated partitions. This report assumes that all Storage and Assembly uses are considered to be accessory and so not separated.

IBC Ch. 6 – Types of Construction
(IBC Table 601) No information is provided by the Milton Assessing Department with regard to the type of construction of the building. As observed in the field, the building appears to be constructed of a wood frame with a stone veneer with punched windows and doors.

As the existing construction system is assumed to be wood framed with non-fire rated members, this generally conforms to the requirements for Type V-B (Roman numeral 5 - B, unprotected) construction in the current IBC. The structure does not appear to be protected with spray fireproofing or other rated construction. Interior partitions are assumed to be non-load bearing wood stud / drywall construction. The Use Group is assumed to be Residential (R-2) with accessory or mixed use areas for Business and Storage.

Type V-B Construction Type Min. Fire Resistance Rating Requirements (780 CMR Table 601)

Building Elements	Required Fire Resistance Rating (Hrs)
Structural Frame (including columns, girders, and trusses)	0
Exterior Bearing Walls	0
Interior Bearing Walls	0
Exterior Non-Bearing Walls and Partitions (See Table 602)	0
Interior Non-Bearing Walls and Partitions	0
Floor Construction (including support beams and joist)	0
Roof Construction (including support beams and joist)	0

Table 601 establishes the required minimum fire rating of construction elements and is related to the allowable height and area discussed in Table 503 below. Type V-B (5-B) construction allows the building structural members to be unprotected (not fire rated). The tradeoff for not protecting the building structure is a reduction in the allowable height and area that can be built; essentially, the greater the fire protection of building structural elements, the larger the building height and area which is allowed.

(IBC Chapter 10 - Means of Egress)
Occupancy load in the existing facility is determined by the functions in each area of the building and not the primary use group. According to the IBC Table 1004.1.1, Business functions require an occupant load calculated at 100 GSF per person, Residential sleeping areas (bunks) are calculated at 120 GSF per person, Locker rooms are calculated at 50 GSF per person, and Mechanical/Storage areas are calculated at

300 GSF per person, and Assembly spaces are calculated at 5, 7, or 15 GSF per person dependent upon whether the persons are standing, sitting, or at tables. As the functions and areas for each may change over time, areas with lesser occupancy rates may be renovated for a use with a higher occupancy rate. This summary will not break out each function separately; as a preliminary determination of occupancy, a rate of 100 GSF per person will be used as an overall general occupancy rate for this building as this will be the predominant occupancy for any renovation of the building:

- 6,768 GSF (All Floors) / 100 sf. per occupant = 68 occupants on all floors

The egress capacity (0.3"/per occupant for non-sprinklered buildings) for a minimum 44-inch wide stairway is approximately 146 occupants. The egress capacity (0.2"/per occupant for non-sprinklered buildings) for a typical single 36-inch wide egress doorway is approximately 170 occupants.

IEBC 102.2.2.1 is an amendment by the State of Massachusetts and supersedes other less restrictive paragraphs in the IEBC. This amendment requires that all existing stairs comply with current requirements of the IBC with regard to the quantity of exit ways on each floor, the width of all exit ways, fire rating, handrails, continuity, etc., to "provide safe and adequate means of egress".

- The existing egress stair in the building is not enclosed in required fire rated construction, does not have risers and treads of required dimensions, does not have railings and guards on both sides of the stair, does not have railings and guards with required height and spacing, does not have required rail extensions, and does not have fire rated doors which comply. All stair conditions must be corrected in accordance with current egress requirements as part of any renovation project.

(IEBC 703.2.1 Existing Vertical Openings)
All existing vertical openings connecting 2 or more floors must have an enclosure with a fire-resistive rating of 1 hour minimum.

- The stair connecting the basement, main and upper levels is a vertical opening. This opening is not separated from adjacent areas by fire rated construction. This stair cannot be used as an exit in its current configuration.

(IBC Table 1016.1 Exit Access Travel Distance)

- The greatest travel distance to an exit enclosure occurs on the 2nd floor and is approximately 100 feet. This is far less than the allowable travel distance of 200 feet.

(IBC 1014.3) In buildings of a Business Use with a sprinkler system, the allowable length of a common path of travel is 100 feet.

- All locations appear to be compliant.

(IBC 1018.4) In buildings of a Business Use without a sprinkler system, the allowable length of a dead end corridor is 20 feet.

- Far end of the upper level corridor appears to be non-compliant.

(IBC 1015.2) When multiple exits are required, the exits must be separated by a minimum distance equal to 1/3 of the longest diagonal distance of the floor plate.

- There is only one non-compliant Exit from the basement, main and upper floors. As a result separation distance is not applicable.

(IBC 1021.1) All stories are required to provide a minimum of 2 means of egress, except when serving a maximum of 4 dwelling units. As this building is classified as a Business B Use Group with more than 4 dwelling units on the second floor, a minimum of 2 means of egress must be provided.

ACCESSIBILITY CODE COMPLIANCE ANALYSIS (521 CMR AAB)

AAB 11 – Commercial Buildings (Municipal Facilities)
(521 CMR 11.1)
Public Areas, Toilet rooms, transaction counters and other work areas are required to be accessible.

- Accessible transaction counters at First Floor Public Lobby is not provided.
- Accessible male and female toilet rooms are not provided for public use on the First Floor.

AAB 14 – Places of Assembly
(AAB 14.2) Places of assembly are not provided in the existing building.

AAB 19 – Recreational Facilities (Fire Only)
(AAB 19.4) Locker rooms are provided for male and female Fire staff and officers. These lockers and associated toilet rooms are not required to be accessible.

AAB 20 - Accessible Routes

(AAB 20.1) Accessible routes within the building generally comply with requirements for width, passing space, protruding objects, headroom, etc.

- Access to all floors is not provided for public and administrative staff. A compliant elevator is required to provide access to all floor levels and activities.
- Many doorways reviewed do not provide required clearance for accessibility.

(AAB 20.6.1) Objects projecting from walls with their leading edges between 27 inches and 80 inches above the finished floor must not protrude more than 4 inches into walks, halls, corridors, passageways or aisle and must not have sharp edges.

- There does not appear to be any non-compliant conditions.

(AAB 20.12) Areas of rescue assistance at stairways and means of egress are not required in accordance with Exception a. Existing Buildings.

AAB 24.00 - Ramps

There are no ramps required on the exterior of the building.
Please refer to the Landscape section of this study for information regarding site accessibility.

AAB 25.00 – Entrances

(AAB 25.1) All public entrances to the building must be accessible and be on an accessible route.

- Access to the building from the exterior is non-compliant at the Ground Level public entrances.

AAB 26.00 – Doors and Doorways

(AAB 26.6 – Maneuvering Clearances)
Many doors in the building do not provide required pull and push clearances for accessible doors. In public areas or areas accessed by civilian staff, modify these doorways to provide accessible clearances.

(AAB 26.11 - Door Hardware)
Existing hardware throughout building is not compliant and replacement with lever-type hardware at all doors is recommended.

AAB 27.00 – Stairs

(AAB 27.3 – Nosings)
Stair nosings are required to be angled or radiused and not abrupt. Existing wood stair nosings at the connecting stair between the Garage Level and the First Floor have a protruding lip at each tread.

- The stair treads need to be modified to comply. Modification of the treads with tread covers is necessary to reduce the abrupt nosing.

AAB 28.00 – Elevator

(AAB 28.1) Multistory buildings are required to be served by an elevator.

- The building must be modified to provide an elevator to access all floors of the building.

AAB 30.00 – Public Toilet Rooms

The are no public toilet rooms in the building. The plumbing code requires separate toilet rooms for men and women; although unisex fixtures are allowed for compliance with AAB, this is not compliant with the plumbing code.

AAB 31.00 – Public Bathing Rooms
(AAB 31.7) A single unisex toilet/shower room is provided for able-bodied staff only and compliance is not required. However, the plumbing code requires separate toilet/shower rooms for men and women; although unisex rooms are allowed for compliance with AAB, this is not compliant with the plumbing code.

AAB 32.00 - Kitchens
(AAB 32.1) Commercial kitchens are not regulated by the AAB.

AAB 36.00 – Drinking Fountains
(AAB 36.1.1)
Drinking fountains are not provided within the building.

- Please refer to the plumbing section of this report for discussion about requirements for drinking fountains

AAB 41.00 – Signage

(AAB 41.00)

Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage.

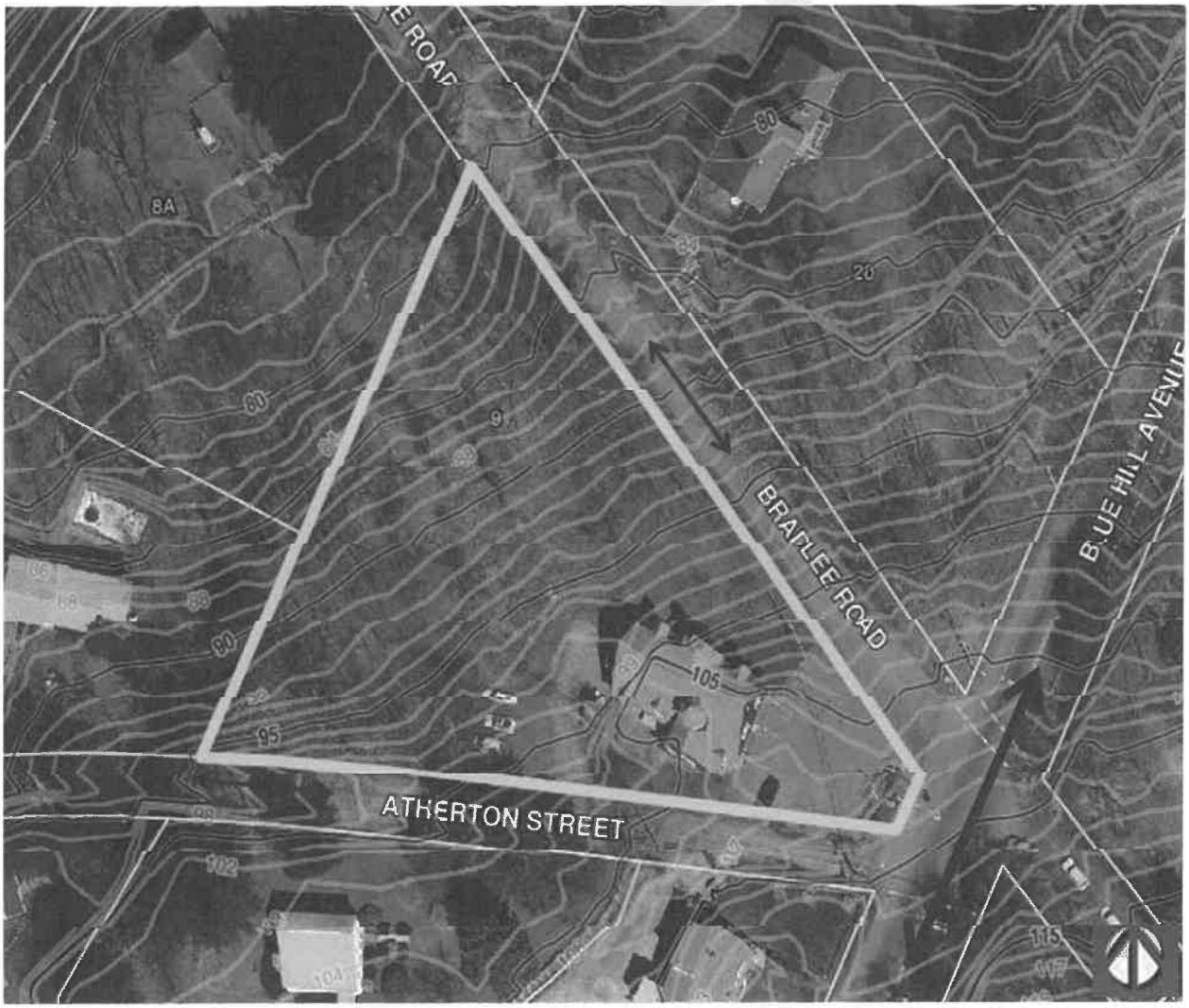
- Compliant signage and Symbols of Accessibility are missing throughout the building. Where exit signs indicate an accessible route, if all routes are not accessible, these signs shall include the symbol of accessibility.

– EXISTING CONDITIONS ANALYSIS –

LANDSCAPE ARCHITECTURE

Site Overview

The Blue Hill Station - Engine #4 is located on the west bound side of Blue Hill Avenue at the intersection of Bradlee Road and Atherton St. The site is 1 acre and owned by the Town of Milton Fire Department. The station serves the western portion of the town and is less than a quarter of a mile to Curry College, which lies to the west. Only the eastern corner of the site is developed while the western section is currently wooded and undeveloped. The original building was constructed in 1901 for horse pulled pumpers and is multi-storied with apparatus bays on the second floor accessing a triangular section of asphalt pavement, which is in good condition. There are small concrete aprons in front of the apparatus bays. There is a lower story vehicle access to a single overhead door for small vehicle storage. The lower lot is gravel only.



Site plan

There are significant grade changes on the property, with the high point at the intersection at elevation 109 and the rear of the property (northern corner) being the lowest point at elevation 80, an almost 30' drop in elevation over a distance of 343'. This translates into an 8.45% slope along Bradlee Road. The elevation change along Atherton is only 14', translating into a 4.5% slope. Grades effectively sheet water away from the building with all roof drains spilling on to the ground.

There are no handicapped entrances to the building and no marked or signed handicapped parking. A small landscaped area in front of the station has two evergreen plantings, cobble stone edging, several granite blocks for protection, a memorial and a flagpole.

There are some indications of old oil fill lines into the building but it has not been determined if these have been removed, as the building is now heated with gas. Dumpsters are in an enclosed wooden shed on the south wall of the building. An oil water separator is located behind the building as part of the drainage system.

Aprons and pavement at front of building

Front landscaped area

Zoning

Municipal buildings are exempt from the Zoning Bylaws

The property is in the Residential A District. Property ID is B 89
Maximum Height: 2 ½ stories or 35'
Minimum Frontage: 150'
Minimum Front yard: 30'
Minimum Side yard: 15' or within 30' from building on adjacent lot.
No Accessory building may be closer than 10'.
Where a lot abuts on two intersections streets, distance is 30'.
Minimum Rear yard setback: 30'
Maximum building coverage: 15%. GFA shall not exceed 30% or 6,000 sf, whichever is greater.
Minimum Open Space requirements: 75% of lot. (Building and parking included)

Parking requirements: Section VII. 5. Sufficient parking for employees and users under normal conditions.

There are no Wetlands on site, or Water or Natural Resource Protection restrictions on the property.

Utilities

The building is served by natural gas (National Grid), town water, town sewer and electric (Eversource).

– EXISTING CONDITIONS ANALYSIS –

STRUCTURAL

815 BLUE HILL AVENUE – ENGINE #4

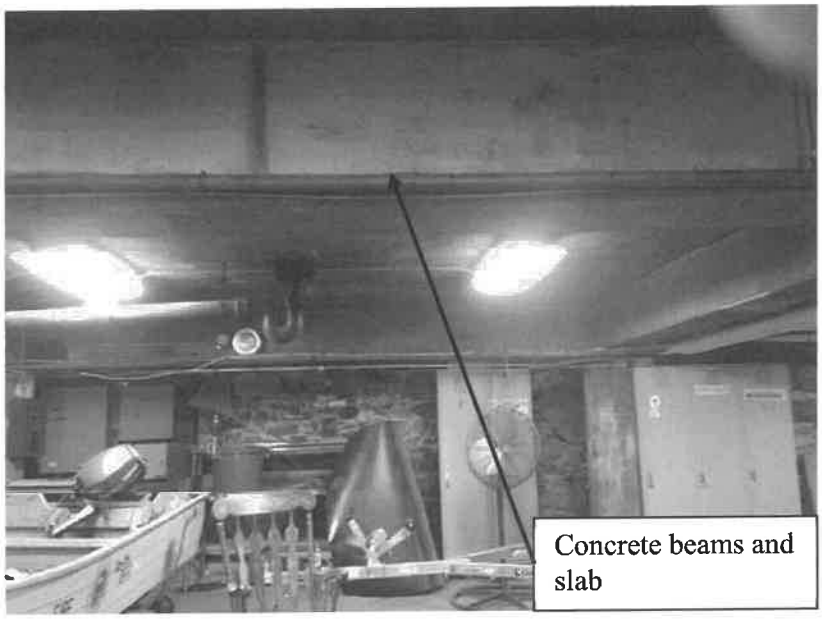
DISCRIPTION

The Milton Fire Station located at 815 Blue Hill Avenue is a multi-story building with a basement, Main and Upper Level floors and attic.

The structure was constructed in 1901 utilizing unreinforced field stone walls which support timber and wood framing consisting of timber trusses and beams for the support of the wood roof and attic joist. The Upper Level floor framing was also framed with wood floor joists and beams which were concealed beneath finishes. It appears that the joints in the stone were mortared at least on the exterior.

