Maynard Fire Station
Existing Conditions Assessment
Civil

draft

October 12, 2015

CIVIL ASSESSMENT

Overview

Nitsch Engineering has performed research of the existing site conditions at the Maynard Fire Station located on 1 Summer Street in Maynard, Massachusetts. Nitsch Engineering's research included information gathered during a site visit conducted by Steve Ventresca, PE of Nitsch Engineering on September 2, 2015. Information included in this report is also based on Water Distribution Map of the Town of Maynard provided by the Maynard Department of Public Works. A summary of our observations and findings are described below.

General Site Description

The Maynard Fire Station is located at 1 Summer Street in Maynard, Massachusetts. The site consists of the existing main building, parking areas, landscape bed, and garden. The site is bounded by Summer Street to the south and southeast, Acton Street to the east, and two−family dwellings to the north and northeast.

The site contains a driveway on the south side of the site which acts as a thru way from Acton Street to Summer Street. Access is provided to the northwest and southwest parking lots from two driveway entrances on Summer Street.

Image 1: *West Face of Fire Station Building*

The fire station garage has 3 doors for emergency vehicles on the west side of the building. Access to these garage doors is provided by a three lane driveway entrance on Summer Street (image 1). The fire station garage also has one emergency vehicle entrance on the northeast side of the building. Access to this garage door is provided by a one lane driveway entrance on Acton Street.

The site contains three parking areas, located in the northwest corner, the southwest corner, and northeast corner of the site. Access is provided to the northwest and southwest parking areas from two driveway entrances on Summer Street. Access is provided two the northeast parking area from one driveway entrance on Acton Street. The site contains a small garden on the north corner of the site.

Image 2: *East Face of Fire Station Building*

EXISTING SITE UTILITIES

Storm Drainage

A storm water main of unknown size in Acton Street that runs under the two islands at the intersection to the south of the site and continues in Waltham Street. A second storm water main of unknown size is located in Summer Street to the south of the site and also continues into Waltham Street. This is approximated with the location of drainage manholes and catch basins from the site visit.

It appears that there is a closed storm water system that consists of a roof drain that conveys runoff on the roof to a storm water main. No roof drain was observed on the site visit. It is very likely that a roof drain exists and is connected to either the storm water main in Acton Street or the storm water main in Summer Street.

The parking lots and driveways are sloped to direct flow to the adjacent streets. The runoff flow on the east side of the site is directed to Acton Street, while the runoff flow on the west side of the site is directed to Summer Street. Both flows are then directed to the nearest three catch basins that are located at the intersection of Acton Street and Summer Street (images 3–5).

Image 3: *Drainage Manhole and Catch Basin in Acton St*

Image 4: *Drainage Manhole and Catch Basin in Summer St*

Image 5: *Drainage Manhole & Catch Basin in Intersection of Summer St & Acton St*

Sewer

The town of Maynard has a public sewer system. There is a sewer main which runs parallel with Summer Street. It cannot be determined if there is a sewer main in Acton Street. No record drawings were found which had information on the existing sewer system.

Water

There are no record drawings of the existing water infrastructure. What is believed to be a water valve cap was observed during the site visit (image 6). There are two outside water spigots on the side of the building, one on the southwest face and the other on the northeast face (image 7). There are no fire hydrants located directly off the property.

Image 6: *Water Valve Cover*

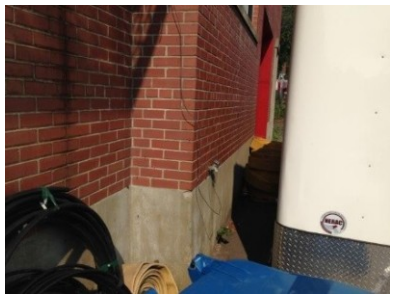

Image 7: *Outside Water Spigot*

Oil and Natural Gas

A Kohler Power System natural gas generator (image 9) located on the east side of the building was observed during the site visit. A gas cover (image 8) was observed on the sidewalk adjacent to the generator. It is possible that there is a gas line along Acton Street, although this could not be confirmed.

Image 8: *Gas* ***Cover***

Image 10: *Overhead Wires (Image from Google Maps)*

Image 9: *Gas Generator*

Electrical

Overhead wires connecting to a utility pole along Acton Street were observed along the northeast part of the site connecting to the third floor tower of the fire station (image 10).

EXISTING SITE UTILITIES

Soils

Based on the Natural Resources Conservation Service (NRCS) Middlesex County Soil Survey, the site of the Maynard Fire Station is classified as Soil Group A.

Pavement & Curbing

The asphalt pavement within the site is in generally poor condition with many areas of cracking and degradation (Image 11 and Image 12). There is vegetation that is coming through the cracks in many areas. Curbing on the site is of vertical concrete curb. Curbing is in general fair condition (image 13). No areas of ponding were detected during the site visit.

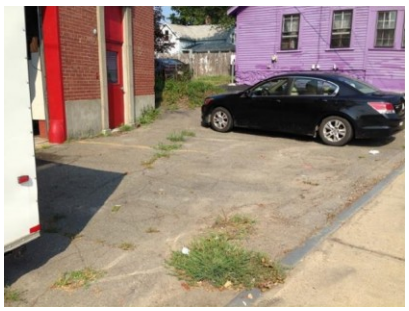

Image 11:
Cracks & Vegetation in Parking Lot

Image 12: *Cracks in Parking Lot*

Image 13: *Vertical Granite Curbing*

RECOMMENDATIONS

- Provide full depth pavement reconstruction and new parking space layout;
- Provide topographic survey and record research for existing utilities;

Image 14: *Adjacent Property on Acton Street*

Image 15: *Adjacent Property on Acton Street*

Image 16: *Adjacent Properties on Acton Street*

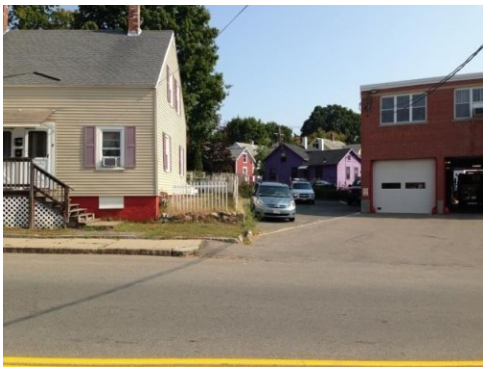

Image 17: *Adjacent Properties on Summer Street*

Image 18: *Adjacent Properties on Summer Street*

Maynard Fire Station
Existing Conditions Assessment
Structural

draft

October 12, 2015

STRUCTURAL ASSESSMENT

Overview

The purpose of this report is to describe, in broad terms, the structure of the existing building; to comment on the condition of the existing building; and on the feasibility of renovating and expanding the structure.

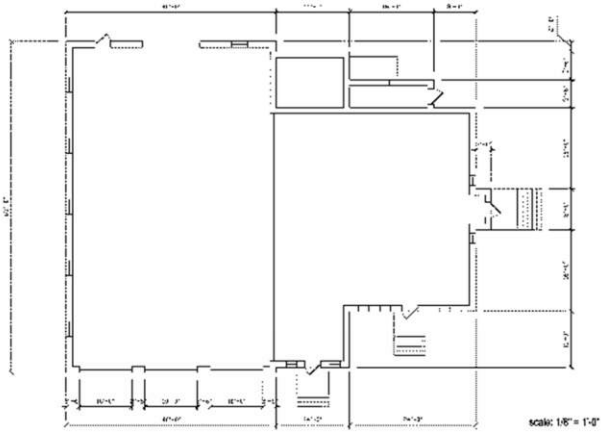

Image 2

Image 1

Scope

- Description of existing structure
- Comments on the existing condition
- Comments on the feasibility of renovation and expansion

Basis of Report

This report is based on visual observations made during our visit on September 2nd, 2015. During our site visit, we did not remove any permanent finishes or take measurements. No drawings of the existing construction were available at the time of the visit, and our observations are limited to the exposed structure.

