



Municipal Building Conditions Assessment Report

Town of Southwick

Southwick, Massachusetts

August 2018

Tighe & Bond
Engineers | Environmental Specialists

Tighe&Bond

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SECTION 1

Section 1

Introduction

The Town of Southwick engaged Tighe & Bond to evaluate the existing conditions of five key town buildings and to develop a comprehensive Facilities Asset Management Plan that provides recommendations for improvements over a 20-year planning horizon (“Project”). This report summarizes the assessment and provides improvement recommendations for the five Town buildings.

1.1 Project Overview

The purpose of this assessment is to develop an asset management plan to identify and prioritize immediate and future maintenance and improvement needs for the following five Town buildings:

- Town Hall
- Fire Station
- Police Station
- Public Library
- Department of Public Works

This Facility Assessment will be comprehensive and consider current Building Codes, Accessibility, and Life Safety. It will consider site-related systems and amenities, building envelope and related components, and the architectural spatial and functional aspects of each building. Also considered; building structural systems and foundations, fire protection, plumbing, Heating, Ventilation, & Air Conditioning (HVAC), and electrical, including fire alarm and information technology systems.

The Facilities Asset Management Plan will provide the Town with the ability to prioritize expenditures, plan for and normalize expenditures over the planning period, as well as minimize operating and maintenance costs.

All recommended costs provided in this report incorporate a multiplying factor to predict the future cost value for projects at 5 years, 10 years, and 20 years from now. The time value of money was incorporated into the assessment; however, the future worth of the project may vary depending on economic stability.

All Building Code Evaluations presented in Appendix E are based on current building conditions, use, and occupancy, in conjunction with the latest edition of the Massachusetts State Building Code, 780 CMR and IBC 2015, to form a base document. All new work or projects associated with any of the Town’s buildings will require its own code evaluation relative to the intended project. The project’s design consultant will be responsible for the incorporation of the new work, revisions, and updates to the base document as necessary to maintain code compliance.

1.2 Project Scope

The evaluation and building assessment consisted of the following tasks:

1. Met with the Town of Southwick Department Officials, and Tighe & Bond engineers, to discuss the Building Facility Assessment. The meetings reviewed the project's goals, objectives, and methodology for the assessments. They also allowed the Town's Department Heads to review with the engineers the present building problems and concerns. The information was documented for the assessment.
2. Conducted on-site assessments of each building facility to evaluate their condition and identify needed repairs in the following disciplines:
 - Civil
 - Architectural
 - Structural
 - Fire Protection
 - Plumbing
 - HVAC
 - Electrical
3. The assessments were generally completed in two site visits with three follow-up visits to verify specific issues. The first three buildings assessed included, the Fire and Police Stations, and Public Library on December 17, 2018. The second site visit was made on January 8, 2019 to assess the Town Hall and the Department of Public Works. Subsequent site visits were scheduled throughout January and completed to accommodate structural assessments.
4. Obtained record drawings and building floor plans for each facility. See Appendix D for record drawings and floor plans. Building systems were assessed and major equipment items and systems were documented. Nameplate data, age, condition, and other available information were recorded.
5. Based on record plans and field findings, Tighe & Bond identified deficiencies associated with each building and included in Section 2, Field Findings.
6. Tighe & Bond hired Harold Cutler Consultant to perform building code evaluations for each of the five Town buildings. Facility and code deficiencies were identified to evaluate the feasibility of the proposed upgrades to each building.
7. Developed recommendations for replacing, rehabilitating, and maintaining assets. See Section 3 for recommendations for improvements.

1.3 Service Life of Building Systems, Components & Equipment Assets

The condition assessment was based upon visual inspection, age of the building, building systems and components, equipment, structure, known deficiencies, energy efficiency, and regulatory concerns. In addition to drawing upon Tighe & Bond's experience, we considered equipment manufacturer recommendations and guidance from professional organizations to determine the expected remaining service life. The Service Life Table presented in Appendix B summarizes the expected equipment life for various types of equipment.

Note that some equipment has longer, or shorter, operating lives depending upon the quality of the original equipment and installation, the specific environment, service conditions, and operation and maintenance practices.

1.3.1 Site/Civil Components

The following summarizes the expected service life for the major civil components found in Southwick's five key town buildings.

1.3.1.1 Pavement Surface

Characteristics of a paved surface affect safety, comfort, and durability. A paved surface can have varying characteristics: high severity cracking and/or potholes, an immediate need for repair, a surface with minimum or no distress found, or little to no need for repair.

The typical life expectancy of an asphalt parking lot subject to New England weather conditions is up to 20 years with proper maintenance. Proper rehabilitation treatments include crack sealing, pavement overlay, mill and overlay, and full depth reconstruction.

Crack sealing is a maintenance technique used to repair cracks in pavement surfaces. A yearly schedule of crack sealing is best to prolong the life of an asphalt surface. Pavement properly maintained by crack sealing can increase serviceability 1 - 4 years.

Mill and overlay involves the removal and replacement of the top layer of asphalt, usually 2 inches. This repair option is suitable for asphalt surfaces that have a sound foundation but need some rehabilitation work on the uppermost layers. Mill and overlay can increase the design life of asphalt pavement by 8 to 12 years while maintaining the same overall pavement height.

Full-depth pavement reconstruction typically provides the best pavement repairs but is also the most expensive. Full-depth reconstruction is frequently recommended when base deformation and heavy cracking of the existing pavement are observed. The life expectancy of full-depth pavement reconstruction is 20 to 30 years.

1.3.1.2 Site Accessibility

Site accessibility should allow for continuous flow of traffic and safe pedestrian pathways, and also provide appropriate signage. This section assesses pedestrian safety including safe crossing areas, clear indication of usage, sharp delineations, protective buffers, and site lighting. Proper pedestrian safety and traffic flow satisfies regulatory standards for site accessibility.

1.3.1.3 Architectural Access Board (AAB) Compliance

Commercial building sites are regulated by the Architectural Access Board (AAB). The AAB requires public buildings and facilities to be accessible and safe for persons with disabilities. The enforcement to make public buildings accessible to people with disabilities was established in 1996 by the Board. These regulations are listed in Section 521 of the Code of Massachusetts Regulations and apply to all buildings and facilities in the Commonwealth open to the public. This parameter identifies accessible routes from the parking lot to the building entrances.

1.3.1.4 Storm Drainage

The desired service life of a drainage system is generally a minimum of 50-years. The Estimated Material Service Life (EMSL) for a concrete pipe is 70 to 100 years, at least 50

years for cast iron and steel, and 50 years for plastic; however, this may also vary depending on structural deficiencies, maintenance techniques, and the need for infrastructure improvements.

1.3.1.5 Septic/Sewer System

A septic system receives, treats, and disposes of wastewater from a building while a sewer system receives and transports wastewater to a treatment facility. Septic systems and sewer systems can be affected by structural deficiencies, lack of maintenance, and the need for infrastructure improvements.

The average design life span of a sewer system is 50 years; however, this may vary depending on the type of pipe, soil characteristics, and installation methods. The Estimated Material Service Life (EMSL) for a concrete pipe is 70 to 100 years, at least 50 years for cast iron and steel, and 50 years for plastic. Pipe design life may vary depending on structural deficiencies, maintenance techniques, and the need for infrastructure improvements.

A properly operated and maintained septic system should last at least 20 years.

1.3.2 Architectural

The following summarizes the expected service life for most of the major materials, components, systems, and finishes making up the architectural systems and components in Southwick's municipal building facilities.

1.3.2.1 Building Exterior Envelope

The exterior building envelope comprises the exterior wall assembly, roofing and drainage system, and building foundations.

The exterior wall assembly may include masonry walls, wood framed walls, or metal building structures. Masonry walls have by far the longest service life. Solid masonry wall assemblies, if properly constructed and maintained, will last 100 years or more. Newer masonry cavity wall assemblies consisting of brick veneer, air space, insulation, and CMU back-up are equally well suited to last 50 to 100 years or more if properly executed and maintained.

Wood framed walls, if properly constructed and maintained, have a service life greater than 50 years, with other historical structures lasting well beyond that, depending on materials, installation, and degree of maintenance.

Metal building systems are typically suited to pre-engineered structures with set modular configurations; they are quick to assemble, relatively inexpensive to construct. These systems typically consist of concrete foundation and slab with steel bent frames, sub-girt wall framing, purlin roof framing and corrugated metal siding and roofing panels. Depending on the quality of system used and regular maintenance, metal building assemblies should last 40 to 60 years.

Roofing system life expectancies vary by material and system type. Asphalt shingle roofing varies between 20 to 30 years and is an effective and inexpensive roofing system.

Slate Roofing systems vary in life expectancy depending on quality. An S1-Slate is rated at 75 years and may last upwards of 200 years. Typically, an S1 slate is used in North America. S2-Slate is rated for 40 to 75 years and S3 is rated for 20 to 40 years. Service

life of slate roofing depends on quality of overall system products, and installation. For example, 50-year fasteners and 100-year roofing will yield a 50-year roof.

Membrane Roofing systems are common applications for buildings and tanks. Membrane roofs are most commonly made from thermoplastic (PVC or TPO), ethylene propylene diene terpolymer (EPDM), or modified bitumen. The service life of PVC & TPO is approximately 10 to 20 years, EPDM is approximately 15 to 25 years, and modified bitumen is 20 years. Galvanized metal roofing standard fluoropolymer painted finish typically has a service life of approximately 20 years while the roofing system itself has between 40 to 70 years, depending on material and installation.

Most gutters installed today are made of aluminum or steel while older buildings have gutters made of copper. Aluminum and steel gutters have a life expectancy of 20 years while copper gutters have a life expectancy of 50 years or more. Since downspouts experience less wear and tear than gutters, aluminum and steel downspouts may last 20 years. Copper downspouts can last up to 100 years before needing to be replaced.

Concrete footings and foundations can last a lifetime, assuming they were properly built; but generally, concrete footings, foundations and slabs have service lives exceeding at least 100 years.

1.3.2.2 Building Openings

Building openings include entrance doors and windows. Entrance doors have a service life of 30 to 100 years, including aluminum, wood, and steel doors. Door hardware will last the life of the building, depending on quality. Last, garage doors have a service life of 20 to 25 years and garage openers have a service life of 10 to 15 years.

Window assemblies are typically warranted for a period of 10-years. Service life depends on material type and quality of product. Consequently most insulating glass units are warranted for a period of 10-years. After ten years, the gases used between panes typically evacuate. The perimeter seals forming the insulating glass unit typically begin to fail. This becomes evident with condensation or cloudiness between the panes of glass making up the insulating glass unit.

Typically, most paints provide a service life of 15 to 20 years while sealants have service lives between 5 and 10 years. Sealants are most often the weak links in any wall or opening assembly. Routine inspection and maintenance are required.

1.3.2.3 Building Interior

The building interior is made up of interior wall assemblies, interior openings, interior finishes, flooring, ceilings, and interior furnishes and building foundations.

Interior wall assemblies, including masonry walls, gypsum board partitions, and operable partitions are designed to last the life of the building. Interior openings including doors, door hardware, and windows can also last the life time of the building.

Interior finishes are basically decorative. They provide a finished product for the interior of a building. Interior finishes will last 10 years or more depending on quality, use, and routine maintenance.

Many types of flooring are built to last the lifetime of the building depending on proper installation and daily maintenance. Ceramic tile, quarry tile, terrazzo, and wood strip

flooring are designed to last more than 75 years while vinyl composition tile, rubber tile, carpet and linoleum are expected to last less than 25 years.

Walls and ceiling last the full lifespan of the building. Repainting of walls is required every 10 to 15 years. Repainting can vary based on surface preparation prior to applying the paint as well as climate control within the building.

Building furnishings include appliances and plumbing fixtures. The average life expectancy of most appliances is 10 years. The service life of plumbing fixtures is provided in section 1.3.5.2.

1.3.3.4 Egress Components

The life expectancy of egress components depends on safety requirements and building occupancy. Exit passageways and stairways are the most common means of egress. Exit signs and exit discharge lighting must be provided for a minimum of 90 minutes to meet National Fire Protection Association (NFPA) codes and standards. Most exit signs and emergency lighting are operated by batteries with a 5 to 7-year life expectancy.

1.3.3.5 Accessibility Accommodation, Components & Compliance

Accessible entrances, routes, signage, restrooms, and drinking fountains are required through the ADA and AAB for all public buildings. The minimum width for wheelchair passage shall be 36 inches and a turning space of a 60 inch diameter or T-shaped space. Reach ranges for a person in a wheelchair shall not exceed a forward reach height of 48 inches, a side reach height of 54 inches, and a side reach over an obstruction with a maximum height of 24 inches. Additional compliance standards are provided in 521 CMR. 521 CMR codes regulate access for persons with disabilities for building in the Commonwealth of Massachusetts.

The service life of accessible routes, signage, entrances, hardware, plumbing furnishes, and drinking fountains are given the same service life as their standard components.

All multi-story buildings are required to provide a passenger elevator compliant with 521 CMR 28. Elevator systems are expected to last 20 to 25 years. However, the industry standard recommends modernizing elevators after 20 years, which is when most elevators reach the end of their life cycle costs.

1.3.3 Structural

Structural components are expected to be serviceable for the life of the building. Exposed structural components are expected to be serviceable for the life of the building with proper maintenance. Components with painted finishes need to be maintained. The building envelope protecting interior structural components is expected to be maintained to prevent system degradation.

1.3.4 Fire Protection

Building fire protection systems are designed to help protect the building and its occupants during a fire. The maintenance of fire protection systems is a very important part of the building's safety plan. Generally, sprinkler heads should be replaced every 50 years. "Fast response" heads should be replaced every 20 years. Gauges and valves should be replaced every 5 years by a licensed fire sprinkler technician to determine the correct calibration. NFPA requires owners to have a licensed technician to inspect the fire protection system annually to keep the building safe and up to code.

1.3.5 Plumbing

The life expectancy of plumbing equipment is age-driven. Certain fixtures and components have different lengths for their useful lives.

1.3.5.1 Equipment

Plumbing equipment includes water heaters, floor drains, and roof drains. The life expectancy of water heaters & associated equipment is 10 to 15 years. Floor drains and roof drains have a lifespan of over 30 years.

1.3.5.2 Fixtures

Plumbing fixtures include, water closets, lavatory sinks, urinals, urinal flushometers, kitchen sinks, service sinks, faucets, emergency showers, and drinking fountains. Water closets, lavatory sinks, cast iron service sinks, and urinals have a lifespan of 25 to 30 years. Stainless steel kitchen sinks, urinal flushometers, all faucets, and drinking fountains have a life expectancy of 10 to 15 years. Last, emergency showers have a lifespan of 20 to 25 years.

1.3.5.3 Piping Systems

Copper water piping systems have a life expectancy of up to 70 years, cast-iron waste pipe (above and below ground) has a life expectancy of 50 to 60 years, and black steel pipe has a life expectancy up to 75 years.

