

INTRODUCTION

Marshfield Police Station and Emergency Operations Center is located on an approximately 1.9 acre plot at 1639 Ocean Street (Rt 139), Marshfield, Massachusetts (Image 1). The site is bounded to the north by Ocean Street, to the east by a residential neighborhood fronted on Carr Road and Woodlawn Circle, to the south by the Town DPW Garage and to the west by Parsonage Street. Ocean Street (Rt 139) is mixed residential and commercial, Parsonage Street is commercial/industrial and the other streets are residential.



Image 1

The facility was built in 1958. An addition and renovation occurred in 1978 by the architectural firm of Rich, Lang & Cote. The project added to the entire front (north) face of the building, added a stairwell on the west, and added the current Emergency Operations Center (EOC) to the south. A number of improvements were made to the interior, with the benefit of grant funding primarily.

This report is based on our visual observations during our site visits in the summer of 2015. During our site visit, we did not remove any permanent finishes or take measurements. Our understanding of the building is limited to the available drawings and our observations.

CIVIL ENGINEERING ASSESSMENT

GENERAL SITE DESCRIPTION

There is a paved asphalt driveway to the North of the existing building where the main entrance to the building is also located. Visitor and ADA Accessible parking is located along the driveway. There is an entrance to the driveway along Ocean Street and Parsonage Street. There is curb only along the parking area of the driveway. To the south of the existing police building is a paved parking lot for police and employee vehicles. On the south end of the parking lot is a shed. To the east of the building is an enclosed gravel area where utility systems are housed.

EXISTING SITE UTILITIES

STORM DRAINAGE

The existing roof of the building is drained with down spouts. There are down spouts on site that drain at grade and flow overland (Image 2). The downspouts on the north side of the building drain below grade (Image 1).

No drainage structures were observed on site; however Marshfield GIS information shows two drainage inlets on site. There was one unmarked manhole to the south of the existing (Image 3) which may be a drain manhole.

There is a stormwater system in Ocean Street to the north of the site which on site drainage likely connects to.

Sewer

No record plans show the existence of an on-site septic system or a connection to a public sewer main.

One sewer manhole was observed on site towards the south end of the parking lot to the south of the building (Image 4). There was an unmarked manhole immediately to the south of the building which may be a sewer manhole (Image 3). No record plans show this manhole.

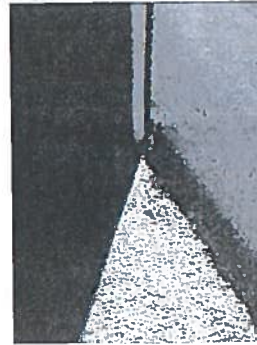


Image 1



Image 2



Image 3



Image 4

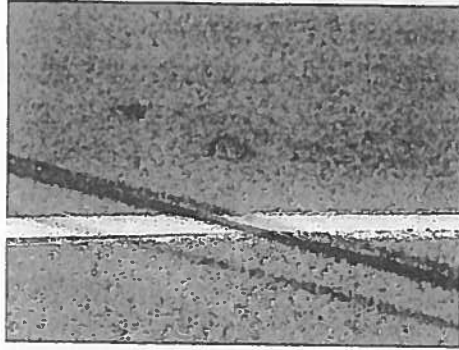


Image 5

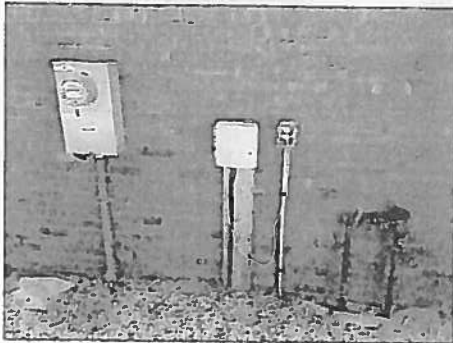


Image 6



Image 7

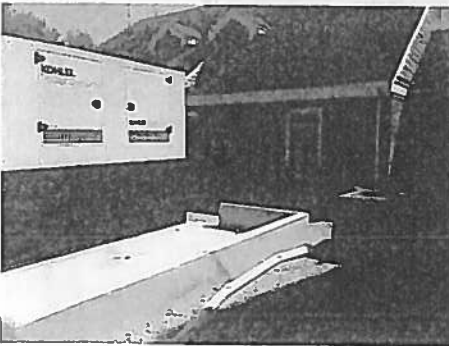


Image 8

No septic tanks or vents were observed on site. There appears to be a public sewer main in Ocean Street but no sewer manholes were observed in Parsonage Street adjacent to the site. It is possible the site connects to a sewer main in Ocean Street.

WATER

Water for the Town of Marshfield is obtained from 15 different gravel packed wells and one well field within the town. Prior to distribution through the municipal system, water is treated. In the past, some of the wells have been closed due to salt water intrusion. The water system is maintained by the Town of Marshfield.

There is a hydrant located across the street from the police station at the intersection of Ocean Street and Chandler Drive.

There are no record plans that show the water service(s) entering the building; however a water valve was observed on site where the driveway entrance to the north of the building meets Parsonage Street (Image 5). There appears to be a water meter located on the eastern face of the building in the enclosed gravel space (Image 6). Water for the Police Station likely connects to a water main in Parsonage Street and flows into the building along the eastern face.

NATURAL GAS

There is no record information of the gas service through the site. A gas meter was observed along the eastern face of the building in the enclosed gravel utility area (image 7). There is also a generator to the east of the building in the enclosed gravel area (Image 8).

ELECTRICAL

There is no electrical information provided on the record plans. An electrical meter was observed on the eastern face of the building near the gas and water meters (Image 6). Air conditioning equipment was located along the western and eastern face of the building (Image 9, 10 and 11)

EXISTING SITE CONDITIONS

SOILS

Based on the Natural Resources Conservation Service (NRCS) Middlesex County Soil Survey, Issued February 2010, the site soil is classified as an urban land which does not have listed soil characteristics. Immediately adjacent to the site are Hinckley Loamy Coarse Sand soils and Deerfield Fine Sand soils. Both soil types are classified as Hydrologic Soil Group A. The Hinckley Loamy Coarse sand is excessively drained and the Deerfield Fine Sand is moderately well drained.

PAVEMENT/CURBING

The asphalt pavement within the site is in generally good to fair condition with areas of minimal cracking and degradation (Image 12). The walkways onsite are asphalt or concrete and are generally in good to fair condition. The walkways are not for public access and are only located to the south of the building. Access to the front of the building is from the parking spots in the driveway and across the driveway to the main entrance. There is concrete curb along the parking area of the driveway to the north of the building. The curb is in good condition. There is concrete curbing located along the south side of the building along a walkway. The curb is in good condition with minimal areas of degradation (Image 11).

PERMITTING CONCERNS

The Police Station Site does not appear to be adjacent to any Wellhead Protection areas, FEMA Flood Zones, or Wetlands.

RECOMENDATIONS

- Mill and overlay sections of pavement where cracking/degradation has occurred.
- Replace curb where it has been damaged.
- Provide ADA access from parking spaces to the north of the building to the main building entrance.



Image 9



Image 10



Image 11



Image 12

STRUCTURAL ASSESSMENT

The purpose of this report is to describe the following:

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

BUILDING DESCRIPTION

The building (Image 1 and 2) is a two story structure constructed using a combination of wood, CMU and steel. The building also has a partially finished basement (Image 3). The main floor currently houses the dispatch center, the chief's office and other office spaces (Image 4). The cells and a workout room are also located on the first floor. The upper level includes more office spaces and the server room. The basement includes storage rooms and a gun range.

EXISTING CONDITIONS

Minor cracks in the drywall finishes were observed in a few locations throughout the building (Image 5 and 6). Exposed wood framing was observed and appeared to be in good condition (Image 7 and 8). Reports of water leaking in the chief's office were described but not observed. The floor finish appeared to be peeling and cracking. **It appears that a significant amount of moisture is present in the basement and has caused some minor damage to the finishes.** It appears that an assessment of the floor structure supporting the servers on the second floor was performed in the past. The previous engineer's recommendation was to install steel plates to spread the load.



Image 1



Image 2

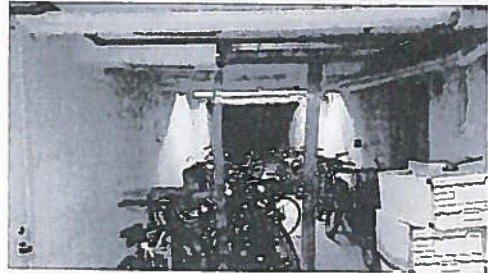


Image 3



Image 4

RECOMMENDATIONS

The structure is in satisfactory repair and performing well for the most part.