Roof framing visible from attic

As the firefighting equipment grew in size and weight the Main Level floor framing was removed in the Apparatus bays and replaced with a reinforced concrete frame slab similar to the other two stations. The reinforced concrete framing is supported on reinforced concrete footings located in the basement area. It is not known if the stone foundation walls are supported on concrete footings.



Reinforced concrete slab and beams supporting the Apparatus Bay floor.

OBSERVATIONS

The exterior stone walls joints appear to have been re-mortared at some time in the past. The mortar consistency is extremely "sandy".

- There several areas where the mortar is becoming powdery and is disengaging from the surface of the stone wall. Loose mortar is visible in many locations both inside and outside. Cracks were also observed in some of the stones. Both conditions will allow water to enter into the walls and subject them to freeze/thaw damage.
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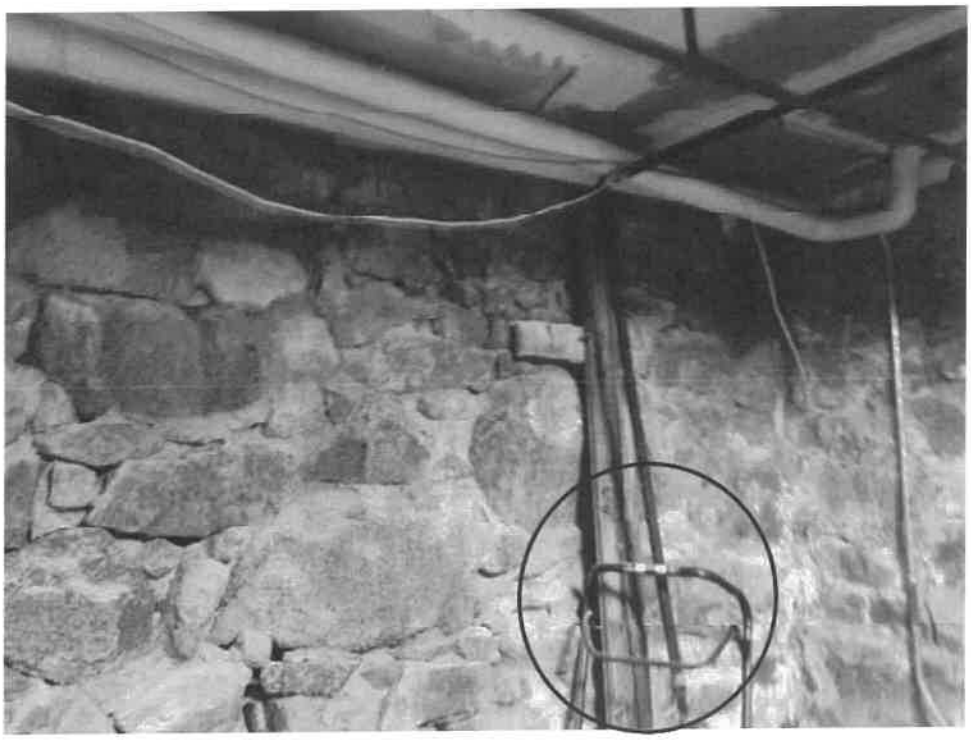
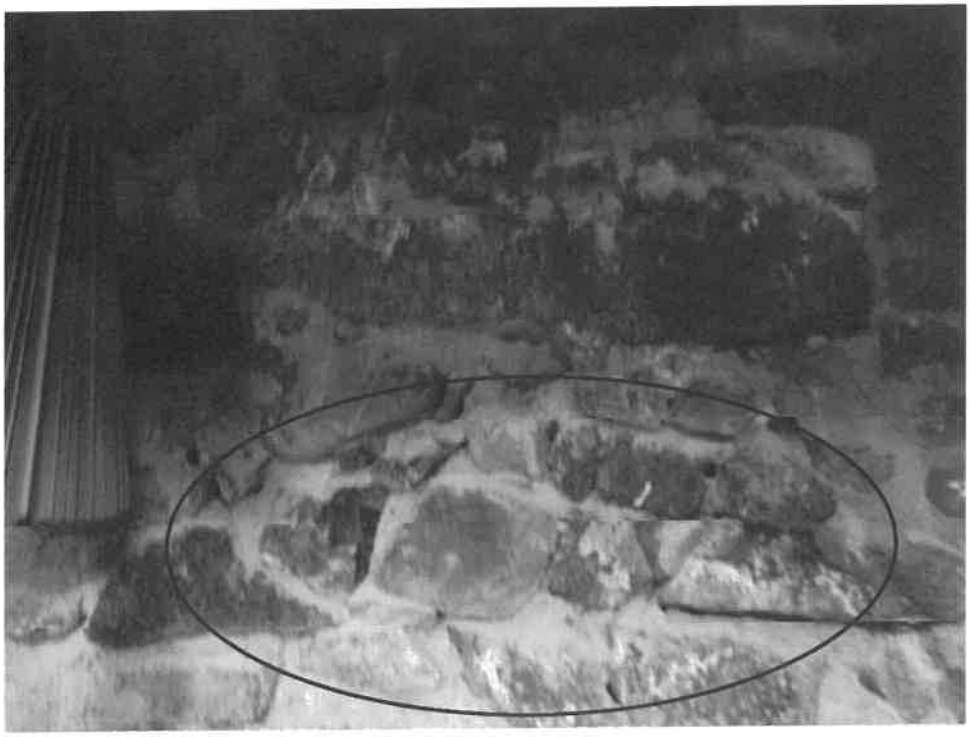
Powdered mortar collected on top of the stones which form the foundation wall as viewed from the basement.

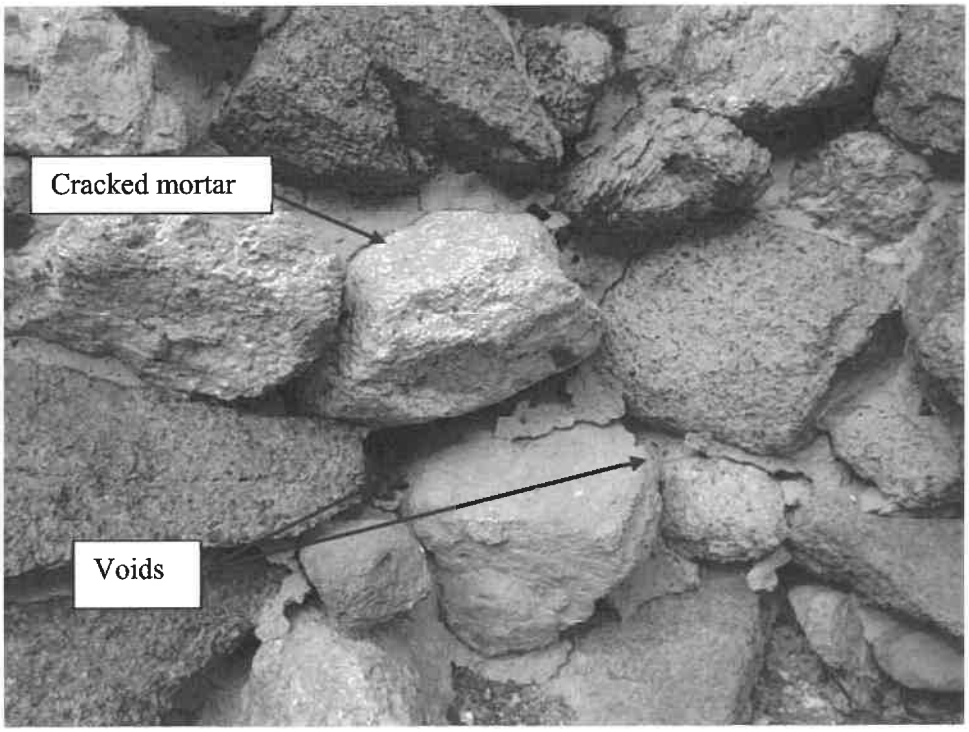


Powdered mortar collected on foundation wall surface viewed from the interior.

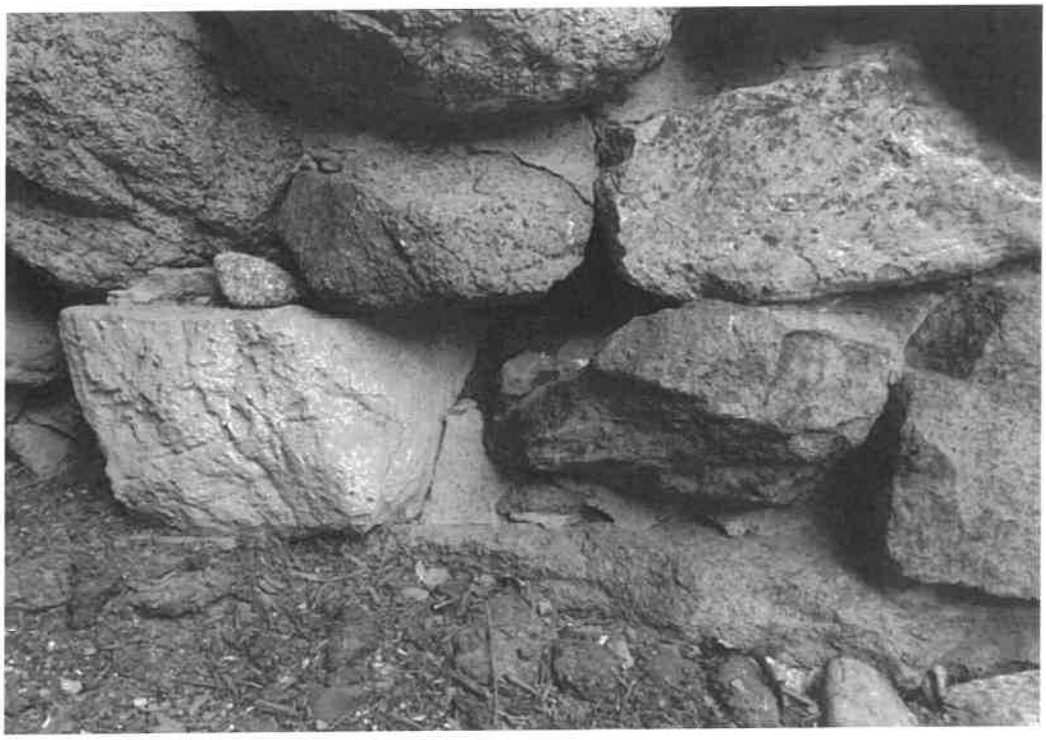


Powdering mortar as viewed from the basement

Cracked mortar joint between stones.



Open voids between stones and fractured stones



Close up of voids, cracked stones and mortar.

Dislodged stones from exterior face of wall.

RECOMMENDATIONS

The following are recommendations to correct the items noted above in the report.

- The condition of the mortar needs to be further investigated to determine the type of patch mortar used including strength. The wall should be sounded with a hammer to identify any areas where the stones are loose as indicated by the photo of the dislodged stones. Based on the findings of the investigation, recommended repair plan would be developed.

SUMMARY

The unreinforced stone foundation and exterior walls that support the Upper Floor, attic and roof structure do not meet the current Commonwealth of Massachusetts Building Code requirements for seismic design. The building structure would sustain a partial to total collapse during a seismic event. Due to the fact that the unreinforced walls will not be able resist the lateral forces generated by seismic events, this building would not be able to provide emergency services.
Our structural review of the building is based only on the areas which were not concealed by exterior grades, slabs, interior finishes or other obstructions. Other recommended repairs and maintenance procedures should be implemented to eliminate possible future damage to the structure.

– EXISTING CONDITIONS ANALYSIS –

ARCHITECTURAL

Building Overview

The building appears to be a type "5-B" multi-story building. The building was originally constructed in 1901. The basement of the building is constructed of stone foundation walls. The main level slab in the apparatus bays appear to have been re-cast and supported with cast-in-place concrete columns and beams, to accommodate newer heavier apparatus. We were not able to determine the date the re-casting took place.

The main level exterior walls are believed to be wood stud with stone veneer or naturally weathered wood shingle on the exterior and stained bead board siding on the interior face. Interior walls are assumed to be wood stud framed with gypsum wall board sheathing. There is an attic which is accessed through a residential type pull down stair. The attic is constructed within the wood roof trusses. The roof system appears to be asphalt shingles on wood sheathing supported by wood roof trusses.

The building does not have a fire suppression system, there is not a second egress from the upper levels, nor is it handicapped accessible. The finishes are in poor condition and are far beyond their useful life span. The Heating system has recently been replaced (2015), while the air circulation and overall quality of air in the building is questionable.

Exterior Envelope

Exterior Walls

The basement level (foundation walls) are stone, while the main level has a stone veneer on the exterior of wood stud frames with stained wood panel on the interior, and the upper level is believed to be wood framed with gypsum board and plaster on the interior and wooden shingles on the exterior. The wood shingles exhibit considerable wear with a number of locations missing shingles or needing replacement.

Ivy covers a fairly large amount of the stone veneer on the south and west elevations, limiting the review of these elevations. In general, the stone veneer appears to be in good condition minor mortar spawling at a couple of locations.

The down spouts and gutters are light gauge aluminum (appear to be residential grade) and appear to be in good condition. Down spouts are not tied into a storm water drainage system nor do they have splash blocks.

Exterior Doors

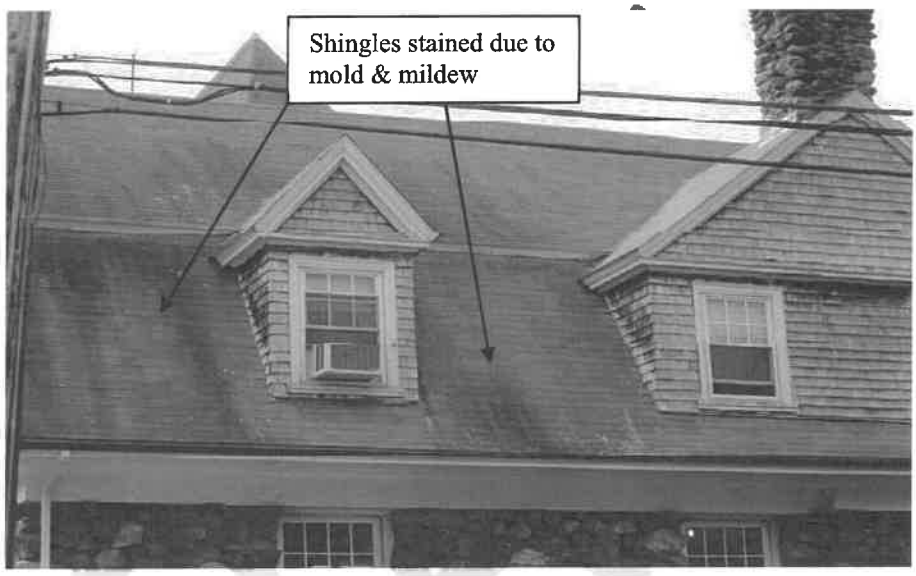
The entrance door is painted wood stile and rail door with true divided lites, Doors and frames are generally in fair condition, and exhibit considerable wear. The seals and caulking are in poor condition. The lock set is failing as is the weather stripping. The doors have not been outfitted with a "crash-bars"; or equipped with lever handles.

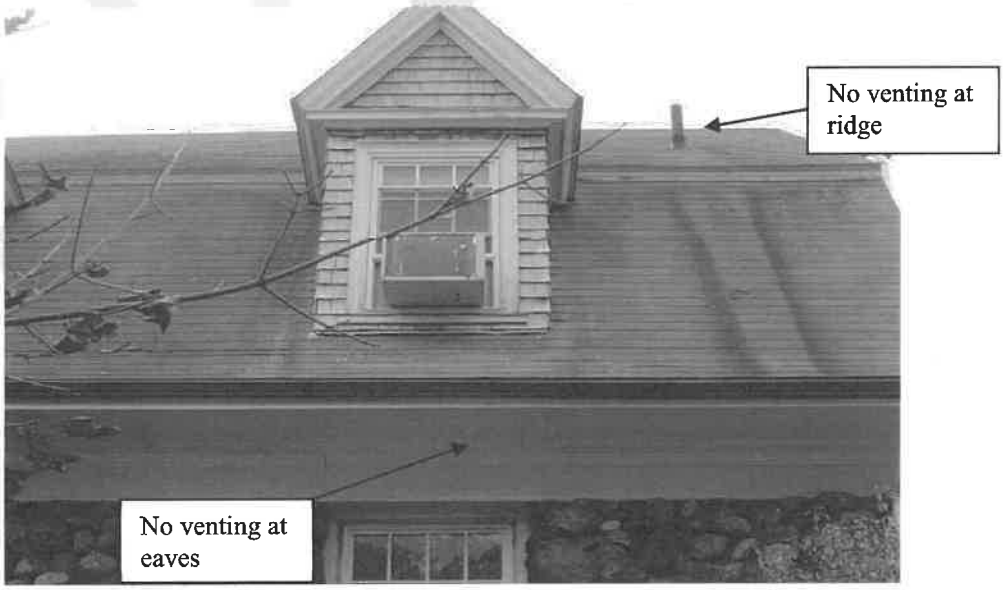
Exterior Windows

Most of the windows are pre-finished aluminum replacement double hung units with insulated glass and insect screens, set into existing wood frames, and are approximately 10 years old and are in good to excellent condition. The painted wood frames and trim appear to be sound but need to be scraped and repainted, as well as have the perimeter caulking replaced.