1.3.6 HVAC

The expected remaining useful lives of HVAC equipment is age driven. Considerations such as the criticality of the facility, location/remoteness of the buildings, and frequency of patrol of the facilities also factor into prioritization of equipment replacement. For example, a remote facility inspected once per week, where there is one unit-heater and the risk of freezing is unacceptable, may receive higher priority for replacement over a facility inspected more frequently or has multiple unit heaters.

ASHRAE performed studies to determine service life of typical HVAC equipment. The values given depend on duty cycle, exposure to corrosive elements and maintenance but present a useful guidance to determine the state of systems.

Electric unit heaters have service life expectancies of 10 to 15 years. External louvers and fan life are about 15 to 25 years and depends on the fan type. Ductwork is expected to last for 20 to 30 years and associated actuators for 15 to 30 years. Residential type dehumidifiers can last 2 to 8 years.

1.3.7 Electrical

As electrical equipment ages, the equipment becomes obsolete and repair parts are no longer available off the shelf. As a result, a failed part may need to be replaced with a refurbished part, if available, or a custom part; and it could possibly take several weeks to either track down a suitable refurbished part or build a replacement part. In addition, replacement parts may not fit the way the original part did, which could lead to problems or even failure down the road.

Successful operation of switches and breakers is critical to the safe operation of a facility. If a circuit breaker does not open when there is a short circuit on the line it is protecting, serious equipment damage and possibly a fire or explosion could result.

As such, considerable risk is involved in the “wait and see” approach for aging electrical equipment. Only proactive replacement of electrical equipment will provide assurance of long-term reliability. As a result, recommendations for electrical equipment replacement are typically age driven, and damp atmospheres may further reduce the recommended service life for a particular piece of equipment. Replacement of electrical equipment should be given the highest priority at critical facilities. In addition, the recommendations in the condition assessment account for improvements that can be made to the electrical systems in the areas of operation, maintenance, or energy efficiency.

Panelboards and transformers have typical service life expectancies of 30 years. Electrical wiring, under optimum conditions, has a typical life expectancy of 50 years. Incandescent and fluorescent light fixtures have a useful service life of about 30 years and are less efficient than LED fixtures. LED lighting fixtures are now the preferred industry standard because LED lights reduce electricity usage and maintenance costs throughout the life of the fixture.

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SECTION 2

Section 2

Field Findings

On December 17, 2018 and January 8, 2019 Tighe & Bond conducted facility inspections to inventory assets and assess conditions at five of the Town's Municipal Buildings. The existing site conditions were assessed based on the criterion defined in section 1. The following facilities were inspected:

- Town Hall
- Fire Station
- Police Station
- Public Library
- Department of Public Works

Narratives discussing our findings for these facilities are provided in Sections 2.1 through 2.7. Appendix A contains tables presenting the asset inventory list by discipline with recommended improvements. Appendix B contains typical Life Expectancies of Building Systems and Components. Appendix C contains photographs taken during the site visits. Asset identification codes used to identify assets and recommendations throughout this report are assigned as follows:

- Each identification begins with a facility code:
 - Town Hall: TH
 - Fire Station: FS
 - Police Station: PS
 - Public Library: PL
 - Department of Public Works: DPW
- An asset type designation follows the facility code
 - C for Civil/Site (Facility Name Code TH-C)
 - A for Architectural
 - S for Structural
 - FP for Fire Protection
 - P for Plumbing
 - H for HVAC
 - E for Electrical
- A 3-digit number follows the asset type designation. For example, the table below shows definitions for each civil asset series codes (i.e. TH-C400 would designate a drainage network asset).

Table 2-1 Asset Series Identification

Civil Asset Series Code	Civil Asset Type
C100	Pavement Surface
C200	Site Accessibility
C300	AAB Compliance
C400	Storm Drainage
C500	Sewer/Septic System

- Recommendations are referenced with the Asset ID followed by a one-digit task identification number. For example, TH-C101 would designate a recommendation for a Pavement asset at the Town Hall.

2.1 Town Hall

The Town Hall was originally constructed in 1928 as Southwick High School, with an Art Deco design aesthetic. The building was substantially renovated in 1996 for the Town Offices, (approx. 12,820 SF) and later, in 2012 to accommodate the Council on Aging Senior Center (Approx. 1,800 SF). The building has 3-levels including basement, and approximately 41,820 SF total area. The construction is generally solid masonry with brick veneer. The newer addition(s) are cavity wall construction with brick veneer and concrete masonry unit (CMU) back-up. The 1996



Renovations altered the low slope roof typically associated with a structure of this size and incorporated a steep-slope roof using a combination of wood trusses and stick-framing, finished with asphalt shingle roofing. The completed renovation upgraded the entire interior, creating a new basement storage room under the auditorium floor area, provided accessible toilet rooms and elevator, and outfitted all floors with department offices to serve their needs. The building exterior masonry envelope was restored, and new entrances and fenestration installed, meeting energy code compliance for that time. In general, the building is in good condition.

2.1.1 Civil/Site

The facility has paved entrance and exit driveways off College Highway (Route 10). Parking areas are provided north, east and south of the building. The exit driveway is in substandard condition with moderate cracking and pavement patching observed. Conversely, the entrance driveway and parking areas are in standard condition with minimal hairline cracking observed. The typical service life of a well-designed, well-built and well-maintained asphalt parking lot ranges from 15 to 20 years. A mill and overlay of the entrance driveway and parking lot area are recommended within the next 5 years while full depth reconstruction is recommended within the next 11 to 20 years (TH-C100). Full depth reconstruction is recommended within the next 5 years for the exit driveway area (TH-C101). Crack sealing maintenance is recommended annually for all paved areas.

The Town Hall is a multi-use building for town personnel and community meetings. The driveway entrance circulates vehicle traffic one-way around the town hall in the clockwise direction. Parking is provided to the north, east, and south perimeters of the town hall. The parking on-site is well utilized for daily use; however, during town voting sessions the parking is insufficient. The Town should consider purchasing additional land from an adjacent property owner, expanding the parking lot behind the building or adjacent to Prifti Park, or moving voting to the high school to accommodate for additional parking spaces. The Town should investigate further to understand which option is the most economical and feasible solution (TH-C202).

Site accessibility from the parking lot to the building entrances is adequate with clearly marked signage and well-located sidewalks and crosswalks. It is recommended to repaint parking lot striping as an annual maintenance practice (TH-C201). The parking lot and exterior building are well lit as the Town recently began converting to LED light fixtures. It is recommended to complete LED upgrades to the facility (TH-C200).

Under 521 CMR 11, the facility does not comply with the regulations mandated by the AAB to provide safe and accessible walkways and ramps. Minor upgrades to the facility include but are not limited to joint sealing concrete/asphalt transitions routinely, installing compliant concrete wheelchair ramps, and extending the sidewalk to the drinking fountain within the playground area (TH-C300).

Stormwater management infrastructure for the Town Hall includes underground roof drains, two catch basins on the south side of the building and a corrugated HDPE culvert that discharges to a wooded area south of the basketball court. The catch basins collect untreated parking lot run-off. The below-grade outlet extensions either daylight downhill from the building structure or connect to the existing storm drain at the south side of the building. It is recommended to perform catch basin cleanings (TH-400) and install storm drain filters to remove containments from the stormwater runoff collected in the catch basins (TH-C401). Additional stormwater management practices should be evaluated for the paved areas north of the municipal building where collection appears inadequate.

The Town Hall Building is served by the Town sewer system. One sewer manhole was observed on the southwestern perimeter of the parking lot area. The sewer service appears to be maintained; however, further investigation is required to determine the current condition (TH-C500). Replacement of the sewer lateral may have significant cost implications if investigations reveals damage to the septic pipe.

2.1.2 Architectural

Architectural components observed during the field visits include the exterior building envelope, the building interior, building egress components, accessibility, and building occupancy. The architectural observations from the site visits are noted in sections 2.1.2.1 to 2.1.2.5.

2.1.2.1 Exterior Building Envelope

The building consists of a combination of solid brick masonry wall construction as well as newer cavity wall construction, comprised of brick veneer with CMU back-up. The brick masonry is laid up with "running bond" and raked mortar joints. The brick is an extruded brick with a velour texture. The front entrance of the 1928 building appears to have limestone (or pre-cast concrete) entablature panels and entrance door surrounds articulated with Art Deco period detail. Limestone would have been a traditional material used for the building entablature and door surrounds, although pre-cast concrete or cast-

stone were common economical substitutes. There are other varying trim components for doors and window sills in cast-stone or concrete and some windows have traditional rowlock brick sills, others incorporate soldier course sills. The foundation walls are concrete and finished with a chamfered transition to the masonry veneer and coated with an elastomeric finish. In general, the original 1928 exterior masonry walls are in good condition with localized areas exhibiting problems requiring repair. The 1996 building addition is in good condition but requires similar masonry repointing and repairs at the masonry window sills. General observations of sealant joints indicated failure due to age as well as installation problems. The following are observations during the site assessment:

- Brick masonry panels below windows have cracked brick and some window sills have cracked brick. (TH-A101, see photo A1 and A2)
- Mortar joints in brick masonry, cast-stone or concrete, sills have failed and require cutting and repointing. (TH-A101, see photo A3 and A4)
- Brick masonry walls appear to require additional cutting and pointing in select areas, most typically under windows.
- Sealant joints observed have failed and need replacing. (TH-A103 and TH-A104, see photo A5 and A6)
- Some of the Limestone entablature panels located at the building front entrance have spalling faces and appear to have been previously repaired. The repairs are failing and need to be repaired. (TH-A102, see photo A7)
- The elastomeric coating applied over the "stone" components and foundation walls will need to be removed and recoated because of areas of adhesion failure. (See photo A8)
- Expansion/Control sealant joints in foundation wall have failed and need replacement.
- Foundation wall cracks require repair prior to recoating with elastomeric coating.
- Elastomeric wall coating is delaminating in some areas of the foundation wall and needs to be repaired or replaced.

The original 1928 building had low-sloped roofs of tar and gravel. The 1996 renovation constructed a new wood truss and stick-framed roof framing assembly with new wood deck over the entire building. The roof construction comprised new 30-year asphalt shingle roofing over roofing underlayment and incorporated built-in gutters, conductor boxes, and down spouts to accommodate stormwater drainage. The stormwater is collected at grade in storm water management system. Painted aluminum edge-metal copings, and fascia, trim out the building perimeter. The attic insulation is located within the top chord of the truss with polyethylene vapor barrier. The attic is essentially a warm space containing HVAC equipment. The 2012 renovations and additions incorporated a new low-slope roof area with PVC membrane roofing over rigid insulation and concrete roof deck. This assembly was provided in preparation for future second story addition. The following are observations during the site assessment:

- Roofing is essentially 23-years old. (30-year shingles were originally specified). (MB-A107)
- Roof leaks are evident at some eave locations and appear to be associated with the built-in gutter. (TH-A108)
- Some edge-metal and fascia trim details are poorly done and need replacement. (See photo A9)
- Low-sloped roofing appears to be in good condition. (7-years old)

Building fenestration comprises painted aluminum flush-glazed storefront framing and integral awning-type vent units with insulating glass. Some at-grade openings incorporate extended metal trim around the opening exterior and interior, including head, jamb, and sill. Building Entrances consist of both aluminum storefront, and paneled wood doors with insulating glass. The College Highway elevation incorporates traditional wood paneled doors and aluminum-clad wood, replacement windows installed to match original fenestration, required by the Historical Commission. The building is equipped with a garage and sectional overhead doors. The following are observations during the site assessment:

- Exterior perimeter joint sealant has failed. (See photo A10)
- Window glazing gaskets for flush glazed units are aged and loose and require replacement. (TH-A117, see photo A11)
- Some insulating glass is fogging, indicating insulating glass seal failure.
- Sill flashing, jamb and head extension flashings are poorly installed. Sealant has failed, and flashing joints are open to the weather. (TH-A118)
- Existing paired wood entrance doors require repair, refinishing, and new perimeter weather stripping. Existing astragal binds during closing, doors in general difficult to operate.
- Existing aluminum-clad wood windows are in good condition. Maintain exterior perimeter and field sealant joints. Note: Window replacement may be required in its entirety if insulating glass seals fail, or window breaks. This type of replacement window is not easy or capable of being easily repaired.
- Overhead door appears to be in good operational condition.
- Building is equipped with an accessible entrance and it is in good condition.

2.1.2.2 Building Interior

The interior renovations conducted in 1996 were comprehensive and substantial. The interior was updated to code at that time and much of the work appears to comply with current code with minor exceptions that will be discussed further on in the report. The ground level consists of some office space for the Council on Aging and related program space for the Senior Center including game, fitness, multipurpose spaces, Café, Dining Room and Kitchen. The support spaces include accessible toilet rooms, Maintenance Office, mechanical and electrical rooms, storage, and Emergency Management Spaces.

The Main floor is accessible from grade at the street entrance, and accessible at the lower grade level entrance by means of an elevator. The Main floor houses the Town's Municipal offices including the Selectmen, Accounting, Assessor, Clerk, Community Development, Building Department, Department of Public Health, and Auditorium. The interior of the building is in good condition with only localized areas exhibiting problems with moisture. The following are observations noted during the site assessment.

The interior wall assemblies consist of painted and unpainted brick, CMU masonry, concrete, as well as metal and wood stud framed walls. The concrete foundation walls are generally painted concrete, with related brick and CMU masonry for infill walls and partitions. Some areas utilize metal stud framing with gypsum wall board to form offices and provide interior finished space. The painted masonry is covered with a multiple-coat spray applied durable finish which imparts the appearance of wall covering. This coating is typical for stair shafts, corridors, concrete and masonry walls. Some gypsum board walls are treated in similar manner where they abut to existing masonry and concrete walls.

The interior openings are primarily hollow metal door frames with solid core wood doors. Some solid wood doors and frames were used strategically at the main entrance lobby and auditorium.

Most of the finishes observed were in good condition with only a few areas requiring repair. The lower ground level showed evidence of moisture penetration along the South and West walls, with blistering and peeling paint coatings and damaged gypsum wall board at the base. (See photo A12) The moisture appears to have started lifting floor tile in the same local area, as evidence by some hollow sounding tile. Finishes are basically cosmetic. They provide a finished product relative to the interior of a building. Interior finishes will generally last quite long depending on use and routine maintenance.

Flooring materials are generally in good condition. Flooring materials consisted of the following:

- Quarry tile: Building Entrances
- Ceramic Tile: Toilet rooms
- Vinyl Composition Tile
- Rubber stair treads & risers, and landings
- Wood strip flooring: Main Lobby, Auditorium, Multi-purpose Room

Wall materials consisted of the following:

- Painted gypsum wall board
- Glazed ceramic wall tile
- Quarry tile wall base
- Vinyl cove and carpet base
- Painted wood

Some door frames are provided with wood casing. The auditorium is articulated with painted wood trim and paneling.

Ceilings are in good condition with only a few areas showing evidence of water stains from leaks (See photo A13).