- During any significant renovation project, incorporate upgrades to the structure to resist current seismic and snow loads.



Image 5

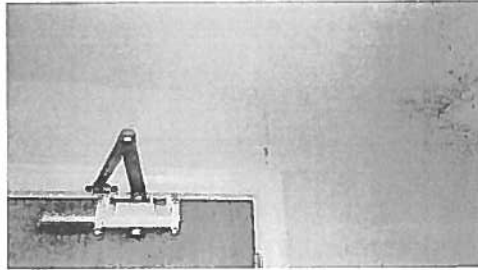


Image 6



Image 7

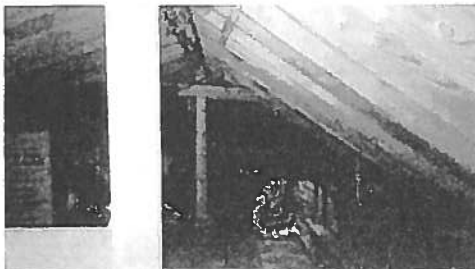


Image 8

ARCHITECTURAL ASSESSMENT

The Police Station is approximately 12,395 SF in area. Although the Emergency Operations Center (EOC) is part of the Police Station, it has a separate entrance.

EXTERIOR

FOUNDATION

Foundations are poured-in-place concrete. The foundation was primarily located below grade; no specific issues were observed.

WALLS

Exterior walls are chiefly brick veneer at the lower level and cedar sidewall shingles at second floor dormers and gable ends

Specific Issues

- Chipping/cracking observed at outside corner of garage rm 104. Cracking continues up into brick veneer above for approximately 30". (Image 1)
- At the exterior stairwell, the stairwell brick wall intersects the older building brick. (Image 2, 3, 4) The source is not known however there are several areas that may be contributing factors: a) a gutter downspout (on the south side) is discharging water onto the door pad (and then toward the building, b) the extent and workmanship of step-flashing at roof to wall condition, c) the air conditioner drips condensation directly onto joint and extends down to foundation, d) inadequate thermal continuity at roof to wall transition causes build-up of ice dam and then freeze thaw action sends water behind shingles. Evidence of water intrusion is seen at the basement level of this stairwell. (Image 5)
- Condensate (for AC units) and power lines are penetrating sidewall and laying on roof. (Image 4, top). From inside the attic, daylight is visible around the opening where the refrigerant line passes. Similar condition is noted at louver on south side of building.
- Most cedar sidewall shingles are in reasonably good condition however there are a number of locations,

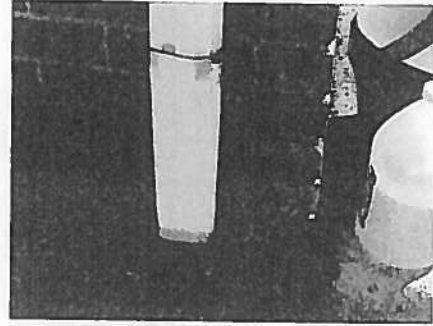


Image 1

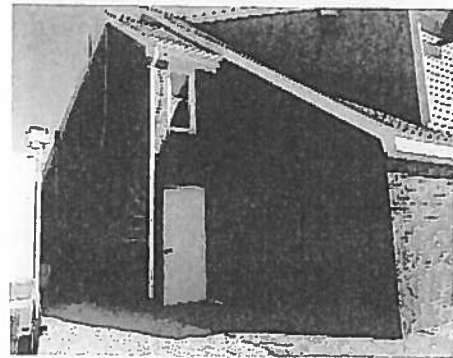


Image 2



Image 3



Image 4



Image 5

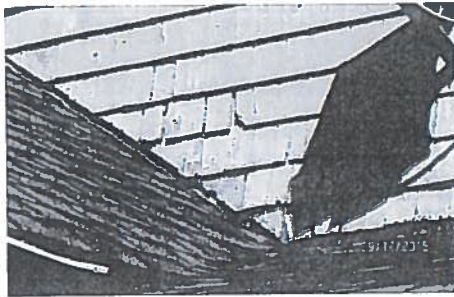


Image 6



Image 7



Image 8

particularly at roof to wall transitions, southern exposure, or areas where snow may stay for a long period of time. Having the wood siding so close to the roof below allows for accelerated deterioration of the siding. (ie. at shed dormer above the link between police station and the EOC, the shingles at the corner especially are in poor condition (Image 6). Paint/stain has faded from wood trim and fascia. Wood trim in at least one location had rotted, and large hole is visible (Image 7).

- Additionally, there are no “weep holes” at the bottom of the brick on this building. Typically weeps allow proper drainage of any water that enters the brick cavity (the air space behind the brick). According to the 1978 drawings there is 1” of insulation and no air space in this wall, which is a deficit as there is limited means of removing water or condensation that occurs within the wall.

Recommendations

- Provide a control joint at corner of building. Replace cracked bricks with new.
- Remove wood siding 6” up from roof on entire perimeter where asphalt shingle roof to siding occurs, and at dormers. Re-flash roof to wall transition with ice & water shield and metal flashing.
- Replace rotted wood and seal openings water tight.
- Re-paint/stain wood siding, trim and fascia.
- Ensure that Air Conditioning (AC) lines penetrations are adequately air and weather-sealed. Re-route lines to provide more direct route inside of building instead of draping along roof.
- At concrete pads in front of stairwell exterior doors, remove concrete pads and replace with frost-foundation wall and pad, such that water drains away from building

WINDOWS

Windows are insulating vinyl insert/replacement windows, which appear to have been installed fairly recently and are in good condition.

Specific Issues

- Original wood brick mould (exterior trim) on windows is not in good condition. (Image 8)

- Sealant around perimeter of windows is failing. (Image 8)
- Steel lintels spanning masonry opening at windows is rusting.

Recommendations

- Replace exterior wood brick mould/trim where deteriorated. Prep and paint where wood is not damaged.
- Remove and reinstall backer rod & sealant joint around windows
- Remove rust from lintels, prime and paint with industrial coatings.

DOORS

Exterior doors are primarily hollow metal with hollow metal frames in varying condition.

Specific Issues

- Main front entry door; gap observed above door head. (Door itself is fairly new and in good condition)
- Stairwell doors are in fair to good condition. South door is rusting at lockset and beginning to rust at bottom. (Image 9)
- Sallyport (garage) overhead door. Reportedly there have been numerous failures and repairs of the door. The other overhead doors are apparently not operated frequently.
- Frames at some exterior doors are rusting. (Image 10)

Recommendations

- Infill gap over main entry door to be weather tight.
- Replace doors and frames that exhibit rusting (estimate three locations).
- Replace overhead doors with thermally-efficient doors and operating assemblies.

LOUVERS / OTHER OPENINGS

Specific Issues

- There is a mechanical/air duct that penetrates the east wall of the police station and connects to a ground-mounted air handling unit and is adjacent to a shed roof

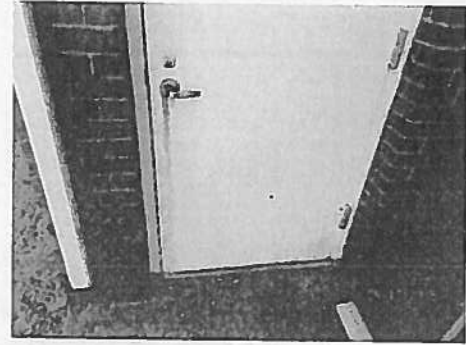


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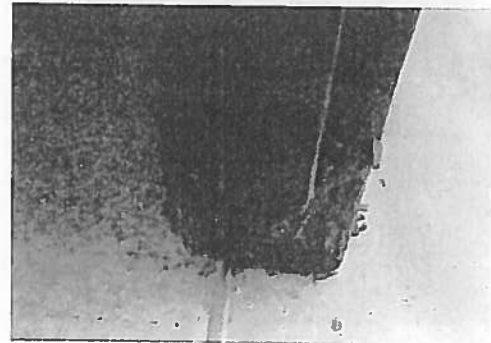


