



Bolton, Massachusetts

MUNICIPAL BUILDING CONDITIONS ASSESSMENT REPORT

Town of Bolton

June 2022

FINAL

Tighe&Bond

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Tables

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Section 1
Introduction

The Town of Bolton engaged Tighe & Bond to evaluate the existing conditions of six key town buildings and to develop a comprehensive Facilities Asset Management Plan that provides recommendations for improvements over a 10-year planning horizon ("Project"). This report summarizes the assessment and provides improvement recommendations for six Town buildings.

1.1 Project Overview

The purpose of this assessment was to identify improvements, repairs, and upgrades at each building and prioritize those that should be completed immediately, as well as over the next 1–5 and 6–10 years. The following Town of Bolton owned facilities were assessed as a part of this project:

- Public Safety (Police and Fire)
- Old Fire Station
- Houghton Building
- Town Hall
- Public Library
- Department of Public Works

The project team assessed each building's structure, site-related systems and amenities, as well as mechanical, electrical, plumbing, and fire protection systems. Interior finishes as well as ADA accessibility were also reviewed.

The Facilities Asset Management Plan will provide the Town with the ability to prioritize expenditures, plan for and normalize expenditures over the planning period.

1.2 Project Scope

The evaluation and building assessment consisted of the following tasks:

1. Met with the Town of Bolton 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 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 completed over four days between October 22 and October 27, 2021 by two teams. The first team consisted of civil and structural engineers, while the second team consisted of mechanical and electrical engineers. Each Team spent two days in Bolton, reviewing the Public Safety Building, Old Fire Station and Houghton Building the first day, and the Town Hall, Library, and DPW Facility the second day.

4. Obtained available record drawings and building floor plans for each facility. Building systems were assessed and major equipment items and systems were documented. Equipment 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 developed recommendations for replacing, rehabilitating, and maintaining assets. See Section 2 for field findings and recommendations.

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 Table 1-1 at the end of Section 1 summarizes the expected equipment life for various types of equipment, building and site features.

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 Bolton's six key town buildings.

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 between 20 and 30 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.

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.

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.

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.

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 30 years if properly maintained.

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 Bolton's municipal building facilities.

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.

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, but could range from 10 to 40 plus years. Consequently, most insulating glass units are warranted for a period of 10-years. After ten years, the gases used between panes typically evacuates. 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.

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 lifetime 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.

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.

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 asset-driven. Remaining useful life expectancies vary depending on the fixture or component.

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.

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. Emergency showers have a lifespan of 20 to 25 years.

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.

Table 1-1 Service Life Table

Site Asset	Item Description	Service Life (Years)
Architectural	Caulking (interior & exterior)	5 to 10
Architectural	Paint (exterior)	7 to 10
Architectural	Paint (interior)	10 to 15
Architectural	Roofing Adhesives/Cements	15+
Architectural	Sealants	8
Architectural	Appliances	10 to 13
Architectural	Kitchen Cabinets	50
Architectural	Laminate Countertops	20 to 30
Architectural/Structural	Acoustical Tile Ceiling	40+ (older than 25 years may contain asbestos)
Architectural/Structural	Ceramic Tile	70+
Architectural/Structural	Concrete Walls	75+
Architectural/Structural	Gypsum	75
Architectural/Structural	Wood Paneling	20 to 50
Architectural/Structural	Suspended Ceiling	25+
Architectural/Structural	Fiberglass Doors (exterior)	100+
Architectural/Structural/Fire Protection	Fire-Rated Steel Doors (exterior)	100+
Architectural/Structural	Wood Doors (exterior)	100+
Architectural/Structural	Wood Doors (solid-core interior)	30 to 100+
Electrical	Accessories	10+
Electrical	Bare Copper	100+
Electrical	Bulbs (compact fluorescent)	8,000 to 10,000+ hours
Electrical	Bulbs (halogen)	4,000 to 8,000+ hours
Electrical	Bulbs (LED)	1,000 to 2,000+ hours
Electrical	Copper-Clad Aluminum	30,000 to 50,000+ hours
Electrical	Copper-Plated	100+
Electrical	Fixtures	40
Electrical	Ground-Fault Circuit Interrupters	up to 30
Electrical	Lighting Controls	30+
Electrical	Service Panel	60
Structural	Steel Beams	200+
Structural	Steel Columns	100+
Structural	Steel Plates	100+
Architectural/Structural	All Wood Floors	100+
Architectural	Carpet Floors	8 to 10
Architectural/Structural	Concrete Floors	50+
Architectural	Granite Floors	100+
Architectural	Laminate Floors	15 to 25
Architectural	Linoleum Floors	25