Interior specialties and furnishings are generally in good condition. Interior specialties and furnishings consisted of the following:

- Toilet Room Accessories: Toilet room accessories are in good condition
- Casework: Casework appears to be in good condition
- Appliances: Appliances appear to be in good condition

2.1.2.3 Building Egress Components

Stairs and corridors appear to be in good condition and code compliant. Guardrail with balusters, handrails, and railing returns and extensions comply. Exit signage is operational and clearly marked exits.

2.1.2.4 Building Accessibility: Accessibility Components & Compliance

Wood entrance doors from the main lobby to the auditorium space are designed to be accessible. The doors bind and are difficult to open and close relative to the opening force. Door operators are present, but don't always work well. The building is accessible with code compliant door hardware.

It appeared that the recessed drinking fountains on the main level don't provide for front approach access.

The building is equipped with a hydraulic elevator. The Town has commented that it requires more frequent service than originally installed. System upgrades are likely needed.

2.1.2.5 Building Miscellaneous

The building is well suited to its present use. The offices appear to be occupied with little room for expansion. The Town has requested that the area over the new multi-purpose room in the Senior Center be considered for a second floor. The Senior Center addition was supposed to be designed to accommodate a second floor. The area will be reviewed by the structural portion of the report for adequacy. Utilizing this floor area if possible, with a new second floor addition would create additional office space or light storage. The Council on Aging and its Senior Center appears to be active and provides useful services to Seniors. Its presence creates a dynamic place for the Town and maximizes the building's square footage. When the Senior Center out grows the present facility and requires a new standalone facility to service their client base, then the Town Hall would have additional space to expand its own services when required.

2.1.3 Structural

The structural components are in overall good condition. Masonry and concrete walls, the building foundation, and building entrances and routes were evaluated during the field visits.

2.1.3.1 Building Interior

Generally, the interior masonry walls are in very good condition. In the Emergency Operations Center room, it was noted that there is some minor cracking by the glass infill (MB-S201, see photo S1).

The majority of the deterioration of the existing concrete walls was noted in the basement. The foundation walls in the southwest area (see photos S2 and S3), the northwest area in the playroom (see photo S4), and the café area (see photo S5). The Town has mentioned that they have observed active leaks through the crack located in the café area in the past. These concrete deteriorations should be repaired to prevent further deterioration and to provide a smooth surface for repainting (MB-S101 and S102).

2.1.3.2 Building Exterior

The exposed areas of the exterior foundation walls exhibited various concrete deterioration from vertical cracking, minor scaling, to moderate spalls (see photos S6 through S8 and S13). Additional concrete spalling was noted at the emergency exit from the multi-purpose room addition, at the exterior concrete steps leading up to the Senior Center south entrance, and along the walkway/ramp around the railing posts. Concrete repairs are recommended at all these locations. (MB-S103, MB-S104, and MB-S105)

2.1.3.3 Building Miscellaneous

The Town is interested in adding a second floor above the multi-purpose room of the Senior Center which was added to the building in 2009. Based on the available drawings, the roof framing was designed for a live load of 20 pounds per square foot (PSF) and a snow load of 50 PSF. The roof framing consists of 16" deep joists; however, it is unclear what the exact size is because there were two alternatives in the design drawings that were available to us. A preliminary load calculation did verify that the joists are capable of supporting a total live load of 100 PSF. A complete structural analysis of the existing structure with the new loads would need to be performed in order to define the absolute loading that can be put on to the existing joists. Based on the preliminary load assumptions, the new addition would be able to be used for office space. The new addition would not be able to support any storage space because the minimum design load for light storage is 125 PSF.

2.1.4 Fire Protection

The fire protection system appears to be sufficient for the building. It is recommended to have a licensed professional come in to do a complete inspection of the building's fire protection system if this has not been performed within the last year.

2.1.5 Plumbing

The plumbing components are in overall poor condition. Plumbing components evaluated during the site visits included fixtures, floor drains, appliances, drinking fountains, a sewage ejector, a storage tank, hot water heater, and natural gas system.

All plumbing fixtures located in the restrooms appear to be original to the building. This includes lavatory sinks and faucets, water closets and their flushometers, urinals and their flushometers, hose bibbs, shower drains and valves, and floor drains. The vitreous china plumbing fixtures located in the restrooms, including lavatory sinks, urinals and water closets, have a life expectancy of 30-35 years and therefore should last another 7-12 years, approximately (TH-P201 thru TH-P208).

The majority of the plumbing fixtures located outside of the restrooms also appear to be original to the building. This includes service/janitors' sinks and faucets, handwash/kitchen sinks and faucets, drinking fountains, exterior wall hydrants, and all other floor drains located in janitor closets and mechanical room. Faucets, shower heads and valves, and flush valves have a shorter life expectancy of approximately 10-15 years and therefore, these fixtures are essentially past their useable life. If the fixtures still appear to be in good, working condition, they can remain for the time being but should be replaced in the next 1-3 years. Any leaking fixtures should be replaced immediately (TH-P201 thru TH-P208).

The service sinks should be replaced in the next 5-10 years, but the associated faucets should be replaced in the next 1-5 years as they appear to be reaching the end of their useable life and may begin malfunctioning (TH-P209 and TH-P210). The kitchen sinks should be replaced in the next 5-10 years, but the associated faucets should be replaced in the next 1-5 years as they appear to be reaching the end of their useable life and may begin malfunctioning (TH-P211, TH-P212, and TH-P213). The existing sink in Exam 310 should be replaced in the next 5-10 years, but the associated faucet should be replaced in the next 1-5 years as it appears to be reaching the end of its useable life and may begin malfunctioning (TH-P214).

Maintenance noted that the floor drains in the ground level Janitor's Closet were clogged. The floor drains should be removed and replaced immediately. An investigation should be performed into what is clogging the pipes and the blockage should be removed as well as any necessary repairs to the pipes if damaged at all. It is recommended to replace the floor drains with units that have sediment buckets to prevent debris from entering the sanitary system and causing blockages in the future (TH-P102, see photo P4).

A washer/dryer unit was added to the janitor's closet on the ground level and appears to be 5-10 years old.

An additional service sink was added to the general storage room on the ground level after the 1996 drawings were issued. However, judging by the condition of this sink, it was probably installed not long after 1996. The existing sink and faucet in General Storage 011 should be replaced in the next 1-5 years (TH-P215, see photo P3).

The drinking fountains have also reached the end of their useable life and should be replaced in the next 1-3 years as they have a life expectancy of 10-15 years (TH-P216 and P217).

It was noted that there appeared to be a sewage ejector on the property. Maintenance confirmed that it was located in the existing mechanical room and no longer in use and had been filled in previously.

There is a small electric water storage tank located in the Council on Aging's kitchen that appears to only be a few years old. Its sole purpose is to make high temperature hot water for a Hobart LX30H commercial dishwasher, located adjacent to the water heater. The water heater currently has its relief valve routed to the floor with no floor drain present.

The existing water heater is a Rheem-Ruud model located in the mechanical room and appears to be original to the building. The unit is gas-fired with atmospheric burner and a 50-gallon storage capacity. Storage temp is set to 140 degrees F. It is assumed that the associated equipment such as the recirculation pump, mixing valve and expansion tank are also the originals. The recirculation pump is set to maintain a hot water temp of 126

degrees F in the piping. The water heater needs to be replaced soon as it appears to be from the early-mid 1990's. The life expectancy for most water heaters is 10-15 years. It is best to be proactive in this situation and replace it before it fails and leaves the building with no hot water (TH-P101, see photos P1 & P2).

There is a natural gas system serving a 200 MBH RTU, a 1,300 MBH boiler, and 98 MBH water heater. Gas piping to the aforementioned RTU was added in 2009/2010. No additional measures are recommended at this time.

2.1.6 HVAC

HVAC components evaluated during the site visits included air conditioners, condenser units, air handlers, terminal units, heaters, and dehumidifiers.

The entry area on the ground level has hydronic cabinet unit heaters, either wall or ceiling mounted. There is a perimeter radiation loop along most exterior walls that are partially below grade.

There is a crawl space off the center stairwell. This space has a dirt floor, efflorescence on the concrete block east side wall, and visible moisture on the south end wall.

The janitor's closet under the center stairs is used for storage of cleaning chemicals. This area is not ventilated. It is recommended to install an exhaust fan.

There are dehumidifiers in Parks & Rec (off) and G2 Activities Rm (two of them, running and set to 30% RH). There is visible moisture damage on brick walls in northwest and southwest corners of room.

G2 Activities Rm has an auxiliary air handler with a 3-ton air-cooled condensing unit, located on grade on the north side of the building. It is recommended to replace the air-cooled condensing unit (ACCU-1) with high-efficiency unit that does not use R-22 refrigerant. G7 Emergency Operations Center has strings tied to the grilles as telltales for air movement. G14 Data Center has a portable cooling unit that is vented outdoors through G4 Café.

The kitchen in the Council on Aging area has a range hood, but the hood is not vented outside, and the fan does not work. The G4 Café has an electric range, but no hood. These areas should have proper hoods that are vented outdoors.

The Fitness Room in the Council on Aging is served by its own RTU with 7.5 tons of cooling, two compressors, and 200 MBH gas-fired heat. The unit was manufactured in 2012.

The garage has a ceiling-hung unit heater and is very warm despite the thermostat being set at 66 degrees F.

Several areas including corridors and stairwells, and a function room at the Council on Aging, have electric cabinet unit heaters with unit-mounted controls. Some rooms, such as the upper level corridor near the elevator, are very warm.

Cooling is from a McQuay ALP080C 80-ton air-cooled condensing unit, located on grade outside the northeast corner of the building. The unit was manufactured in 1997 and is at the end of its service life. This unit was converted from refrigerant R-22, an ozone-

depleting chemical that is no longer manufactured and will be commercially unavailable in 2020, to R-407C. This conversion results in slight losses of capacity and efficiency.

Heating is provided by an HB Smith cast iron boiler with two atmospheric burners, rated for a total capacity of 1,300,000 Btu/hr input natural gas. The unit was manufactured in 1997. The boiler is beyond its service life, a single unit does not provide redundancy, and the atmospheric burner can be sensitive to building pressurization. Replacing it with condensing boilers that have sealed combustion will improve efficiency, reliability, and safety.

A pair of 3-hp B&G inline pumps run primary/standby to circulate hydronic hot water in the boiler room. These are controlled by Schneider Electric variable frequency drives (VFDs) following a differential pressure sensor, with taps. It is recommended to locate this sensor farther out in the distribution piping to enable deeper cycling of the VFD, saving significant pump energy.

There is an air handler (AHU-1) with a 30-hp fan located in the attic between the old flat roof and the new sloped roof. Air distribution is variable air volume, and the supply fan is controlled by a VFD located in the basement. There is an issue with having such a long feeder between the VFD in the motor, as well as having a disconnect between the VFD and the motor, and the motor has been replaced at least once. The long feeder length is subject to losses and harmonic reflections (e.g. unit is noticeably warm to the touch) and stresses the motor. Disconnect is aft of the VFD, located near the AHU. This should be remedied immediately.

The location of the AHU-1 is difficult to access as ductwork and trusses make for a complex and difficult path. Original VFD and supply fan motor were abandoned in place. There is also a records storage room located directly below the AHU-1. Leaks from condensate or the hot water coil in the past have resulted in damage to the records. This has been addressed by installing a drain below the unit. If this air handler is to remain in its present location, the coils should be replaced in the next 5-10 years.

A sloped roof with wood truss construction was added above the old roof, which was built up with 4" polyisocyanurate insulation below sprayed-on roofing. This roofing was cut away in many areas for structural attachments, duct penetrations, and access to the ceilings below. The new attic space between the old roof and the new roof is conditioned space. The new roof is insulated with fiberglass batts between the roof joists. The poly vapor barrier is non-contiguous, with seams stapled and not taped, and has been breached and compromised in many areas. The rim joist is not sealed and has large visible air leaks in many areas. The poly vapor barrier is stapled over the rim joist in some areas, but not fastened to the parapet wall. In other areas the rim joist is exposed.

The ground level areas are scheduled for infrequent use (G2 Activity Rm has play group twice a week for 1.5 hours, the Game Rm is for employee exercise on break, G4 Café has occasional meetings), but temperatures are not set back. The Main Auditorium is used infrequently, but not set back. Ventilation is likely inadequate for large crowds.

The hydronic system was completely re-piped recently after neglected ethylene glycol turned acidic and perforated copper and steel piping. The boiler survived, as confirmed by a fluorescent penetrant test, but the entire distribution was replaced.

2.1.7 Electrical

The Town Hall's electrical service is a 208/120V, 400A, three phase service consisting of a utility disconnect switch outside the building, main disconnect switch inside the electrical room, main distribution panel (MDP), and various electrical panels. Backup power is provided via an outdoor Cummins standby generator and ASCO Automatic Transfer Switch (ATS).

The electrical equipment inside the building is in good condition. The generator and ATS are becoming old and unreliable, and are showing some signs of rust. The condition of the generator and ATS should be monitored for further damage, and should be replaced in the future. The utility disconnect switch is beginning to rust and should be replaced (see photo E1). A heat control switch in the building is damaged and should be replaced (see photo E2).

A data closet should be installed to protect and organize the exposed data and telephone equipment and cabling. Security for critical rooms throughout the facility could be improved by adding magnetic locks tied to the security system. Security throughout the building should be evaluated and magnetic locks should be installed as required. Magnetic locks should be added to the emergency response room if required. Site lighting levels are low. Wall mounted LED fixtures should be added to the building to improve site lighting around the building. Pole mounted fixtures should be added throughout the site to improve lighting levels around the parking lot and walkways. There is no surge protection device installed at the facility. A surge protection device of at least 300kA/phase to protect the electrical equipment throughout the facility.

An arc flash study has not been performed for this facility. Given the size of the service and type of equipment, an arc flash study is recommended if there is a possibility of energized work per NFPA 70E (2018).

2.2 Fire Station

The Southwick Fire Station is a 2-story rectangular structure of approximately 28,300 SF. The building was constructed in 1999 with an eclectic design aesthetic, reminiscent of "Romanesque Revival". The building is comprised of a simple rectangular form with a large hipped roof, and articulated with four, 2-story dormers with gabled masonry walls. The building is decorated using polychromatic brick and roofing shingles. The building plan has a bi-axial configuration with five apparatus bays occupying the center with flanking side bays containing support functions and office space. The second floor houses the administrative offices, work room, conference room, training room, staff locker rooms and sleeping quarters, day room, and kitchen. The conference room is adorned with an elliptical aluminum window. The kitchen/dining space has access to an exterior porch.



2.2.1 Civil/Site

The facility has an asphalt driveway in the front and the back of the fire station for heavy truck access. A shared driveway is located between the fire station and police station to allow access to the animal control building and rear entrances to the fire and police stations. Perpendicular parking spaces are located on either side of the shared driveway near the entrance/exit as well as behind the fire station. Additional parallel parking is provided along the shared driveway adjacent to the fire station. The front parking spaces are in adequate condition while the rear parking lot has overgrowth and moderate cracking, specifically at monitoring well locations and the southern area of the parking lot. The typical service life of a well-designed, well-built and well-maintained asphalt parking lot ranges from 15 to 20 years. At a minimum, the Town will need to mill and overlay the asphalt pavement surface at the fire station within the next 5 years (FS-C100). However, it is recommended to perform immediate full depth reconstruction along the heavy truck access route (FS-C101).