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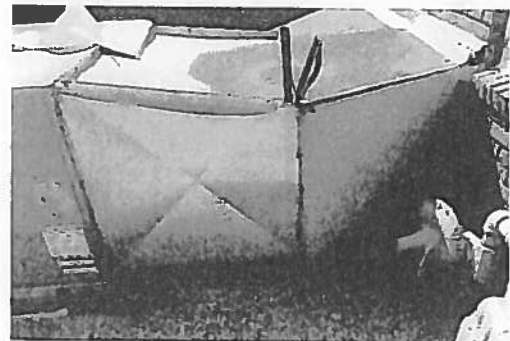


Image 11



Image 12

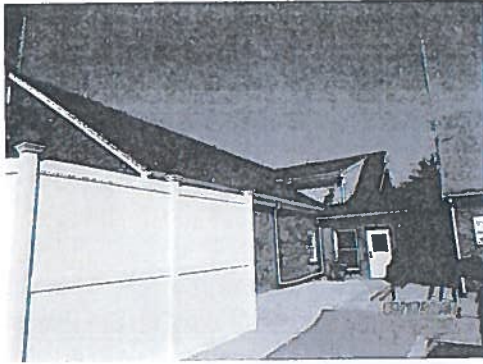


Image 13

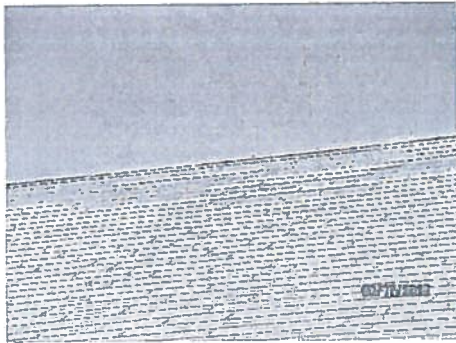


Image 14



Image 15



Image 16

at ground level, over the basement stair (Image 11, 12). The duct is significantly rusted, not insulated, the flashing has failed between the wall and the duct and a 5" gap between the duct and shed roof over the basement stairway allows water and snow to accumulate up against the shed roof. We believe this is source of water entering basement (see Interior Walls and Partitions).

Recommendations

- The exterior duct from the AC condenser unit to east of police station should be removed completely and reinstalled as an insulated duct with proper flashings at wall penetration (approx. 8'Lx 4' w x3' h).
- In this type of construction, typically systems using gable end vents do not perform as well as those using ridge vents. See Roof recommendations.

ROOF & ATTIC

The roof on the police station (Image 13) and the EOC is asphalt shingle. The police station was re-roofed a few years ago but the EOC was not done at that time.

Specific Issues

- Reportedly there was a roof leak above the Chief's Office last year which resulted in the need to remove and replace the ceiling.
- The EOC roof is older than the police station roof and is in fair condition. There are areas where it is apparent that patching has occurred. (Image 14, 15)
- The EOC attic has a number of deficiencies. The concept of a continuous "plane" of insulation is completely missing, as are any systems for adequate ventilation, or VRAIB (Vapor Retarder/Air Infiltration Barrier) to control water, air and water vapor penetration. Specifically:
 - Inadequate thickness and placement of insulation. Insulation has been disturbed for running cabling and HVAC related work, creating breaks in the thermal envelope. (Image 16, 17)
 - Insulation at ceiling plane is generally very problematic due to number of penetrations and difficulty of keeping a continuous plane of insulation. It is much preferred if insulation is at roof plane(s).

- Vapor/air-infiltration barrier did not appear to be present.
- Evidence of water damage on fiberglass batt insulation, near “recessed dormers” at street front side of EOC.

The Police Station attic is also in poor condition with similar issues. Specifically:

- Lack of soffit vents (Image 18) Small gable end louver vents in the EOC appear undersized resulting in not enough air to adequately vent the roof.
- Mechanical ducts ineffectively wrapped with fiberglass batt insulation (Image 19)
- Inadequate thickness of insulation (R-11 at kneewall), and numerous gaps. While a vapor barrier (poly-sheet) was visible at corridor wall, none was visible between insulation and ceiling (Image 20). Several areas were noted where insulation was missing or moved.
- Evidence of water staining on floor of air handling unit
- Evidence of water intrusion around gable end vents (Image 21).

Recommendations

- Monitor EOC roof and plan to re-roof within five years. Relocate insulation to the roof plane by providing a vented composite insulation board, and using spray-foam insulation at gable end walls and roof to wall transitions. This will allow for a continuous thermal envelope that is not affected by any HVAC, plumbing or electrical cabling work done in the attic.

In the interim, perform thermal scan of the roof and exterior envelope to identify gaps. Provide a continuous vapor-barrier between insulation and interior space and adjust insulation to be as continuous as possible. Re-route data wiring to be more orderly; install on cable management trays. Repair gaps in walls, seal all penetrations to exterior and spaces below. Fully insulate all ductwork and air handling equipment by using a professional mechanical contractor.

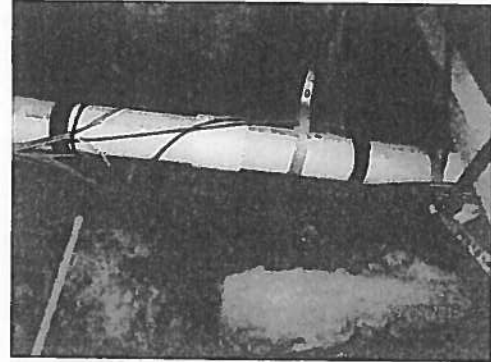


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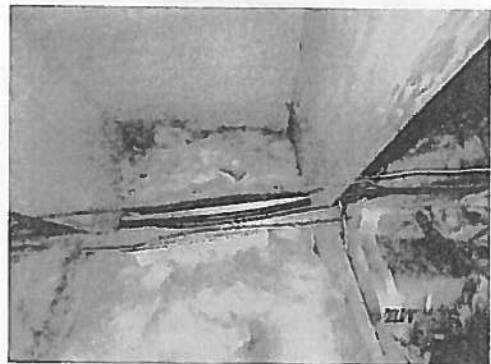


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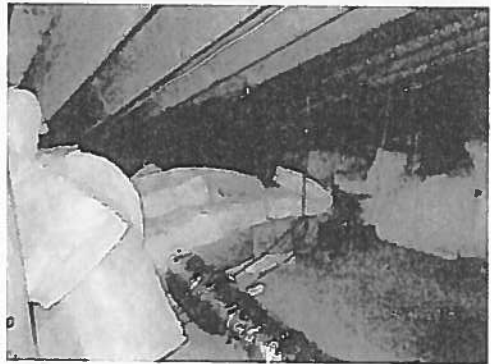


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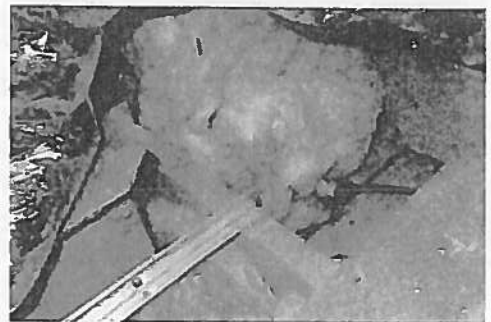


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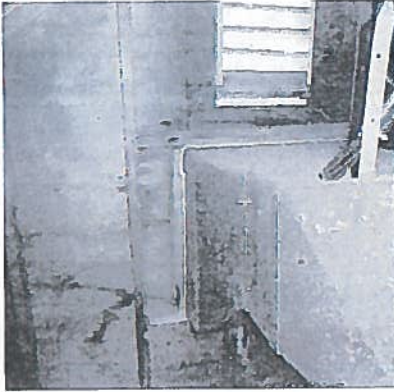


Image 21



Image 22

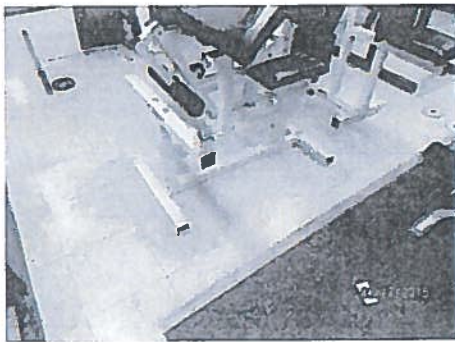


Image 23



Image 24

INTERIOR

FLOORING

Flooring throughout the building is a mix of VCT, carpet and ceramic tile in mixed condition.