Roof

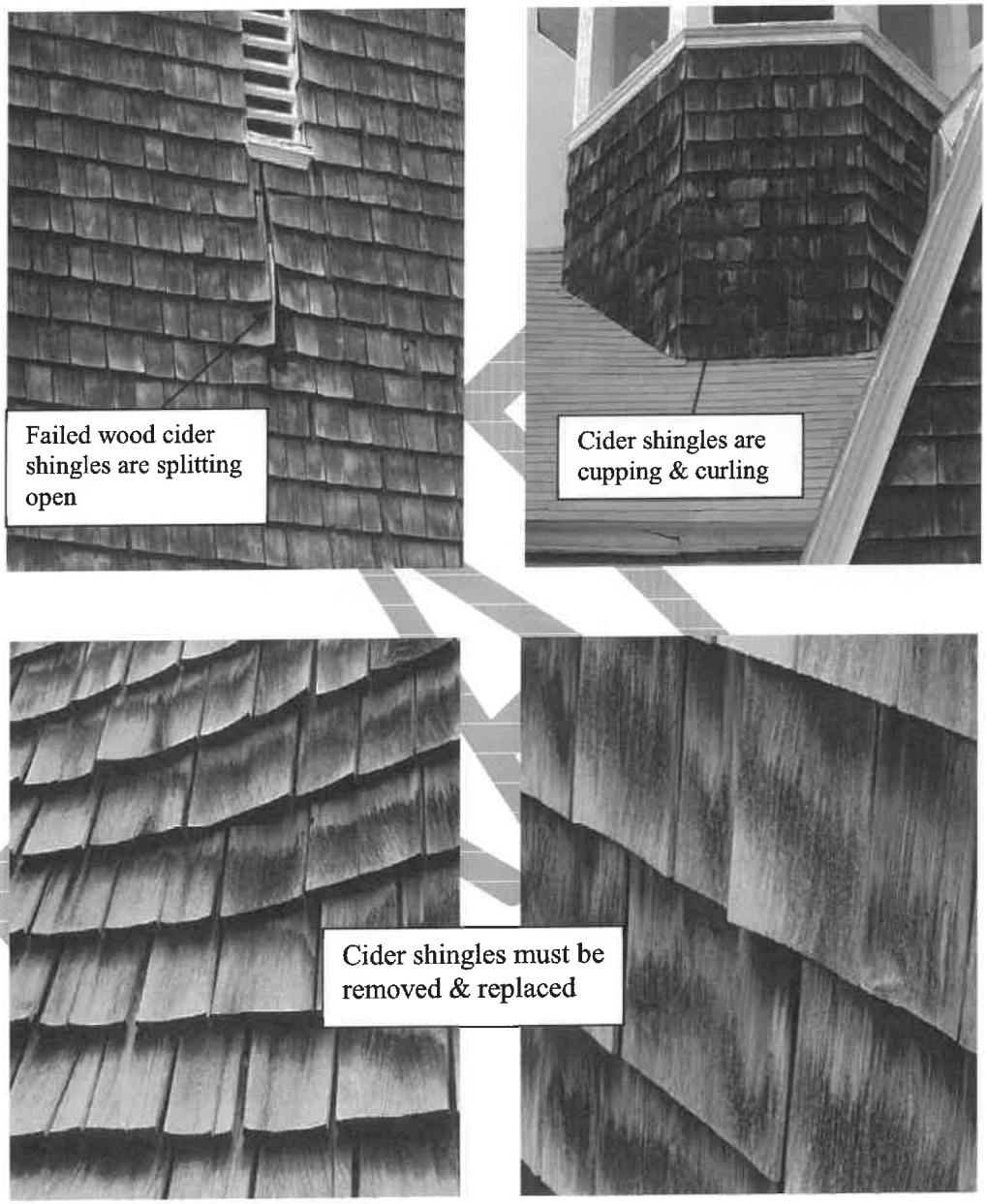
The roof consists of older 3 tab asphalt shingles on steep sloped wood decks with cedar shingle siding on the exterior wall at the gables ends. The shingle roofs are stained with mold and mildew most likely because the roof was installed without correct flow thru ventilation at the eaves and ridges. The lack of ventilation accelerates the aging process because the hot summer sun evaporates the essential oils that provide the shingles with its water proofing properties. The shingle roof should be replaced with new 50 year lifetime architectural shingles incorporating proper eave and ridge ventilation.





The wood cedar shingles on the gable ends are failing. They are cupping and curling, in some cases they have split open completely. This condition allows water to easily enter the facility causing possible

growth of mold and mildew inside the facility. This condition should be addressed by removing and installing new material.



Building Components

Interior Walls

The basement level is stone foundation wall. There are many locations that exhibit signs of water infiltration. It was reported that the east end of the building frequently allows water into the basement, preventing storage of materials on the floor. The main level utilizes wood stud and stained wood siding, while the upper level utilizes wood studs with wood wainscoting and painted plaster above in most areas.

The interior wood paneling is exhibiting considerable wear and is generally in sound condition, requiring minor repairs in some locations. All of the siding requires refinishing. The gypsum walls appear to generally be in good to fair condition. Minimal cracks were observed in the plaster which will require repair and repainting.

Interior Doors

The interior doors are mainly stained solid wood stile and rail type. Door frames are mainly stained Most of the doors have not been outfitted with ADA compliant lever-style handles. The doors/frames and trim are worn and will require new hardware and refinishing.

Ceilings Systems

The basement ceiling is exposed unpainted concrete slabs and exposed cast in place concrete beam, The predominant ceiling system throughout the main level is stained wood paneling. The upper level is mainly painted gypsum board. Main and upper level ceilings are generally in good condition and only require minimal repair and refinishing.

The lighting fixtures are surface mounted and lighting levels seem inadequate. In general, the light fixtures are in poor condition. Refer to the electrical section of this report for more information.

Floors Finishes

The flooring materials in the building are a combination of vinyl asbestos tile (VAT), ceramic tile, stained and exposed sealed concrete. The vast majority of the flooring is VAT, which is utilized in the corridors, work rooms, kitchen, bunk rooms and day room. In general, the VAT is in poor condition and needs be abated as part of an overall building hazardous materials abatement plan.

Ceramic tile, primarily located in the toilet rooms, appears to be in fair condition, showing obvious signs of wear.

Stairs

There is one switch back stair that provides access to all levels. The stair is wood framed with wood treads and risers. Treads and risers to the basement and upper level are rubber clad. The stairs appear to be structurally sound. Wooden handrails are provided on one side only and are not continuous as required by code. It has non-complaint treads and risers, is too narrow and requires a second handrail to be installed. The stair is not enclosed in a fire rated enclosure as required by code.

At the rear of the building there is an exposed galvanized steel grate fire escape, that provides a second egress from the upper level. It does not have handrails and has open risers. It is in excellent condition.

Elevator

There is not an elevator in the building to allow for handicapped access to the multiple levels. Any addition or renovation to the building would require installation of one to comply with ADA.

Signage, Miscellaneous Accessories and Equipment

The room signage is almost nonexistent. Where provided, signs are typically a room name printed on a piece of paper and taped on or adjacent to the room doors. Any addition or renovation would require the installation signage with braille to comply with ADA.

Fire extinguishers are located sporadically throughout the building, but appear to be inadequate in number

Window treatments in the building consist of shades and curtains or none at all. All are in fair to poor condition and need to be replaced.

Kitchen

The kitchen is located on the upper level and utilizes painted gypsum walls, with vinyl asbestos tile flooring and gypsum board ceiling with surface mounted lights. All finishes are in poor condition and need to be replaced. Cabinets and counter tops exhibit excessive wear. Appliances appear to be in fair condition. There is no emergency gas shutoff to the gas oven/stove.

Toilet Rooms

There is one toilet/shower room on the upper floor accessed from the main corridor, and utilizes ceramic tile wainscoting (approx. 4' high) and painted gypsum walls, with ceramic tile flooring. The shower compartment has ceramic tile walls and ceiling with an acrylic base. All of finishes are worn and are at the end of their useful life. A janitors 'slop sink' is also in the room.

The fixtures do not meet ADA requirements. The sinks do not have insulated drain piping or approved lever style faucets handles and thus are non-complaint. The toilets do not have proper grab bars and or clearances. Additionally there are no separate toilet/shower facilities for male and female use.

Our recommendation would be to execute a total renovation of these spaces. The fixtures, partitions and accessories should be replaced with new.

Hazardous Materials

It is our recommendation that a comprehensive survey of hazardous materials be conducted as vinyl asbestos tile flooring was observed in the attic areas. The scope of the survey should include asbestos, lead paint, mercury and PBC's.

Program Components

Watch Room

This room is located on the main level adjacent to the apparatus bays with direct access to the exterior. It appears to be used for a variety of programmatic functions including greating the public, report preparation and multi-purpose room. These functions are not conducive to providing an appropriate environment for fire fighters to communicate with headquarters in emergency circumstances, nor the walk-in public.

Bunk Room

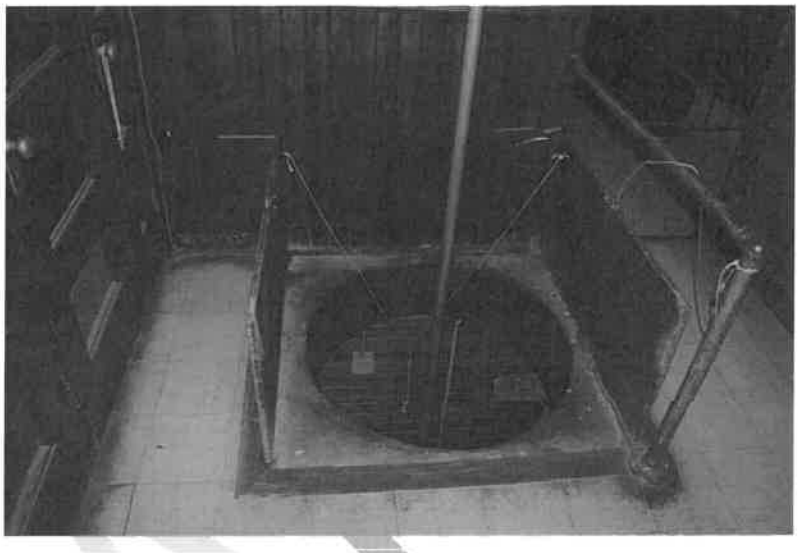
There are three private bunk rooms located on the upper level. They utilizes painted gypsum board and plaster walls, plastered ceiling and VAT floor tile. All the finishes are in poor condition, especially the VAT flooring which is cracked and missing pieces.

Head End Room
The stations computer network head equipment is located on the upper level in a closet located off the main corridor. The space is not secured nor is it climate or dust controlled.

Apparatus Bays
There are two apparatus bays which utilize stained wood paneling on the walls and ceiling and stained/painted concrete floors. The wood panels are worn but in generally good condition and only require refinishing. The stain/paint on the concrete floor is worn and needs to be refinished. The overhead door openings are too narrow & short and barely allow passage of the current apparatus. The circulation space around the apparatus is too narrow per recognized fire station facility design standards.

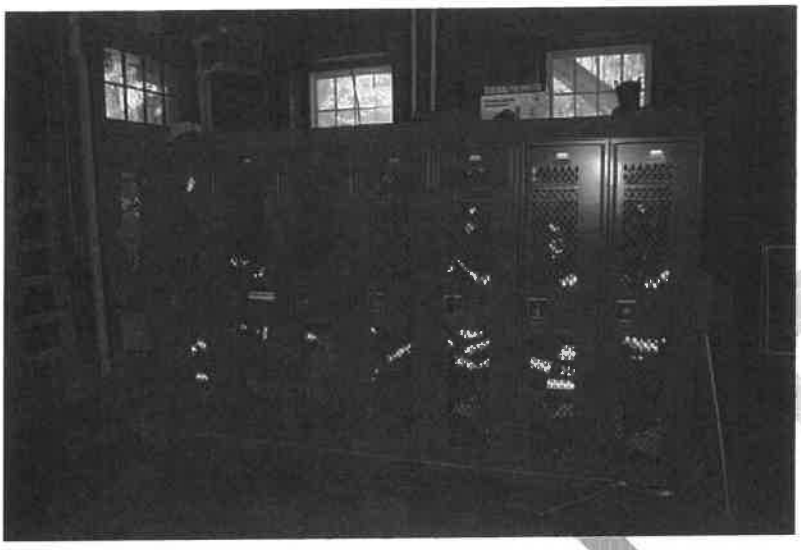
The apparatus doors are insulated metal clad pre-finished sectional overhead doors, which were installed in 1987 and are in good condition.

There is a fire pole that is operational from an upper level corridor. It lacks proper weather seals which would prevent vehicle exhaust and cold air to infiltrate the upper floor from the apparatus bays when the bay doors are open. It also does not have OSHA approved access at the upper level.



The vehicle exhaust system is installed within the last 10 years and is in excellent condition.

Additionally the bays house the turnout gear lockers, oxygen fill station, decontamination area, laundry, hose/supply storage and work areas. All of these spaces should be in their own spaces



Storage Facilities
There appears to be inadequate storage facilities for archival records, training materials, department equipment, and supplies.

– EXISTING CONDITIONS ANALYSIS –

PLUMBING

Plumbing:

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent system, storm drain piping & natural gas. Garage waste and vent systems serve the Apparatus areas. The building is serviced by Town Water and Sewer.

In general, the fixtures do not meet current water conservation requirements. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require the fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water-conserving type fixtures. All new fixtures are recommended.

In general, the drainage piping can be reused where buried underground and where adequately sized for the intended new use. Video inspection of any existing piping to be re-used is recommended.

Fixtures:

The water closet is floor mounted vitreous china tank type with elongated bowls.

The urinals is wall mounted vitreous china with exposed manual flush valves.

Lavatories are counter mounted vitreous china with single lever faucets.

The shower is tiled with an acrylic base equipped with a shower head and single lever balancing valve.

Janitor's sink is a wall hung, cast iron unit with exposed trap standard. Faucet is not equipped with vacuum breakers.

Service sink is a freestanding thermoplastic unit with a deck mounted faucet.

Kitchen sink is a stainless steel counter mounted unit with a hot & cold water handle deck mounted faucet.

Water Closet

Urinal

Lavatory

Shower

Janitor's Sink

Service Sink

Kitchen Sink

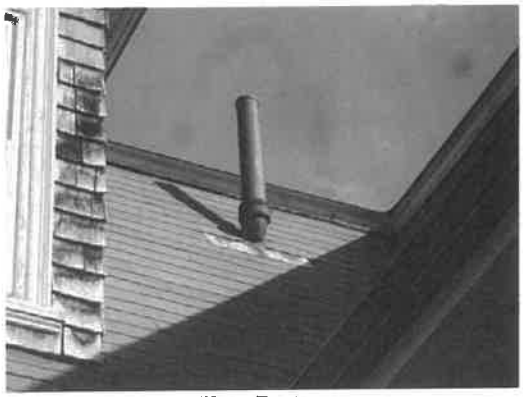
Sanitary Drainage System:

Sanitary, waste and vent piping is generally cast iron bell and spigot. The piping appears to be in good condition.

Apparatus bay floor drains are directed through an oil/sand separator.

Cast Iron Bell & Spigot

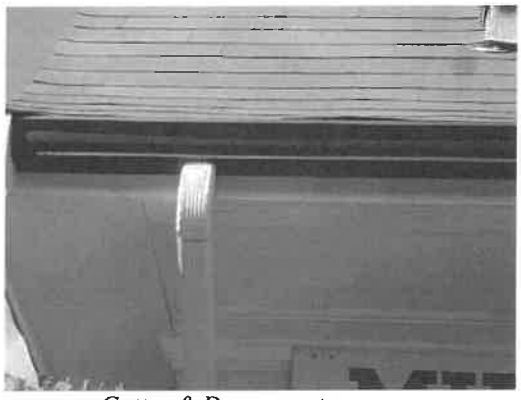
Apparatus Bay Floor Drain & Trap Piping



Vent Piping

Storm Drainage System:

Storm drainage from pitched roofs are collected by a gutter system and spill onto grade.