Image 3

Building Description

The fire department is located at 1 Summer Street in the Town of Maynard, Massachusetts. The footprint is essentially in the shape of a square in plan with various small protrusions and was constructed in 1954. No substantial renovations or additions have been constructed since the original construction.

Image 4

The lowest level construction consists of a concrete slab on grade. The typical elevated floor and flat roof level construction consists of wood plank deck on metal joists spanning between wide flange steel beams and masonry walls which are supported on cast in place concrete foundations. The exterior façade consists of masonry. Interior partition construction consists of hollow concrete masonry blocks. The main building is two-stories high and a three story hose tower extends above the main roof level

Existing Conditions

Based on our observations, we assessed that the structure is functioning adequately for the most part. We noted a few deficiencies during our walk-through.

Above the main entrance, we observed the masonry façade and noted a large horizontal crack and open mortar joint (Image 5 & 6). We also noted water staining over the head of the door. Further investigation would be required to determine the cause of the cracking. Removing the loose material and sealing the open joint is recommended to resist water infiltration and further deterioration to the façade.

We observed the exterior façade of the building and noted a rusting metal-framed catwalk (Image 7) and at small metal brackets which support window air conditioning units.

We observed light rusting on the metal lintels above various window penetrations (Image 8). When a future renovation is planned, we would recommend cleaning the lintels with a wire brush and coating the steel to protect it from deterioration due to moisture and weathering. At the ends of the lintels, we observed open portions of the horizontal masonry joints. We would recommend routine masonry maintenance, which would include repointing joints.

The interior masonry partition walls essentially consist of hollow concrete masonry unit construction. We observed interior masonry partition walls and noted some damage (Image 9). From within the damaged area, we did not observe reinforcing bars, and we observed hollow cells in the masonry. We would recommend infilling the damaged masonry with new blocks and joint material to match the existing.

We observed concrete stairs at the entrances and noted deterioration to the base of the railings (Image 10). We noted rust staining, delaminating steel, and cracked and spalled concrete. We would recommend repairing the base of the railing post bases, which would include welding new

Image 5

Image 6

Image 7

Image 8

baseplates and installing new anchors into the concrete. Repairing the concrete is recommended, which would include patching the spalls with a bonding agent and a cementitious patch material.

The floor construction consists of wood plank decking on open web metal joists (Image 11) spanning between structural steel beams and masonry bearing walls.

The metal grating at the first floor level in the hose tower is deteriorating (Image 12) as evidenced by rusting, scaling, and light delamination.

We observed the concrete slab on grade in the apparatus bay and noted cracking in the slab. We would recommend sealing the slab to resist water infiltration and deterioration due to salts.

Image 9

Image 10

Proposed Scope of Renovations

We understand that there are various schemes for renovation and/or replacement of the building structure. Any proposed renovation would likely be a major gut renovation, possibly with reconfiguration of the majority of the interior partition walls and certain amount of structural alteration, but avoiding major reconfiguration of exterior walls other than isolated individual openings. Major mechanical and electrical system replacements are warranted, and there will likely be creation of new structural openings to accommodate new systems.

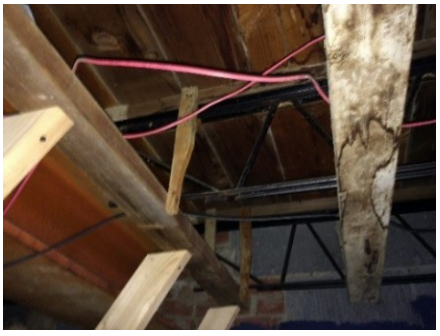

Image 11

Under a renovation scheme, the proposed structural alterations would be classified as limited structural alterations, if the proposed structural alterations are less than 30 percent of the total floor and roof areas of the building. The structural modifications would consist of the creation of openings in floors and walls for mechanical ducts, doors, and an elevator shaft. Locally, framing may be required to be reinforced to support new mechanical equipment. If there are additions planned, they would be separated by way of expansion joints from the existing structure.

Image 12

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations, additions or change of occupancy or use are made to the existing structures, a check for compliance with 780 CMR, Chapter 34 "Existing Structures" (Massachusetts Amendments to The International Existing Building Code 2009) of the Massachusetts Amendments to the International Building Code 2009 (IBC 2009) and reference code "International Existing Building Code 2009" (IEBC 2009) is required. The intent of the IEBC and the related Massachusetts Amendments to IEBC is to provide alternative approaches to alterations, repairs, additions and/or a change of occupancy or use without requiring full compliance with the code requirements for new construction.

The IEBC provides three compliance methods for the repair, alteration, change of use or additions to an existing structure. Compliance is required with only one of the three compliance alternatives. Once the compliance alternative is selected, the project will have to comply with all requirements of that particular method. The requirements from the three compliance alternatives cannot be applied in combination with each other.

The three compliance methods are as follows:

- Prescription Compliance Method
- Work Area Compliance Method
- Performance Compliance Method

Comment

The approach is to evaluate the compliance requirements for each of the three methods and select the method that would yield the most cost effective solution for the structural scope of the project. The selection of the compliance method may have to be re-evaluated after the impact of the selected method is understood and after analyzing the compliance requirements of the other disciplines, Architectural, Mechanical, Fire Protection, Electrical and Plumbing.

The existing building includes unreinforced masonry walls. If the proposed work area exceeds 50 percent of the aggregate area of the building, the alteration work shall include installation of wall anchors at the roof and floor levels to brace the existing masonry walls.

Prescriptive Compliance Method

In this method, compliance with Chapter 3 of the IEBC is required. As part of the scope of this report, the extent of the compliance requirements identified are limited to the structural requirements of this chapter.

Additions

Based on the project scope, the following structural issues have to be addressed:

- All additions shall comply with the code requirements for new construction in the IBC.
- For additions that are not structurally independent of an existing structure, the existing structure and its addition, acting as a single structure, shall meet the requirements of the code for new construction for resisting lateral loads, except for the existing lateral load carrying structural elements whose demand-capacity ratio is not increased by more than 10 percent, these elements can remain unaltered.
- Any existing gravity, load-carrying structural element for which an addition or its related alterations causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.

Alterations

- Any existing gravity, load-carrying structural element for which an addition or its related alterations causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.
- For alterations that would increase the design lateral loads or cause a structural irregularity or decrease the capacity of any lateral load carrying structural element, the structure of the altered building shall meet the requirements of the code for new construction, except for the existing lateral load carrying structural elements whose demand-capacity ratio is not increased by more than 10 percent, these elements can remain unaltered.

Change of Occupancy

- When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy with some exceptions. In our case, the existing building would not be reclassified.

Work Area Compliance Method

In this method, compliance with Chapter 4 through 12 of the IEBC is required. As part of the scope of this report, the extent of the compliance requirements identified are limited to the structural requirements of these chapters.

In this method, the extent of alterations has to be classified into LEVELS OF WORK based on the scope and extent of the alterations to the existing structure. The LEVEL OF WORK can be classified into LEVEL 1, LEVEL 2 or LEVEL 3 Alterations. In addition, there are requirements that have to be satisfied for additions to the existing structure.

If the extent of the renovations (includes Architectural, FP and MEP renovations) for this project were to exceed 50 percent of the aggregate area of each of the buildings, the LEVEL OF WORK for this project would be classified as LEVEL 3 Alterations. This would require compliance with

provision of Chapter 6, 7 and 8 of the IEBC. If the scope of the project includes new additions to the existing structure; this would trigger compliance with provisions in Chapter 10 of the IEBC.