Architectural	Slate Floors	100
Architectural	Terrazzo Floors	75+
Architectural	Ceramic Tile & Quarry Tile Floors	75 to 100
Architectural	Vinyl Flooring	25
Structural	Baseboard Waterproofing System	50
Structural	Bituminous-Coating Waterproofing	10
Structural	Concrete Block	100+
Structural	Poured-Concrete Footings and Foundation	100+
Structural	Slab on Grade (concrete)	100
Structural	Timber Framing	100+
Structural	Steel Framing	100+
Architectural/Structural	Garage Doors	20 to 25
HVAC	Air Conditioner (central)	7 to 15
HVAC	Air Exchanger	15
HVAC	Attic Fan	15 to 25
HVAC	Boiler	40
HVAC	Burner	10+
HVAC	Ceiling Fan	5 to 10
HVAC	Condenser	8 to 20
HVAC	Dampers	20+
HVAC	Dehumidifier	8
HVAC	Diffusers, Grillers, and Registers	25
HVAC	Ducting	20 to 30
HVAC	Electric Unit Heater	10 to 15
HVAC	Evaporator Cooler	15 to 25
HVAC	Furnace	15 to 25
HVAC	Heat Exchanger	10 to 15
HVAC	Heat Pump	10 to 15
HVAC	Heat-Recovery Ventilator	20
HVAC	Hot-Water and Steam-Radiant Boiler	40
HVAC	Humidifier	12
HVAC	Induction and Fan-Coil Units	10 to 15
HVAC	Thermostats	35
HVAC	Ventilator	7
HVAC	Batt & Roll Insulation	100+
HVAC	Cellulose Insulation	100+
HVAC	Fiberglass Insulation	100+
HVAC	Foamboard	100+
HVAC	House wrap	80+

HVAC	Liquid-Applied Membrane	50
HVAC	Loose-Fill	100+
HVAC	Rock Wool	100+
HVAC	Wrap Tape	80+
Structural	Brick	100+
Structural	Concrete Masonry Units (CMUs)	100+
Architectural/Structural	Masonry Sealant	2 to 20
Structural	Stone	100+
Architectural	Custom Millwork	100+
Plumbing	ABS and PVC Waste Pipe	50 to 80
Plumbing	Cast-Iron Waste Pipe (above ground)	60
Plumbing	Cast-Iron Waste Pipe (below ground)	50 to 60
Plumbing	Cast-Iron Service Sinks	25 to 30
Plumbing	Copper Water Lines	70
Plumbing	Drinking Fountains	10 to 15
Plumbing	Emergency Showers/Eyewashes	20 to 25
Plumbing	Faucets	10 to 15
Plumbing	Floor Drains	30+
Plumbing	Gas Lines (black steel)	75
Plumbing	Gas Lines (flex)	30
Plumbing	Hose Bibs	20 to 30
Plumbing	Lavatory Sink (Vitreous China)	25 to 30
Plumbing	Roof Drains	30+
Plumbing	Stainless Steel Sinks	15 to 20
Plumbing	Toilet/Urinal Flushometers	10 to 15
Plumbing	Toilet Tank Components	5
Plumbing	Toilets/Urinals (Vitreous China)	25 to 30
Plumbing	Vessel Sink (stone, glass, porcelain, copper)	5 to 20+
Plumbing	Water Heater (conventional)	10 to 15
Plumbing	Water Line (copper)	60
Fire Protection	"Fast Response" Sprinkler Heads	20
Fire Protection	Sprinkler Heads	50
Architectural/Structural	Asphalt Roofing	30
Architectural/Structural	BUR (built-up-roofing)	30
Architectural/Structural	Copper Roofing	70+
Architectural/Structural	EPDM (ethylene propylene diene monomer) Rubber	15 to 25
Architectural/Structural	Metal Roofing	40 to 80
Architectural/Structural	Modified Bitumen Roofing	20
Architectural/Structural	Simulated Slate Roofing	10 to 35