Gutter & Downspout

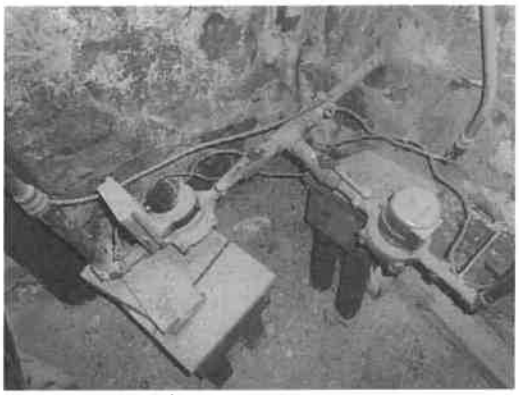
Spill to Grade

Domestic Cold Water System:

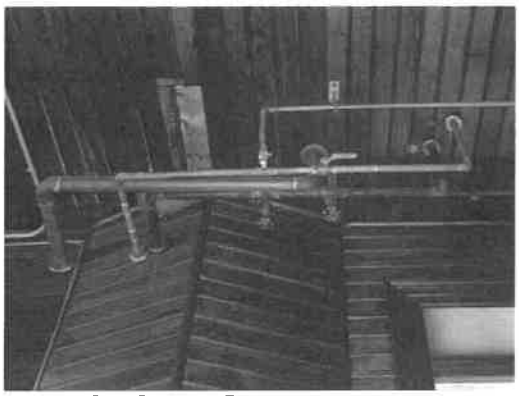
The water service enters the building in the basement level.

Domestic water piping is copper tubing with sweat joints. The majority of the copper piping is not insulated.

Domestic water service is 1" in size and splits to (2) water meters.



Water Service & Meters



Un-insulated Water Piping

Domestic Hot Water System:

Domestic hot water is generated through a gas-fired condensing boiler. There is a 80 gallon hot water storage tank.

The hot water system is circulated through the building.

The system includes a thermostatic mixing valve and expansion tank.

The domestic hot water system was just recently installed (2015).

Maintenance to the existing Oil/Sand Separator is required.

Domestic Hot Water System

Expansion Tank

Hot Water Circulation Pump

Thermostatic Mixing Valve

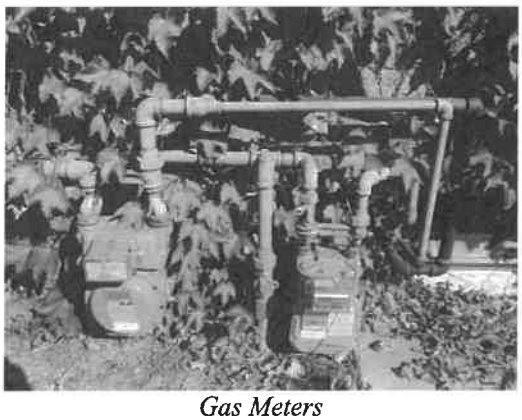
Gas System:

Natural gas is provided to the building. Gas meters are located on the exterior of the building.

Gas service is 1½" in size and splits to a 1¼" and a 1".

Gas is provided to the boiler, generator, clothes/gear dryer & cooking range.

In general piping is schedule 40 black steel with welded fittings.



Gas Meters

Compressed Air System:

Air compressor is located in the Apparatus garage and provide compressed air for general use and the Plymovent system.

Air Compressor

Plymovent System

Plumbing Recommendations:

Provide new high efficiency water conserving plumbing fixtures.

Provide fixtures for code compliant accessibility.

In general, existing cast iron drainage piping can be re-used if sized appropriately. We recommend video inspection of existing drains to confirm integrity.

Maintenance to the oil/sand separator will be required.

Insulate all domestic water piping.

– EXISTING CONDITIONS ANALYSIS –

HVAC

HVAC:

Executive Summary:

The primary heating, ventilation and air conditioning equipment within the Milton Blue Hill Fire Station Building has received fair to poor maintenance with the exception of the new boiler heating system that was just recently installed. It appears that the heating system presently installed is antiquated with the exception of the heating hot water boiler system. Overall the system is lacking ventilation and exhaust air and thermal comfort, creating hot and cold spots throughout the building. We recommend a complete upgrade of all terminal heating equipment and control system to achieve higher system efficiencies, reduce energy consumption, provide code required ventilation and provide quality temperature control.

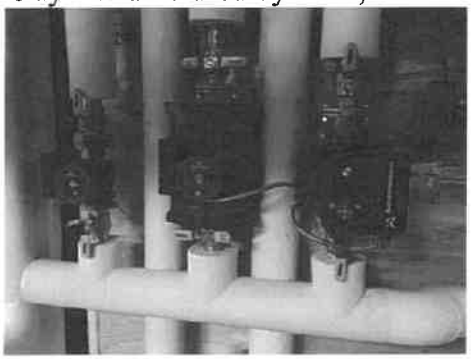
Heating Plant:

The building is heated by one (1) wall mounted gas-fired high efficiency condensing boiler located in the basement of the building. This boiler along with four inline pumps and expansion tank was just recently installed and is in excellent condition. The boiler is manufactured by Viessmann (Model Vitodens 200, 262 MBH output for hot water and 285 MBH max input). The boiler is provided with a direct vent option which utilizes separated combustion flues. One flue is utilized for combustion air and the other is for the combustion gases. Each system utilizes polypropylene material and exits the building through an exterior wall where it terminates with an elbow and screen. The boiler has its own burner management control system which utilizes outdoor air reset and high turn down modulation for high efficiencies.

High Efficiency Boiler

Direct Vent for Boiler

The hot water circulates throughout the building through the use of three inline pumps manufactured by Grunfos, these pumps are of the self-sensing type which allows the pump speed to modulate based on the buildings demand. One inline pump is utilized just for the unit heaters located in the basement, the other two operate as a primary/standby system. There is one more inline pump associated with the heating hot water system and this pump is utilized for the indirect domestic water storage tank. Currently the heating hot water system is used to provide domestic hot water for the building. Control of all these pumps is performed by a three zone switch relay manufactured by Taco, model SR501.

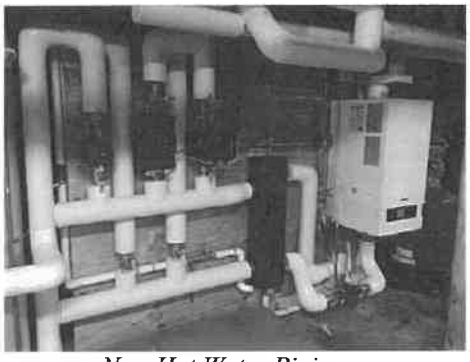


Inline Pumps

Zone Switch Relay

The piping system associated with the heating hot water boiler and pumps is all new and recently installed. The material is schedule 40 black steel with Victaulic fittings. The boiler utilizes a low loss header system which was provided by the boiler manufacture. This allows multiple independent zones to be circuited to the boiler plant. All the piping located near the boiler itself is insulated with new fiberglass insulation with PVC fitting covers. The piping throughout the rest of the building is original and is not insulated completely, some locations are exposed and have no insulation or the fiberglass insulation is damaged. The piping from all outwards appearance seems to be in fair condition however, a section of piping should be removed to examine the internal condition of the piping system and ensure that there is no corrosion or scaling.

Low Loss Header



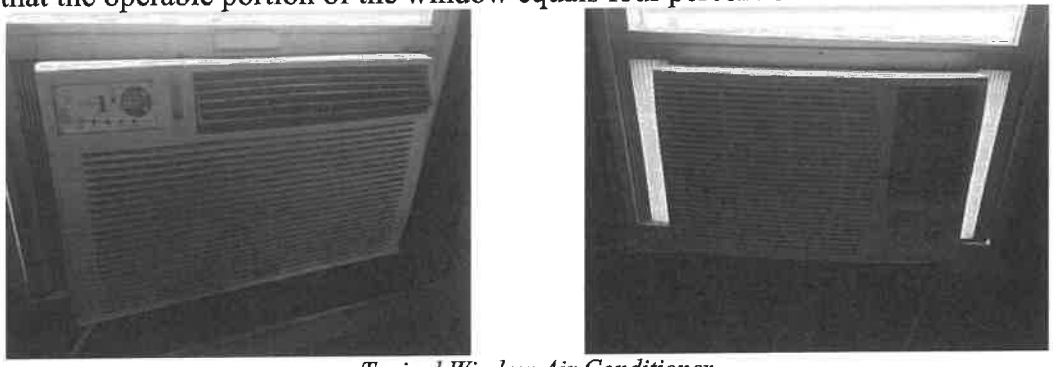
New Hot Water Piping

Hot water expansion is completed through the use of a vertical non-insulated bladder style expansion tank. This tank was also recently replaced and in excellent condition. However, it is not insulated and should be to help reduce the systems heat loss.

Expansion Tank

Air Conditioning And Ventilation:

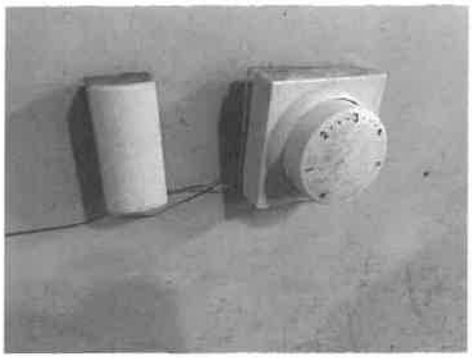
There is no central air conditioning system in the Fire Station. Window air conditioning units are located throughout the fire station. As for ventilation air, there are no mechanical ventilation units. The building utilizes operable windows as its means for ventilation, this is allowed by code however the actual requirements required by the code do not appear to be achieved with the current windows. A review of the current windows and square footage would need to occur to ensure that the operable portion of the window equals four percent of the floor area.



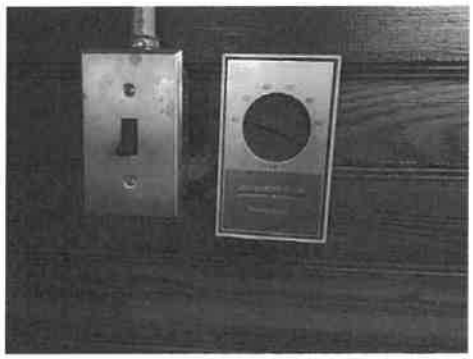
Typical Window Air Conditioner

Automatic Temperature Controls:

Automatic temperature controls for the building is minimal, some equipment such as the unit heaters in the apparatus bay are controlled with standalone electronic thermostats. These standalone thermostats are tied directly into each unit and are antiquated. These thermostats were provided by the equipment manufacturer. Other areas of the building that are heated with hot water convectors are equipped with thermostatic control valves however many of them are not functional and in some cases damaged. The overall control system appears to be malfunctioning and the controllability of the system is less than desirable. We would recommend removing the stand alone electronic system and replacing it with a direct digital control system throughout.



Wall Mounted Thermostatic Control Valve



Standalone Thermostat

Apparatus Bay

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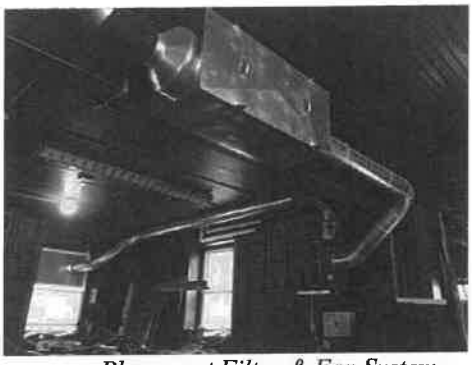


Plymovent Filter & Fan System

Plymovent Controller

Plymovent Track System

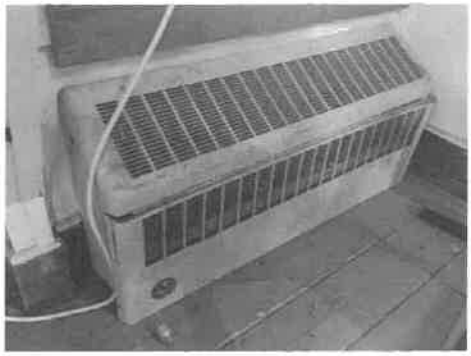
Typical Garage Unit Heater

Wall Mounted Exhaust Fan

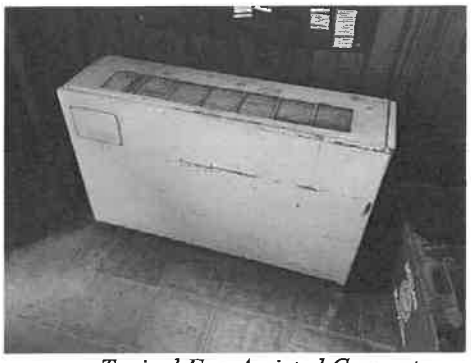
Office Areas and Sleeping Quarters

The office area and sleeping quarters utilize wall mounted hot water convectors. The office area on the first floor utilizes wall mounted hot water convectors which is controlled via a wall mounted standalone thermostats. The second floor sleeping quarters also utilizes convectors, majority of these units are damaged, dirty and non-functional. Majority of them do not have any type of control associated with them and those that do utilize thermostatic control valves that are wall mounted. These pieces of equipment run wild and generally overheat or do not provide enough heat for the spaces. Overall the terminal heating system throughout the building is damaged, missing components, and antiquated. The systems require a complete replacement.

Typical Damaged Convector



Typical Convector



Typical Fan Assisted Convector

Typical Convector

Shower and Toilet Room

There is no mechanical exhaust system for the shower or toilet room which is not code compliant. Operable windows provide natural ventilation to these spaces. Floor mounted convector is located in the bathroom on the second floor. The convector is antiquated and is in need of replacement.

Typical Cast Iron Convector

HVAC Recommendations:

Provide heating, ventilation and air conditioning requirements throughout the building through the use of new gas-fired rooftop units and supplemental terminal heating equipment such as radiant ceiling panels or wall mounted fin tube radiation.
Provide new galvanized sheet metal ductwork with fiber glass insulation.

Provide tempered make up air system for the apparatus bay.

Provide new exhaust system throughout the building for general exhaust with new roof-mounted exhaust fans.

Provide individual space temperature control for office areas through the use of variable air volume diffusers.

Provide a new direct digital control system with web access providing full building control of every component and piece of equipment, alarm notifications, trending capabilities for trouble shooting and optimal start/stop of cooling and heating modes for increased energy savings.

The existing boiler plant should be re-used since it is a high quality condensing boiler and recently installed in 2015.

– EXISTING CONDITIONS ANALYSIS –

HVAC

HVAC:

Executive Summary:

The primary heating, ventilation and air conditioning equipment within the Milton Blue Hill Fire Station Building has received fair to poor maintenance with the exception of the new boiler heating system that was just recently installed. It appears that the heating system presently installed is antiquated with the exception of the heating hot water boiler system. Overall the system is lacking ventilation and exhaust air and thermal comfort, creating hot and cold spots throughout the building. We recommend a complete upgrade of all terminal heating equipment and control system to achieve higher system efficiencies, reduce energy consumption, provide code required ventilation and provide quality temperature control.

Heating Plant:

The building is heated by one (1) wall mounted gas-fired high efficiency condensing boiler located in the basement of the building. This boiler along with four inline pumps and expansion tank was just recently installed and is in excellent condition. The boiler is manufactured by Viessmann (Model Vitodens 200, 262 MBH output for hot water and 285 MBH max input). The boiler is provided with a direct vent option which utilizes separated combustion flues. One flue is utilized for combustion air and the other is for the combustion gases. Each system utilizes polypropylene material and exits the building through an exterior wall where it terminates with an elbow and screen. The boiler has its own burner management control system which utilizes outdoor air reset and high turn down modulation for high efficiencies.

High Efficiency Boiler

Direct Vent for Boiler

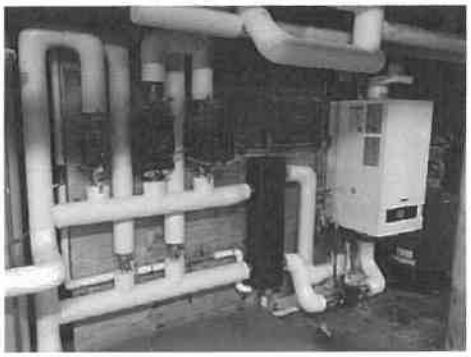
The hot water circulates throughout the building through the use of three inline pumps manufactured by Grunfos, these pumps are of the self-sensing type which allows the pump speed to modulate based on the buildings demand. One inline pump is utilized just for the unit heaters located in the basement, the other two operate as a primary/standby system. There is one more inline pump associated with the heating hot water system and this pump is utilized for the indirect domestic water storage tank. Currently the heating hot water system is used to provide domestic hot water for the building. Control of all these pumps is performed by a three zone switch relay manufactured by Taco, model SR501.