Level 3 Alterations

- Any existing gravity, load-carrying structural element, for which an alteration causes an increase in the design gravity load of more than 5 percent, shall be strengthened, supplemented or replaced.
- For alterations where more than 30 percent of the total floor area and roof areas of a building or structure have been or proposed to be involved in structural alterations within a 12 month period, the evaluation and analysis shall demonstrate that the altered building complies with the full design wind loads as per the code requirements for new construction and with reduced IBC level seismic forces.
- For alterations where not more than 30 percent of the total floor and roof areas of a building are involved in structural alterations within a 12 month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads at the time of the original construction or the most recent substantial alteration (more than 30 percent of total floor and roof area). If these alterations increase the seismic demand-capacity ratio on any structural element by more than 10 percent, that particular structural element shall comply with reduced IBC level seismic forces.
- The existing anchorage of all unreinforced masonry walls to the floor and roof structures have to be evaluated and strengthened.
- For alterations where 25 percent of the roof is replaced for buildings assigned to seismic design category D, E or F, all un-reinforced masonry walls shall be anchored to the roof structure and un-reinforced masonry parapets shall be braced to the roof structure.

Additions

- All additions shall comply with the requirements for the code for new construction in the IBC.
- Any existing gravity, load-carrying structural element for which an addition or its related alterations cause an increase in design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.
- For additions that are not structurally independent of any existing structures, the existing structure and its additions, acting as a single structure, shall meet the requirements of the code for new construction in the IBC for resisting wind loads and IBC Level Seismic Forces (may be lower than loads from the Code for New Construction in the IBC), except for small additions that would not increase the lateral force story shear in any story by more than 10 percent cumulative. In this case, the existing lateral load resisting system can remain unaltered.

Change of Occupancy

When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic, gravity, snow and wind load requirements of the International Building Code. In our case, the existing building would not be reclassified.

Performance Compliance Method

Following the requirements of this method for the alterations and additions may be onerous on the project because this method requires that the altered existing structure and the additions meet the requirements for the code for new construction in the IBC.

Particular Requirements of Compliance Methods

In order to meet compliance with one of the two compliance methods "Prescriptive Compliance Method" or the "Work Area Compliance Method", we have to address the following.

Performance Compliance Method

Additions

Any proposed additions would be designed structurally independent of the existing structures, thus, would not impart any additional lateral loads on the existing structure.

If the proposed alterations are such that the alterations increase the design lateral loads on the existing building or cause any structural irregularity of decrease the lateral load carrying capacity of the building, the structure of the altered building shall meet the requirements of the Code for New Construction in the IBC.

If the proposed additions increase the design gravity load on portions of the existing roof members, these members would have to be reinforced and this incidental structural alteration of the existing structures would have to be accounted for in the scope of the alterations to the existing fire department and would trigger requirements for alterations.

Alterations

Alterations that would increase the design gravity loads by more than 5 percent on any structural members would have to be reinforced.

If the proposed alterations to the structure increase the demand capacity ratio of any lateral load resisting element by more than 10 percent, the structure of the altered building or structure shall meet the requirements for the code for new construction.

If the proposed alterations of the structures increase the effective seismic weight on the existing structures due to the greater snow loads from the drifted snow against any proposed additions, or, by addition of equipment on the roof, the increase of the effective seismic weight from the drifted snow and the equipment would require that the existing lateral load resisting system comply with the requirements of the code for new construction in the IBC and it would increase the demand-capacity ratio on certain structural elements of the existing lateral load resisting system.

Change of Use

In our case the existing structure will not be reclassified; therefore, no structural upgrades are triggered based on this change of use.

Work Area Compliance Method

Level 3 Alterations

If the proposed structural alterations of an existing structure are less than 30 percent of the total floor and roof areas of the existing structure, we have to demonstrate that the altered structure complies with the loads applicable at the time of the original construction and that the seismic demand-capacity ratio is not increased by more than 10 percent on any existing structural element. Those structural elements whose seismic demand-capacity ratio is increased by more than 10 percent shall comply with reduced IBC level seismic forces.

If the proposed structural alterations of an existing structure exceed 30 percent of the total floor and roof areas of an existing structure, we have to demonstrate that the altered structure complies with the IBC for wind loading and with reduced IBC level seismic forces.

The replacement of the existing roofs would trigger a requirement for anchorage of un-reinforced masonry walls to the roof structures and bracing of un-reinforced masonry parapets to the roof structures. Since there are no existing un-reinforced masonry parapets, this requirement does not have any impact on the structural scope of the project.

An aggregate work area of 50 percent would trigger a requirement for all un-reinforced masonry walls in the existing fire department to be have to be identified, evaluated, and strengthened. These un-reinforced masonry walls are required to be anchored to the floor and roof structures.

Additions

Any proposed additions would be designed structurally independent of the existing structures, thus, they would not impart any additional lateral loads on the existing structures.

Change of Use

We have determined that we would require full compliance with the Code for New Construction as required in the IBC for a change of use, with a few exceptions. In our case, we are not changing the Use.

Comment

Based on the preliminary anticipated renovation scope for the project either of the two compliance methods, Prescriptive Compliance Method or The Work Area Compliance can be used for the project as the structural compliance requirements for each of the methods are similar for this project.

SUMMARY

The existing structure is performing adequately for the most part. The deficiencies we observed are not critical to the function of the building but need to be addressed as part of a maintenance plan going forward. Repairs are required to repair the cracks and the deteriorated masonry in the exterior walls, and a hole in the interior partition wall. Repairs are also recommended for the cracked exposed concrete slab on grade.

If the scope of the proposed renovations to the existing structure is not exhaustive, does not require much reconfiguring of the walls and windows, and is separated from any addition by way of an expansion joint, we would recommend that the Prescriptive Compliance Method be selected for the project. No structural upgrades will be required to the existing structure if the work area is limited to less than 50 percent of the aggregate area of the building as per the requirements of the Prescriptive Compliance Method.

For any planned renovations, if the work area of the renovation is greater than 50 percent, we would be required to brace all of the existing masonry walls to the floor and roof structures. If the work area of the renovation is limited to 50 percent, we would not anticipate any major structural upgrades to the building, but locally some elements may need to be strengthened based on the proposed renovations.

If the structural alterations to the fire department exceed 30 percent of the gross floor area of the building, we would recommend the Work Area Compliance Method be selected for the project as the seismic loads to be used in the design would be lower than that required in the Prescriptive Compliance Method. The existing structure would still essentially have to comply with the code for new construction which would require the addition of new lateral load resisting elements such as structural steel braced frames or full height masonry shear walls from the basement level to the roof. Additions of lateral load resisting elements may not be feasible in the existing apparatus bay without major compromises in the Architectural planning or major modifications to the existing structure. Alternatively, proposed additions could be attached to the existing structure and the entire structure would be designed to resist lateral and gravity loads for new construction as prescribed by the IBC.

Any detached addition would have to meet the requirements for new construction.

Once the proposed scheme is finalized and impacts to the scope of other disciplines is identified, we can reevaluate the appropriate compliance method and any upgrades to the existing structure that may be required.

Maynard Fire Station
Existing Conditions Assessment
Architectural

draft

October 12, 2015

ARCHITECTURAL ASSESSMENT

Overview

The existing Maynard Fire Station was constructed in 1955 to house both the Fire Department and the Police Department. In 2009 the Police Department moved out of the building and into its current facility adjacent to Town Hall. The structure has a finished floor area of approximately 9,000 square feet divided over two stories plus approximately 960 sf of basement area, consisting of mostly infrastructure space, as well as a gun range and storage areas vacated by the Police Department.

The facility needs significant upgrades to address space needs and code deficiencies, (including ADA regulations and seismic requirements), energy issues, electrical & mechanical deficiencies, lack of equipment & hazardous materials storage, and the absence of an elevator and a fire sprinkler system, as well as others that will be described in the following documentation.

Building Interior

There are three existing apparatus bays that houses a variety of firefighting, emergency medical, and command vehicles. The bays are considerably undersized for these modern day vehicles, leaving almost no space for circulation between, behind, or in front of the vehicles, creating dangerous conditions for staff. The bay doors are barely large enough for the vehicles to pass through, putting the facility at risk from damage.

From a maintenance standpoint, the interior of the facility has been sustained to the extent feasible but numerous issues are apparent such as cracked floor slabs, degraded finishes, lack of insulation, and underperforming mechanical and electrical systems that are beyond their useful life expectancy (building system assessments are provided in the following sections).