The site accessibility at the front of the building is adequate. Sidewalks are in good condition and provide pedestrian access from the front of the building along the western building perimeter to the back of the building and parking lot areas. A pedestrian pathway is defined from the parking spaces to the building entrance. The rear parking lot layout and shared driveway are substandard and underutilized. It is recommended to reconfigure the rear parking lot (FS-C202) and reduce the width of the shared driveway area to minimize future maintenance costs and improve traffic flow circulation (FS-C203). The pavement markings are faded, and signage could be improved to clearly identify facility entrances and parking areas for the fire station, police station, and animal control building. It is recommended to repaint parking lot striping every 5 years (FS-C201). Additional signage is recommended to improve pedestrian and vehicular circulation (FS-C204). Reconfiguration of the parking lot, pavement removal, and line striping are recommended to occur during pavement rehabilitation upgrades.

The exterior building and parking lot are well lit. It is recommended to upgrade the lighting fixtures to the Town standard LED fixtures (FS-C200). Multiple light poles in the parking lot have four metal guardrail posts surrounding the light base foundation. It is

recommended to remove the guardrail posts and replace with 4" steel bollards to protect the base of the light pole (FS-C205). No other security measures are recommended at this time.

Under 521 CMR, fire stations are not defined as a public space. However, the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) requires that buildings must be accessible to individuals with disabilities within "work areas". Work areas are defined as those areas used only by employees and must be accessible so that an individual with disabilities can approach, enter, and exit the areas. While the fire station is usually occupied by trained personnel, the facility may also need to accommodate the public for community education, emergency shelter space, or outreach programs. The fire station does not comply with the regulations mandated by the AAB to provide safe and accessible walkways, parking, ramps, and entrances to persons with disabilities. It is recommended to modify the facilities' parking spaces, signage, ramps, and entrances to be compliant with AAB disabilities access codes. Updating the exterior facility is an immediate need to comply with AAB 521 CMR regulations. Upgrades include but are not limited to adjusting walkways and ramps and joint sealing concrete/asphalt transitions (FS-C300).

The existing stormwater management network appears to adequately service the exterior facility. Stormwater management infrastructure observed for the fire station building includes six existing catch basins, four storm drain manholes, building roof leaders, and a 36" RCP stormwater culvert. One catch basin is located at the front of the building in the median between the shared driveway and fire truck exit driveway. A low point has formed a couple feet southeast of this catch basin. Filling the low spot with additional pavement would increase the rate of sheet-flow to the existing catch basin (FS-401). The other catch basins are located in the southern area of the rear parking lot. The catch basins are full of debris and require bi-annual cleanings (C-400). Existing building roof leaders are in adequate condition; however, some outlet below grade while other roof leaders daylight to the existing surface. It is recommended to update all roof leaders to outlet below grade (FS-C402).

The fire station is served by a septic system. The existing septic tank services both the police station and fire station. The septic tank appears to be maintained; however, further investigation is required to determine the current condition (FS-C500). Replacement of the septic system may have significant cost implications if investigations reveal damage to the system.

2.2.2 Architectural

Architectural components observed during the field visits include the exterior building envelope, the building interior, building egress components, accessibility, and building occupancy. The architectural observations from the site visits are noted in sections 2.2.2.1 to 2.2.2.5.

2.2.2.1 Exterior Building Envelope

The building consists of masonry cavity wall construction comprised of jumbo brick veneer with CMU back-up. The brick masonry is laid up with a "1/3 running bond" with simple tooled mortar joints, and multi-colored brick accents. The brick is an extruded wire-cut red brick, with buff and black colored accents forming a visual base and alternating colored band course separating the base from a field of red brick. The wall is topped with an implied cornice using a similar colored band course, and stone coping along the horizontal and gabled portions of the exterior wall. The corner of the exterior walls as well the

entrances to the apparatus bays are articulated with corbelled brick. Window and door opening are deeply recessed into the wall construction with brick masonry returns. Overhead sectional door openings are formed with buff colored brick masonry jack arches. Foundation walls are concrete, with slab on grade construction. The foundation wall is not exposed above grade.

The brick masonry walls are in good to fair condition with localized areas exhibiting problems requiring immediate repair. Our site assessment observed large amounts of efflorescence at the upper portion of the masonry walls including the gabled masonry walls. Upon further inspection, it was evident that the sealant in the building expansion and control joints failed along with the mortar joints associated with the stone wall coping. Some mortar joints were dislodged or missing. There is also evidence of cracked brick. The weep holes were inspected to find most of them clogged. Cavity vents at the upper portion of the exterior wall were not observed. The attic was searched to locate and determine the extent of moisture penetration and wall damage. It appears that the visible efflorescence and masonry damage is confined to the veneer. Further exploration will need to be performed to define scope of work for repairs. The following are observations during the site assessment:

- Brick masonry wall exhibited large amounts of efflorescence, indicative of substantial moisture penetration into the wall system. Repair/rebuild masonry parapet assembly around perimeter of building. (See photo A1 and A2)
- Mortar joints in brick masonry, and coping stone, are cracked, dislodged, and eroded. Joint failure to this degree in a building only 20-years old is problematic. Further investigation of the entire wall assembly should be performed to determine full extent of damage, the cause, and proper corrective action. Review of the available construction drawings provided some insight and it appears to be the result of poor wall construction and detailing. (See photo A3)
- Failed mortar joints require cutting and repointing. Replace damaged brick, cut and point masonry damaged from the water infiltration. (FS-A101, see photo A4)
- Failed sealant joints require removal and replacement with new backer rod and sealant. (FS-A103, see photo A5)
- Wall Cavity Weep holes are clogged and prevent proper operation. (FS-A104)
- Wall Cavity Vents are not apparent in the veneer assembly. This effects proper air circulation and drying capabilities of the wall cavity.

The building is detailed to incorporate built-in metal gutters with surface applied conductor boxes and downspouts. The concept is fine, but the execution is problematic. The present installation includes heat tape to prevent ice dams just above the gutter. This would indicate ongoing problems with freezing and leaks. The existing roofing system is a 30-year asphalt shingle over wood deck. The roof presently has issues with the occasional roof leak. Given its age, replacement will be required in near future. The roof and gutter assembly should be repaired / replaced during the masonry parapet repairs.

- The gutter installation details are problematic and should be corrected in conjunction with the masonry wall. This would be considered an immediate repair considering present damage. (FS-A108)

- Replace the Roofing System in conjunction with the gutter masonry parapet repairs. (FS-A106 and FS-A107)

Window and door openings are deeply recessed into the wall construction with brick masonry returns. The entrance doors and windows are flush-glazed painted aluminum storefront framing. Windows frames are constructed to incorporate operable ventilating units. Glass for doors and sidelights are insulating units. All windows have insulating glass. The overhead garage doors are motor operated, painted aluminum, sectional doors, with insulating glass.

- Aluminum stile & rail entrance doors appear to be in good condition.
- Windows appear to be good condition with exception of one decorative, elliptical window unit on the South side of the building. This elliptical window unit shows evidence of water penetration at the interior window sill and perimeter. Further investigation identified a strange flashing detail situated below the supporting lintel of the opening. This may be the source of wind driven rain penetrating through the window assembly into the interior. Gypsum wall board surround is showing evidence of cracking, paint finish is peeling. (FS-A117, see photo A6)
- The apparatus bay sectional doors appear to be aging. The paint finishes show wear and UV degradation. The insulating glass panels are fogging, an indication that the insulating glass unit seals have broken. The perimeter door gasketing is aged, brittle, and deteriorating. (FS-A115, see photo A7)
- Fire Department staff indicate that the motor operators are in need of replacement because of more frequent failures to open. (FS-A113)

2.2.2.2 Building Interior

The building interior is in good condition. The following are observations of the building interior.

Interior walls consist of two basic types, CMU and metal stud with gypsum wall board. Walls have a painted finish. Toilet room walls are painted with tile base. Staff toilet facilities have a dedicated accessible shower space with ceramic tile walls. The CMU appears to be in good condition with only minor cracking at window openings observed.

Interior doors comprise standard painted hollow metal door frames with flush wood doors and natural finish. Fire rated stair enclosure doors are painted hollow metal doors and frames.

Interior finishes are generally in good condition with some exceptions. During the site assessment we observed stained ceiling tile consistent with roof leaks, locations were sporadic but obvious. The gypsum wall board around the elliptical window in the administrative conference room showed evidence of water penetration. Joint compound has cracks and the sill has peeling paint. This should be repaired during the work to repair the window. The finishes in the second-floor lobby and administrative area are in good condition. Carpet appears to be in good condition for its age. Kitchen & dining area has vinyl composition tile (VCT) throughout. The VCT is showing wear around the dining table, from the chair bases. The flooring is dented and has permanent markings associated with heavy wear and tear. The apparatus bays have epoxy-based traffic coating. The coating is showing signs of age, areas are delaminating.

Flooring materials consisted of the following:

- Quarry tile: Building Entrance vestibules and lobbies
- Ceramic Tile: Toilet room floors and base, shower walls and floors
- Epoxy Traffic coating: Apparatus bays
- Vinyl Composition Tile
- Rubber stair treads & risers, and landings
- Carpet: Administrative wing offices, corridors, training, day-room, and conference rooms

Wall materials consisted of the following:

- Painted CMU
- Painted Gypsum Wall Board with rubber cove base
- Ceramic tile in wet areas with tile cove base

Ceilings are in good condition with only a few areas showing evidence of water stains from leaks. Ceiling materials consisted of the following:

- 2x2 lay-in acoustical tile in suspended grid. Some water stained.
- Painted gypsum wall board and soffits
- Painted structure & metal deck

Interior specialties and furnishings are generally in good condition. Interior specialties and furnishings consisted of the following:

- Toilet Room Accessories: In good condition
- Casework: Clear finish wood cabinetry, finish is showing signs of age
- Appliances: Operational

2.2.2.3 Building Egress Components

Stairs and corridors appear to be in good condition and code compliant. Exit signage is operational and clearly marked exits.

2.2.2.4 Building Accessibility

The building has an accessible entrance, accessible public toilet rooms, and elevator to access public spaces. The building is also equipped with proper signage in compliance with 521CMR Architectural Access Board Regulations. Staff locker rooms have accessible wet spaces to accommodate combined accessible privacy use shower & toilet room. Egress stairs are compliant.

2.2.2.5 Building Miscellaneous

The facility has bunk rooms that lack privacy, are cramped, and the spaces are not air conditioned. As the Town grows, the firefighting staff has also grown to a point where additional space is needed. The fire station has a mezzanine level that is presently underutilized. This area will be considered for providing additional support for the fire fighters to help with sleeping quarters (Refer to Appendix D for floor plans).

2.2.3 Structural

The structural components are in overall good condition. The following structural observations were noted for the existing building during our field visit:

2.2.3.1 Building Interior

We observed some cracks in the concrete floor slab of the eastern mezzanine which appeared to be located in line with the support beam below. We believe the cracking occurred due to lack of negative moment reinforcement over the supports (FS-S201, see photo S1).

The CMU part wall at the mezzanine level measured approximately 44 ½" in height. The existing drawings detailed that wall as an 8" wide CMU wall; however, based on our measurements that wall is a 10" wide CMU wall. There was no evidence that a removable railing was ever installed per the existing drawings. The Town would like to consider transforming this mezzanine area into additional sleeping quarters for the growing crew. According to the existing drawings, the mezzanine floor framing was designed for a uniform live load of 100 PSF which will be plenty of design capacity to accommodate future sleeping quarters for the fire station. Additional cmu would need to be grouted and spliced into the existing to complete a full wall. (FS-S301)

2.2.3.2 Building Exterior

On the west side of the building, we observed that the window lintels show beginning signs of rust deterioration (FS-S402, see photo S2). The steel canopy on the south side of the building has locations of peeling paint (FS-S401, see photo S3). There is some minor deterioration of concrete located near the garage bay entrances on the north side of the building (FS-S202, see photo S4).

2.2.4 Fire Protection

The fire protection system for the building is not compliant to building codes. The following Fire Protection System observations were noted during our field visits.

There are crawl spaces in Storage Rooms 220, 221, 222 and 223 that do not have sprinkler coverage. We believe that the spaces were originally covered by sidewall sprinklers and were code compliant during the original construction and then new walls were added which cut off the sidewalls from the rest of the crawl space. These additional walls will need to be removed to bring the space back up to code or sprinklers will need to be added to the unprotected crawl spaces (FS-FP101).

Additionally, it is recommend to have a licensed professional come in to do a complete inspection of the building's fire protection system if this has not been performed within the last year.

2.2.5 Plumbing

Plumbing components evaluated during the site visits included fixtures, floor drains, appliances, drinking fountains, hot water heater, and natural gas system.

The plumbing fixtures located in the restrooms appear to be original to the building. This includes lavatory sinks and faucets, water closets and their flushometers, urinals and their flushometers, hose bibbs, shower drains and valves, and floor drains. All of the vitreous china plumbing fixtures located in the restrooms, including lavatory sinks, urinals and water closets, have a life expectancy of 30-35 years and therefore should last another 10-15 years, approximately (FS-P201 thru FS-P204, see photos P5, P6 and P7).

Majority of the plumbing fixtures located outside of the restrooms also appear to be original to the building. This includes an emergency shower and nearby wash sinks, service/janitors' sinks and faucets, handwash/kitchen sinks and faucets, drinking fountains, exterior wall hydrants, and all other floor drains located in the apparatus bays and mechanical rooms. Faucets, shower heads and valves, and flush valves have a shorter life expectancy of approximately 10-15 years and therefore, these fixtures are essentially past their useable life. If the fixtures still appear to be in good, working condition, they can remain for the time being but should be replaced in the next 1-3 years. Any leaking fixtures should be replaced immediately (FS-P201 thru FS-P204, see photos P5, P6 and P7). The emergency shower has a life expectancy of approximately 25 years and therefore should be replaced in the next 5 years (FS-P205). Stainless steel sinks have a life expectancy anywhere from 15 years to 30 years depending on how well they were maintained. Recommend replacing these sinks in the next 5-10 years (FS-P206). The kitchen sink should be replaced in the next 5-10 years, but the associated faucet should be replaced in the next 1-5 years as it appears to be reaching the end of its useable life and may begin malfunctioning (FS-P207).

The drinking fountain has also reached the end of its life and should be replaced in the next 1-3 years as it has a life expectancy for 10-15 years (FS-P208, see photo P8).

It was noted that the floor drain in the first floor Pump Room was clogged at the time of the walk-thru. Water had pooled around the fixture. The floor drain in the pump room is clogged and should be removed and replaced immediately. An investigation should be performed into what is clogging the pipes and the blockage should be removed as well as perform any repairs necessary if the pipes are damaged at all. It is recommended to replace floor drains with units that have sediment buckets to prevent debris from entering the sanitary system and causing blockages in the future (FS-P102, see photos P3 & P4).