Inline Pumps

Zone Switch Relay

The piping system associated with the heating hot water boiler and pumps is all new and recently installed. The material is schedule 40 black steel with Victaulic fittings. The boiler utilizes a low loss header system which was provided by the boiler manufacture. This allows multiple independent zones to be circuited to the boiler plant. All the piping located near the boiler itself is insulated with new fiberglass insulation with PVC fitting covers. The piping throughout the rest of the building is original and is not insulated completely, some locations are exposed and have no insulation or the fiberglass insulation is damaged. The piping from all outwards appearance seems to be in fair condition however, a section of piping should be removed to examine the internal condition of the piping system and ensure that there is no corrosion or scaling.

Low Loss Header



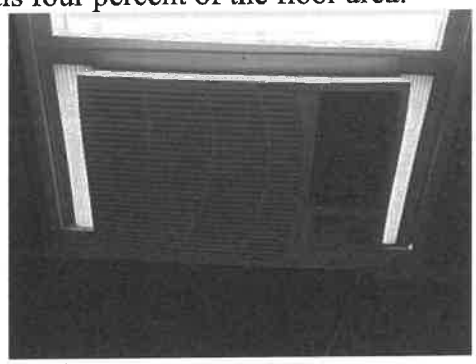
New Hot Water Piping

Hot water expansion is completed through the use of a vertical non-insulated bladder style expansion tank. This tank was also recently replaced and in excellent condition. However, it is not insulated and should be to help reduce the systems heat loss.

Expansion Tank

Air Conditioning And Ventilation:

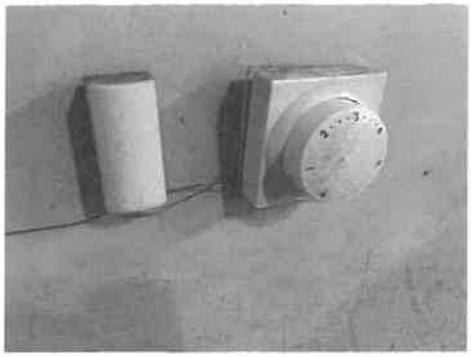
There is no central air conditioning system in the Fire Station. Window air conditioning units are located throughout the fire station. As for ventilation air, there are no mechanical ventilation units. The building utilizes operable windows as its means for ventilation, this is allowed by code however the actual requirements required by the code do not appear to be achieved with the current windows. A review of the current windows and square footage would need to occur to ensure that the operable portion of the window equals four percent of the floor area.



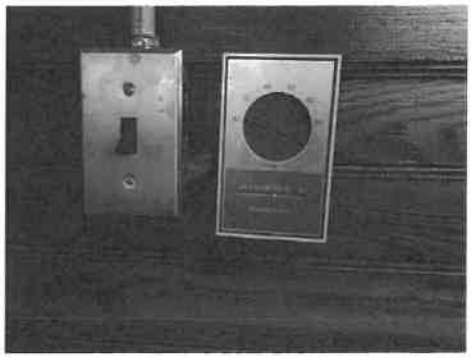
Typical Window Air Conditioner

Automatic Temperature Controls:

Automatic temperature controls for the building is minimal, some equipment such as the unit heaters in the apparatus bay are controlled with standalone electronic thermostats. These standalone thermostats are tied directly into each unit and are antiquated. These thermostats were provided by the equipment manufacturer. Other areas of the building that are heated with hot water convectors are equipped with thermostatic control valves however many of them are not functional and in some cases damaged. The overall control system appears to be malfunctioning and the controllability of the system is less than desirable. We would recommend removing the stand alone electronic system and replacing it with a direct digital control system throughout.



Wall Mounted Thermostatic Control Valve



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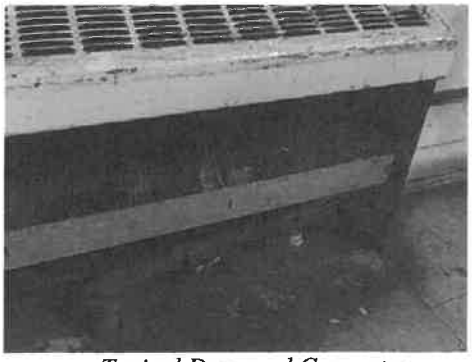
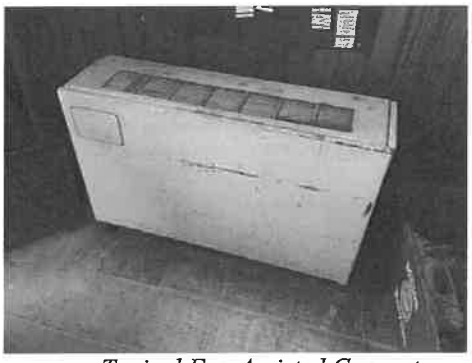


Typical Damaged Convector

Typical Convector



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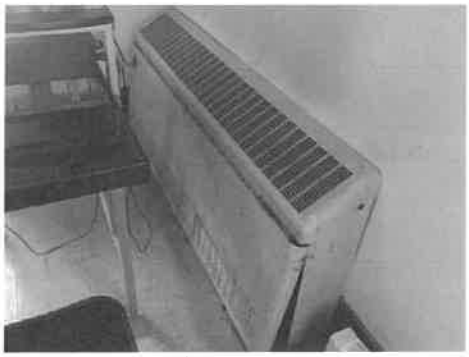

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– EXISTING CONDITIONS ANALYSIS –

ELECTRICAL

ELECTRICAL

Executive Summary:

In general, the existing Electrical systems, although functioning, are at the end of or have exceeded their useful life. The entire Power Distribution System, Lighting, and Tel/Data Systems should be replaced with new systems under a renovation program. Most systems are marginally sized and are no longer code compliant.

Electrical Distribution System:

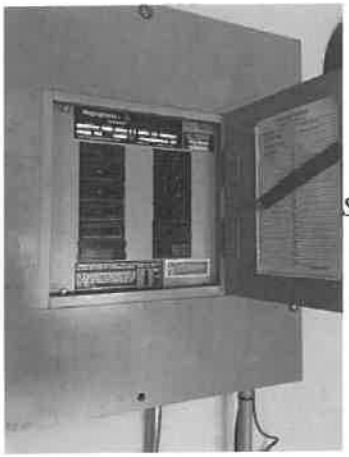
Single phase primary power runs overhead on Route 138 then underground to the building from a pole located adjacent to the building on Route 138. The meter is mounted within the building, Meter #2531381.

Utility Pole

Meter

The service is rated at 200 amperes at 120/240 volt, single phase, 3 wire.

The Distribution System is in poor condition and inadequately sized for a renovation program.



Sub-panel

Emergency Power System:

An interior, natural gas generator is installed. The generator is manufactured by Kohler, rated at 5.3 kVA @ .8 PF, serial number 455359, Model 6.5RMY62. It is mounted in the lower level Garage. The generator feeds a single automatic transfer switch located in the Garage. It is unclear as to what is fed from the emergency generator.

The emergency generator and the automatic transfer switch are in poor condition. Life safety lighting is fed from the generator and is not compliant with today's codes. Exit signs are in fair condition; however, are not installed in all required locations. The generator is undersized and should be replaced in a renovation program.

Generator

Automatic Transfer Switch

Fire Alarm System:

The building has a 4 zone microprocessor based fire alarm control panel manufactured by Fire Lite, Model MS-5UD. The panel seems to be in good condition; however, the notification devices and detection devices are in poor condition.

There is a combination of heat detectors and smoke detectors located throughout the building. The dorms do not meet the latest codes with respect to notification as they do not have low-frequency horns in sleeping areas. Self-contained Kidde wall mounted CO detectors are located in the Corridor outside the dorms. Horn strobe coverage is inadequate.

FACP

Exterior Lighting System:

Exterior lighting consists of HID building mounted floods. Fixtures are in poor condition and are not dark sky compliant.

Exterior Lighting

Interior Lighting:

The interior lighting consists mainly of fluorescent wraparound fixtures with T8 lamps.

Corridors contain surface mounted round fluorescent fixtures with three (3) twin tube compact fluorescent lamps.

Lighting in general is in poor condition, lacks proper controls, and light levels are too low in most spaces.

All lighting should be replaced in a renovation program.

Ceiling Compact Fluorescents

Wraparound – General Lighting

Branch Circuitry:

Receptacle coverage is minimal and inadequate in various spaces. Extension cord use was noted due to scarcity of the outlets.

Kitchen receptacles and Boiler Room do not have ground fault protection. The general wiring method is pipe and wire.

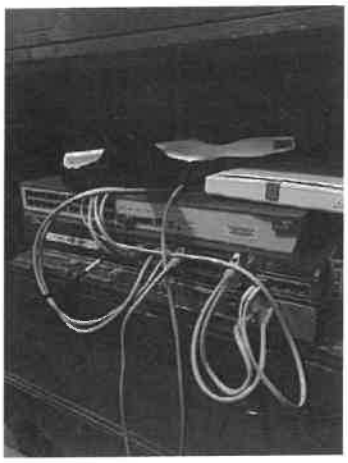
Extension Cords

Kitchen Receptacles

Communication Systems:

The telephone service, CATV, and town fiber run overhead in the street and enter the building underground in the lower level. The fiber is terminated on a wall mounted fiber optic cabinet in the upper level Closet and connects to the building's data rack. The data rack is located in a closet with poor ventilation which will lead to shortened life of the equipment.

The building data/phone infrastructure consists of Cat5e wiring directly to the Cisco switches that are plugged into a local APC UPS.



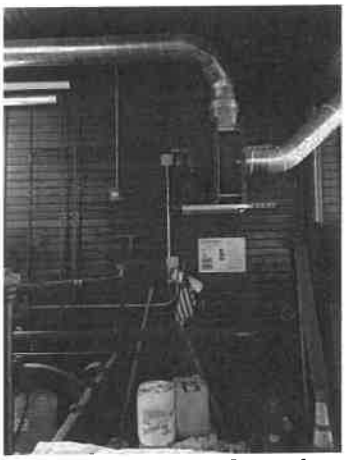
Tel/Data

Micellaneous:

The facility does not have a Lightning Protection System.

Plymovent Vehicle Exhaust System exists; control panel is located in the Apparatus Bay and is in good condition.

Zetron Model 6 for incoming alarms is located outside the Watch Room and is in fair condition.



Plymovent Control Panel

Zetron Model 6

Antiquated technology is used to monitor City fire alarms.

Card Catalogue

Alarm Tape

Recommendations:

In general, the Electrical systems will require full replacement under a renovation program. Under a renovation program, due to the inability to conceal raceways, we recommend the use of a surface metal raceway system in finished spaces equal to wiremold. Mechanical Rooms, Apparatus Bays, etc. will require surface conduits.

Power Distribution:

- The electrical service is marginal for this facility and the voltage and phase is not suitable for a public safety facility. The entire service should be replaced with a 120/208V, 3Ø, 4W service adequately sized and housed in a code compliant space.

- Electrical power will be brought into the site via underground medium voltage cables from the utility company network. A pad mounted step-down transformer will be located at grade adjacent to the building. Service entrance and distribution switchgear will be located in the Electrical Room near the Mechanical Room, along with lighting and power distribution panels.

Emergency Power System:

- The Emergency Power System should be replaced with a code compliant generator rated at 120/280V, 3Ø, 4W with adequate capacity for emergency loads and other critical stand-by loads.

- The generator will be housed in a sound attenuating weather proof enclosure with critical grade exhaust silencer, and automatic starting and safety controls. The generator will include two (2) service breakers and transfer switches: one (1) for life safety equipment, one (1) for other than life safety equipment. The generator will be sized for 100% of all lighting and power loads. All air-handling units will be provided with emergency power to maintain ventilation and heating for the duration of a commercial power outage.

- Exit signs will be of the energy efficient, long life LED type.

Interior Lighting System:

- General office lighting fixtures will consist of a combination of recessed and pendant mounted indirect LED luminaries and electronic drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also wired for multi-level switching. Corridors and other functional lighting fixtures will consist of acrylic recessed direct fixtures with LED and electronic drivers. Storage, Mechanical, Apparatus, etc. will be two industrial LED fixtures with acrylic lens.

- Lighting in the Communications/Watch Room will be direct-indirect dimmable LED with consideration of dimmable down-lights over console.

- Each area will be locally switched and designed for multi-level controls. Each Office space and Toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in space with daylight for dimming of light fixtures.

- The entire facility will be controlled with an Automatic Lighting Control System for programming lights on & off.

- Lighting in the Dorm Rooms, Corridors, and Apparatus Bay will be interfaced with the Zetron System to automatically turn on during an alarm then timed off.

Exterior Lighting:

- Fixtures for area lighting will be pole mounted LED luminaries in the parking area and roadways. The exterior lighting will be connected to the Automatic Lighting Control System for photocell on and timed off operation.

- Building perimeter fixtures will be wall mounted over exterior doors.

- All fixtures will be of the cut-off type and dark sky compliant.

Wiring Devices:

- Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided. Corridors will have a cleaning receptacle at approximately 30-40 foot intervals. GFI receptacles will be provided in Apparatus Bay. Exterior weatherproof receptacles will be installed at exterior doors. A system of computer grade panelboards will double neutrals and surge protective devices will be provided for receptacle circuits.

Fire Alarm System:

- Fire Alarm System should be replaced with an addressable, ADA compliant system with full coverage.
- A Fire Alarm and Detection System will be provided with 60 hour 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.
- Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways.
- The Sprinkler System will be supervised for water flow and tampering with valves.
- Horn/strobes will be provided in egress ways, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.
- Manual pull stations will be provided at exit discharge doors.
- The system will be connected to automatically report alarms to a remote location.
- Dorm Rooms will be provided with local detectors with low frequency sounder base.
- CO detection will be provided per code.

Uninterruptible Power Supply (UPS):

- A three phase centralized UPS System will be provided. The system will provide conditioned power to sensitive electronic loads for Communications Equipment Room and Communications/Watch Room. The UPS will bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage. The UPS System will also be connected to the stand-by generator.

Lightning Protection System:

- A system of lightning protection will be provided. The system will be installed in compliance with the provisions of the latest "Code for Protection Against Lightning" for buildings as adopted by the National Fire Protection Association and the Underwriters' Laboratories, Inc. for UL Master Label System.

- The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors, ground rods, etc.

Technology:

- The Data System infrastructure is to be located in a properly designed room, and should be updated to include Category 6A UTP cabling for the both data and telephone systems for gigabit connectivity at the work station. Each office should have 1 voice and 2 data outlets.

- A Central Paging System should be provided and integrated with the Telephone System.

CCTV:

- A Closed Circuit TV System should be installed and include computer servers with image software, computer monitors and IP based closed circuit TV cameras. The head end server should be located in a properly designed head end MDF Room and will be rack mounted. The system should have accessibility from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (NVRs) should record all cameras and store this information for 21days at 30 images per second. The location of the cameras should generally be in corridors and exterior building perimeter.

- The system should fully integrate with the access control system if provided to allow viewing of events from a single alarm viewer. Camera images and recorded video should be linked to the Access System to allow retrieval of video that is associated with an event.

Card Access:

- A Card Access System should be considered and include a card access controller, door controllers, and proximity readers/keypads. Proximity readers should be located at various locations. Each proximity reader should have a distinctive code to identify the user and a log will be kept in memory. The log within the panel should be accessed through a computer. The alarm condition should also initiate real time recording on the integrated CCTV System.

– SPACE NEEDS –

Milton Station 4 Fire Program

Project Name: Milton

1st Program Meeting Date: **October 14, 2015**

Printout Date: **November 17, 2015** Filename: Milton Fire Program

This document is not meant to be limited to an inventory of what you currently have.

Indicate what you currently need for proper operations and try to forecast what you will need for the future.