As for building codes, there are a number of life-safety issues that need to be addressed such as a lack of emergency egress routes; exposed combustible materials; unbraced and unrated structural elements; and lack of a sprinkler system. In addition, there are numerous accessibility upgrades required to meet current ADA regulations. Specifically, an elevator needs to be added to access the second floor; multi-level spaces are approachable by stairs only without ramp access; doors have insufficient clearances, hardware, and thresholds;

stairs do not met requirements for nosings and handrails; kitchen sink & cabinets do not meet requirements; restroom plumbing fixtures and accessories are not compliant and restrooms do not provide adequate clearances.

From the perspective of space-needs, the current facility is significantly undersized to meet the demands placed on a Fire and EMS department of this size. There are currently minimal accommodations for full-time staff; a lack of administrative space; inadequate bathroom and shower facilities, sleeping quarters, and fitness facilities; insufficient records storage; no locker room facilities, no decontamination area, no area for bio-hazard storage, no plan review area, no dedicated space for medicine or paramedic equipment, and no space for staff or public meetings.

Building Exterior

Similar to the interior, the exterior of the facility has been sustained to the extent feasible but numerous issues are apparent due to weathering. In addition, window glazing is inadequate and overhead bay doors are uninsulated, resulting in thermal issues. An evaluation of the roofing surface was not conducted as part of this study but it is believed that the existing roof membrane is beyond its useful life expectancy.

Existing Site

The existing site is approximately .367 acres at the intersection of Summer Street, Main Street (Rt. 62), and Acton Street (Rt. 27). The site is adjacent to several residential properties. Three (3) of these properties, with a total of four (4) residential structures, are currently being considered for purchase to allow for expansion of the facility, which is currently restricted by the tight site constraints, and dominated by the paved apparatus apron and minimal parking areas. Any expansion within this area would eliminate the area available for parking, which is already insufficient to meet the current needs of the site, and still allow for only minor improvements to the facility.

Recommendation:

The existing Fire Station has outlived its useful life expectancy based on the growth of the department since its original construction. Due to the extent of renovations needed to resolve maintenance issues, code deficiencies, and the lack of operation space, along with the limited area available for expansion due to site constraints, the recommendation would be as follows:

1. Build a new Fire Station on the existing site, with enough space for proper access and circulation.
2. A complete renovation and upgrade of all spaces and building systems & structure, along with an addition to the facility that would allow space to meet the demands of the department for both its current operations and for years to come.

Maynard Fire Station
Existing Conditions Assessment
Fire Protection

draft

October 12, 2015

FIRE PROTECTION ASSESSMENT

The Building does not contain an automatic sprinkler system.

In general, Massachusetts General Law M.G.L. c.148, s.26G requires that any existing building over 7,500 square feet that undergoes major alterations or modifications or a building addition must be sprinklered.

As the building floor area appears greater than this threshold, if the proposed work includes a major renovation or a building addition, then an automatic sprinkler system would be required for the existing building and any additions.

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

Maynard Fire Station
Existing Conditions Assessment
Plumbing

draft

October 12, 2015

PLUMBING ASSESSMENT

EXISTING SUMMARY

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent system, storm system, and natural gas.

In general, the fixtures in the building are in fair condition. Fixtures do not meet current codes for accessibility. Current Access Code requires accessible fixtures wherever plumbing is provided. 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.

Most of the domestic water distribution and drainage systems are original and they have exceeded their life expectancy.

PLUMBING FIXTURES

Water closets are floor mounted, vitreous china with exposed manual flush valves. *(Image 1)*

Urinals are wall hung vitreous china, with exposed manual flush valves. *(Image 2)*

Lavatories are wall-mounted vitreous china with individual hot and cold handle faucets or 4"centers, single lever faucets. *(Image 1)*

Drinking fountain is wall mounted, vitreous china with chrome bubbler.

Kitchen sink is double bowl, counter mounted, stainless steel and deck mounted, single lever faucet with pull-out vegetable spray. *(Image 3)*

Janitor's sink is a wall mounted, cast iron sink with wall mount faucet. Faucet is equipped with vacuum breaker. *(Image 4)*

Showers are fiberglass units with single handle mixing valve and a fixed shower head. *(Image 5)*

Image 1 – Water Closet & Lavatory

Image 2 - Wall Mounted Urinal

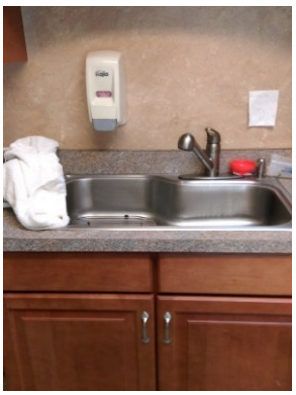

Image 3 - Kitchen Sink

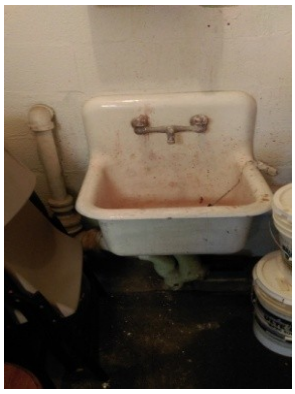

Image 4 – Service Sink

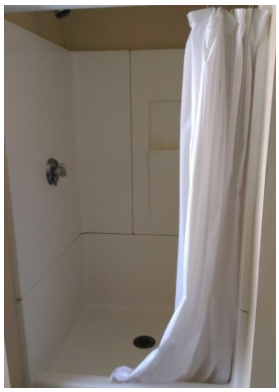

Image 5 - Shower

Domestic Water Systems

The water service enters the building in the Mechanical Room located in the Basement. Water service is 2" in size and includes a 1-1/2" water meter. *(Image 6)*

Water piping is copper tubing with sweat joints. Piping is in good condition in the Basement Mechanical Room but is in poor condition beyond the Mechanical Room. The existing domestic water distribution is uninsulated in most areas, does not include identification, and the isolation valves are original gate valves which may not be operating properly. The domestic water distribution has exceeded its' life expectancy.

There is a reduced pressure backflow preventer for the boiler water make-up.

The hose connection in the Apparatus Bay does not include a required vacuum breaker. *(Image 7)*

The exterior wall hydrants do not include required vacuum breakers.

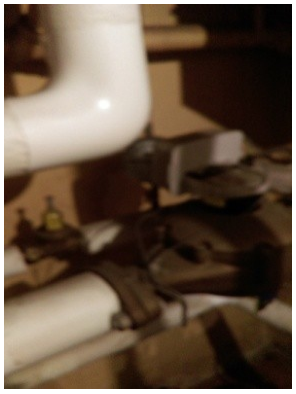

Image 6 – Domestic Water Service & Meter

Image 7 – Hose Connection

Domestic Hot Water System

The main building hot water is generated through gas fired, 50 gallon hot water storage type water heater. The hot water system is not recirculated through the building. The system does have a mixing valve and an expansion tank. *(Image 8, Image 9, Image 10)*

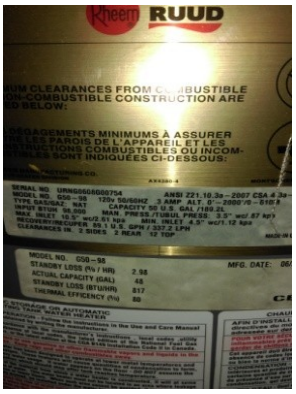

Image 8 – Water Heater Information

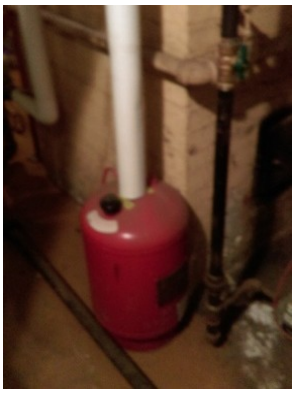

Image 9 – Expansion Tank

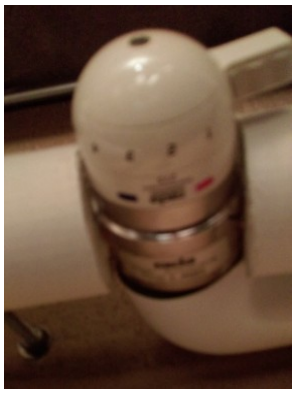

Image 10 – Mixing Valve

Drainage Systems

Sanitary, waste and vent piping is generally cast iron bell and spigot while there is evidence of galvanized steel vent piping throughout. Piping appears to be original and in fair to poor condition. There are floor drains in the Apparatus Bay, but there is no gas-oil separator on site. The entire building sanitary system is directed to Municipal sewer on street. *(Image 11, Image 12)*