Specific Issues

- Carpet has been installed on floor and up the walls in the narrow first floor corridor that runs east/west and is in very good condition. Carpet on the walls was added in an effort to reduce noise and provide some protection to walls from traffic; corridor is very narrow. (Image 22)
- Dispatch/Communications Center has a relatively new anti-static carpeted floor.
- VCT on second floor is in relatively poor condition.
- There is a hump in the floor at the top of the west stairs apparently at the junction between 1958 and 1978 construction. (Image 23)
- Some office areas on second floor are carpeted, in good condition.
- Garage area has bare concrete slabs. Floor drains in the bay being used for sallyport have been infilled because there was no gas/oil separator. Snow and water from incoming vehicles has no place to drain.
- Storage and evidence holding areas near garage have bare concrete floors.
- Treads on east stairs are VCT with aluminum nosing. This is not a durable or effective stair tread covering. Additionally, there is a gap between the stairs and the adjacent stairwell wall.
- VCT floor at weight room area in basement is shows signs of water leaking onto floor. (Image 23)
- Data equipment room in basement is bare concrete.
- Records storage and other rooms in basement with bare concrete floors. (Image 24)
- VCT in basement, near Electrical Vault, is in very poor condition.

Recommendations

- Replace 2nd floor VCT floors with flocked flooring.
- Reconstruct stair landing to eliminate hump.
- Prep and add seamless resilient flooring or flocked flooring to evidence storage areas adjacent to garage.
- Remove VCT from stair treads and install raised rubber treads.
- Infill gap between wall and stairs.
- Replace VCT in weight room with rubber flooring designed for weight rooms. Include topical moisture mitigation. Prior to beginning work, address sources of water leaking.
- Prep basement data equipment room floor and install anti-static resilient flooring.
- Prep basement room floors and install industrial coating.

WALLS AND PARTITIONS

Interior walls are primarily GWB (gypsum wall board) construction. CMU is used at some basement walls.

Specific Issues

- CMU wall at basement level of 1958 stairs shows significant water damage from water being driven in from outside (Image 25). (This is the stair area which is adjacent to the weight room area in the basement) The 1978 drawings indicate that an existing high window opening was to be infilled with CMU at the corner. (although it appears that infill occurred floor to ceiling). Water is also infiltrating the concrete portion of this wall as well. (Image 26) 1978 drawings indicate this wall did not receive any waterproofing/damp-proofing or footing drains.
- In the records room, water infiltration through the concrete wall has been a major problem and exterior site work was performed to alleviate the problem. Reportedly water still enters the wall during heavy rain. Water has damaged town and harbormaster records in

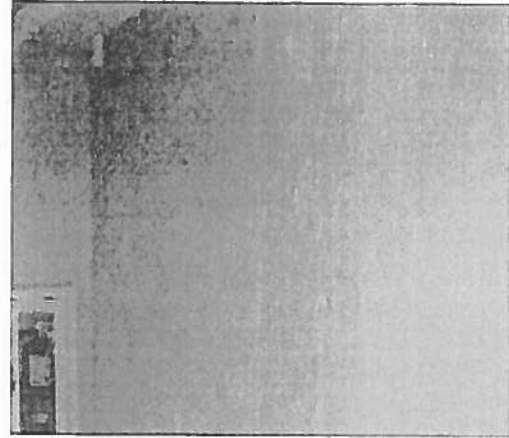


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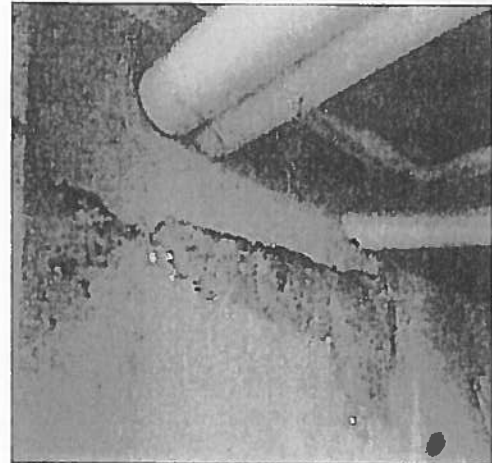


Image 26



Image 27



Image 28



Image 29

the past and water infiltration continues to damage some stored items. There is no floor drain. A dehumidifier is attempting to keep the ambient moisture levels low. This space is inadequate for archival storage of records. (See more info in Other section at the end of this document).

- Much of resilient wall base is in poor condition.

Recommendations

- Excavate along perimeter of foundation wall, install waterproofing and drainage mat, and perimeter drainage system tied into storm drainage system, and 3" of rigid insulation to provide complete vapor retarder/air infiltration barrier to basement level.
- A complete exterior and interior architectural and mechanical retrofit of the records room should be undertaken. Alternately the Town may consider an alternate location that is an environmentally-controlled space appropriate for such long-term use.
- Replace resilient wall base.

CEILINGINGS

Ceilings in the facility are in varying condition. Most ceilings are hard (GWB).

Specific Issues

- Second floor ceiling at Chief's Office was damaged in 2014 by water infiltration through roof and was recently repaired.
- Some basement ceilings have penetrations for various electrical conduits and wiring which have not been infilled. The ceiling is damaged in numerous areas (Image 27, 28). The ceiling is very tight to the structure
- Acoustical Ceiling Tile (ACT) ceilings in the EOC room have some water damage in various locations (presumably from water leaking through roof) (Image 29)

Recommendations

- Repair various ceiling penetrations in basement (estimate 200 sf)

- Replace damaged ceiling tile and GWB assemblies in the EOC room, after completion of attic and roof repairs and modifications. (estimate 100 sf)

DOORS

Interior doors are in varying condition, most being original to the building. Doors are typically solid-core wood-veneer in reasonable condition with good architectural-grade hardware packages and mortise locksets. Veneers are generally in good condition. A couple locksets are in needs of tightening.

Specific Issues

- Doors and hardware in prisoner processing area and cells area indicate makeshift modifications to attempt to meet security needs. (Image 30) Note that egress/exit doors may not be controlled via combination locks or other mechanisms which would prevent egress in case of emergency.
- Basement door to east stairwell has damaged door frame at lock strike area (Image 31)
- Lack of door closers with proper hold-open function results in contrived solutions. (Image 32)

Recommendations

- Replace hollow metal door frame at east stairwell.
- Replace closers at three locations with closers that have hold-open feature.
- Replace doors and hardware throughout prisoner processing area, cell doors, evidence rooms as well as basement door, utilizing an integrated building keycard or similar electronic access & security/alarm system that aligns with the operational needs of the department.

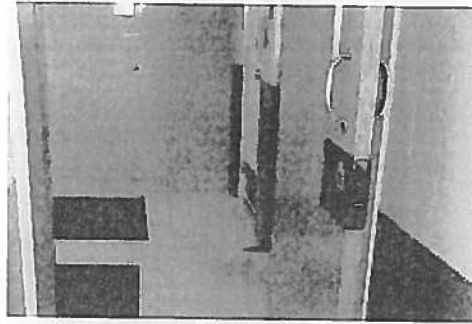


Image 30

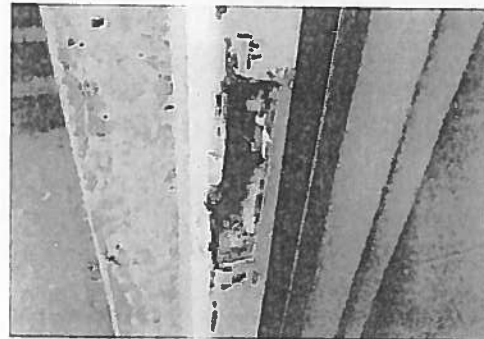


Image 31

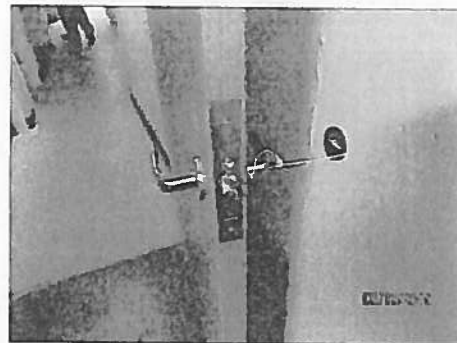


Image 32



Image 33



Image 34



Image 35



Image 36



Image 37

ACCESSIBILITY

While the building has a limited area at the entrance area that is accessible, generally the building has significant barriers to access; a lack of an elevator for the three floors is the primary one. Although the second floor is primarily for use by able-bodied police men/women, all areas of police stations are required to be provided with an accessible route.