B Functional Activities in Building

B1. Types of response:

B1.1. Fire: **Yes**

B1.2. EMS: **Yes (BLS Engine Co's)**

B1.3. Heavy Rescue: **No**

B1.4. HAZ MAT: **No**

B1.5. Water Rescue: **Yes**

B1.6. Ambulance: **No**

B1.7. Other: **UTV (Off road rescue)**

B2. Training activities in building:

B2.1. **No**

Training activities on site:

B2.2. **No**

B3. Fuel Filling Station: **No**

B4. Other uses of apparatus bay:

B4.1. Social events: **No**

B4.2. Craft fairs: **No**

B4.3. Other: **None**

B5. Sleeping Over:

B5.1. Now

.5.1.1. Long term: **Yes**

B5.2. Future

.5.2.1. Intermittent, short duration: **Storm coverage**

.5.2.2. Long term: **Yes**

B6. Standing by: **Mutual Aid**

.6.1.1. Will other fire companies park their apparatus in the bay under certain circumstances: **No – only at HQ**

B7. Emergency Shelter: **No**

B8. Firematic Business: **None**

B9. Meetings: **None**

B10. Social Life:

B10.1. Daily recreation – describe: **Physical fitness activities by the on duty firefighters, Day Room w/ t-v**

B10.2. Periodic recreation – describe: **None**

B10.3. Outdoor recreation – describe: **None**

B11. Misc. Activities

B11.1. **Fire Prevention Week school visits**

B11.2. **Weekly visits by parents and children**

B11.3. **Medical walk-ins at Engine 2 (East Milton Square) maybe 6/year**

B12. Access control:

B12.1. Electronic access: **Yes**

B12.2. Vendor's access to drop off material: **No**

C Site

C1. Who owns the road at apron: **State, County, Town**

C1.1. **E4 is currently on A State Rd. If we situate it behind the current building it will exit to a Town rd.**

C2. Number of primary responder parking spaces needed : **E4-4**

C3. Number of other parking spaces needed: **E4-1**

C4. Number of spaces needed for visiting apparatus: **0; Parking space for training trailers on loan**

C5. Number of spaces needed for visiting firefighter parking: **TBD**

C6. Recreation requirements (Pavilion, grill, patio, etc.): **None**

C7. Training requirements: **None, done at HQ**

C8. Site signage requirements: **No**

C9. Dumpster: **No**

APPARATUS

1 Apparatus Bays

1.1 Number of vehicles: **6** ; # of bays: **4**

Front Line Vehicles

1.1.1	Name: **Engine 4**	type: **E- One**	length: **30'**	weight: **39,200lbs**
1.1.2	Name: **Brush Truck**	type: **Pick up**	length: **19'**	weight: -
1.1.3	Name: **Squad**	type: **Pick up**	length: **18'**	weight: **10,000lbs**
1.1.4	Name: **Kubota**	type: **UTV on trailer**	length: **17'**	weight: -
1.1.5	Name: **Boat**	type: **Boat on trailer**	length: **16'**	weight: -
1.1.6	Name: **Decon. Trailer**	type: **enclosed trailer**	length: **16'**	weight: -

1.2 Type of bays:

1.2.1 Drive-through: **Would like one for engine**

1.2.2 Double deep: **No**

1.2.3 Single deep: **All**

1.3 Wash bay: **No, will wash in place**

1.4 Plan for future expansion of bays: **Yes** ; # **1**

1.5 Overhead doors:

1.5.1 Front:

1.5.1.1 Number: **4**

1.5.1.2 Width/Height: **(use 13'-4" W x 14'-0" H)**

1.5.1.3 Windows: **Yes**

1.5.2 Rear:

1.5.2.1 Number: **1**

1.5.2.2 Width: **11'9";** Height: **13'11" (use 13'-4" W x 14'-0" H)**

1.5.2.3 Windows: **Yes**

1.6 Signage requirements: Plan for future digital display of fire information

1.7 Trench drains: **Yes** ; Layout: **Centerline of trucks**

1.8 Wall mounted water hose reels: **Yes** ; Quantity: **1 per two trucks**; Tempered: **No**

1.9 Fume exhaust: **Yes** ; Type: **Plymovent** ; Later: **Same**

1.10 Truck fills:

1.10.1 Overhead: **No**

1.10.2 Wall hydrant: **Yes** ; Quantity: **TBD**

1.10.3 Outdoor hydrant: **TBD**

1.11 Overhead electrical drops: **Yes** ; Quantity: **6**

1.12 Overhead airdrops: **Yes** ; Quantity: **5**

1.13 Compressed air for tools: **Yes**

1.14 Wall mounted air hose reels: **currently no, moving forward yes;** Quantity: **3, 1 per station**

1.15 Utility sinks: **Locate in adjacent room**

1.16 Hand wash sinks: **Yes**; Where: **At door to balance of building**

1.17 Water fountain/bottle filling station: **No**

1.18 Ice machine: **Future** ; Location: **Near the bay**

1.19 Storage of Diesel Exhaust Fluid: **No**

1.20 Epoxy flooring: **Currently No moving forward possibly**

1.21 Wall construction type: **Masonry**

1.22 Size: **3,574** sq ft

FIREMATIC SUPPORT

2 Storage Room #1

2.1 Use: **Equipment storage**

2.2 Items to be stored: **Back up fire service items- axes, haligans, valves, etc.**

2.3 Location: **currently we have no storage rooms**

2.4 Security: **Yes**

2.5 Adjacencies: **Apparatus bay**

2.6 Comments: **heavy duty shelving**

2.7 Size: **203** sq ft

3 Turnout Gear Storage Room

3.1 Operational Comments: **We currently store turn out gear in lockers on the apparatus floors.**

3.1.1 Response pathway

3.1.1.1 **Turnout gear get placed at truck at start of shift**

3.2 Quantity of Lockers: **E4- 20 each**

3.3 Describe Lockers: **Metal mesh lockers**

3.4 Locker Size: **20" x 20" x 72"**

3.5 Location: **apparatus floor**

3.6 Adjacencies: **Ideally near decon laundry**

3.7 Comments: **Enclosed, with dehumidification and heat recovery ventilation**

3.8 Size: **156** sq ft

4 Hose Storage

4.1 Operational Comments:

4.1.1 **Storage of modest quantity of spare hose**

4.2 A room, or on the floor: **Currently Stored on apparatus floor**

4.3 Hose racks: **1** ; Size: **10 ft**

4.4 Hose drying: **No**

4.5 Hose washer: **No**

4.6 Hose winder: **No**

4.7 Inventory:

4.7.1 5" suction: **0**

4.7.2 5" LDH: **5 lengths at each station @ 100'** [7 ½" footprint]

4.7.3 4" LDH: **0**

4.7.4 2 1/2" LDH: **5 lengths in each station @ 50'** [4" footprint]

4.7.5 1 3/4" LDH: **4 lengths in each station @ 50'** [3" footprint]

4.7.6 1 1/8" LDH: **4 lengths in each station @ 50'** [2" footprint]