Image 11 – Waste & Vent Piping

Image 12 – Apparatus Bay Floor Drains

Roof Drainage Systems

Roof drains consist of retro fit type, 4" pipe outlet with hexagonal strainers. Horizontal drainage piping does not appear to be insulated. *(Image 13)*

Image 13 – Roof Drain/Vents thru Roof

GAS SYSTEM

Natural gas is provided to the building. Gas service is a 1" elevated pressure line. At service location, a gas pressure regulator and gas meter is installed with an additional gas pressure regulator on the outlet side of meter. Gas supplies the heating boilers, domestic water heater, gas-fired unit heaters in Apparatus Bay and an emergency generator. There is a dedicated 2" gas line from the gas meter to the emergency generator and a 2-1/2" gas line with welded fittings to the building equipment. *(Image 14)*

In general, piping is Schedule 40 black steel with threaded fittings for piping 2" and smaller and welded fittings for piping 2-1/2".

Image 14 – Gas Service and Meter

RECOMMENDATIONS

- Provide new high efficiency low flow water conserving plumbing fixtures.
- The original domestic water piping shall be replaced in its entirety. All new isolation valves shall be full port ball valves and the valves should be tagged and charted. All new domestic water piping shall be insulated with 1"thick fiberglass insulation.
- Provide new high efficiency water heater, master mixing valve, and expansion tank. Hot water shall be storing hot water at 140 degrees F. and hot water from mixing valve shall be 120 degrees F. to fixtures. A hot water recirculation line and pump shall be installed.
- In general, existing above slab drainage piping should be replaced in its entirety. We recommend video inspection of existing buried drains to confirm integrity and determine if re-

useable. The Apparatus Bay floor drains shall be piped to a gas/oil separator. Horizontal roof drainage piping shall be insulated to prevent condensation.

- The gas piping is in good condition and can be modified to suit a renovation project.

Maynard Fire Station
Existing Conditions Assessment
HVAC

draft

October 12, 2015

HVAC ASSESSMENT

Heating - Boiler Plant

The building is heated by four (4) gas-fired cast iron sectional low pressure steam boilers *(Image 1)*. The boilers were manufactured by Weil-McLain (Model EG/PEG-65, 157 MBH output for steam, 250 MBH max input). The boilers appear to be in good condition. The boilers appear to have been manufactured within the last 10 years and would be expected to have approximately 20 more years of serviceable life. Each boiler has a ducted 6" diameter B-vent duct connection *(Image 2)* into the chimney. The boilers have a low operating efficiency due to being high mass cast iron sectional type in comparison to today's high efficiency boiler systems.

The Boiler Plant has one condensate receiver pump system that serves all the boilers. The Condensate receiver (Image 3) was manufactured by Mepco manufactured approximately in 2008 Model number VD630 2E. The condensate receiver has two (2) ½ horsepower motors and appears to be in fair condition and could be expected to have approximately 13 more years of serviceable life.

Combustion air (Image 4) is introduced from a fan assisted system in the corner of the room with open end ductwork to providing combustion air on a call from the boilers.

Image 1 – Boilers

Image 2 – Boiler Vent

Image 3 – Condensate Receiver

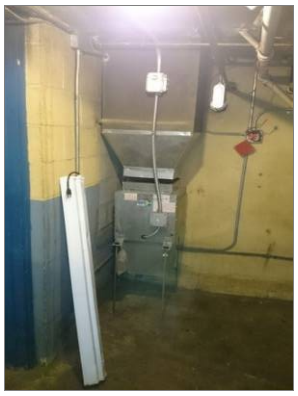

Image 4 – Combustion Air

Air Conditioning And Ventilation

There is no central air conditioning in the Fire Station. Through wall air conditioning units are throughout the fire station located in windows and wall penetrations. The age of the air conditioners throughout the station vary, but largely most appear toward the end of their serviceable life expectancy. (Image 5) (Image 6) (Image 7)

Image 5 – Typical Window AC

Image 6 – Typical Window AC & Convector

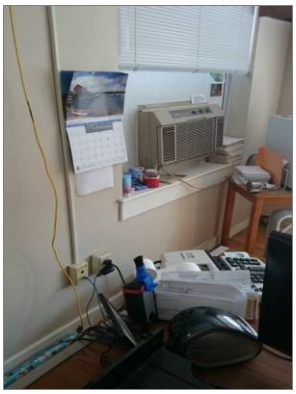

Image 7 – Typical Window AC

Apparatus Bay

A vehicle exhaust air capture system is installed in the apparatus bay. The system is manufactured by Plymovent (Image 9) (Image 10), and consists of vent-set exhaust fan (Image 8) and filter unit located in the apparatus bay that is ducted to vehicle exhaust hose ductwork in the attic above the apparatus bay and the building exterior by a galvanized steel sheetmetal distribution system. In general, the vehicle exhaust air system appears to be in fair condition. Two gas fired unit heaters (Image 11) serve the apparatus Bay. The apparatus bay unit heaters appear to be in fair condition and should still have approximately 5-10 years of useful service life.

Image 8 – Apparatus Bay Sidewall Exhaust Fan

Image 9 – Apparatus Bay PlymoVent System

Image 10 – Apparatus Bay PlymoVent System

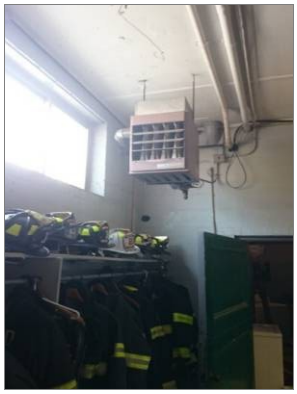

Image 11 – Apparatus Bay Unit Heater

Living Quarters

The kitchen has a residential style kitchen recirculation hood located over the combination stove/oven. The spaces have low pressure steam floor mounted convectors located throughout. The convectors appear to be in fair condition but would be recommended to be replaced due to the age of the equipment. (Image 12) (Image 13)

Image 12 – Typical Convector

Image 13 – Residential Recirculating Hood

Bathrooms & Toilet rooms

There is no mechanical exhaust system for the bath or toilet rooms. Operable windows provide natural ventilation to these spaces. Floor mounted convectors (Image 14) are located in the bathrooms on the main level while exposed uncased fin tube radiation bare element is run under the storage rack in the large gang toile on the second floor off the living quarters. The convectors and fine tube bare element appear to be in fair condition but would be recommended to be replaced due to the age of the equipment.