Generally door locksets are of a compliant lever type, however some doors in the custody intake area have knobs.

Specific Issues

- General public/staff toilet facilities; some have been upgraded and are close to being compliant but are lacking some features, such as properly-located grab bars at both side and rear of toilet. (Image 33)
- Changes in levels, where the area is not served by an elevator, are non-compliant. (Image 34,35)
- There are numerous areas where aisle and side clearances are not compliant with accessibility codes (Image 36)
- Countertops/sinks do not have proper knee clearance/height requirements etc.
- The staff locker room and showers are on the 2nd floor; the entire space is not accessible and does not have accessible shower, toilet, lockers, etc.
- Door threshold at south door alongside garage doors is approx. 10" above grade.
- There are numerous barriers to an accessible route for people that are taken into custody and in the processing area (i.e. door knobs, counter height, passage widths, lack of handicap accessible toilet) (image 37, 38).
- There are numerous locations where walls or furniture and equipment are preventing proper clearances at doors.



Image 38

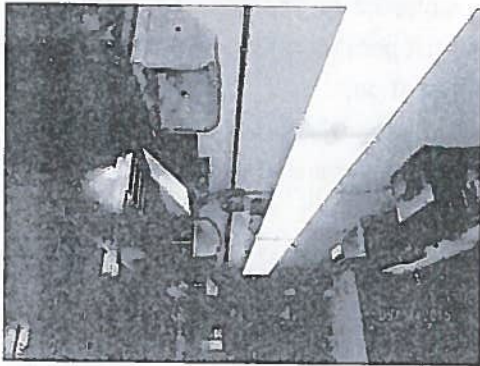


Image 39



Image 40

Recommendations

- Provide grab bars at public use toilet.
- Provide an elevator to access all three floors and intermediate level.
- Modify locker room, shower and toilet facilities for staff.
- Provide modifications at door openings and passageways throughout the building to meet handicap accessibility guidelines (estimate 10 locations).
- Provide an accessible ramp for access into rear of building.
- Create an accessible toilet room in the intake/custody processing area.
- Modify counter/cabinetry to provide accessible sink at kitchenette. Create low counter area at intake/processing area.

FIXTURES, MILLWORK & CASEWORK

In general the built-ins, fixtures and equipment are of varying age, condition and quality.

The station recently purchased new computer and radio equipment, monitors etc. for their dispatch center however the space is limited. Space is also limited/inadequate for storage of evidence and property seizures. This scope of this study does not review space needs. We recommend that assessment of operational needs and available space be done.

HEALTH, SAFETY & WELFARE

Building codes and industry guidelines have changed significantly since the original construction occurred; there are a number of issues affecting the health, welfare, and safety of officers, staff, and visitors that have emerged based on these changes to the codes, guidelines and our general understanding and definition of building health and safety. Below are our observations.

Specific Issues

- Lack of adequate ventilation at cells (Image 39, 40)



Image 41



Image 42



Image 43

- Lack of proper wall and door ratings between spaces. Example, stairs connecting three occupied floors.
- Storage of evidence, drugs and firearms where lack of ventilation, adequate space, storage racks/shelving/secure cabinets, lighting, or ventilation makes these potentially unsafe/inadequate spaces (Image 41).
- Corridor in admin area was very narrow at approximately 3'.
- Lack of safe means of progressing with a person in custody from the sallyport to booking and detention. People in custody must pass through central work areas in the current configuration.
- Lack of facilities which properly segregated female from males and juveniles from adults in custody (Image 40 and 42)
- Outmoded processing area/lack of proper equipment and facilities.
- Lack of ligature-proof fixtures, grilles, doors and grates.
- Fitness room located in garage and basement have inadequate heating and ventilation system.
- Archival records storage is located in the basement with inadequate ventilation and damp conditions (Image 43).

Recommendations

- Refer to Mechanical Report for recommendations on ventilation system upgrades.
- Replace door frame, door and hardware at stairwell and storage rooms with fire-rated type.
- Renovate approximately 800 sf of space to provide proper and secure storage of confiscated evidence, firearms, drugs, etc. as well as archival storage.
- Widen admin 3' corridor to be 4' minimum.
- Renovate intake processing area to allow for safe/secure passage of people in custody (estimate 600 sf area).
- Renovate cell area to provide safe and segregated spaces meeting current industry standards (estimate 500 sf area).
- Replace outdated equipment in intake processing area.

HVAC ASSESSMENT

HEATING

BOILER PLANT

The building is heated by a single gas-fired condensing boiler. (Image 1) The boiler was manufactured by Aerco model Modulux Unical. The boiler recently installed and should have many years of service expected. The boiler would be estimated to have another 28 years of its expected useful service life. The boiler does not appear to have an acid neutralization system on the condensate discharge into the open end drain which is required by code. Venting is PVC at the boiler into type B vent into the chimney.

The boiler provides hot water heating to terminal heating equipment (unit heaters, air handling unit, and radiation heating equipment) located throughout the building through a two-pipe steel and copper hot water piping distribution system. Hot water is circulated by inline type circulator pumps manufactured by Taco pumps (Model 1612). There are two (2) pumps installed. The pumps are constant volume pumps with no Variable Frequency Drives. (Image 2)

The Police Station is heated by a combination of a hot water coils in the air handling unit, fin tube radiation and unit heaters. The unit heaters and associated piping appears to be originally installed equipment. The fin tube radiation heating equipment is generally in fair condition. (Image 3)

The basement has minimal heating convectors and fin tube radiation only in occupied areas such as the weightlifting room and corridors.

The building has many spaces that cannot maintain adequate space temperature. The entry lobby of the Station has no heat source and becomes very cold in the winter. Heating pipes in the stairwell freeze on an annual basis. Overall the Heating system appears undersized for the building and distribution in the building does not appear adequate to satisfy the building heat loss.



Image 1 - Boiler

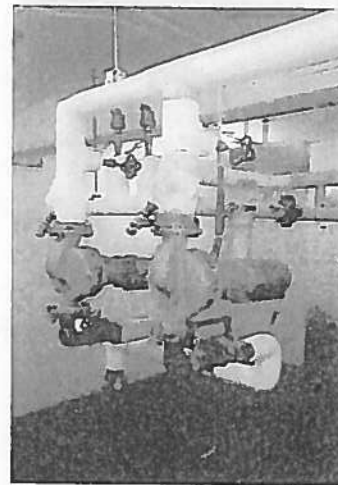


Image 2 - Heating System Pumps

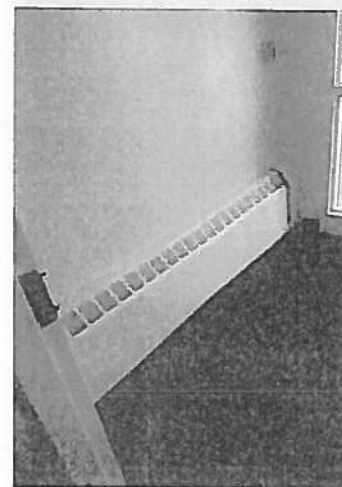


Image 3 - Hot Water Baseboard Fin Tube Radiation Heating

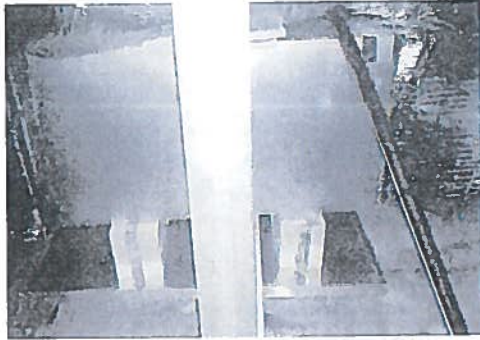


Image 4 – Indoor Air Handling Unit



Image 5 – Outdoor Air Cooled Condensing Unit

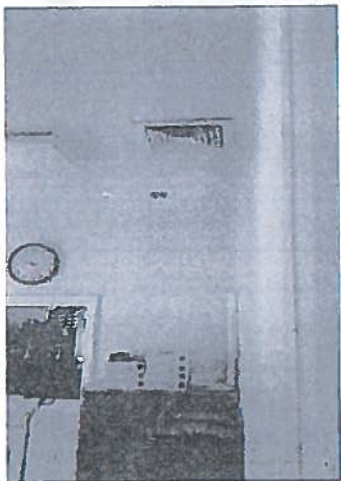


Image 6 – Overhead Supply Diffusers

AIR CONDITIONING AND VENTILATION

Split system indoor air handling units with DX outdoor air cooled condensing units provide Air conditioning in the Station. Indoor air handling units were manufactured by Goodman Air Conditioning model ARUF48D14AC5. (Image 4) Outdoor air cooled condensing units manufacturers but appear to be from the same renovation of 1999 to 2000. Outdoor condensing unit manufactured by Rheem model RAKA-048JAZ6. (Image 5) Equipment is approaching the end of its service life expectancy.