There is a gasoline interceptor located underground outside of the fire station. All floor drains located in the apparatus bays are routed through this interceptor before tying into the building sanitary system. No measures are recommended at this time.

There is a relatively new washer and dryer located on the first floor. No measures are recommended at this time.

The existing water heater is a 100-gallon, storage-type, gas-fired (200 MBH) Rheem-Ruud model and appears to be about 12 years old. It is assumed that the associated equipment such as the recirculation pump, mixing valve and expansion tank are the same age as the water heater. The recirculation pump is set to maintain a hot water temp of 112 degrees F in the piping. The water heater and all associated equipment (i.e. recirculation pump, mixing valve, expansion tank, etc.) should all be replaced in the next 5 years. It is best to be proactive in this situation and replace it before the water heater fails and leaves the building with no hot water (FS-P101, see photos P1 & P2).

There is an existing natural gas system that serves the aforementioned water heater as well as an 1,800 MBH boiler used for heating the building. No measures are recommended at this time.

2.2.6 HVAC

HVAC components evaluated during the site visits included air conditioners, condenser units, air handlers, terminal units, heaters, and dehumidifiers.

The antiquated pneumatic controls require a dedicated air compressor, and limit the control schemes that can be implemented. We recommend upgrading controls to full DDC, and removing the control air compressor.

The apparatus bays are heated by six hydronic unit heaters, and a Plymovent system is used to evacuate vehicle exhaust. There is no provision for makeup air.

There are many seals blown in glass panels of overhead doors. This not only affects the appearance of the glass, it also reduces the insulating value and causes condensation in winter. Glass panels with blown seals should be replaced. Consider replacing some with lighter weight insulated metal panels for better thermal performance and lighter weight.

The turnout room, adjacent and open to the apparatus room, is heated with ceiling-mounted cabinet unit heaters. CUH's and UH's heat other rooms on ground floor. Perimeter radiation heats stairwells and open mezzanine areas.

The second floor is served by an 8000-cfm variable air volume (VAV) air handler. Cooling is provided by an aging Carrier 38AH 21-ton air-cooled condensing unit. VAV boxes have reheat coils. There is ductwork in the attic, accessible from the catwalk, which according to an earlier report is undersized.

The Training Room does not have adequate ventilation or cooling capacity for typical functions, that capacity of the room is 122 people (1830 sq.ft.) and the supply air is 2000 cfm. We recommend providing a dedicated outdoor air system (DOAS) heat recovery ventilator for Training Room, with CO2-based controls. Budget is based on 1500 cfm with a 4-ton air-source heat pump.

For the main HVAC system, replace portions of the ductwork that are undersized if the new ventilation system does not alleviate that problem.

The emergency generator is located at same corner of building as the AHU, and at a similar height above the ground, so that prevailing winds help draw the generator exhaust into the outdoor air intake. We recommend adding an exhaust stack extension. It appears that approximately 10' of extension will work, supported by struts and/or guy wires from the top of the enclosure, which has dunnage to support the muffler. Check backpressure w/ Generac.

Heat is provided by a six-module (2x3) gas-fired boiler, a Hydrotherm MR-1800 rated for 1800 MBH input, 1440 MBH output. This is an older unit with atmospheric burners, which is a bit concerning in a space with potential negative pressure. A pair of 3-hp circulator pumps is run primary/standby.

Replace the boiler with a modular condensing unit with sealed combustion. Not only will this reduce fuel use by improving efficiency, it will also alleviate backdraft concerns due to pressure fluctuations in the apparatus space.

Cooling is from an air-cooled condensing unit mounted outdoors on grade. The Carrier 3AH-028 unit has a capacity of 21 tons, and originally used R-22 refrigerant. This may have been converted to R-407C, the contractor was unsure. R-22 will be phased out by 2020 when production and import will be banned, and R-407C has a slight capacity and efficiency reduction. This unit should be replaced. Check to see if the existing cooling coil can be used with the new refrigerant.

There is a row of four exhaust fans on the roof, but only one serves the toilet rooms according to the HVAC plans. We were not able to determine if the other three serve the attic space.

The 2nd floor has an L-shaped storage room on each of the building's four corners, with a knee wall and crawl space to the building's eaves. The perimeter space outside of knee walls, typical of four locations, is unconditioned and vented to outdoors. The knee walls are 2"x4" construction with exposed fiberglass batts and poly vapor barrier, and the air and/or vapor barrier are not sealed at floor or ceiling. The access doors, two in each room, are uninsulated interior-grade. The concrete floor is uninsulated and there are conditioned spaces below. This cause air leakage and heat loss.

There is electric heat tracing along the gutter edges.

We recommend insulating and air sealing the spaces behind knee walls. Weather strip and insulate doors, apply rigid insulation (Thermax w/ taped seams) to walls and floor. Insulate roofs near gutters so see if heat tracing can be eliminated, or hours of operation reduced.

Air compressor in pump room serves the vehicles in the Apparatus Bays, to keep the brake systems pressurized.

Air compressor in the boiler room serves the pneumatic control system. The building management system has antiquated pneumatic actuators on VAV boxes, radiation zone valves, and unit heater control valves.

2.2.7 Electrical

The Fire Station's electrical service is a 208/120V, 800A, three phase service consisting of a service disconnect circuit breaker, main distribution panel (MDPF), and various panelboards. Backup power is provided via a 250kW diesel standby generator which is shared between the Police Station and the Fire Station. An Automatic Transfer Switch (ATS) installed in and dedicated to the fire station starts the generator and distributes standby power throughout the facility in the event of an outage.

The majority of the electrical equipment throughout the building is in good condition. The standby generator and ATS are old and becoming unreliable. The generator should be replaced with a generator sized and dedicated for the fire station. The ATS should be replaced during the generator replacement project.

Interior lighting levels are sufficient, but fixtures are inefficient. As interior lighting fixtures are replaced in the future, efficient LED fixtures should be installed. A data closet should

be installed on the 2nd floor to protect and organize the data and telephone equipment and cabling (see photo E1). There is no surge protection device installed at the facility. A surge protection device of at least 400kA/phase to protect the electrical equipment throughout the facility.

An arc flash study has not been performed for this facility. Given the size of the service and type of equipment, an arc flash study is recommended if there is a possibility of energized work per NFPA 70E (2018).

The area in front of the upstairs electrical panels and equipment is being used for storage. This is a code violation. The area in front of electrical equipment must be kept clear to provide code compliant working space. Equipment stored in front of the electrical equipment should be removed, and this space should be kept clear and dedicated as working space for the electrical equipment.

2.3 Police Station

The Police Station was originally built in the 1940's as the Town's primary municipal building, housing the Town Offices along with the Fire and Police Stations. The building was designed in the "Colonial Revival" style. Between 1996 and 1999, the Town had renovated a school building to house the Town's Municipal Offices and constructed a new facility for the Fire Department. In 2000, this building was substantially renovated, and dedicated to house the Police Department. The building is approximately 13,200 SF.



The Police building comprises two distinct structures, one 2-story building housing the administrative offices and second floor conference room, and a one-story addition housing garage bays, storage, sally port, prisoner processing, holding, and patrol officer support. The 2-story structure is solid brick masonry construction, with limestone band coursing, entrance portico, and paneled window bay. The roof of the 2-story building is wood framed with original slate roofing, lead-coated copper flashing, and adorned with the original wood cupola/belfry with copper roof and finial. The 1-story addition is similar solid wall construction with brick and CMU. The roof is low-slope, steel framed with gypsum plank roof deck, as well as corrugated steel deck, and EPDM membrane roofing. The building is generally in good condition.

2.3.1 Civil/Site

The facility has asphalt parking in the front and rear of the police station. The parking lot in the front of the building has minor cracking. It is recommended to crack seal the parking lot annually to maintain the condition of the lot. Following crack sealing maintenance techniques, mill and overlay is recommended 5 years from now and full depth-reconstruction is recommended in 15 to 20 years (PS-C100). The parking lot behind the police station is in poor condition. The old DPW building foundation area is used for additional parking behind the police station as well. It is recommended to perform immediate full depth reconstruction at the rear parking lot due to heavy cracking, failed sub-base, and poor grading (PS-C101).

The site accessibility at the front of the building is adequate. Sidewalks are in good condition and provide pedestrian access from the front parking spaces to the building entrance. On the eastern side of the police station, granite bump outs were observed in between the garage bay doors. It is recommended to remove the granite bump outs as they appear to provide impediments for the snow plows during the winter season (PS-C202). The rear parking lot layout is substandard and provides no pedestrian connectivity from the parking spaces to the building entrance. It is recommended to redesign the parking lot to improve site grading and pedestrian circulation (PS-C203). The pavement markings are faded (PS-201), and signage could be improved to clearly identify facility entrances and parking areas between the fire station, police station, and animal control building (PS-C204).

The exterior building and parking lot are adequately lit. The lighting layout in the rear lot is substandard but can be improved during the reconfiguration of the parking lot layout. Upgrading to LED lighting fixtures is recommended (PS-C200). Multiple light poles in the

parking lot have four metal guardrail posts surrounding the light base foundation. It is recommended to remove the guardrail posts and replace with steel bollards to protect the base of the light pole (PS-C205). No other security measures are recommended at this time.

Under 521 CMR 11, the facility does not comply with the regulations mandated by the AAB to provide safe and accessible walkways, parking, walkways, ramps, and entrances to persons with disabilities. The exterior building access lacks compliant walkways, parking and passenger loading zones, ramps, and entrances. The exterior facility has an immediate need for upgrades to comply with AAB 521 CMR regulations. Upgrades to the facility include but are not limited to joint sealing at concrete/asphalt transitions, installing compliant handicap ramps, and reconfiguring handicap parking spaces (PS-C300).

Stormwater management appears adequate in both the rear and front paved areas. One catch basin was observed in the front and rear parking lots of the police station. The front parking lot drains to a drop inlet catch basin that connects to the stormwater system along Depot Street. The catch basin observed in the rear lot is located on the old concrete building foundation. The catch basin was full of debris when inspected and further investigation is recommended to locate the pipe outlet (PS-C400).

The police station is served by a septic system. The existing septic tank services both the police station and fire station. The septic tank appears to be maintained; however, further investigation is required to determine the current condition (PS-C500). Replacement of the septic system may have significant cost implications if investigations reveal damage to the system.

2.3.2 Architectural

Architectural components observed during the field visits include the exterior building envelope, the building interior, building egress components, accessibility, and building occupancy. The architectural observations from the site visits are noted in sections 2.3.2.1 to 2.3.2.5.

2.3.2.1 Exterior Building Envelope

The building consists of solid masonry wall construction comprised of brick veneer with CMU back-up. The brick masonry is laid up with a Flemish Common bond, simple tooled mortar joints, and flashed header brick. The brick is a molded red brick, with dark flashed header brick accents. Limestone is incorporated into the façade using band courses to articulate the building entablature for both the 2-story building and one-story garage bay. Limestone is also used to form grade level window bays consisting of one large double-hung window unit with two smaller double-hung units flanking each side. The window bay consists of limestone paneled lower wall, limestone framed openings and entablature, and crested by a segmented stucco panel. The building is graced with a formal entrance, comprising a Classical portico in limestone, including classical free standing and engage columns, entablature, and pediment. The entrance door is adorned with similar limestone surround.

The brick masonry walls are in good condition with localized areas exhibiting some small amounts of efflorescence at the upper portion of the masonry walls (See photo A2). Upon further inspection, it was evident that the staining occurred below joints in the limestone bands. Limestone joints will require cutting and pointing along with the masonry associated with the band coursing. The roof edge metal will need to be inspected to determine whether or portions are damaged allowing water in behind the stone and brick

masonry. Masonry repointing is required at the masonry window sills, as well as the overhead door openings in the garage bay addition. The sealant in the building expansion and control joints has failed and will require removing and replacing with new backer rod and sealant. The mortar joints associated with the limestone band coursing, and related trim will need to be pointed. Stained limestone will need cleaning.

The 2-story building has a steep slope roof with slate shingles, original to the building and essentially going on 80 years old. The roofing appears to be serviceable. There are some broken slate and areas requiring patching. The flashing appears to be lead-coated copper and appears to be in good condition. The roof drainage is accomplished using lead-coated copper gutters and downspouts. The downspouts discharge at grade. The entrance portico has the same flashing, gutters, and downspouts. The length of gutter along the East side of the portico is damaged and needs replacement.

The one-story addition is a low-slope roof with steel farming, gypsum plank decking, and a contemporary EDPM membrane roofing system. The roofing was part of the renovations in 2000.

2.3.2.2 Building Interior

The interior wall assemblies consist of painted brick and CMU masonry, as well as metal stud framed walls with painted gypsum wall board. Office areas utilize metal stud framing with gypsum wall board to form offices and provide interior finished space. The painted masonry predominately in prisoner processing areas and is covered with a multiple-coat spray applied durable finish which imparts the appearance of wall covering. This coating is typical for stair shafts, corridors, concrete and masonry walls. Some gypsum board walls are treated in similar manner where the abut.

Interior doors comprise of standard painted hollow metal door frames with flush wood doors and natural finish. Fire rated stair enclosure doors are painted hollow metal.

Flooring materials are generally in good condition. Flooring materials consisted of the following:

- Quarry tile: Building Entrance vestibules and lobbies
- Ceramic Mosaic Tile: Toilet room floors and base, shower walls and floors.
- Vinyl Composition Tile
- Rubber stair treads & risers, and landings.
- Carpet: Administrative wing offices, corridor,

Wall materials consisted of the following:

- Painted CMU
- Painted Gypsum Wall Board with rubber cove base
- Glazed Ceramic tile in wet areas with tile cove base
- Epoxy Paint

Ceilings are in good condition with only a few areas showing evidence of water stains from leaks. Ceiling materials consisted of the following:

- 2x2 lay-in acoustical tile in suspended grid.
- Painted gypsum wall board and soffits
- Painted structure & metal deck

2.3.3 Structural

The structural components are in overall satisfactory condition. The following structural observations were noted for the existing building during our field visit:

- We observed some cracking on the slab-on-grade concrete floor slab in the garage bay. (PS-S201, see photo S1)
- There is a noticeable step crack in the CMU partition wall between the garage bay and the hallway in the north side. The crack is located just above the existing door on the garage bay side of the wall. (PS-S301, see photo S2)

The Town is considering relocating the existing community room to the garage bay due to the lack of accessibility to the current location on the second floor of the police station. Currently the garage bay consists of three garage bays with a concrete slab-on-grade floor. There is a wire mesh partition that separate the garage bays from three storage units in the west side of the room and the salle port to the south.

The existing roof framing consists of 8" deep channel purlins that span between steel I-beams which are support by steel columns. The existing drawings that were available are from the renovations made to the building in May 2000. These drawings do not call out the sizes of the existing framing members; however, it is noted in the framing plan that new C8x11.5 purlins were added between the existing purlins, the existing I-beams were reinforced with 2-C9x20, and the existing columns were reinforced with 2-C4x5.4.