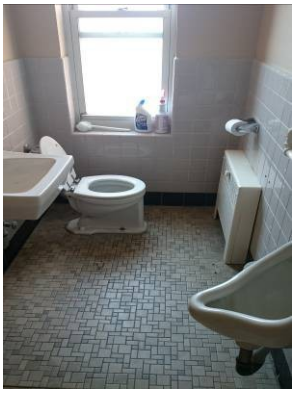

Image 14 – Toilet Room Convector

Tower

The tower is open to the apparatus bay and rises higher than the second floor. There appears to be minimal heat in the tower. There is some computer and radio equipment located in the tower. (Image 15)

Image 15 – Electrical Equipment in Tower

Detention Area

The Detention Area has ceiling mounted exhaust grilles. These grilles are ducted out of the Detention Area and into an open end duct in the adjacent room. This area is currently used for equipment storage. (Image 16)

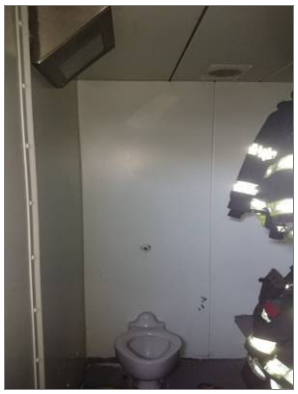

Image 16 – Cells

Basement Area

The majority of the basement area is used only for storage area. There does not appear to be many terminal heating units downstairs. Operable windows would provide the only source of natural ventilation. (Image 17)

Image 17 – Basement Storage

Controls

All of the controls in the building are stand-alone non-programmable. The controls are in poor condition and would be recommended to be completely replaced. (Image 18)

Image 18 – Thermostats

Recommendations

In general the Fire Station's heating, ventilation, and air conditioning systems do not meet the thermal comfort needs, energy efficiency, and code-requirements of a modern day Fire Station.

Therefore we recommend the following HVAC system replacements:

- Heating System: The existing low pressure steam boilers are inefficient in comparison to today's energy efficient boilers. We recommend that the existing boilers are replaced with a high efficiency gas-fired condensing hot water boiler plant, consisting of high efficiency gas-fired condensing boiler, pumps equipped with VFD drives (or ECM motors), DDC controls (including outdoor air reset), and accessories. All new steel/copper mains distribution system should be provided to replace the existing main low pressure steam piping and hot water piping mains.

- Ventilation: We recommend mechanical ventilation to be installed providing code compliant ventilation throughout the fire station. Outside air could be introduced and improve overall indoor air quality throughout the building.

- Restroom exhaust air fans system provided in toilet and bathrooms, kitchen exhaust from the cooking hood should be ducted outside rather than recirculating in the space. The apparatus bay exhaust fan should be tested.

- The apparatus bay vehicle exhaust air system appears to be in good condition. The system fan and ductwork distribution system would be recommended to be tested to ensure it can be re-used. It is recommended that the system be fully tested, repaired as required, and maintained in accordance with manufacturers' recommendations.

- Air Conditioning: We recommend that a new high efficiency air conditioning system(s) be installed in areas that required air conditioning. The replacement system should could be a central system also providing ventilation and replace the wall mounted air conditioning units. A new system would be recommended for the building that could meet the cooling load requirements of the building and improve overall thermal comfort.

- Controls: We recommend a full upgrade of controls for the building. Controls should be capable of energy saving features such as nighttime or unoccupied setback and outside air temperature reset for the hot water heating system.

Maynard Fire Station
Existing Conditions Assessment
Electrical

draft

October 12, 2015

ELECTRICAL ASSESSMENT

EXISTING SUMMARY

The existing electrical systems for this facility range from original vintage to some recent upgrades. However in general systems do not meet current codes due to the constant code changes, although they probably met code when installed. Systems are marginally sized and would not be suitable for a full renovation/expansion. Furthermore characteristics such as a single phase for the main electrical service and generator, and a conventional fire alarm system cannot be expanded as they are not compatible with current technologies. In general there is not much that we would recommend salvaging except equipment within dispatch and other supporting equipment to dispatch. We recommend a gut renovation of the electrical systems under a renovation program.

POWER DISTRIBUTION SYSTEM

Three phase overhead primary service runs on Summer Street and ends on last pole #92-2 across from the Fire Station. The Fire Station is fed with two secondary services; one rated at 150 Amperes, 120/240 Volt, 1 Phase, 3 Wire service and a second service rated at 100 Amperes, 240 Volt, 3 Phase, 3 Wire service. Both services run overhead between utility pole #92-2 and two meters located on exterior of the building. Service equipment for both services is located in the Apparatus Bay and appears original to the building and is in poor condition. *(Image 1, Image 2)*

The switchgear consists of fused disconnect switches with multiple splices on load side of fuses, some without overcurrent protection for the tapped feeders. *(Image 3, Image 4)*

The single phase service feeds miscellaneous power and lighting and is backed-up by the generator.

The three phase service feeds the plymovent and the compressors and is not backed-up by the generator. Services feed other remote panelboards of original vintage, as well as, other more recent panels. *(Image 5)*

The E911 breaker still exists but the UPS has been removed and relocated to the Police Station.

In general, switchgear for this facility is obsolete, in poor condition, and is not suitable for reuse during a renovation program.

Image 1 – Primary Pole

Image 2 – Electric Meters

Image 3 – Single Phase Disconnect Switches

Image 4 – Three Phase Disconnect Switches

Image 5 – Panelboards

EMERGENCY POWER SYSTEM

The emergency power system for the facility consists of a 50 KW, 120/240 Volt, 1 Phase, 3 Wire natural gas generator located on the exterior. The generator has a weatherproof steel enclosure. The enclosure is not sound attenuated. The generator is in poor condition and is located near operable windows. *(Image 6)*

The generator does not back-up the entire facility and is not code compliant for life safety systems.

A 225 Amp, 120/240Volt, automatic transfer switch with two poles is located in the Apparatus Bay. The switch does not have the proper working clearance when the fire apparatus is in the bay. *(Image 7)*

The generator and transfer switch were manufactured by Kohler and are in poor condition, are not code compliant, and are not suitable for reuse under a renovation program.

Image 6 – Generator

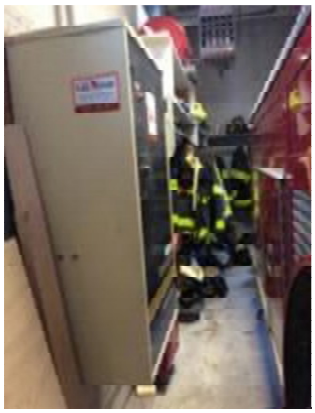

Image 7 – Transfer Switch

FIRE ALARM SYSTEM

The fire alarm system for the facility consists of a Fire-Lite MS-4, 4 zone conventional (non-addressable) control panel. The fire alarm panel is located in the Boiler Room in the Basement. *(Image 8)*

The form of alarm transmission is via an exterior local energy master box with IMSA cable and via an AES radio box. Old style heats exist in Bunk Rooms, Basement and Apparatus Bay, could not locate heats in Boiler Room. *(Image 9)*

Second Floor Corridors do not have smoke detectors. An occasional smoke detector was spotted throughout the facility.

Most areas do not have horn/strobe units.

The fire alarm system provides inadequate coverage, does not meet code, and is not ADA compliant.

The fire alarm system should be replaced under a renovation program.

Image 8 – FACP

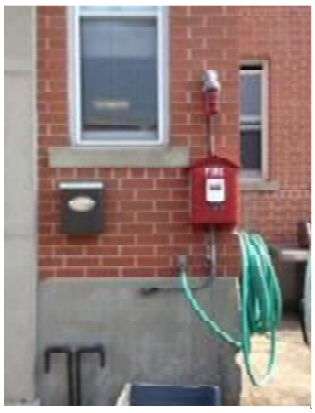

Image 9 – Master Box

INTERIOR LIGHTING

The Apparatus Bay has 2x4 suspended troffers with six (6) T8 lamps in good condition. *(Image 10)*

The former cell block used as storage has circline and porcelain sockets.

Second Floor Corridor, Day Room, and other areas generally have 2x2 & 2x4 recessed troffers with T8 lamps. Typical Bunk Room has a porcelain socket on a local switch, plus a second socket activated by incoming Alarms. *(Image 11, Image 12)*

Some porcelain sockets were left in place above the suspended acoustical ceilings when the ceilings were installed.

Most lighting fixtures are not suitable for reuse under a renovation program.