The indoor units appear to be from 1997 and operate on R22 refrigerant. The unit states that is tested at 0.5" of external static pressure which may not be adequate based on the connected ductwork to the units.

Overhead supply diffusers and return grilles in the ceiling are located throughout the building. (Image 6)

There is no air conditioning in the basement level of the police station.

Through wall air conditioners have been added in many spaces throughout the Police station as supplemental air conditioning. (Image 7)

The Air conditioning system does not satisfy the cooling load demands of the Police station. Often the building is at uncomfortable space temperatures for the occupants.

Equipment operates on R22 refrigerant which has been phased out in the HVAC industry and replaced with R-410A which is less harmful to the environment.

The bathrooms are exhausted by exhaust air fans systems. (Image 9) Bathroom fans off the entry Lobby (Image 10) and between the rear conference room and clerical discharge to a wall mounted louver. Exhaust air in the cells discharges directly into the corridor between the cells. Each cell is equipped with a sidewall style exhaust fan with a backdraft damper. Not all cells appear to have dedicated ventilation. (Image 10)

VEHICLE GARAGE

The single Garage is heated with a hot water unit heater. There is no vehicle exhaust system in this space. The double garage has been converted for an exercise space in the open area and confiscated storage in the lockable storage goods. There is not adequate exhaust or ventilation in these spaces. Storage areas are heated, but have no air conditioning. (Image 11)

BASEMENT

The Basement includes the boiler room, electric room, and storage areas. The basement is utilized as records storage, a server room an exercise equipment storage room. The door to the room with the server rack must remain open at all times to prevent the equipment from overheating. Record storage has piping in the ceiling area that serves terminal heat sources on the first floor such as fin tube, convectors and unit heaters. There is no air conditioning serving the basement level. There is no level of humidity control in the basement including record storage. (Image 12)

CONTROLS

It is our understanding that the HVAC Building Management system is very dated and of little use for building operation, maintenance, and understanding how the building system is operating. The existing system does have recently upgraded equipment integrated into it such as the recently replaced boiler.

RECOMMENDATIONS

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

Therefore we recommend the following HVAC system replacements:



Image 7 – Wall Air Conditioner



Image 8 – Toilet room Exhaust



Image 9 – Cell Exhaust



Image 10 – Converted Vehicle Garage/Exercise Space

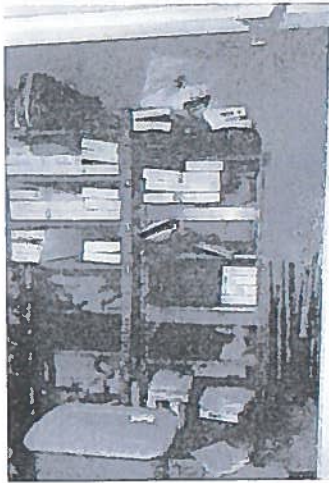


Image 11 – Confiscated Storage



Image 12 – Basement Record Storage

- Heating System: Although the boiler has recently been converted to a high efficiency condensing boiler, the boiler plant appears undersized to satisfy the total building heat loss demand. Provide a second high efficiency condensing boiler to add to the system. The second boiler would provide built in redundancy minimizing the building losing its heat source and satisfy the overall heat loss demand of the building.
- Add acid neutralization kit to existing boiler.
- Ventilation: Clean existing supply and return ductwork. Replace excessive sections of flexible ductwork with insulated galvanized sheetmetal ductwork. Confirm any ductwork systems proposed to be reused is properly sealed and fit for reuse by performing a pre-construction air testing report.
- Test and clean restroom exhaust air fans system. Test apparatus bay exhaust fan.
- Provide air conditioning in the basement to control humidity levels in critical storage areas such as records.
- Exhaust/ventilation upgrades in confiscated storage rooms.
- Controls: Installed new direct digital control, energy management system that all replacement and existing to remain HVAC systems can be controlled by for improved thermal comfort control and energy efficient system operation.
- Air Conditioning: Install a new high efficiency air conditioning system(s) in areas that required air conditioning in the next 5 years to replace the existing air handling unit and associated condensing unit. The replacement system should utilize alternative refrigerant to replace the existing R-22 refrigerant AC system. Provide a new system for the building that could meet the cooling load requirements of the building and improve overall thermal comfort. Add ducted ventilation to the new air conditioning system to provide code compliant ventilation in each space, including in cell rooms.

ELECTRICAL ASSESSMENT

EXISTING SUMMARY

The Police Station was built in 1958. The Electrical systems in general are in fair condition and within their intended useful lifespan.

POWER DISTRIBUTION SYSTEM UPGRADE

The primary service runs overhead along Ocean Street where it transitions to underground and runs to a meter on exterior of the building and to a 400 Ampere, 120/208V, 3Ø, 4W main distribution panel. The main breaker is a 400 Amp frame. The equipment was manufactured by FPE. The distribution section is rated at 400 Amps and consists of breakers feeding other panels throughout the building. (Image 1, Image 2)

Local and remote panelboards, also manufactured by FPE and General Electric, are generally mounted within Corridors and are of the breaker type.

The FPE switchgear is in poor condition and should be replaced

There are a number of locations where electrical outlets are overloaded and various cords are presenting a hazard.

The Main Electric Room has gas and heating pipes running through it. (Image 3)

The Electric Room has one (1) door swinging into the room.

INTERIOR LIGHTING

The interior lighting has been upgraded over the years to T8 lamps and electronic ballasts, but there are still T12 and incandescent lamps.

The Main Lobby has 1x4 surface mounted parabolic lensed fixtures with T8 lens. (Image 4)

Corridors generally have 1x4 surface wraparound fixtures with acrylic lens locally controlled with switches.



Image 1- Pole Mounted Overhead Service

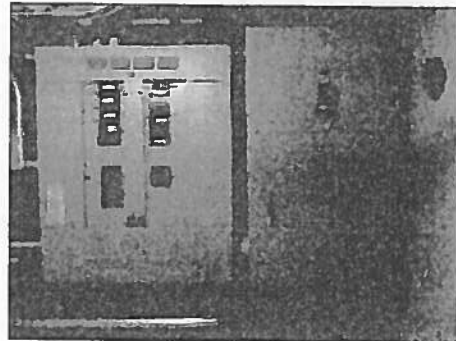


Image 2 - Main Switchboard

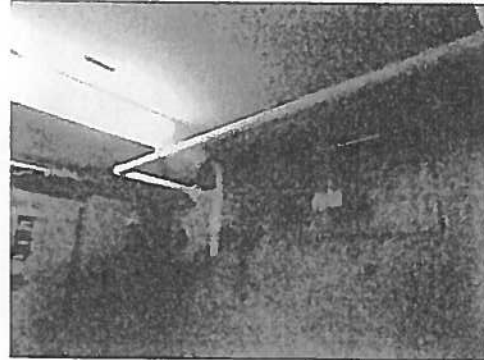


Image 3 - Gas Piping in Electric Room

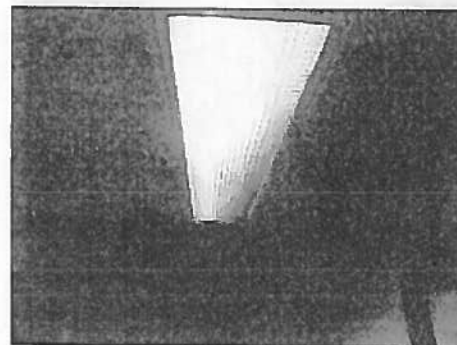


Image 4 - Lobby Lighting



Image 5 – Office Lighting

Typical Offices have 1x4 surface wraparound fixtures with acrylic lens controlled with two (2) switches. There are no occupancy sensors in the building. (Image 5)

The facility does not have an Automated Lighting Control System.

The lighting is generally in poor condition with spaces not well lit.