The existing exterior columns were built into the exterior walls and the interior columns had been built up with gypsum board; therefore, we were unable to verify the size and condition of the columns or if the columns had been reinforced per the existing drawings.

In order to open up the space for the community room function, it would be ideal to remove one or two of the interior columns in the garage bay. Removal of the columns would require that a transfer beam be designed and installed to support the roof framing. We would recommend that a structural analysis is completed first to verify the existing framing members and the loads on the existing columns and foundations. The results of the structural analysis would determine how many columns could be removed, whether the remaining existing columns can support the additional loads from the transfer beam, or if separate columns would need to be designed adjacent to the existing columns.

2.3.4 Fire Protection

The fire protection system appears to be sufficient for the building. It is recommended to have a licensed professional come in to do a complete inspection of the building's fire protection system if this has not been performed within the last year.

2.3.5 Plumbing

Plumbing components evaluated during the site visits included fixtures, floor drains, appliances, drinking fountains, hot water heater, natural gas system, and roof drainage system.

All of the plumbing fixtures located in the restrooms appear to be original to the building. This includes lavatory sinks and faucets, water closets and their flushometers, urinals and their flushometers, hose bibbs, shower drains and valves, and floor drains. All of the vitreous china plumbing fixtures located in the restrooms, including lavatory sinks, urinals and water closets, have a life expectancy of 30-35 years and therefore should last another 10-15 years, approximately (PS-P201 thru P204).

Majority of the plumbing fixtures located outside of the restrooms also appear to be original to the building. This includes an emergency shower and nearby wash sink, janitors' sinks and faucets, handwash/kitchen sinks and faucets, drinking fountains, exterior wall hydrants, and all other floor drains located in the parking bays and mechanical rooms. Faucets, shower heads and valves, and flush valves have a shorter life expectancy of approximately 10-15 years and therefore, these fixtures are essentially past their useable life. If the fixtures still appear to be in good, working condition, they can remain for the time being but should be replaced in the next 1-3 years. Any leaking fixtures should be replaced immediately (PS-P201 thru P204).

The service sink should be replaced in the next 5-10 years, but the associated faucet should be replaced in the next 1-5 years as it appears to be reaching the end of its useable life and may begin malfunctioning (PS-P205). The kitchen sinks should be replaced in the next 5-10 years, but the associated faucets should be replaced in the next 1-5 years (PS-P206 thru P208). The emergency shower has a life expectancy of approximately 25 years and therefore should be replaced in the next 5 years (PS-P209). Stainless steel sinks have a life expectancy anywhere from 15 years to 30 years depending on how well they were maintained. Recommend replacing these sinks in the next 5-10 years (PS-P210).

The drinking fountain has also reached the end of its life and should be replaced in the next 1-3 years as it has a life expectancy for 10-15 years (PS-P211).

The Police Department stores vehicles in a garage. Code requires drains be routed through an oil/water separator (OWS) prior to entering the sanitary waste system. There is no existing OWS shown on the plans (refer to Appendix D). If there is indeed no OWS on site, one will need to be installed immediately to meet code and all drains located in areas where road-legal vehicles are stored inside will need to be routed to that OWS (PS-P103, see photos P1 and P2).

There is no gasoline interceptor called out on the existing drawings even though vehicles are being stored in the building. Floor drains are present, but one or two appear to be clogged. The existing drains in the garage should be inspected for clogs and blockages. If any are found, an investigation should be performed into what is clogging the pipes and the blockage should be removed as well as perform any repairs necessary if the pipes are damaged at all. It is recommended to replace the floor drains with units that have sediment buckets to prevent debris from entering the sanitary system and causing blockages in the future (PS-P102).

We did not tour the holding cells, but it is assumed the fixtures in that area are also original to the building.

The existing water heater is a 74-gallon, storage-type, gas-fired (75 MBH) A.O. Smith model and appears to be about 13 years old. It is assumed that the associated equipment such as the recirculation pump, mixing valve and expansion tank are the same age as the water heater. The water heater and all associated equipment (recirc pump, mixing valve, expansion tank, etc.) should all be replaced in the next 5 years. It is best to be proactive in this situation and replace it before the water heater fails and leaves the building with no hot water (PS-P101, see photos P3 and P4).

There is an existing natural gas system that serves the aforementioned water heater as well as a 355 MBH boiler, a 280 MBH furnace and a 90 MBH furnace.

It was noted that pooling occurs on the roof after a rain storm. Roof drains are not draining correctly, if at all. There is an issue with the roof drainage system. Pooling occurs around certain roof drains which leads one to believe that there is a blockage in the storm drainage system. We recommend investigating what is causing the blockage and if there is any permanent damage done to the system. This investigation and any necessary repairs should be performed immediately. We also recommend replacing the roof drains with models that will keep debris from falling into the drainage system and causing more blockages in the future (PS-P104).

2.3.6 HVAC

HVAC components evaluated during the site visits included air conditioners, condenser units, air handlers, terminal units, heaters, and dehumidifiers.

The existing controls are antiquated, we recommend modernizing the DDC controls, upgrading two existing controllers to the new standard, and replacing 22 VAV box controllers.

Most of the building is served by an 8000-cfm variable air volume (VAV) air handler. Cooling is from a Carrier 38AH 21-ton air-cooled condensing unit, which barely has enough capacity to handle peak days. When temperature gets over 90F, maintenance staff set up a lawn sprinkler below the unit for additional evaporative boost. There are two compressors in this unit, and one has been converted from R-22 to R-407C, which results in a slight reduction of efficiency and capacity. The peak summer cooling capacity is strained. This is likely a maintenance issue and not a design issue, the unit is 18 years old. We recommend replacing the chiller with an inverter-drive unit. Consider adiabatic cooling as well. Another alternative is to consider installing a Variable Flow Refrigerant (VRF) system that could provide cooling and heating.

The dispatch room has a raised computer floor and is served by a 4-ton split system air handler. Return air is from under the floor, supply is overhead. The records room is cooled by a 2-ton split system with an American Standard air-cooled condensing unit.

The condensing unit for dispatch appears to be in good shape, but it uses R-22 refrigerant. The condensing unit for the records room also uses R-22. This refrigerant will be phased out by 2020 when production and import will be banned. Budget for the replacement of the 4-ton and 2-ton condensing units, in case these fail soon.

A 355-MBH HB Smith gas-fired atmospheric boiler heats most of the building via a hot water coil aft of the AHU. This replaced the original source of heat, an indirect gas-fired duct furnace rated for 280 MBH. This unit was vented through the roof, and this stack remains along with the original intake.

Hydronic system has duplex pumps run primary/standby, but there is only a single boiler so if the boiler goes down, there is no heat. We recommend replacing the boiler with two (or more) wall-hung sealed-combustion condensing gas boilers.

The original seven garage bays are heated by a gas-fired furnace, rated for 1995 cfm and approximately 90 MBH.

If the community room is moved from 2nd floor to garage area, it will require proper ventilation from and an energy or heat recovery ventilator (ERV or HRV). Provide ERV or HRV for new community room, with CO₂-based ventilation control.

There are seven rooftop exhaust fans and six ceiling exhaust fans that serve locker rooms, toilet rooms, and the jail cells. These total 1575-1950 cfm (discrepancy due to summing registers vs fan schedule on plans). This exhaust volume creates a negative pressure with no dedicated makeup air.

The five jail cells and eight toilet rooms are heated by 250-watt electric radiant ceiling panels. Note: we did not tour the cell area.

We were unable to verify whether the radiant ceiling panels in eight toilet rooms were installed and operational. Installation and operation of the electric radiant ceiling panels should be verified.

There are stained ceiling tiles from water leaks, occupants stated they may be from condensation in summer but this is not clear. Could these be from sprinkler piping?

Seal up roof penetrations for flue and intake of gas-fired equipment that is no longer there.

Air seal attic and cupola.

2.3.7 Electrical

The Police Station's electrical service is a 208/120V, 400A, three phase service consisting of a service main disconnect switch, main distribution panel (MDP), and various panelboards. Backup power is provided via a 250kW diesel standby generator which is shared between the Police Station and the Fire Station. An Automatic Transfer Switch (ATS) installed in and dedicated to the police station starts the generator and distributes standby power throughout the facility in the event of an outage.

The majority of the electrical equipment throughout the building is in good condition. The standby generator and ATS are old and becoming unreliable. The generator should be replaced with a generator sized and dedicated for the police station. The ATS should be replaced during the generator replacement project.

Interior lighting levels are sufficient, but fixtures are inefficient. As interior lighting fixtures are replaced in the future, efficient LED fixtures should be installed. A data closet should be installed to protect and organize the exposed data and telephone equipment and cabling. The Main Distribution Frame (MDF) is located next to a transformer, causing interference. The MDF should be relocated to minimize IT equipment interference (see photo E1). There is no surge protection device installed at the facility. A surge protection device of at least 300kA/phase to protect the electrical equipment throughout the facility.

An arc flash study has not been performed for this facility. Given the size of the service and type of equipment, an arc flash study is recommended if there is a possibility of energized work per NFPA 70E (2018).

2.4 Public Library

The Southwick Public Library is a 1-story rectangular structure of approximately 13,500 SF. The building was constructed in 1997 with an eclectic design aesthetic, displaying Colonial Revival influences. The building is comprised of a simple rectangular form with a large hipped roof, and articulated with four major dormers, one forming the entrance portico. The building is adorned with a central cupola of similar construction. The building is clad with vinyl clapboard siding with painted aluminum panning making up the fascia, eave, and rake details. The siding has vinyl corner boards, and related trim.



The entrance portico is large with a segmented-arch open ceiling finished with a linear aluminum strip ceiling system and supported by paired columns. The roof has asphalt shingles, with aluminum gutters and downspouts. The building plan has a bi-axial configuration with large reading room, and central book stack area. Children's room occupies one dormer, with the office and support functions the opposite. Windows are vinyl clad wood with exterior muntin grids. Doors consist of a combination of insulated hollow metal service doors, and a monumental mahogany entrance door with side lights. The construction is wood framed walls and wood trusses. The interior is painted gypsum wall board with decorative soffits, and vaulted ceiling. In 2016, the building was renovated to update a dry sprinkler system to a wet sprinkler system for the entire building. The building's boiler and electrical equipment and storage rooms are located in a partial basement with stair access.

2.4.1 Civil/Site

A paved parking lot and driveway are located north of the library building. Major cracking and failed sub-base conditions were observed in the driveway to the library parking lot. The paved area within the parking area is in moderate condition. It is recommended to reconstruct the driveway (PL-C100) and crack seal the driveway and parking lot annually to maintain the condition of the paved surface. Following crack sealing maintenance techniques, mill and overlay of the parking lot is recommended 6 to 10 years from now (PL-C101).

The library parking lot has spaces for 33 vehicles including two handicap spaces. The pedestrian connectivity from the parking lot to the building entrances is sufficient. Concrete sidewalks are provided along the southern perimeter of the parking lot to the main building entrance, west entrance and back entrances to the building. The sidewalks are in good condition except for one concrete panel which is recommended to be replaced (PL-C202). The parking lot pavement markings and signage are in moderate condition. It is recommended to maintain the pavement markings every 5 years (PL-C201). The exterior building and parking lot are adequately lit. Conversion to the Town's LED lighting standards is recommended (PL-C200).

Under 521 CMR 11, the facility does not comply with the regulations mandated by the AAB to provide safe and accessible walkways, parking, walkways, ramps, and entrances to persons with disabilities. The exterior building access lacks compliant walkways, parking and passenger loading zones, and ramps. The exterior facility has an immediate need for upgrades to comply with AAB 521 CMR regulations. Upgrades to the facility include but

are not limited to joint sealing at concrete/asphalt transitions and installing compliant handicap ramps (PL-C300).

Stormwater run-off from the parking lot sheet flows to the four existing catch basins in the parking lot. Two catch basins are located at the northeast and southeast corners of the lot while the other two catch basins are located at the north and south perimeter of the parking lot, immediately west of the main entrance. Additional catch basins and stormwater drains were identified in front of the building, east of the parking lot, and behind the library building within landscaped areas. It is recommended to perform annual catch basin cleanings at a minimum (PL-C400).

A low spot was observed in the west side of the parking lot. Regrading the existing pavement within the low spot would improve sheet flow to enter the existing catch basins (PL-C401). Additional grading work is recommended in the garden beds adjacent to the building. The existing mulch cover is placed 2 to 3 inches above the building foundation, covering the building siding. Minimizing the mulch layer along the perimeter of the building would improve infiltration and prevent standing water against the building foundation (PL-C402). One building roof leader was observed to outlet above grade while the remainder of the system outlets below grade. It is recommended to update all roof leaders to outlet below grade (PL-C403). The drainage network in the front of the building outlets through a culvert under College Highway. At the culvert outlet, additional fill is recommended under the culvert headwall at the outlet to prevent further undermining (PL-C404).

The library building is served by a septic system. The septic tank appears to be maintained; however, further investigation is required to determine the current condition (PL-C500). Replacement of the septic system may have significant cost implications if investigations reveal damage to the system.

2.4.2 Architectural

Architectural components observed during the field visits include the building interior, building egress components, accessibility, and building occupancy. The architectural observations from the site visits are noted in sections 2.4.2.1 to 2.4.2.5.

2.4.2.2 Building Interior

The interior openings are comprised of standard painted hollow metal door frames with flush wood doors and natural finish. Fire rated stair enclosure doors are painted hollow metal.

Flooring materials are generally in good condition. Flooring materials consisted of the following:

- Quarry tile: Building Entrance vestibules and lobbies
- Ceramic Mosaic Tile: Toilet room floors and base, shower walls and floors
- Vinyl Composition Tile
- Rubber stair treads & risers, and landings
- Carpet: Administrative wing offices, corridor

Wall materials consisted of the following:

- Painted CMU
- Painted Gypsum Wall Board with rubber cove base
- Glazed Ceramic tile in wet areas with tile cove base
- Epoxy Paint

Ceilings are in good condition with only a few areas showing evidence of water stains from leaks. Ceiling materials consisted of the following:

- 2x2 lay-in acoustical tile in suspended grid.
- Painted gypsum wall board and soffits

2.4.2.5 Building Miscellaneous

The Library Board would like to address a couple of problems that they have faced. The basement has experienced problems with moisture and has been eliminated for use as book storage. The Librarian's office houses an obsolete computer system, with associated system wiring, and takes up a large portion of her office. The Library Board would like to construct a dedicated space in the basement, conditioned properly to contain the computer server, upgrade the computer wiring to contemporary standards, and return her office to a more workable space. The basement moisture issue will be addressed in the report to accommodate this end goal.

2.4.3 Structural

Overall, the structural components are in good condition. The key item of structural concern is the moderate rusting on the underside of the metal deck in the mechanical and storage rooms down in the basement level.