Architectural/Structural	Slate Roofing	60 to 150
Architectural/Structural	TPO Roofing System	7 to 20
Architectural	Aluminum Siding	25 to 40+
Architectural/Civil	Aluminum Gutters, Downspouts, Soffit and Fascia	20 to 40+
Architectural/Civil	Copper Downspouts	100
Architectural/Civil	Copper Gutters	50+
Architectural/Structural	Fiber Cement Siding	100+
Architectural/Civil	Galvanized Steel Gutters/Downspouts	20
Architectural	Trim	25
Architectural	Vinyl Siding	60
Architectural/Civil	Vinyl Gutters and Downspouts	25+
Architectural	Wood/Exterior Shutters	20
Architectural	Aluminum/Aluminum-Clad Windows	15 to 20
Architectural	Double-Pane Windows	8 to 20
Architectural	Skylights	10 to 20
Architectural	Window Glazing	10+
Architectural	Vinyl Windows	20 to 40
Architectural	Wood Windows	30+
Civil	Asphalt Pavement	up to 30
Civil	Crack Sealing	1 to 4
Civil	Mill & Overlay	8 to 12
Civil	Full Depth Reconstruction (FDR)	20 to 30
Civil	Storm Drainage	at least 50
Civil	Septic System	at least 30
Civil	Sewer System	at least 50
Civil	Concrete Walks	40 to 50
Civil	HMA Walks	up to 20
Civil	Mulch	1 to 2
Civil	Waterborne Pavement Markings	over 1
Civil	Thermoplastic Pavement Markings	3 to 5

Service Life Expectancies provided by the International Association of Certified Home Inspectors (InterNACHI).

Section 2
Findings and Recommendations

Between October 22, 2022 and October 27, 2022 Tighe & Bond conducted facility inspections to inventory assets and assess conditions at six 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:

- Public Safety (Police and Fire)
- Old Fire Station
- Houghton Building
- Town Hall
- Public Library
- Department of Public Works

Narratives discussing our critical findings for these facilities are provided in Section 2.3. Appendix A contains tables presenting the asset inventory list by discipline with recommended improvements and associated costs. Appendix B 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
  - Old Fire Station: OFS
  - Public Safety Building: PS
  - Houghton Building: HB
  - Public Library: L
  - Department of Public Works: DPW

- An asset type designation follows the facility code
  - C for Civil/Site (Facility Name Code TH-C)
  - S for Structural / Architectural
  - FP for Fire Protection
  - P for Plumbing
  - H for HVAC
  - E for Electrical

- A number follows the asset type designation. Recommendations are referenced with the Asset ID followed by a one or two-digit task identification number

2.1 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 Bolton's six 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.

The Service Life Table presented in Table 1-1 at the end of Section 1 summarized the expected useful life for various types of equipment, buildings and site features. Remaining useful life was used to help make the asset recommendations further described below.

2.2 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 and B. These categories reflect the immediacy of need, as described in Table 2-1.

Table 2-1 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

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

2.3 Summary of Field Findings and Recommendations

Recommendations based field findings are summarized in this section. A complete lists of recommendations and budgetary costs for each building are provided in Appendix A. A summary of the anticipated costs for each discipline-specific deficiency for each building that should be addressed within the next 5 years (Immediate or Category A) is included

within this section along with individual anticipated costs for recommendations greater than $100,000 that will require action within the next 10 years.