Image 6 – Pole Lighting with Floods

EXTERIOR LIGHTING

Exterior lighting consists of flood lights with metal halide lamps mounted from the building and pole mounted HID fixtures with floods. (Image 6, Image 7)

The exterior lighting is controlled with photocell on and timeclock off.

EMERGENCY STANDBY SYSTEM

The facility has an exterior diesel generator with an integral tank with alarms. The generator is rated at 125 KW 120/208V, 3Ø, 4W manufactured by Kohler. (Image 8)

There is one (1) transfer switch manufactured by Russ Electric. (Image 9)

Exit signs are of the cast aluminum type with fluorescent lamps. (Image 10)

Exterior doors do not have instant-on emergency lighting.

The emergency equipment is in good condition.



Image 7 – Building Mounted HID Flood Lights

FIRE ALARM SYSTEM

The facility's fire alarm system consists of a FCI 12 zone non-addressable panel. (Image 11)

Heat and smoke detectors exist in egress ways and stairs.

Fire alarm system devices appear to have poor coverage.

The form of alarm transmission is via a master box. (Image 12)

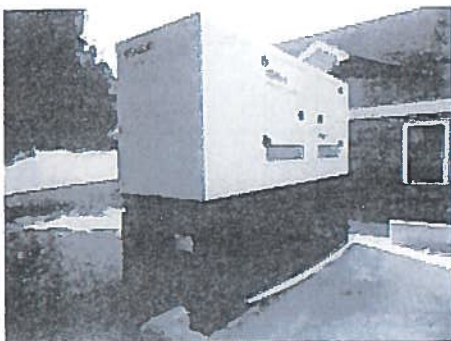


Image 8 – Exterior Diesel Generator

PHOTOVOLTAIC SYSTEM

The facility does not have a Photovoltaic System.

MISCELLANEOUS SYSTEMS

The facility does not have a Lightning Protection System.

Numerous extension cords and power strips were noted due to the lack of receptacles located near the equipment loads (Image 13). The use of extension cords in place of permanent wiring is a safety hazard and a code violation.

RECOMMENDATIONS

- Provide a new 800 Ampere, 120/208V, 3 Phase, 4 Wire Service to replace existing service. Replace all FPE switchgear with new and backfeed existing feeders and circuitry.
- Provide occupancy sensors in all spaces to conserve energy.
- Replace exterior building mounted and pole mounted lights with energy efficient, long-life LED sources that are dark sky compliant.
- Add emergency lighting to exterior doors by replacing existing HID fixtures with instant-on LED fixtures.
- Add fuel monitor annunciator.
- Replace existing fire alarm system with an addressable system with full coverage.
- Replace interior lighting by replacing existing fixtures with LED fixtures.
- Provide additional receptacles and circuitry throughout the facility to suit the needs of the Police Station.



Image 9 – Automatic Transfer Switch

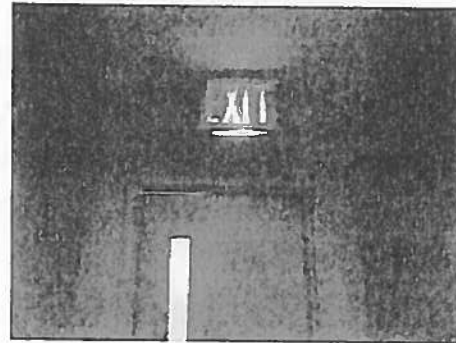


Image 10 – Exit Sign

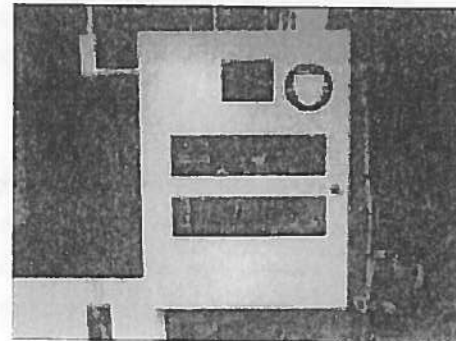


Image 11 – Fire Alarm Control Panel

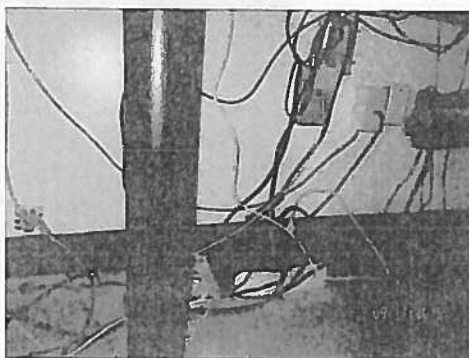


Image 13 – Excess extension cords



Image 12 – Master Box

PLUMBING ASSESSMENT

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent system, garage waste and vent system, storm system and natural gas. Municipal water services the Building, while the building sanitary is directed to a municipal sewer system. The Garage floor drains are directed to a gasoline and oil separator. From the separator the outlet is directed to an exterior drywell.

Portions of the system have been updated as part of building renovation and upgrade projects. The building plumbing systems could continue to be used with maintenance and replacement of failed components; however other non-dependent decisions will likely force the plumbing upgrade.

The plumbing fixtures are in fair to good condition. The bathrooms do not appear to meet current accessibility codes. Where new fixtures are installed, the new fixtures could be water conserving type fixtures.

Cast iron is used for sanitary, waste, vent, storm and garage waste and vent piping systems. Where visible the cast iron pipe appears to be in good condition. Smaller pipe sizes appear to be copper. In general, the drainage piping can be reused where adequately sized for the intended new use.

FIXTURES

The water closets are mostly wall hung, vitreous china, with either manually operated flush valves or battery powered sensor flush valves. The water closets in the recent addition are floor mounted tank type fixtures. (Image 1)

Lavatories are wall hung or counter mounted vitreous china. The lavatories have hot and cold water, dual handle faucets. Some fixtures have been retrofitted with mixing metering faucets with push button handles. (Image 2)

The drinking fountains are stainless steel, recessed units which may not meet current accessibility codes. (Image 3)

The service sinks are wall mounted, cast iron units. The faucets are equipped with vacuum breakers.



Image 1 – Tank Type Water Closet



Image 2 – Wall hung Lavatory

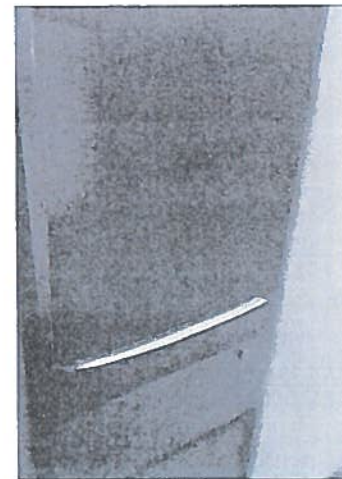


Image 3 – Drinking Fountain



Image 4 – Kitchen Sink

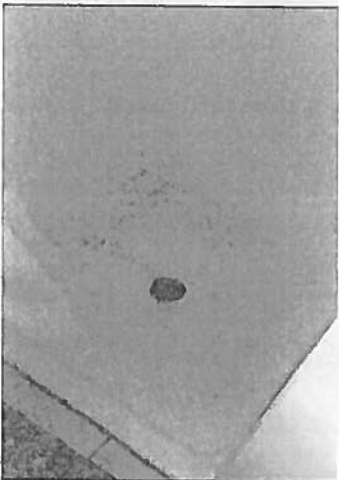


Image 5 – Shower Base



Image 6 – Emergency Eyewash

The Kitchen sink is stainless steel, drop-in type with a hot and cold water faucet and vegetable spray. (Image 4)

The showers are acrylic enclosures with molded stone bases. The shower mixing valves are standard thermostatic and pressure balancing units with standard 2.5 gallon per minute shower heads. (Image 5)

There is an emergency eyewash in the Garage with is piped with cold water only. Current ANSI standards require tempered water to emergency fixtures. (Image 6)

Penal fixtures are wall mounted, stainless steel water closets with remote pushbutton flush valves located outside of each of the cells. There is a service sink in the passage between cells for handwashing purposes. (Images 7, 8, 9)

There are exterior wall hydrants located on the building perimeter. The wall hydrants do include vacuum breakers.