The floor framing, which consists of a mixture of joists and steel beams, has some surface rust but appears to be minor compared to the rust on the underside of the metal deck. (See photo S1) The majority of the rust on the underside of the metal deck appears to be surface rust which can be cleaned and repainted. There are a few areas of heavier rust that would require further investigation to determine if there is significant section loss. There are now existing drawings or information on the material properties of the structural framing; therefore, additional testing would have to be performed to determine the capacity of the deck and the floor slab and whether or not the heavier rusting has caused enough section loss to require bracing of the metal deck. (PL-S401)

In the storage room, one of the concrete encasing at one of the steel columns has some rust staining from above and was poorly consolidated when poured so the surface is not smooth. (PL-S202, see photo S2) There are also some cracks in the concrete slab-on-grade near this column which is due to the lack of isolation joints around the column. (PL-S201, see photo S3)

2.4.4 Fire Protection

The fire protection system appears to be sufficient for the building. It is recommended to have a licensed professional come in to do a complete inspection of the building's fire protection system if this has not been performed within the last year.

2.4.5 Plumbing

Plumbing components evaluated during the site visits included fixtures, floor drains, drinking fountains, hot water heater, and natural gas system.

All of the plumbing fixtures located in the restrooms appear to be original to the building. This includes lavatory sinks and faucets, water closets and their flushometers, urinals and their flushometers, hose bibbs, and floor drains. All of the vitreous china plumbing fixtures located in the restrooms, including lavatory sinks, urinals and water closets, have a life expectancy of 30-35 years and therefore should last another 10-15 years, approximately (PL-P201 and PL-P202).

The majority of the plumbing fixtures located outside of the restrooms also appear to be original to the building. This includes service/janitors' sinks and faucets, handwash/kitchen sinks and faucets, drinking fountains, exterior wall hydrants, and any other floor drains. Faucets and flush valves have a shorter life expectancy of approximately 10-15 years and therefore, these fixtures are essentially past their useable life. If the fixtures still appear to be in good, working condition, they can remain for the time being but should be replaced in the next 1-3 years. Any leaking fixtures should be replaced immediately (PL-P201 & P202).

The drinking fountain has also reached the end of its life and should be replaced in the next 1-3 years as it has a similar life expectancy for 10-15 years (PL-P203).

There is an existing natural gas system that serves a boiler. No additional measures are recommended at this time.

The existing water heater is a 40 or 50-gallon, storage-type, electric Bradford White model and appears to be approximately 15 years old. The water heater and all associated equipment should be replaced in the next 5 years. It is best to be proactive in this situation and replace it before the water heater fails and leaves the building with no hot water. When this unit is being replaced, we recommend adding a hot water recirc line to the building which would include hot water return piping, a mixing valve, an expansion tank and a recirc pump. IECC requires that there needs to be a hot water loop present serving public fixtures. This installation will make the hot water system much more efficient (PL-P101, see photo P1).

2.4.6 HVAC

HVAC components evaluated during the site visits included air conditioners, condenser units, air handlers, terminal units, heaters, and dehumidifiers.

Heat is provided by a residential-style gas-fired hydronic boiler. A pair of Grundfos multi-speed circulator pumps run primary/standby. Two zone valves control perimeter radiation. The boiler should be replaced with a wall-hung sealed-combustion condensing gas boiler.

There are three horizontal AHU's in basement, each with DX cooling and a hot water coil with 3-way control valve. AHU-1 serves the community room, AHU-2 serves the children's wing, AHU-3 serves the main library.

A Nortec NHRS-30 electric-to-steam humidifier serves AHU-3, 30 lb/hr, 208VAC, 3-phase, 31.8 A. High limit sensor is a Barber-Colman HC-201 duct humidistat, set to 60% RH. We recommend reviewing humidifier controls; make sure unit is only enabled when space requires humidification.

There are three condensing units outside on grade: Trane 3-ton, Trane 5-ton, and a Trane 10-ton unit. Each of these units uses R-22 refrigerant, which will be phased out by 2020 when production and import will be banned. The Town of Southwick should budget for the replacement of the condensing units, it may be more cost-effective to replace than repair once R-22 is no longer available.

Invensys I/A Series BMS by SNE Building Systems of East Granby, CT.

The building was originally built with an uninsulated roof deck, with fiberglass batts on the bottom chord of the trusses as the thermal boundary. Most of the fiberglass has been removed, and spray foam (which appears to be 2" to 4" thick) was applied to the roof deck. The attic space is now inside the thermal boundary.

The attic space is protected by a wet-type fire sprinkler system. EF-1 ventilates the attic space. Ductwork in the attic spaces is insulated with foil-faced fiberglass.

The gutters along the north side (front) of the building have heat trace cables. These pre-date the spray foam job and may no longer be needed. Imperfect air sealing and/or gaps in the insulation at the eaves can cause ice dams. Inspect insulation at eaves and seal where needed. Review need for and control of heat trace cables on north (front) eaves. Eliminate if possible.

One foundation corner appears to be leaky. Seal this corner, insulate and air seal (spray foam) around sill band/rim joist and beam pockets, and seal all conduit penetrations through foundation.

2.4.7 Electrical

The Library's electrical service is a 208/120V, three phase service consisting a Main Distribution Panel with a 400A main breaker. Power is further distributed within the building via two sub-panels. A generator inlet is installed allowing a portable generator to provide backup power to the main office area.

The majority of the electrical equipment throughout the building is in good condition. One of the power sub-panels (Panelboard "EM-1") is old and becoming unreliable, and does not have a hinged cover. Panelboard "EM-1" should be replaced with a new panelboard with a hinged cover. The hinges on "Power Panel 1" are rusted, making operation difficult. The cover of "Power Panel 1" should be replaced. Existing communications cabling throughout the building is CAT-5 cable. Horizontal data cabling throughout the building should be upgraded to CAT-6 in the future.

Interior lighting levels are sufficient, but fixtures are inefficient. As interior light fixtures are replaced, efficient LED fixtures should be installed. The basement is a damp location, and contains the majority of the electrical equipment. A dehumidifier should be installed to prolong the life of the electrical equipment in the basement. No surge protection device is installed. A surge protection device of at least 300kA/phase should be installed to protect the electrical equipment throughout the facility. A Main Distribution Frame (MDF) should be created to better organize and contain the communications/IT equipment (see photo E1).

An arc flash study has not been performed for this facility. Given the size of the service and type of equipment, an arc flash study is recommended if there is a possibility of energized work per NFPA 70E (2018).

2.5 Department of Public Works

In 2011 the Southwick Department of Public Works was relocated from the Public Safety Complex on Depot Street to the former Suburban Chevrolet building on College Highway. The former Suburban Chevrolet building, built in 1972, was renovated prior to the DPW's relocation in 2011 to accommodate modernized office and support areas for the staff along with accessible toilet rooms. Since then, no upgrades have been made to the facility. The building is a typical pre-engineered metal building system with forward-most showroom and business office. The building is 1-story and approximately 18,000 SF. The existing structure is 47 years old and has reached its useful life.



2.5.1 Civil/Site

The facility has an asphalt driveway and parking area that wraps around the building. The pavement is in various stages of failure including areas of significant cracking, overgrowth, and ponding water were observed during the field visit. The typical service life of a well-designed, well-built and well-maintained asphalt parking lot ranges from 15 to 20 years. Due to the inadequate grading of the parking lot and condition of the pavement surface, full depth pavement reconstruction is recommended (DPW-C100).

The site accessibility to the facility lacks adequate signage, vehicular circulation, and pedestrian pathways. The driveway entrance into the facility are not marked or signed properly. The parking lot layout has substandard pavement marking and appears to be underutilized. The life-expectancy for pavement markings can vary between over 1 year for waterborne paint and 3 to 5 years for thermoplastic. The parking lot and exterior building are well lit but lack suitable pedestrian access to and from the building. No sidewalks or crosswalks are provided on-site. The parking lot layout is substandard and should be redesigned to reduce future maintenance costs and surface area, increase yard space for potential building additions, and improve traffic flow circulation (DPW-C204). Additional pavement markings (DPW-C201) and new signage are recommended to improve pedestrian pathways and vehicular traffic flow (DPW-C202).

Security fencing around the perimeter of the facility was installed in recent years. The 4-foot high chain link fencing and a solar-operated access gate are in good condition. The exterior building and parking lot are well lit. LED lighting is recommended if sufficient capital funding is available (DPW-C200). No other security measures are recommended at this time.

A fuel tank was installed at the facility in recent years. The fueling area is protected by a perimeter of steel bollards and the tank is set on a concrete equipment pad. A permanent canopy is recommended if sufficient capital funding is available (DPW-C203).

A material stockyard and salt storage facility are located west of the main DPW building and an equipment storage area is located south of the DPW main building. The layout of the material stockyard and the condition of the salt storage facility are adequate. Additional storage facilities are recommended to store equipment or renovations to the

existing garage to accommodate for large heavy equipment and equipment attachments (refer to Structural section 2.5.3).

Under 521 CMR 11, the facility does not comply with the regulations mandated by the AAB to provide safe and accessible walkways, parking, ramps, and entrances to persons with disabilities. The exterior building access lacks required walkways, parking and passenger loading zones, ramps, walkways and entrances. The exterior facility is in immediate need of upgrades to comply with AAB 521 CMR regulations (DPW-C300).

Stormwater run-off flows from the building roof leaders directly to the existing surface. The water then sheet-flows to low spots in the paved parking lot and gravel stockyard area. Minimal water is collected in the subsurface stormwater management system. The existing subsurface stormwater management system includes stone-lined perimeter swales, grass berms, floor drains and culvert crossings. A large area of surface run-off flows off-site through a stormwater culvert under College Highway. Ponding was observed around the salt storage facility and within the parking lot areas. The two observed catch basins were full of debris and are set at inadequate elevations to collect stormwater. The catch basin located at the north side of the DPW building collects minimal amounts of water and results in run-off to the adjacent property from the ponding water. The water meter was located on the north side of the DPW building as well and appears to be settling. It is recommended to reset the water meter cover (DPW-C401). The existing stormwater management infrastructure requires routine maintenance. Additionally, minimizing and re-grading the existing paved surface area will also assist in improving the subsurface stormwater. It is recommended to provide upgrades to the drainage network after further investigation of the system (DPW-C400).

The DPW building is served by a septic system. The septic tank appears to be maintained; however, further investigation is required to determine the current condition (DPW-C500). Replacement of the septic system may have significant cost implications if investigations reveal damage to the system.

2.5.2 Architectural

Architectural components observed during the field visits include the exterior building envelope, the building interior, building egress components, accessibility, building occupancy. The architectural observations from the site visits are noted in sections 2.5.2.1 to 2.5.2.5.

2.5.2.1 Exterior Building Envelope

The building is a pre-engineered metal building system with structural steel bents making up the garage portion of the facility, and simple steel frame with bar joist forming the smaller forward-most office building. The building is clad with corrugated metal wall and roof panels. The foundation consists of a frost wall and slab on grade floor. This building has been added onto over many years, with similar building systems. These systems are approximately 40 to 47 years old and approaching their normal life expectancy. The building is presently not up to energy code and will require substantial renovations to upgrade the building and maintain the facility in operation. Given the present use of the building, the Department of Public Works has expressed difficulties, housing and maintaining their truck fleet because of limited height, and lack of proper maintenance bays. The issues are well understood given the original use of the building was for cars and light trucks.

The existing roofing system is the original metal corrugated roofing panels. These panels have remained in place over the years with only repairs performed to address roof leaks. The building does have ongoing problems with roof leaks and needs replacement.

The building has limited areas of glass fenestration, primarily located at the office area. The windows are original to the building and have no insulating glass. Other windows located in the breakroom appear to be more contemporary and do have insulating glass. The remainder of the building has large overhead high-lift sectional doors, along with hollow metal pass doors located incrementally around the perimeter of the building. The entrance to the office area is a new aluminum entrance with sidelight and insulating glass.

2.5.2.2 Building Interior

Flooring materials are generally in good condition. Flooring materials consisted of the following:

- Quarry tile: Building Entrance vestibules and lobbies
- Ceramic Mosaic Tile: Toilet room floors and base, shower walls and floors.
- Epoxy Paint:
- Vinyl Composition Tile
- Rubber stair treads & risers, and landings.
- Carpet: Administrative wing offices, corridor,

Ceilings are in good condition with only a few areas showing evidence of water stains from leaks. Ceiling materials consisted of the following:

- 2x2 lay-in acoustical tile in suspended grid.
- Painted gypsum wall board and soffits

2.5.3 Structural

The structural components are in overall satisfactory condition. The following structural observations were noted for the existing building during our field visit:

- Based on the existing framing, the additions are clearly separate pre-engineered metal building. The transition locations have two structural steel frames next to one another (See photo S1)
- There are multiple locations where the roofing systems has previously failed and leakage had occurred. In some of these locations, there is surface rust on the structural steel members (See photo S2)

The rear buildings are used for storage and maintenance of various types of work vehicles. The Town would like to add a vehicle lift for the ability to perform maintenance on their trucks, but the current headroom is not enough to allow for a vehicle lift. The existing building is also too small to accommodate the current fleet. The Town would like additional covered space to be able to store all the equipment year-round.

Based on the construction type of the existing building, it would not be feasible to alter the existing structural framing to accommodate the current fleet. Pre-engineered metal building systems are designed in such a way to not accommodate any additional loads; therefore, any reconfiguration of the existing structure may not be possible without totally redesigning and possibly replacing existing structural elements.

Instead, we have considered two main options for the Town to consider, that we feel would be most effective: Improving the existing building by performing necessary repairs and constructing an addition to the building that would fulfill the space needs for the Town; or construction a completely new structure to accommodate all the Town's current and future needs.

2.5.4 Fire Protection

The fire protection system appears to be sufficient for the building. It is recommended to have a licensed professional come in to do a complete inspection of the building's fire protection system if this has not been performed within the last year.

2.5.5 Plumbing

Plumbing components evaluated during the site visits included fixtures, floor drains, drinking fountains, hot water heater, and natural gas system.

All of the plumbing fixtures located in the restrooms appear to be original to the renovation in 2011. This includes lavatory sinks and faucets, water closets and their flushometers, urinals and their flushometers, hose bibbs, shower drains and valves, and floor drains. All of the vitreous china plumbing fixtures located in the restrooms, including lavatory sinks, urinals and water closets, have a life expectancy of 30-35 years and therefore should last another 20-25 years, approximately (DPW-P201a thru P204a).

Faucets, shower heads and valves, and flush valves located in the restrooms have a shorter life expectancy of approximately 10-15 years and therefore, these fixtures should last another 5-8 years. Any leaking fixtures should be replaced immediately (DPW-P201 thru P204).

Majority of the plumbing fixtures located outside of the restrooms also appear to be original to the renovation. This includes service/janitors' sinks and faucets, handwash/kitchen sinks and faucets, drinking fountains, exterior wall hydrants, and all other floor drains located in the garage and mechanical room.

The kitchen sink and the associated faucet should be replaced in the next 5-10 years (DPW-P205). The service sink and faucet should be replaced in the next 5-10 years (DPW-P206, see photo P5).

The drinking fountains should be replaced in the next 5-10 years (DPW-P207 and DPW-P208).