2.3.1 Public Safety Building (Police and Fire)

The Public Safety Building consists of two attached buildings, one for the Police and Fire Departments respectively. The Police Department building was built in 2010, adjoined to the Fire Department Building which was constructed in 1965. The Police Station includes a lobby, public restroom, training room, cell bays, booking area, storage, and dispatch room (not currently in use) on the first floor while the second floor contains administrative offices and locker rooms.

The Fire Department building houses the Fire Department and Emergency Medical Services with apparatus bays, equipment storage, offices, a day room, kitchen area, and a training room. Recent increased Emergency Medical Service support is provided out of Bolton, which has put increased staffing and pressure on the limited space.

Electrical

The Public Safety Building electrical distribution consists of a 120/208V, three phase power distribution system. Utility power service is split, with one half being fed from a 500A, 3P enclosed circuit breaker located in the sprinkler control room and the other half being fed from a 1000A, 3P enclosed circuit breaker located in the Electrical Room located off of the Sally Port. The electrical distribution equipment consists of two main circuit breakers, seven 120/208V panelboards, a 120/240V transformer, two 120/240V panelboards, three automatic transfer switches, various disconnect switches, and a 350KW diesel powered outdoor generator in a weatherproof enclosure.

Overall, the electrical equipment at the Public Safety Building is in good condition, with the exception of the backup generator. Most of the electrical equipment appears to have been installed in 2009 and has an expected working life of 30 years.

Interior and exterior lighting levels are sufficient, but fixtures are inefficient. As fixtures are replaced in the future, efficient LED fixtures should be installed. The generator has known mechanical issues and does not function correctly despite numerous repair attempts by the Town. It is recommended that the generator be replaced (PS-E-7 at $138,000). There are no labels indicating an arc flash study has been performed at this station. 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 (2021). The following issues are code violations and/or safety concerns, and should be addressed:

- Insufficient battery powered emergency lighting. Emergency battery-powered LED lighting should be installed where required by code.
- There are a number of locations with working space code violations due to equipment storage on or near the electrical equipment. Code required working space (36-inches deep by 30-inches wide minimum) should be established in front of all applicable electrical equipment. Energized work should be prohibited on electrical equipment until code required electrical working space can be established.

The total anticipated cost of the electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Safety Building is **$169,500**, not including contingency.

Structural / Architectural

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) to the Public Safety Building Exterior:

- Paint finishes on trim boards, especially around columns at base are failing and peeling. Wide uniform gaps present in PVC trim assemblies, need gaps to be filled/ caulked and painted.
- Portions of the building on the North side that are predominately shaded have algae and fungus build up. Wash periodically to slow rate of buildup.
- Entry doors and frames around exterior are beginning to show signs of deterioration at the bottoms, this is likely due to de-icing salts. Frames should be cleaned and touched up to slow the rate of deterioration.
- Exterior joint sealants between interior garage slab & concrete exterior slab is failing. Steel pour stop significantly deteriorated and is expanding and flaking. Pour stop should be cut out and reglet formed and filled with an expansion joint sealant.
- Steel lintels at masonry openings had minor surface rusting. To avoid deterioration of lintels they should be cleaned and painted.
- Roof access door over police area is too close to roof edge and requires a guardrail be installed on leading edge.
- The spray foam silicone roof above the Fire Station side garage has active leaks. The roof should be replaced with a new standard EPDM or PVC flat roof system (PS-S-14 at $300,000).