Image 10 – Apparatus Bay Light

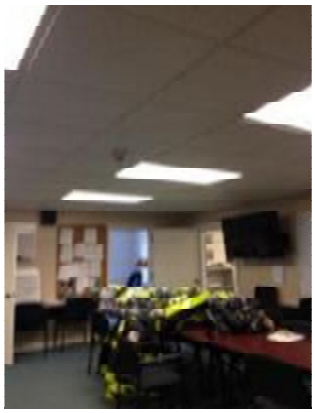

Image 11 – Day Room Light

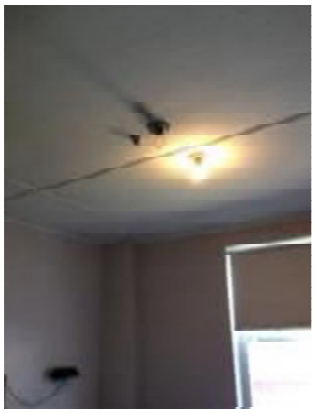

Image 12 – Bunk Room Light

EXTERIOR LIGHTING

The exterior lighting consists of building mounted LED flood lights over overhead doors. An LED wall sconce is located over the entrance door. *(Image 13, Image 14)*

Ground mounted par holders, some broken, are used to light the building mounted identity lettering.

A red globe fixture on an ornamental bracket is located adjacent to front door.

Image 13 - LED Flood

Image 14 - LED Wall Sconce

MISCELLANEOUS

A traffic light NEMA 3R cabinet is located adjacent to the front of the Fire Station. The traffic light secondary service originates on pole 92/2 and runs underground in a 2" conduit to a meter mounted on the cabinet. *(Image 15)*

The fire alarm signal cabling drops on pole #92/2 and runs underground in one (1) 2" conduit and one (1) 1'/4" conduit into the building.

The telephone service cables originate on an unmarked pole on Acton Street and run underground across the street in one (1) 4" conduit and one (1) 4" spare into the Basement.

Cable TV runs overhead into the building from pole #6/111 on Acton Street and enters through the Kitchen skylight.

The fire alarm signaling battery charger is located in the Basement stair tower.

Overhead doors have wall mounted safety sensors. Door control stations are located directly outside the Watch Room, none locally at doors.

Wiring methods range from pipe and wire to MC cable and Romex.

Watch Room has a single position and is not manned 24/7. Incoming municipal alarms are still reporting to Fire Station, as well as, Police Station. Town has been converting to AES radio boxes reporting to the Police Station.

Closed Circuit TV Cameras (2 exterior) are not functional.

One Lobby camera is connected directly to a monitor located in the Kitchen. No recording provisions exist.

Facility does not have card access or security intrusion systems.

Facility does not have a lightning protection system.

Antennae are located on training tower.

Image 15 – Traffic Light Cabinet

RECOMMENDATIONS

- Occupancy sensors should be provided in all spaces to conserve energy.
- Exterior building mounted lights should be replaced with energy efficient, long-life LED sources that are dark sky compliant.
- Replace the two existing Electrical services with a single service rated at 120/208 Volt, 3 Phase, 4 Wire service. Replace original vintage panelboards with new 3 Phase panelboards.

- Replace existing generator with a larger generator rated at 120/208 Volt, 3 Phase, 4 Wire with sound attenuated enclosure. The generator should be provided with two (2) transfer switches, one (1) rated for life safety systems.

- The fire alarm system should be replaced with an addressable system with full coverage.

- The interior lighting should be replaced with energy efficient LED sources.

- A lightning protection system should be provided.

Maynard Fire Station
Existing Conditions Assessment
Hazardous Materials

draft

October 12, 2015

REPORT FOR

HAZARDOUS MATERIALS DETERMINATION SURVEY

AT THE MAYNARD FIRE DEPARTMENT

MAYNARD, MASSACHUSETTS

UEC Project No: 215 310.00

Survey Date: September 2, 2015

SURVEY CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS

12 BREWSTER ROAD, FRAMINGHAM, MA 01702

1.1 INTRODUCTION:

UEC has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of twenty years of experience.

As part of the proposed renovation and demolition project, UEC was contracted by Dore & Whittier Architects to conduct the following services at the Maynard Fire Department, Maynard, MA:

- Inspection and Testing for Asbestos Containing Materials (ACM);
- Inspection for Polychlorinated Biphenyls (PCB's)−Electrical Equipment & Light Fixtures;
- Inspection for Lead Based Paint (LBP);
- Other hazardous materials.

Information included in this report was based on a determination inspection performed by UEC. It is required that once a detailed scope of work is identified for a renovation or a demolition project, a comprehensive Environmental Protection Agency (EPA) NESHAP inspection including asbestos testing for all suspect materials and testing for other hazardous materials including, Polychlorinated Biphenyls (PCB's) and Lead Based Paint (LBP) should be performed, which would provide a more accurate hazardous materials abatement costs and scope.

Additional testing and abatement plans for EPA review are required to be performed should PCB's was found in the caulking.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation. Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with EPA standard.

Bulk samples were collected by a Massachusetts licensed asbestos inspector Mr. Leonard J. Busa (AI− 030673) and analyzed by a Massachusetts licensed laboratory Asbestos Identification Laboratory, Woburn, MA.

Refer to samples results.

2.0 FINDINGS:

The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed.

All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent in accordance with EPA regulations. All suspect materials that contain any amount of asbestos must be considered asbestos if it is scheduled to be removed per the Department of Environmental Protection (DEP) regulations.

Number of Samples Collected

Fifty four (54) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material:

1. Painted finish on CMU at engine bay
2. Painted finish on CMU at stairs up
3. Ceiling plaster type I at basement tank room
4. Ceiling plaster type I at basement tank room
5. Ceiling plaster type I at basement tank room
6. Ceiling plaster type I at basement hall dark room areas
7. Ceiling plaster type I at basement side room dark room areas
8. Ceiling plaster type II at boiler room
9. Ceiling plaster type II at boiler room
10. Ceiling plaster type II at boiler room
11. Wall plaster at women's room weight room
12. Wall plaster at weight room II
13. Wall plaster at weight room I
14. Wall plaster at kitchen
15. Wall plaster at second floor men's room
16. Homasote ceiling at weight room
17. Homasote ceiling at second floor
18. Pipe insulation at engine bay storage
19. Pipe insulation at basement dark room areas entering ceiling
20. Linoleum at kitchen
21. Linoleum at kitchen
22. Adhesive on linoleum at kitchen
23. Adhesive on linoleum at kitchen
24. Glue daub on 12" x 12" acoustical tile at basement hall shooting range
25. Glue daub on 12" x 12" acoustical tile at basement hall shooting range
26. Crème w/ red 12" x 12" vinyl floor tile at stair landing

27. Black / yellow mastic on crème w/ red 12" x 12" vinyl floor tile at stair landing
28. Crème w/ red 12" x 12" vinyl floor tile at stairs
29. Black mastic on crème w/ red 12" x 12" vinyl floor tile at stairs
30. Crème w/ red 12" x 12" vinyl floor tile at men's room weight room
31. Black mastic on crème w/ red 12" x 12" vinyl floor tile at men's weight room
32. White w/ grey 12" x 12" vinyl floor tile at weight room
33. Black mastic on white w/ grey 12" x 12" vinyl floor tile at weight room
34. White w/ grey 12" x 12" vinyl floor tile at weight room
35. Black mastic on white w/ grey 12" x 12" vinyl floor tile at weight room
36. Light blue 12" x 12" vinyl floor tile at weight room by radiator
37. Yellow mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator
38. Light blue 12" x 12" vinyl floor tile at weight room by radiator
39. Yellow mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator
40. Residue black mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator
41. Tan w/ red 12" x 12" vinyl floor tile at second floor storage
42. Yellow mastic on tan w/ red 12" x 12" vinyl floor tile at second floor storage
43. Tan w/ red 12" x 12" vinyl floor tile at second floor bulletin room
44. Yellow mastic on tan w/ red 12" x 12" vinyl floor tile at second floor bulletin room
45. 9" x 9" Vinyl floor tile at engine bay phone storage room
46. Black mastic on 9" x 9" vinyl floor tile at engine bay phone storage room
47. 9" x 9" Vinyl floor tile at engine bay phone storage room
48. Black mastic on 9" x 9" vinyl floor tile at engine bay phone storage room
49. New window framing glazing caulking at exterior random
50. New window framing glazing caulking at exterior random
51. New window framing glazing caulking at exterior random
52. Vinyl floor tile protruding from under stone tile floor at first floor control room
53. Vinyl floor tile protruding from under stone tile floor at first floor control room
54. Mastic present on vinyl floor tile protruding from under stone tile floor