4.8 Items to be located in this space (from current inventory):

4.8.1 **same as above**

4.9 Additional items (not in current inventory):

4.9.1 **None**

4.10 Adjacencies**: Apparatus floor**

4.11 Comments: **Two tier rack, not three**

4.12 Size: **29** sq ft

5 DeCon/Laundry

5.1 Operational Comments: **Allow for decon of personal and gross decon of equipment**

5.2 **Currently in the apparatus bay**

5.3 Sink: **Yes** ; Foot Pedal: **No** ; Number of sink chambers: **two**

5.4 Gear washer/extractor: **Yes, 60 lb capacity**

5.5 Gear dryer: **Yes – DryGear Pro 3**

5.6 Ventilated gear racks: **No**

5.7 Residential type clothes washer & dryer: **Yes**

5.8 Drench shower: **Yes**

5.9 Backboard/Etc. cleaning: **Yes**

5.10 Holding tank: **No**

5.11 Adjacencies: **bay, and near an exterior door**

5.12 Comments: **Incorporate future EMS Decon**

5.13 Size: **258** sq ft

6 Janitor's Closet

6.1 Mop Receptor: **Yes**

6.2 Slop Sink: **Yes**

6.3 Floor Machine: **Yes**

6.4 Shelving: **Yes**

6.5 Mop/Broom Rack: **Yes**

6.6 Adjacencies: **Apparatus bay**

6.7 Comments: **currently we do not have dedicated janitors closets**

6.8 Size: **80** sq ft

7 Apparatus Floor Rest Rooms

7.1 Quantity: **One per station**

7.2 Fixture: Sink, toilet & urinal? **Yes**

7.3 Shower: **No**

7.4 Lockers: **No**

7.5 Adjacencies: **Apparatus bay**

7.6 Comments: **We will need a men's, & ladies room on the 1st floor of each building**

7.7 Size: **62** sq ft

8 Patrol Room

8.1 View control: **Apron**

8.2 Operational Comments:

8.2.1 **Receiving calls from police or public. Communications.**

8.3 Seating for how many: **2**

8.4 Items:

8.4.1 Door operator switches: **yes**

8.4.2 Traffic device control: **DNA**

8.4.3 Light switches for app bay: **yes** ; Outside: **no**

8.4.4 Internal paging system: **yes**

8.4.5 Siren trigger: **no**

8.4.6 Computer equipment: **Work stations**

8.4.7 Closed Circuit TV, Phones, Weather Station: Describe: **no**

8.4.8 File cabinets: **no**

8.4.9 Wall mounted items: **television**

8.4.10 Rechargeable items (flashlights, pagers): **no**

8.4.11 Lockable storage: **no**

8.5 Items to be located in this space (from current inventory):

8.5.1 **3 ring binders, 1 map of town**

8.6 Security: **Open to personnel**

8.7 Adjacencies: **Apparatus bay**

8.8 Size: **67** sq ft

FIREFIGHTERS

9 Day Room

9.1 Uses:

9.1.1 **Cooking & eating**

9.1.2 **Relaxation & watching television**

9.2 Number of chair seating: **2**

9.3 Couch: **Yes** ; seats how many: **3**

9.4 TV: **Yes** ; Size: **42"**

9.5 Bulletin board: **Yes**

9.6 Kitchen: **Yes**

9.7 Dining/Eating: **Shift size=4, seat 6**

9.8 Living/T-V: **Yes**

9.9 Location:2nd floor near bunking

9.10 Size: **432** sq ft

10 Physical Training

10.1 Equipment:

10.1.1 Cardio: **Yes**

10.1.2 Weights: **Yes**

10.1.3 Weight Machines: **Yes**

10.2 Location: **currently they are fit into each station where space allowed**

10.3 Security: **No**

10.4 Adjacencies: **Not critical**

10.5 Comments: **Integral one-person changing room**

10.6 Size: **480 sq ft**

11 Firefighters' Bed Rooms

11.1 Number of rooms: **3**

11.2 Beds per room: **1**

11.3 Storage: **Yes**

11.4 Desks: **Yes**

11.5 Location: **all on second floor**

11.6 Security: **access control**

11.7 Comments: **Single bed w/ 4 exterior lockers @ 20"w x 24" d x 72" h**

11.8 Size: **98** sq ft

12 Lieutenant's Bed Rooms

12.1 Number of rooms: **E1-9, E2-2, E4-3**

12.2 Beds per room: **E1 & E4 – 1, E2 -3, & 1**

12.3 Storage: **Yes**

12.4 Desks: **Yes, small office**

12.5 Location: **all on second floor**

12.6 Security: **access control**

12.7 Comments: **Single bed w/ 4 exterior lockers @ 20"w x 24" d x 72" h**

12.8 Size: 116 sq ft

13 Bunker's Bathrooms

13.1 Quantity: **2**

13.2 Details: **Toilet, urinal sink, shower & bench**

13.3 Location: **all on second floor**

13.4 Security: **Privacy latch**

13.5 Adjacencies: **Bunking**

13.6 Comments: **Single occupant, uni-sex**

13.7 Size: **2 @ 91** sq ft

14 Bunker's Area Laundry Room

14.1 Location: **Currently None**

14.2 Adjacencies: **Near bunking**

14.3 Comments: **Front load machines**

14.4 Size: **59** sq ft

MISCELLANEOUS SPACES

15 Entry Vestibules (2)

15.1 Size: **(2) @ 50** sq ft

16 House Keeping Storage

16.1 Location: **One on each floor**

16.2 Size: **(2) @ 25** sq ft

17 Janitors Closet

17.1 Mop Receptor: **Yes**

17.2 Slop Sink: **No**

17.3 Floor Machine: **Yes**

17.4 Shelving: **Yes**

17.5 Mop/Broom Rack: **Yes**

17.6 Comments: **Will also store bathroom supplies**

17.7 Size: **64** sq ft

18 File Server

18.1 Location: **No – runs off Town server**

19 Mechanical, Electrical, Plumbing, HVAC, Sprinkler, Alarm, etc.

19.1 Fuel type at site: **Gas**

19.2 Heating type in apparatus bay: **In-floor radiant**

19.3 Heating type elsewhere: **Ducted HVAC**

19.4 Building to be sprinklered: **Yes**

19.4.1 Adequate water pressure: **Yes**

19.5 Hose bibs for exterior: **Yes**

19.6 Bay lighting type: **LED**

19.7 Site lighting type: **LED**

19.8 Generator: **Yes**

19.8.1 Fuel: **TBD**

19.8.2 Location of generator: **Exterior**

19.8.3 Circuits on generator: **All**

19.9 Describe Security Type (fob?): **Yes**

19.10 Alarm: **Yes**

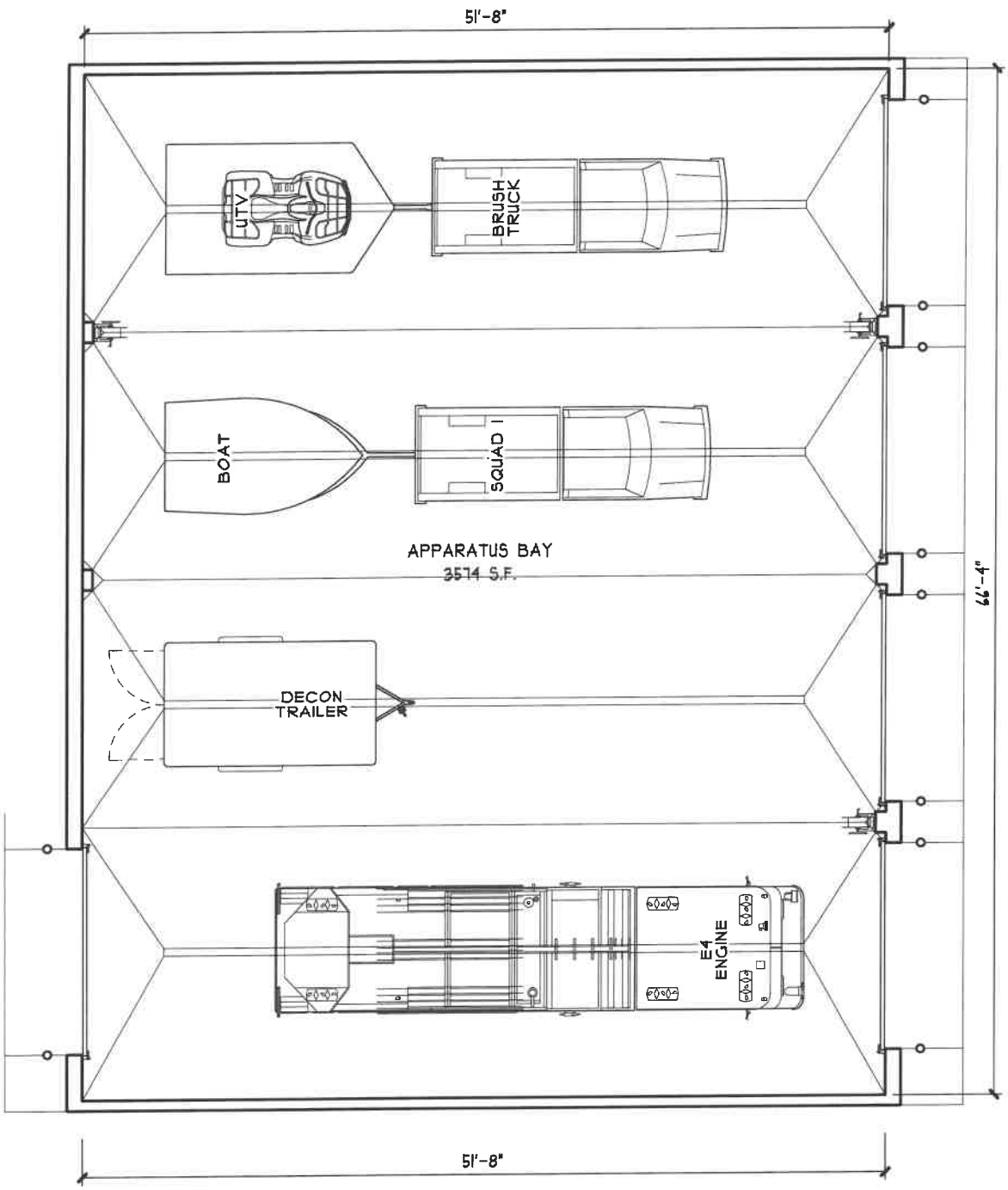
19.11 Siren: **No**

19.12 Location: **Not critical**

19.13 Size: **350** sq ft

Milton Station 4 Space/Usage Analysis

Program Item	Room Name	Proposed Floor Area		Existing Floor Area		Area To Demolish		Floor Area To Renovate		New Construction Area	
		1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor	1st Floor	2nd Floor
	Apparatus Ba										
1	Apparatus Bay	3,574		0		0		0		3,574	
	Subtotal - Apparatus	**3,574**		**0**		**0**		**0**		**3,574**	
	Firematic Support										
2	Storage Room #1	203		0		0		0		203	
3	Turnout Gear	156		0		0		0		156	
4	Hose Storage	29		0		0		0		29	
5	DeCon Laundry	258		0		0		0		258	
6	Janitors Closet	80		0		0		0		80	
7	Apparatus Floor Uni-Sex ADA Rest Room	62		0		0		0		62	
8	Patrol Room	67		0		0		0		67	
	Subtotal - Firematic Support	**855**		**0**		**0**		**0**		**855**	
	Firefighters										
9	Day Room	0	432	0	0	0	0	0	0	0	432
10	Physical Training	0	480	0	0	0	0	0	0	0	480
11	Bunkers Bedrooms (3 @ 98 sf)	0	294	0	0	0	0	0	0	0	294
12	Lieutenants Bedroom	0	116	0	0	0	0	0	0	0	116
13	Bunkers Bathrooms (2 @ 91 sf)	0	182	0	0	0	0	0	0	0	182
14	Bunkers Area Laundry	0	59	0	0	0	0	0	0	0	59
	Subtotal - Firefighters	**0**	**1,563**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,563**
	Miscellaneous Space										
15	(2) Entry Vestibules	100	0	0	0	0	0	0	0	100	0
16	Housekeeping Storage	50	50	0	0	0	0	0	0	50	50
17	Janitors Closet	64	64	0	0	0	0	0	0	64	64
18	File Server	0	0	0	0	0	0	0	0	0	0
19	Mechanical/Electrical	350	50	0	0	0	0	0	0	350	50
	Subtotal - Miscellaneous Spaces	**564**	**164**	**0**	**0**	**0**	**0**	**0**	**0**	**564**	**164**
	Vertical Circulation										
20	(2) Stairwells (area per floor)	356	364	0	0	0	0	0	0	356	364
21	Elevator (area per floor)	58	58	0	0	0	0	0	0	58	58
22	Elevator Equipment Room	52	0	0	0	0	0	0	0	52	0
23	Elevator Foyer	80	80	0	0	0	0	0	0	80	80
	Subtotal - Vertical Circulation	**546**	**502**	**0**	**0**	**0**	**0**	**0**	**0**	**546**	**502**
	Area Subtotals										
	Bay	**3,574**		**0**		**0**		**0**		**3,574**	
	Firematic Support	**855**		**0**		**0**		**0**		**855**	
	Office & Living	**1,110**	**2,229**	**0**	**0**	**0**	**0**	**0**	**0**	**1,110**	**2,229**
	Walls & Circulation										
	Apparatus Bay Walls @ 5%	179		0		0		0		179	
	Firematic Support Walls @ 15%	128		0		0		0		128	
	Firematic Support Circulation @ 15%	128		0		0		0		128	
	Office Area Walls @ 15%	167	334	0	0	0	0	0	0	167	334
	Office Area Circulation @ 20%	222	446	0	0	0	0	0	0	222	446
	As-Built Adjustment			0	0						
	Subtotal - Walls & Circulation	**824**	**780**	**0**	**0**	**0**	**0**	**0**	**0**	**824**	**780**
	Total By Floor>>	**6,909**	**3,511**	**0**	**0**	**0**	**0**	**0**	**0**	**6,909**	**3,511**
	Total By Category>>	**10,420**		**0**		**0**		**0**		**10,420**	
	Footprint>>	**6,909**		**0**		**0**		**0**		**6,909**	



MITCHELL ASSOCIATES ARCHITECTS

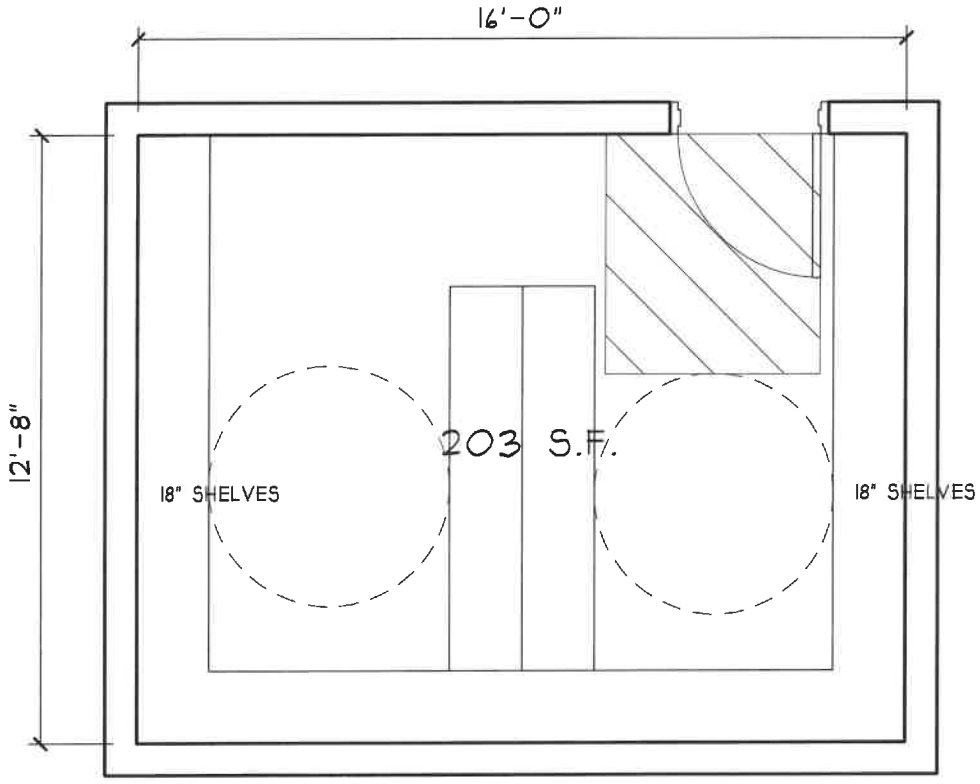
ENGINE 4 APPARATUS BAY

SCALE: 3/32" = 1'-0" | DATE: 11/12/2015

S:\J Drive\Kaestle Boos\Milton\Individual Rooms\1 - Apparatus Bay\01 - Engine 4 Apparatus Bay

01

ROOM #



CMU WALLS

MITCHELL ASSOCIATES ARCHITECTS

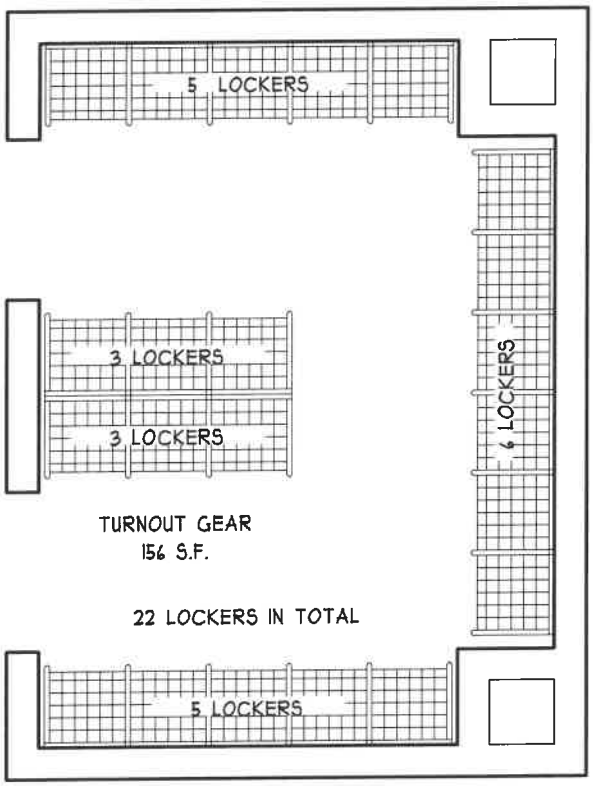
STORAGE ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\1- Bay 1 Firematic Support\02 - Storage Room #1

02

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

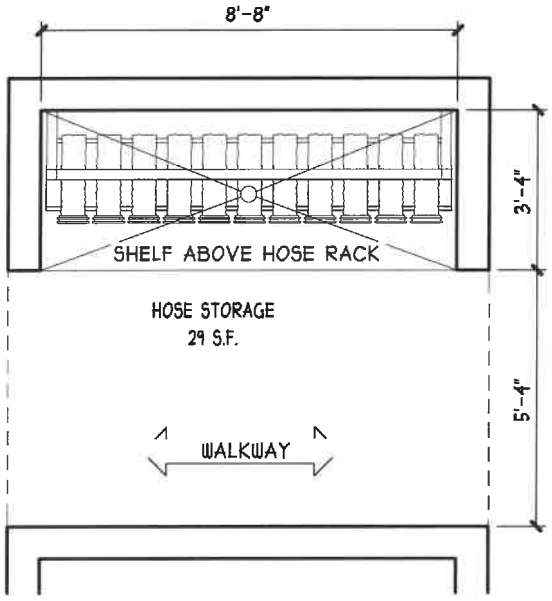
TURNOUT GEAR FOR 22

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Keestle Boos\Milton\Station 1\Individual Rooms\1- Bay 1 Firematic Support\03 - Turnout Gear - Station 1

03

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

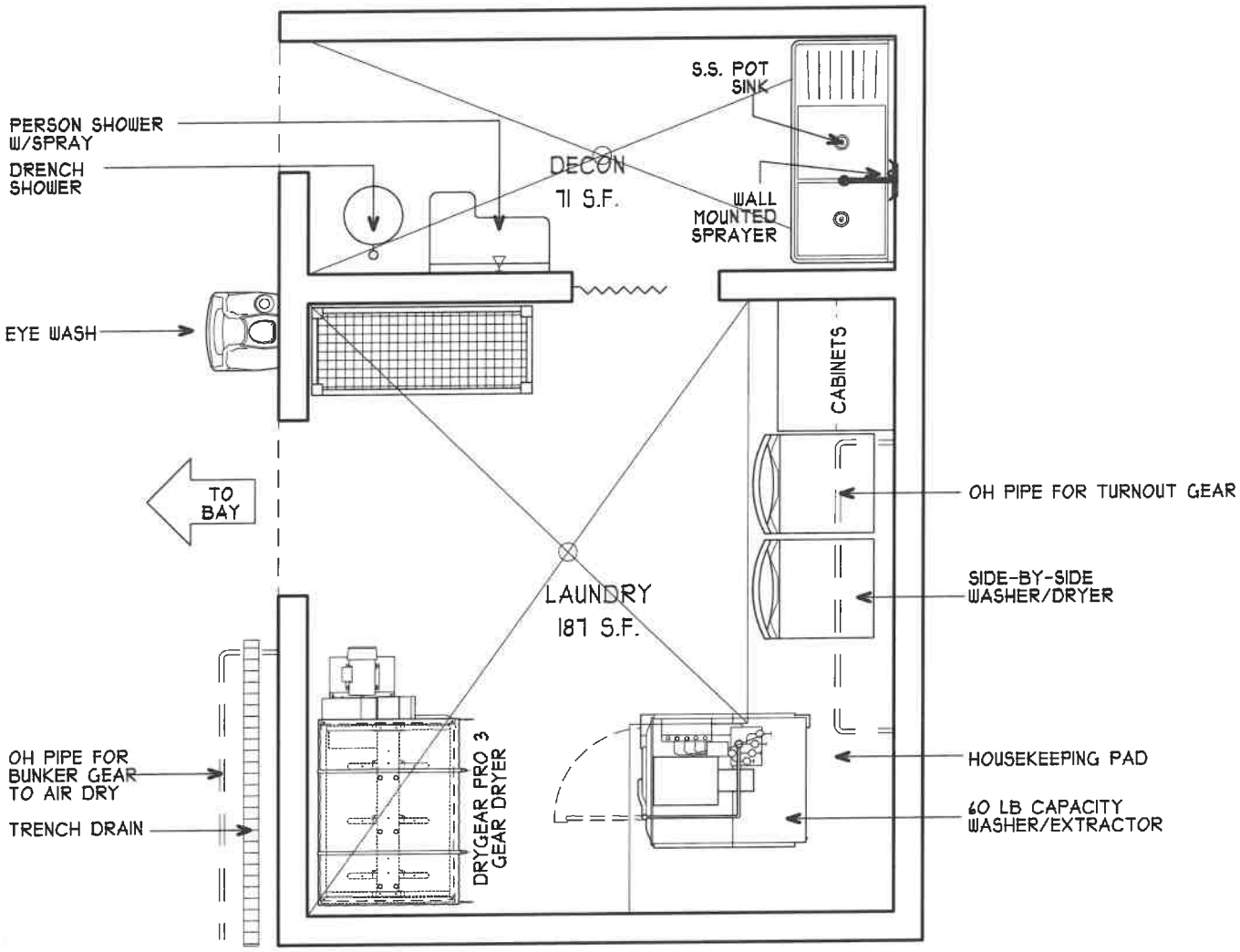
HOSE STORAGE

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 1\Individual Rooms\1- Bay 1 Firematic Support\04 - Hose Storage

04

ROOM #



TOTAL AREA = 294 S.F.

MITCHELL ASSOCIATES ARCHITECTS

DECON / LAUNDRY

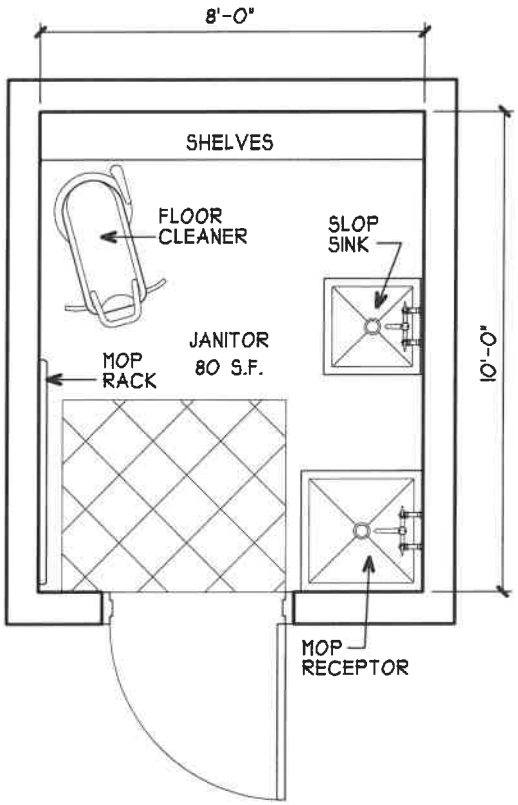
SCALE: 1/4" = 1'-0"

DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\1- Bay 1 Firematic Support\05 - Decon Laundry at Station 1

05

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

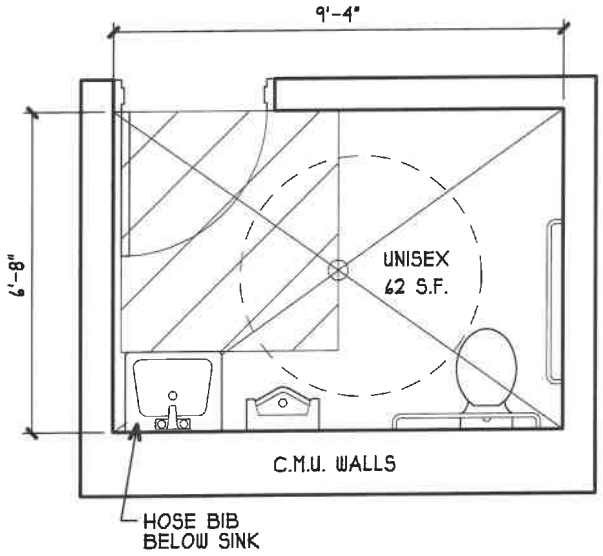
JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\1- Bay 1 Firematic Support\06 - Janitor

06

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

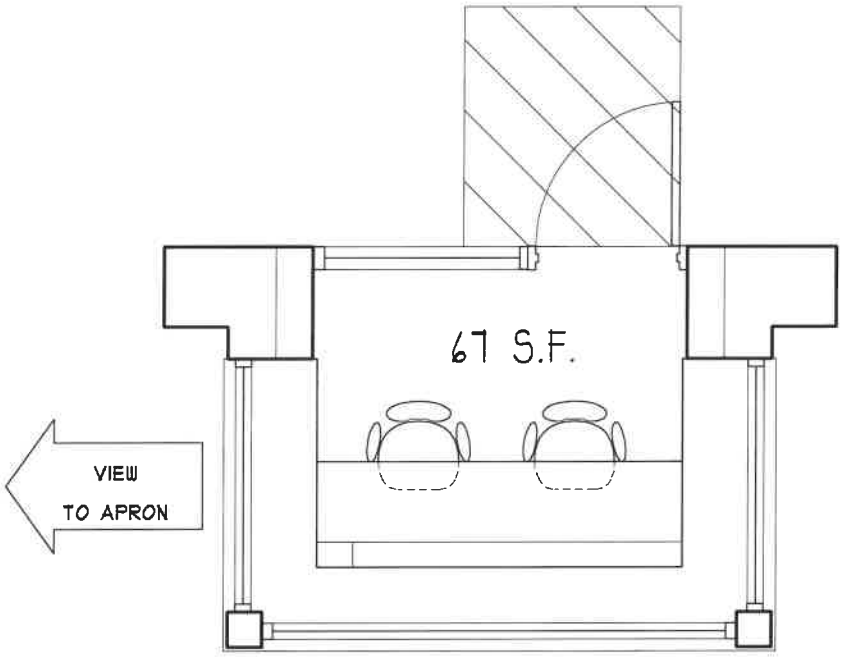
APPARATUS BAY BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\1- Bay & Firematic Support\07 - Bathroom