WATER SYSTEMS

The domestic water service is located in the Storage Room in the Basement. The service is 2" in size and includes a water meter. The main domestic cold-water distribution is 2" in size. (Image 10)

Piping, where exposed, is copper with sweat joints. The majority of the piping is insulated but not labeled. Insulation is missing in some areas, including the water heater. Isolation valves are either ball valves or gate valves. The ball valves appear to be in good condition, where the gate valves should be replaced. The valves do include identification tags in most locations.

The building domestic hot water is generated through a gas-fired storage tank type water heater. The water heater has a 50 gallon capacity and 40,000 Btu input of gas. The hot water system is recirculated by a small recirculation pump. There is no expansion tank on the system, and no master mixing valve.

The water heater is in good condition, but is inefficient. (Image 11)

GAS

The gas service for the building is an elevated pressure line with a regulator, gas meter for the building. Natural gas supplies the heating equipment, Kitchen cooking equipment and domestic water heater. (Image 12)

Gas piping is black steel with screwed joints and fittings.

DRAINAGE SYSTEMS

Cast iron is used for sanitary and garage drainage. Piping and fittings are hub and spigot. Where visible, the cast iron pipe appears to be in good condition. Smaller pipe sizes appear to be copper.

There are 3 floor drains in the Garage which are directed to a gasoline and sand interceptor. From the outlet of the interceptor, the outlet is directed to a drywell. The garage drains were covered by gym mats.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use.

STORM SYSTEM

The Equipment Room in the Basement includes a simplex sump pump, which is picking up 2 Basement floor drains. The storm piping is copper with soldered joints. The sump pump should be replaced.

RECOMMENDATIONS

- Provide new high efficiency low-flow plumbing fixtures throughout.
- Provide mixing valve to deliver tempered water to emergency eyewash.
- Video tape all buried drainage piping and repair/replace sections of pipe and/or any leaks.
- Replace domestic water heater to serve the plumbing fixtures requiring hot water. Provide thermostatic mixing valve and expansion tank.



Image 7 – Penal Water Closet



Image 8 – Remote Flush Valve

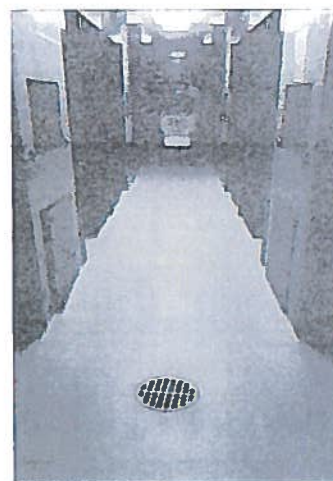


Image 9 – Passage Sink

- Replace all gate valves with new full port, brass ball valves.
- Replace sump pump.

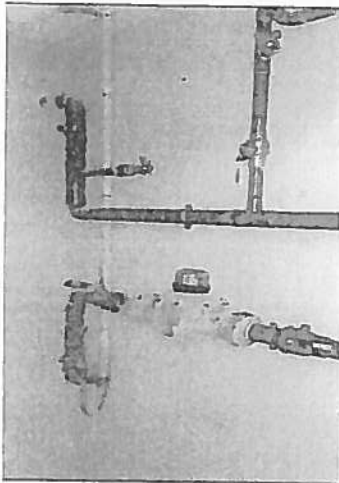


Image 10 – Water Meter

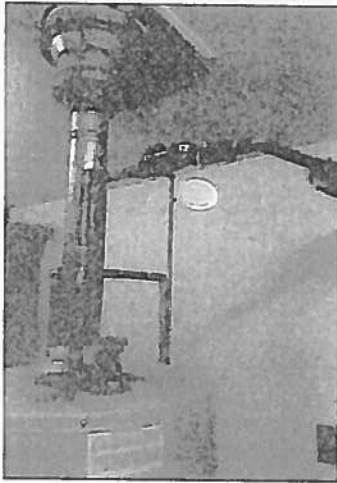


Image 11 – Water Heater



Image 12 – Gas Meter

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 new building or existing building over 7,500 square feet that undergoes major alterations or building addition must be sprinklered.

As the site is supplied by municipal water, a flow test will need to be performed to determine if a fire pump will be required to sprinker the building.

RECOMMENDATIONS

- Provide automatic sprinkler system throughout the existing building and any additions.
- A dedicated fire service form the municipal water supply is required.
- Conduct a hydrant flow test to determine adequate municipal water supply.



October 1, 2015

Mr. Roberto Fitzgerald
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
Police Station, Marshfield, MA

Dear Mr. Fitzgerald:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for limited hazardous materials determination survey at the Police Station, Marshfield, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

A handwritten signature in black ink, appearing to read "Ammar M. Dieb", is written over a horizontal line.

Ammar M. Dieb
President

UEC:\215 309\Police Station Report.DOC

Enclosure

**REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
POLICE STATION
1639 OCEAN STREET
MARSHFIELD, MASSACHUSETTS**

PROJECT NO: 215 309.00

Survey Date:
September 17, 2015

SURVEY CONDUCTED BY:

**UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 BREWSTER ROAD
FRAMINGHAM, MA 01702**

1.0 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 Police Station, Marshfield, MA.

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

The police station was constructed in 1978 and has undergone several renovations. No records were found for review to determine/verify if ACM was removed.

Information included in this report was based on a limited investigation performed by UEC. It is recommended 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.

2.0 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. Roofing materials appears to be new.
2. Caulking on exterior doors was assumed to contain asbestos.
3. It appears that all windows are new.
4. Wall cove base and glue were assumed to contain asbestos.
5. Textured ceiling plaster was assumed to contain asbestos.
6. Wallboard and glue daubs were assumed to contain asbestos.
7. Joint compound was assumed to contain asbestos.
8. Grey 12" x 12" vinyl floor tiles and mastic were assumed to contain asbestos.
9. Vinyl floor tiles and mastic on stairs were assumed to contain asbestos.
10. Various types of vinyl floor tiles and mastic were assumed to contain asbestos. Multiple layers were observed.
11. Caulking on interior doors was assumed to contain asbestos.
12. Popcorn ceiling plaster was assumed to contain asbestos.
13. Insulation on valves was assumed to contain asbestos.
14. Glue daub on shooting range back walls was assumed to contain asbestos.
15. 1'x 1' Ceiling tiles were assumed to contain asbestos.
16. Underground sewer pipe was assumed to contain asbestos.

17. 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.
18. 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.
19. Visual inspection of various equipments 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 equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill.
20. Caulking materials were assumed to contain PCB's.

COST ESTIMATES:

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

| Location | Material | Approximate Quantity | Cost Estimate (\$) |
|-------------------------------------------------------------------------------|------------------------------------------|----------------------|--------------------|
| Police Station: | | | |
| Various Locations | Vinyl Floor Tiles and Mastic | 2,500 SF | 12,500.00 |
| | Textured Ceiling Plaster | 5,000 SF | 25,000.00 |
| | Wallboard and Glue Daubs | 500 SF | 2,500.00 |
| | Joint Compound | 25,000 SF | 50,000.00 |
| | Caulking on Interior Doors | 500 LF | 10,000.00 |
| | Popcorn Ceiling Plaster | 2,000 SF | 20,000.00 |
| | Insulation on Valves | 50 LF | 500.00 |
| | Hidden ACM | Unknown | 5,000.00 |
| | Miscellaneous Hazardous Materials | Unknown | 5,000.00 |
| Shooting Range | Glue Daubs on Walls | 50 SF | 500.00 |
| Emergency Center: | | | |
| Various Locations | Vinyl Floor Tiles and Mastic | 200 SF | 1,000.00 |
| | Textured Ceiling Plaster | 250 SF | 1,250.00 |
| | 1'x 1' Ceiling Tiles | 500 SF | 2,000.00 |
| | Miscellaneous Hazardous Materials | Unknown | 2,500.00 |
| Exterior | Caulking on Doors | 200 LF | 1,000.00 |
| | Transite Sewer Pipes | Unknown ¹ | 10,000.00 |
| | Damproofing on Exterior/Foundation Walls | Unknown ¹ | 75,000.00 |
| PCB's Remediation ² | | | 5,000.00 |
| Estimated costs for ACM Inspection and Testing Services | | | 5,000.00 |
| Estimated costs for PCB's Testing and Abatement Plans Services ² | | | 15,000.00 |
| Estimated costs for Design, Construction Monitoring and Air Sampling Services | | | 31,250.00 |
| Total: | | | 280,000.00 |

¹: Part of total demolition and Excavation.

²: Should results exceed EPA limit.

3.0 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.