It was noted that all of the floor drains in the garage are clogged. Repairs will need to be performed immediately as this does not meet code. The floor drains will need to be replaced along with any damaged piping. The existing oil/water separator (OWS) will need to be checked for damage. Provided it is in good condition, all drains located in areas where road-legal vehicles are stored will need to be routed to the OWS. If there is damage to the OWS that cannot be repaired, it will need to be replaced immediately to bring the

building up to code. Recommend replacing floor drains with models that have sediment buckets to avoid blockages in the future (DPW-P101, see photos P1 thru P4).

There is an existing emergency shower located in the garage area that is assumed to be less than 10 years old. The emergency shower has a life expectancy of approximately 25 years and therefore should be replaced in the next 15 years (DPW-P209).

The existing water heater is a 55-gallon, storage-type, gas-fired (130 MBH) HTP model and appears to be about 9 years old. It is assumed that the associated equipment such as the recirculation pump, mixing valve and expansion tank are the same age as the water heater. The water heater and all associated equipment (recirc pump, mixing valve, expansion tank, etc.) should all be replaced in the next 8-10 years (DPW-P102, see photo P6).

There is a natural gas system serving the aforementioned water heater, two furnaces in the office area and two gas furnaces in the garage bays. No additional measures are recommended at this time.

2.5.6 HVAC

HVAC components evaluated during the site visits included air conditioners, condenser units, air handlers, terminal units, heaters, and dehumidifiers.

Office area is heated and cooled by two Goodman gas-fired high-efficiency condensing furnaces. The two A-coils share a single condensing unit.

Each of the furnaces has a DX cooling coil, rated for 4-5 tons, but only one is connected. There is a single 5-ton air-cooled condensing unit outside, with R-410 refrigerant.

The garage bays are heated by a Reznor gas furnace and a Modine gas furnace with distribution ductwork. Two exhaust systems are no longer used, these had drops for tailpipe connections that are capped and no longer used. Each of the two back garage bays have three paddle-type ceiling fans. These were running (but I'm not sure what they do).

There are through-the-wall exhaust fans in the garage bays, paired with motor-controlled makeup air louvers. One set has the fan and louver on the same (south) wall, limiting its effectiveness for fume removal.

The locker rooms and toilet rooms have ceiling-mounted exhaust fans, controlled by occupancy sensors that also control the lighting.

A Schneider BMS controls the HVAC equipment and allows remote monitoring and control.

Power wash system (diesel or kerosene fired) w/ 5-hp pump motor

Waste oil collection and storage room

Air compressor: Ingersoll-Rand 2545 10-hp two-stage reciprocating compressor with 120-gallon vertical tank. Ingersoll-Rand D59C cycling refrigerated air dryer, 35 scfm.

2.5.7 Electrical

The DPW's electrical service is a 208/120V, three phase, 800A service consisting of a Main Service Disconnect Switch (MSDS) and various electrical panelboards and disconnect switches..

The electrical equipment throughout the facility is in fair to poor condition. The majority of the equipment in the main electrical room along with some panelboards and disconnect switches are old and unreliable. Generally, electrical equipment is manufactured with a service life of approximately 30 years as long as it is properly maintained. The older equipment throughout the facility should be replaced (see photo E1, E2).

A data closet should be installed to protect and organize the exposed data and telephone equipment and cabling (see photo E3). Interior light fixtures are inefficient. As light fixtures are replaced in the future, efficient LED fixtures should be installed. The fire alarm/security system equipment throughout the facility is old and outdated and should be replaced. There is no surge protection device installed at the facility. A surge protection device of at least 400kA/phase to protect the electrical equipment throughout the facility. Backup power is only being provided for the fuel station via a portable generator inlet and MTS. A permanent standby generator and Automatic Transfer Switch (ATS) should be installed to provide backup power to the entire facility. There is currently no access to the Town Hall fiber optic system. The town should investigate extending fiber system down route 202 to join the Town Hall and DPW.

An arc flash study has not been performed for this facility. Given the size of the service and type of equipment, an arc flash study is recommended if there is a possibility of energized work per NFPA 70E (2018).

The area in front of some of the electrical equipment in the main electrical room is being used for storage. This is a code violation. The area in front of electrical equipment must be kept clear to provide code compliant working space. Equipment stored in front of the electrical equipment should be removed, and this space should be kept clear and dedicated as working space for the electrical equipment.

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SECTION 3

Section 3 Recommendations

3.1 Building Assessment Approach

The goal of this assessment was to evaluate the operational and maintenance costs of the municipal buildings and related site assets. The assessment included the following tasks:

1. Inventorying and determining the current state of the assets in Southwick's five municipal buildings
2. Identifying and categorizing maintenance and repair needs
3. Identifying the critical assets
4. Prioritizing capital improvement recommendations, using a ranking system that can be applied to each of the facilities and its related site and building systems and components.

Our approach includes identifying maintenance and repair needs, as well as providing recommendations for capital improvements, consisting of rehabilitation or replacement of significant assets.

3.2 Repair and Maintenance Items

For each of the facilities included in this study, we identified recommended maintenance and repair items and categorized them as follows: Immediate, A, B, C, D, and E. These categories reflect the immediacy of need, as described in Table 3-1.

Table 3-1 Maintenance & Repair Items Classifications

Action Category	Description
Immediate	Items that have an immediate need for maintenance or repair because of their condition or importance, or where there are safety or code concerns.
A	Repair or maintenance needed within the next 5 years, or ongoing maintenance on 1 to 5 year intervals
B	Repair or maintenance needed in 6 to 10 years, or ongoing maintenance on 6 to 10 year intervals
C	Repair or maintenance needed in 11 to 20 years, or ongoing maintenance on 11 to 20 year intervals
D	Items that have an expected remaining service life of 21 or more years - repair, replace, or upgrade when required.
E	New Building, Addition, or substantial renovation to be completed as funding permits.

Section 3 Recommendations

Repair and maintenance items also include replacement of parts or minor items. Repair and maintenance items are considered separately from rehabilitation or replacement of *assets*, which we define as significant pieces of building components, equipment, or systems. Prioritization of asset replacement and prioritization is discussed in the following section.

3.3 Summary of Recommendations

Recommendations developed in Section 2 are summarized in this section. Complete lists of recommendations and budgetary costs for each building are provided in Appendix A.

3.3.1 Town Hall

The Town Hall was substantially renovated in 1996 for the Town offices. It was renovated again in 2012 for the Council on aging to provide facilities for a Senior Center. In general, the interior of the building is very good condition. Finishes are generally intact with only a few exceptions that are repairable. We recommend the Town provides continued maintenance and address any minor problems as they arise. The exterior of the building has much needed repair to properly maintain the building and extend its useful life.

The primary concerns comprise the masonry veneer, and mortar joints as well as all the sealant joints. The sealant needs to be replaced on an average of every 10 years. Some basic masonry repairs are needed to make sills and walls weathertight. Windows are in good condition but have issues with the glazing. The installation of new vinyl or rubber glazing will help with tightening up drafts and help with water penetration. Sealant joints at all windows, doors, and louver penetrations must be replaced. The roofing system is at or very near its life. Replacing the roofing system would be a positive step in protecting the building and extending the life of the building wall envelope as well as the interior finishes. Some ceiling tile were stained from the result of roof leaks. The elevator is showing age. The elevator equipment is basically obsolete and will require replacement. Repairs will no doubt be problematic as parts will no longer be available. We would recommend an elevator modernization which is focused to specifically replace those items necessary for a properly operating and maintainable elevator unit. The proposed idea of the building expansion is doable but with lighter-load storage capacity as indicated in the structural report.

3.3.2 Fire Station

The Fire Station was constructed in 1999. The facility is relatively new but appears to have significant building envelope problems which need immediate repair. The building interior, like the Town Hall, Police, and Library buildings, is in very good condition with only minor blemishes to interior finishes. The report notes only the kitchen flooring as needing replacement. The remaining problems are associated with the exterior building envelope. The roof is at its life expectancy and needs to be scheduled for replacement. The stone wall copings and brick masonry parapets are all exhibiting problems of moisture penetration. The sealant joints have failed, mortar joints dislodged and eroded, and efflorescence stains a large portion of the parapet wall.

The building details indicate some inherent problems which need correction. The work to correct the masonry and replace the roofing, its built-in gutter assembly, and related flashing will essentially overlap to some degree. The masonry repairs and roofing work should be planned and schedule in concert with each, so the assemblies are properly executed in one project. Interior finishes damaged by water infiltration, can be repaired without concern. As part of this exterior envelope repair, all windows, doors, and louvers,

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perimeter sealant joints must be replaced. Overhead doors and pass doors should have all weather stripping replaced. The remaining interior renovations as described in the report can be done as budget permit and include the following:

- Emergency Generators, upgrades or replacement for compliance and proper operation.
- Interior renovations and expansion of existing mezzanine area for Men's bunk area.
- Address general energy efficiency, including lighting, insulation, HVAC equipment and controls. Provide lighting and HVAC controls.
- Address upgrades and replacement of HVAC system to provide properly zoned heating and cooling. Correct cooling capacity for Training Room.
- Address floor coatings in apparatus bays. Replace weather stripping at garage doors and repair/replace insulated glass units where necessary.

3.3.3 Police Station

The Police Station was substantially renovated in 2000. The building interior is generally in very good condition. Finishes are intact with only minor blemishes to painted wall coatings. We recommend providing routine maintenance and repair or replace as necessary. The building exterior requires some work relative to masonry repointing, and cleaning. The sealant around all openings needs to be replaced as it is past its normal life of 10 years. The slate roof is beautiful and adds character to the building. We recommend replacing the roof in kind, with contemporary upgrades to the roofing underlayment and ice & water shield components. Existing flashing components appear to be in good condition and are possibly reusable. If flashing components need replacing, it is recommended that they be replicated to match the original detail. Some slate could be reused and supplemented as needed to complete the work. The Cupola is need of restoration. It doesn't appear to be in poor condition, just in need of repairs and painting. This work should be included with the roof replacement work. The membrane roofing system appears to be in good condition although it is coming close to its life expectancy at 19 years old. The roof did indicate drainage problems associated with the drainage system and not the roof. The storm drainage system needs to be inspected and cleaned to facilitate free flow of water and eliminate the ponding observed.

The interior alterations for a Community Room seem very possible. It would involve some basic structural modifications and new interior walls, ceilings, and finishes as well as mechanical and electrical components. The space would offer an area of approximately 950 SF. The Sally Port and Wash Bay modifications are also simple and very feasible. The renovations to this portion of the building should be budgeted together to save on construction costs. Outdoor structure for the Police vehicles has been considered and the emergency generator included as a dedicated unit for the Police.

3.3.4 Public Library

The Southwick Public Library was constructed in 1997 by volunteers. The building is generally in good condition. The basement level exhibited some moisture issues as described in the report. During its construction there was an episode where the basement level did flood. It isn't clear exactly when this happened but rust on the underside of the floor decking is indicative of moisture. During the field visits, the basement did not feel damp or show additional evidence of moisture penetration. The report does speak to exterior storm water management which should be addressed.

Section 3 Recommendations

Based on present conditions, it appears as though relocation of the server to the basement level is feasible. The main level of the library is in good condition. We recommend routine maintenance of interior finishes as required. The exterior of the building is in good condition. The roofing is at its life expectancy and needs replacement. We recommend that replacement of roofing, flashing, gutters and downspouts, and cupola repairs be conducted together as soon as funding is available. Siding appears to be in serviceable condition. It requires some basic low-pressure water spray cleaning to remove moss and dirt. All window, door, and louver openings should have sealant replaced. The entrance doors are in good condition and should be schedule for routine maintenance including painting.

Other areas that can be addressed as described in the report include the following:

- Upgrade Telecommunication system wiring to Cat 6.
- Address energy efficiency, including lighting, insulation, HVAC equipment and controls.
- Address upgrades or replacement of HVAC system to provide properly zoned heating and cooling.
- Relocate server from Directors office to possible basement location with properly conditioned room.
- Address parking area pavement for replacement.

3.3.5 Department of Public Works

The Department of Public Works building is 47 years old, obtained by the Town and renovated in 2011 for the DPW business offices. The building is old and not well suited to the programmatic and spatial requirements of the DPW. The Public Works department is growing in size including staff, as well as the equipment necessary to perform the day to day tasks. The existing facility has limited capacity to store the equipment given the head room and footprint. Maintenance is a problem because of the lack of a vertical-lift bays and does not have a code compliant wash bay which is now or will be a code requirement. The facility is presently at capacity with the need for additional storage to protect expensive assets from the weather. The cost analysis includes renovations to the existing facility with an addition to accommodate the taller truck bays. It also includes costs for a new facility of a little larger capacity to accommodate additional storage and plans for some future growth.

Given the resulting numbers it is our opinion that the Town should consider relocating the DPW to a new facility specifically designed to accommodate their needs. This facility should have its own emergency generator and be provided with a telecommunications system to interconnect all emergency critical departments. Construction of the new building will be 20,000 SF to accommodate the Town's storage needs and provide room for future fleet expansion. The new building package is estimated to cost approximately \$7,000,000 at \$350 per square foot.

3.4 Recommended Budget

Table 3-2 presents a summary of all the recommendations for replacements, rehabilitation, and repairs developed in Section 2, organized by facility and action category.

Table 3-2 Summary of Estimated Cost Per Building

Location	Estimated Cost for Each Action Category ⁽¹⁾						Total
	Immediate	Cat A	Cat B	Cat C	Cat D	Cat E	
Town Hall	\$ 370,100	\$ 752,200	\$ 278,000	\$ 762,300	\$ -	\$ 700,000	\$ 2,862,600
Fire Station	\$ 1,700,700	\$ 831,700	\$ 475,900	\$ 1,505,000	\$ -	\$ 130,000	\$ 4,643,300
Police Station	\$ 382,100	\$ 586,200	\$ 374,000	\$ 1,573,000	\$ -	\$ 511,400	\$ 3,426,700
Public Library	\$ 49,200	\$ 349,800	\$ 127,000	\$ 443,600	\$ -	\$ 84,400	\$ 1,054,000
Dept. of Public Works	\$ 1,261,100	\$ 813,700	\$ 172,600	\$ 455,100	\$ -	\$ 3,150,000	\$ 5,852,500
Total	\$ 3,763,200	\$ 3,333,600	\$ 1,427,500	\$ 4,739,000	\$ -	\$ 4,575,800	\$ 17,839,100

⁽¹⁾ Action Category Definitions:

Immediate - Items that have an immediate need for repair or replacement because of their condition or importance. Items that were safety or code concerns were included in this category.

Category A - Items that have an expected remaining service life of 5 or fewer years - repair or replacement is expected to be necessary during this period.

Category B - Items that have an expected remaining service life of 6 to 10 years - repair or replacement is expected to be necessary between 6 and 10 years from now.

Category C - Items that have an expected remaining service life of 11 to 20 years - repair or replacement is expected to be necessary between 11 and 20 years from now.

Category D - Items that have an expected remaining service life of 21 or more years - repair, replace, or upgrade when required.

Category E - New Building, Addition, or substantial renovation to be completed as funding permits.

Note: Hazardous materials survey not included.

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