07

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

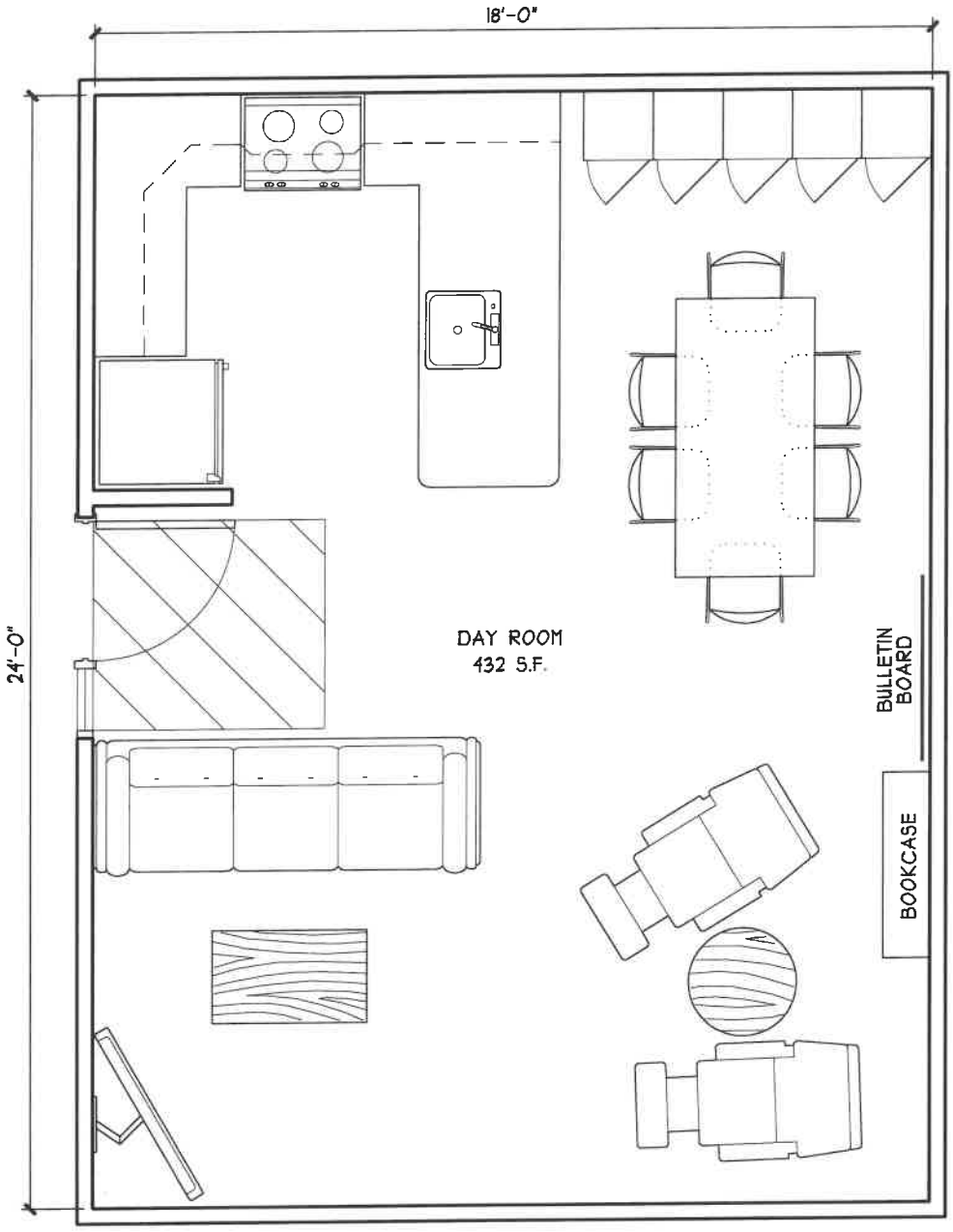
PATROL ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 1\Individual Rooms\1- Bay 1 Firenatic Support\08 - Patrol Room

08

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

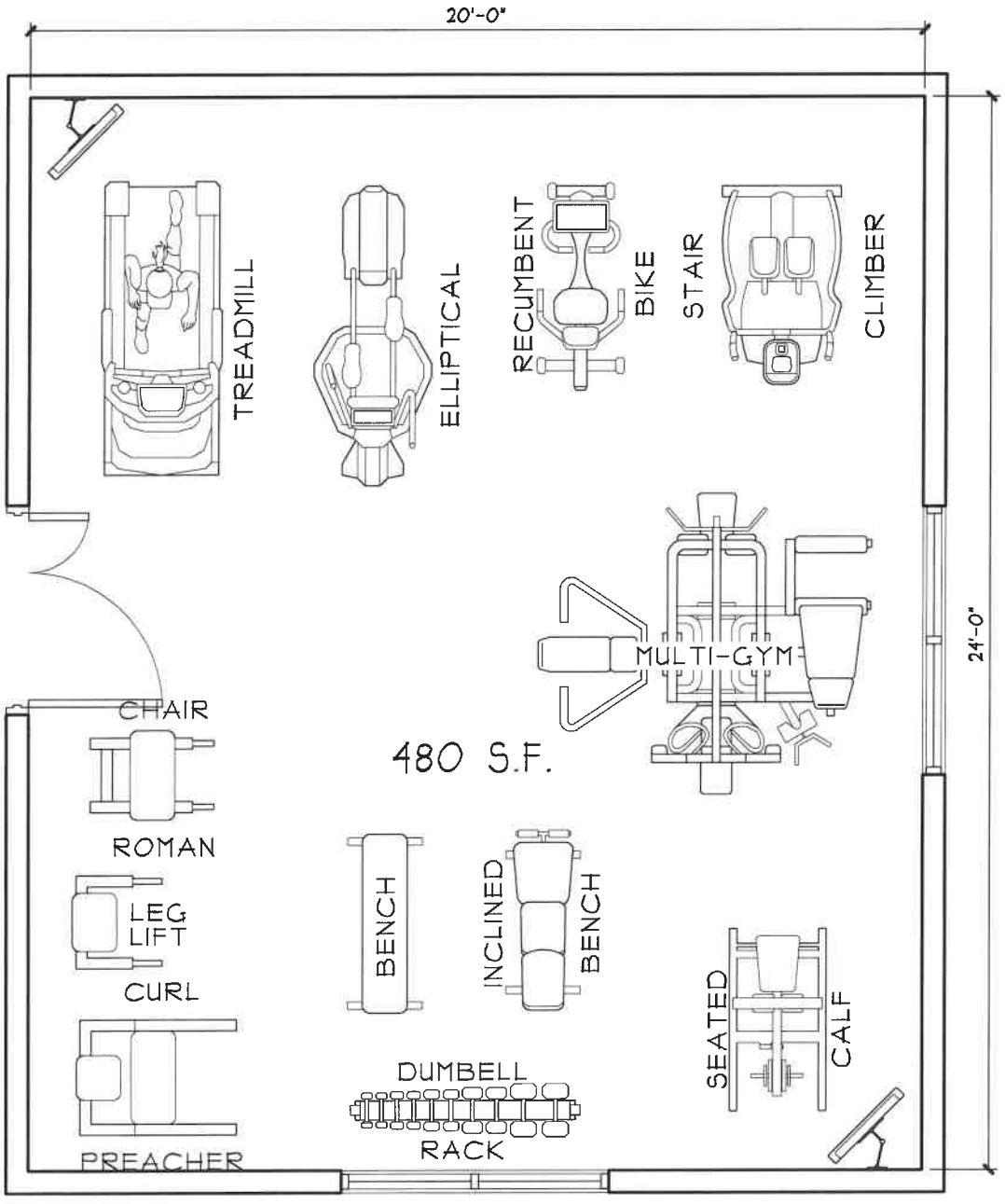
DAYROOM

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 1\Individual Rooms\2 - Firefighters\09 - Day Room

09

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

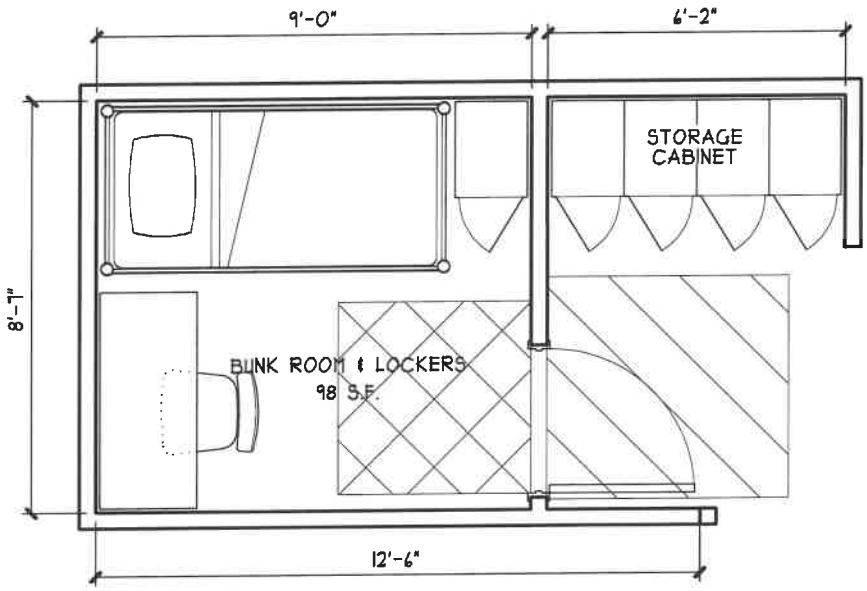
PHYSICAL TRAINING

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\2 - Firefighters\12 - Lieutenants Bedroom

10

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

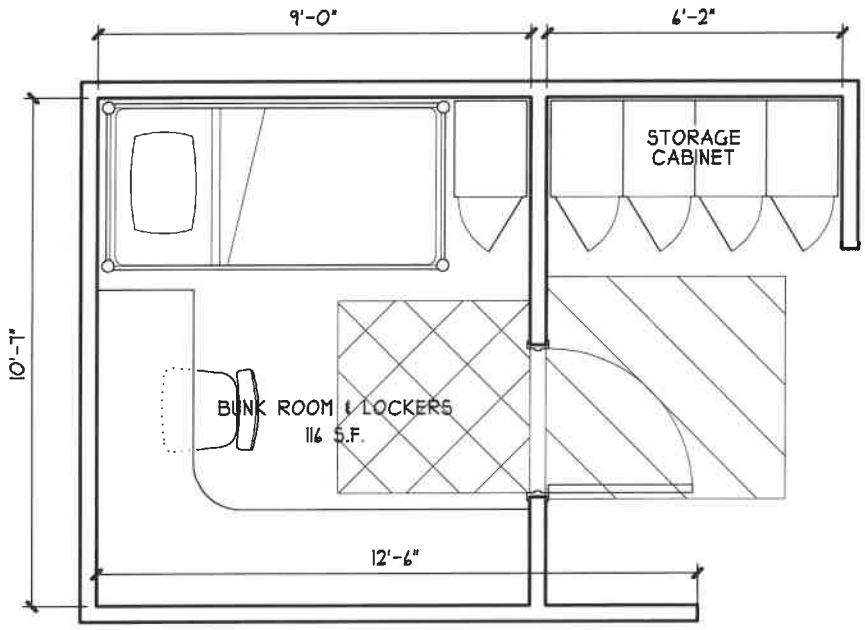
BUNK ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\2 - Firefighters\11 - Firefighters Bedroom

11

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

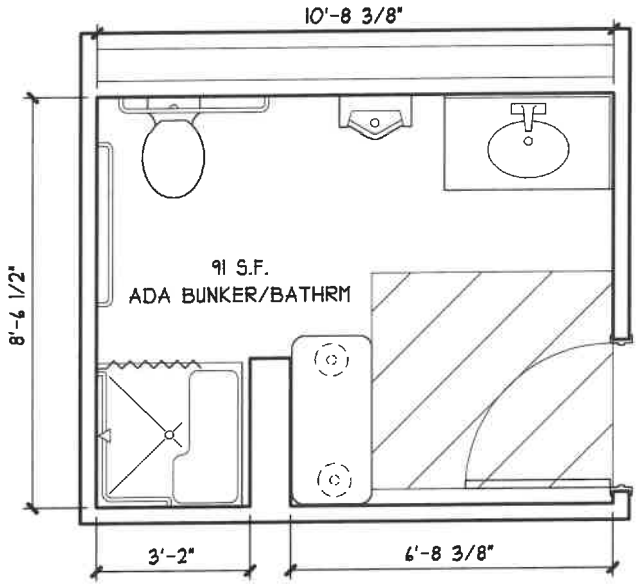
LIEUTENANTS BUNK ROOM

SCALE: 1/4" = 1'-0" | DATE: 11/17/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\2 - Firefighters\12 - Lieutenants Bedroom

12

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

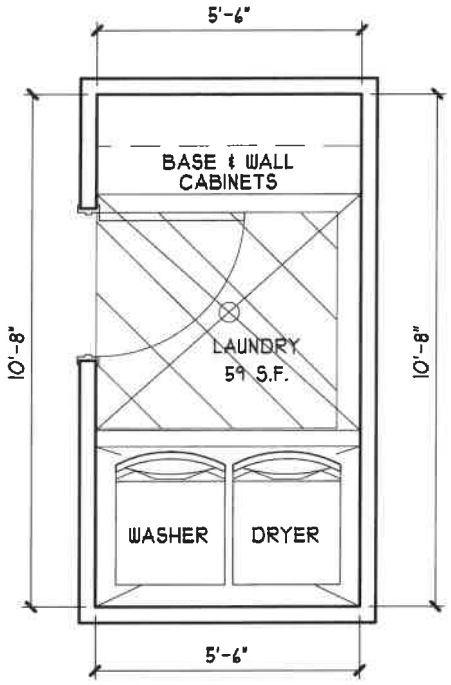
BUNKER'S BATHROOM

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 1\Individual Rooms\2 - Firefighters\13 - Bunker's Bathroom

13

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

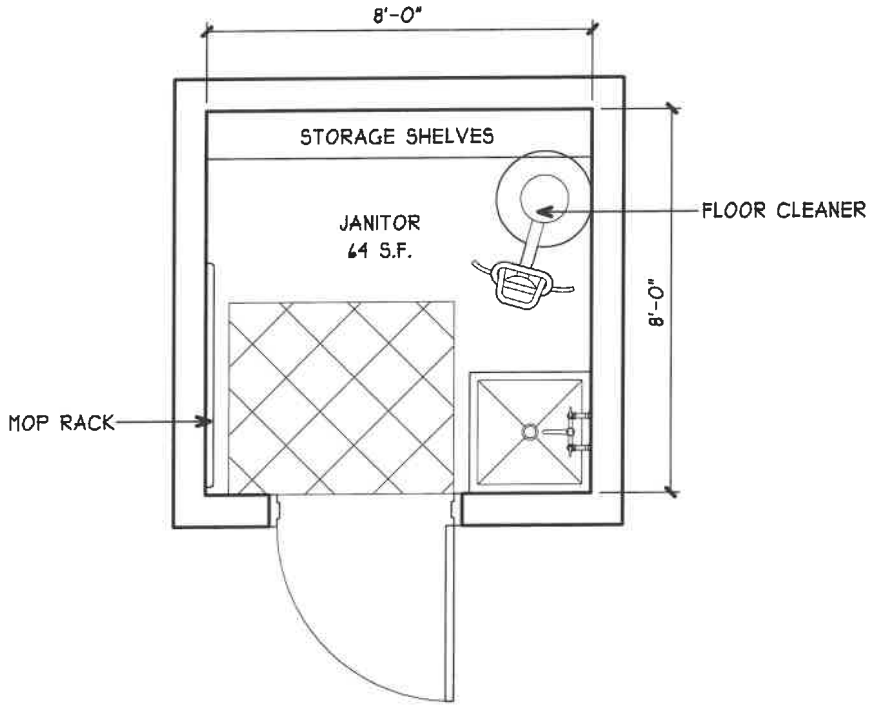
BUNKERS' LAUNDRY

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaeslie Boos\Milton\Station 4\Individual Rooms\2 - Firefighters\14 - Bunker's Laundry

14

ROOM #



MITCHELL ASSOCIATES ARCHITECTS

JANITOR'S CLOSET

SCALE: 1/4" = 1'-0" | DATE: 11/16/2015

S:\J Drive\Kaestle Boos\Milton\Station 4\Individual Rooms\5 - Miscellaneous\17 - Janitor

17

ROOM #