Samples Results

	Type and Location of Material	*Sample Result*
1.	Painted finish on CMU at engine bay	No Asbestos Detected
2.	Painted finish on CMU at stairs up	No Asbestos Detected
3.	Ceiling plaster type I at basement tank room	No Asbestos Detected
4.	Ceiling plaster type I at basement tank room	No Asbestos Detected
5.	Ceiling plaster type I at basement tank room	No Asbestos Detected
6.	Ceiling plaster type I at basement hall dark room areas	No Asbestos Detected
7.	Ceiling plaster type I at basement side room dark room areas	No Asbestos Detected
8.	Ceiling plaster type II at boiler room	No Asbestos Detected
9.	Ceiling plaster type II at boiler room	No Asbestos Detected
10.	Ceiling plaster type II at boiler room	No Asbestos Detected
11.	Wall plaster at women's room weight room	No Asbestos Detected
12.	Wall plaster at weight room II	No Asbestos Detected
13.	Wall plaster at weight room I	No Asbestos Detected
14.	Wall plaster at kitchen	No Asbestos Detected
15.	Wall plaster at second floor men's room	No Asbestos Detected

16.	Homasote ceiling at weight room	No Asbestos Detected
17.	Homasote ceiling at second floor	No Asbestos Detected
18.	Pipe insulation at engine bay storage	30% Asbestos
19.	Pipe insulation at basement dark room areas entering ceiling	40% Asbestos
20.	Linoleum at kitchen	No Asbestos Detected
21.	Linoleum at kitchen	No Asbestos Detected
22.	Adhesive on linoleum at kitchen	No Asbestos Detected
23.	Adhesive on linoleum at kitchen	No Asbestos Detected
24.	Glue daub on 12" x 12" acoustical tile at basement hall shooting range	2% Asbestos
25.	Glue daub on 12" x 12" acoustical tile at basement hall shooting range	2% Asbestos
26.	Crème w/ red 12" x 12" vinyl floor tile at stair landing	No Asbestos Detected
27.	Black / yellow mastic on crème w/ red 12" x 12" vinyl floor tile at stair landing	No Asbestos Detected
28.	Crème w/ red 12" x 12" vinyl floor tile at stairs	No Asbestos Detected
29.	Black mastic on crème w/ red 12" x 12" vinyl floor tile at stairs	No Asbestos Detected
30.	Crème w/ red 12" x 12" vinyl floor tile at men's room weight room	No Asbestos Detected
31.	Black mastic on crème w/ red 12" x 12" vinyl floor tile at men's weight room	No Asbestos Detected
32.	White w/ grey 12" x 12" vinyl floor tile at weight room	No Asbestos Detected
33.	Black mastic on white w/ grey 12" x 12" vinyl floor tile at weight room	No Asbestos Detected
34.	White w/ grey 12" x 12" vinyl floor tile at weight room	No Asbestos Detected
35.	Black mastic on white w/ grey 12" x 12" vinyl floor tile at weight room	No Asbestos Detected
36.	Light blue 12" x 12" vinyl floor tile at weight room by radiator	No Asbestos Detected
37.	Yellow mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator	No Asbestos Detected
38.	Light blue 12" x 12" vinyl floor tile at weight room by radiator	No Asbestos Detected
39.	Yellow mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator	No Asbestos Detected
40.	Residue black mastic on light blue 12" x 12" vinyl floor tile at weight room by radiator	No Asbestos detected
41.	Tan w/ red 12" x 12" vinyl floor tile at second floor storage	No Asbestos Detected
42.	Yellow mastic on tan w/ red 12" x 12" vinyl floor tile at second floor storage	No Asbestos Detected
43.	Tan w/ red 12" x 12" vinyl floor tile at second floor bulletin room	No Asbestos Detected
44.	Yellow mastic on tan w/ red 12" x 12" vinyl floor tile at second floor bulletin room	No Asbestos detected
45.	9" x 9" Vinyl floor tile at engine bay phone storage room	3% Asbestos
46.	Black mastic on 9" x 9" vinyl floor tile at engine bay phone storage room	No Asbestos Detected
47.	9" x 9" Vinyl floor tile at engine bay phone storage room	3% Asbestos
48.	Black mastic on 9" x 9" vinyl floor tile at engine bay phone storage room	No Asbestos Detected
49.	New window framing glazing caulking at exterior random	No Asbestos Detected
50.	New window framing glazing caulking at exterior random	No Asbestos Detected
51.	New window framing glazing caulking at exterior random	No Asbestos Detected
52.	Vinyl floor tile protruding from under stone tile floor at first floor control room	No Asbestos Detected
53.	Vinyl floor tile protruding from under stone tile floor at first floor control room	No Asbestos Detected
54.	Mastic present on vinyl floor tile protruding from under stone tile floor	3% Asbestos

3.0 OBSERVATION AND COST ESTIMATES

OBSERVATIONS

All ACM must be removed by a Massachusetts licensed asbestos abatement contractor under the supervision of a Massachusetts licensed project monitor prior to any renovation or demolition activities that might disturb the ACM.

1. Pipe insulation was found to contain asbestos.
2. Glue daubs on the acoustical tile were found to contain asbestos.
3. 9" x 9" Vinyl floor tiles were found to contain asbestos.
4. Mastic present on vinyl floor tile protruding from under stone tile floor was found to contain asbestos.
5. All other suspect materials were found not to contain asbestos.
6. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the General Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal.
7. Underground sewer pipe was assumed to contain asbestos.
8. Damproofing on exterior and foundation walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non−ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle.
9. Painted surfaces were assumed to be LBP. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926−Construction Industry Standards, 29 CFR 1926.62−Construction Industry Lead Standards, 29 CFR 1910.1200−Hazards Communication, 40 CFR 261−EPA Regulations.
10. Visual inspection of various equipment such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's. Tubes, thermostats, exit signs and switches were assumed to contain mercury. It would be very costly to test those equipment and dismantling would be required to access. Therefore, the above mentioned equipment should be disposed in an EPA approved landfill.
11. Caulking materials were assumed to contain PCB's.

COST ESTIMATES

The cost includes removal and disposal of all accessible ACM, other hazardous materials and an allowance for removal and disposal of inaccessible or hidden ACM that may be found during the demolition or renovation project.

Location	Material	Approximate Quantity	Cost Estimate ($)
Basement and First Floor	Pipe and Hard Joint insulation	100 LF	5,000.00
Basement Hallway	Acoustical Tiles on Walls / Ceiling	350 SF	3,500.00
Engine Bay Phone Storage	9" x 9" Vinyl floor tile	36 SF	1,000.00
Control Room	Mastic under Stone Floor Tiles	250 SF	2,500.00
Various Locations	Hidden Pipe and Hard Joint Insulation	200 LF	6,000.00
	Miscellaneous Hazardous Materials	Unknown	5,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	20,000.00
	Damproofing on Exterior / Foundation Walls	350 Tons	50,000.00
	Roofing Disposal	Unknown	15,000.00
PCB's Remediation[2]			25,000.00
Estimated costs for Inspection and Testing Services			5,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			10,000.00
Estimated costs for Design, Construction Monitoring & Air Sampling Services			17,000.00
		Total:	**165,000.00**

[1]: Part of total demolition and Site Work.
[2]: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS & LABORATORY ANALYSES

Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5−85−030a.

Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA method 600/M4−82−020.

Inspected By:

Leonard J. Busa
Asbestos Inspector (AI−030673)

5.1 LIMITATIONS AND CONDITIONS

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.