The following are structural / architectural deficiencies that should be addressed to the Public Safety Building Interior within the next 5 years (Immediate or Category A):

- In the lobby bathrooms there is grout cracking in tile at base of walls to floor interface.
- Police locker room bathrooms tile grout noted areas of missing grout.
- Elevator carpet is peeling and should be replaced as it is a potential trip hazard.
- Caulks and sealants around toilets and sinks should be redone.
- Ceiling tiles stained from HVAC valve leaks, on-going maintenance item for facility noted in both the Police and Fire sides of the building.
- Leaks were noted by maintenance staff from previous ice dams. This was an isolated event during one winter, however, due to the potential for this to happen again, an investigation of the insulation detailing around the eaves of the building may be warranted to ensure protection from future ice dams.
- Floor tiles within fire side in good condition with isolated areas of tile delamination near washing machines.
- Epoxy floor throughout the police side of the building is beginning to show cracks at edges of wall to floor interface.

The total anticipated cost of the structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Safety Building is **$392,300** not including contingency.

HVAC / Plumbing / Fire Protection

The following are more critical HVAC / Plumbing / Fire Protection related deficiencies that should be addressed within the next 5 years (Immediate or Category A):

- Upgrade ventilation controls in Fire Station Garage to increase airflow upon detection of CO or N_2 gases. Additionally, replace the Garage's Ventilation Ducts to meet current code and increase efficiency. Recommend redesign of space in conjunction with gas detection system; infrared heat could also help to improve efficiency.
- Consider performing water analysis and potential water treatment to reduce pipe corrosion based on the observed signs of pipe deterioration and joint issues. If treatment not added, expect ongoing pipe replacement.
- Clean Return Grilles throughout the building.
- In the arms room, recommend measuring and possibly re-adjusting the vent hood van. Airflow appeared to be very low.
- Replace VAV coils as needed or proactively replace on an ongoing basis, however this would only make sense with water treatment system.
- In the locker rooms, recommend air supply and exhaust system change to include active humidity control. This would involve cooling coil, condenser, refrigerant circuit and controls.
- Recommend replacement of RTU above cell area.
- Replace duct insulation and jacket that is damaged due to water
- Rebuild or replace cooling coil in attic

The total anticipated cost of the HVAC / Plumbing / Fire Protection deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Safety Building is **$223,400** not including contingency.

Site / Civil

The following are more critical Site / Civil related deficiencies that should be addressed within the next 5 years (Immediate or Category A):

- On the parking lot, regrade and restripe the existing designated van accessible parking space and associated access aisles. Repaint all pavement markings throughout parking lot.
- Repair damaged concrete sidewalks and joints in front of East Side Entrance of Police Station building.
- Replace E-One wastewater pumps' control panel and control / power wiring.
- Remove existing underground fuel storage tank that failed pressure test due to faulty seal and replace with an above grade fuel storage tank adjacent to stairs at rear of building.
- Space challenges were evident throughout the facility, particularly on the Fire Department side of the building. Space planning was beyond the scope of this project, however, further investigation into the programmatic and spatial needs of the Fire Department including Emergency Medical Services should be performed. This may result in building expansion to meet present and future needs.

The total anticipated cost of the Site / Civil deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Safety Building is **$13,500** not including contingency.

Table 2-2 provides a summary of the estimated costs by discipline for the Public Safety Building.

Table 2-2 Summary of Estimated Costs for Public Safety Building

Discipline	Estimated Cost for Each Action Category (2)			
	Immediate	Cat A	Cat B	Total
Electrical	$16,000	$153,500	$44,300	$213,800
Structural / Architectural	$45,000	$347,300	$5,500	$397,800
HVAC / Plumbing / Fire Protection	$2,000	$221,400	$40,000	$263,400
Site / Civil	$2,500	$11,000	$7,200	$20,700
Subtotal	**$65,500**	**$733,200**	**$97,000**	**$895,700**
Contingency (40%)	***$26,200***	***$293,280***	***$38,800***	***$358,280***
Total	**$91,700**	**$1,026,480**	**$135,800**	**$1,253,980**

2.3.2 Old Fire Station

The Old Fire Station is a wood framed structure originally built around 1840. The building has historically been used as a church, school, hearse house, and finally a fire station starting in 1930. Currently the ground floor of the building is being used to store an antique fire truck and the second story is used for periodic training by the Fire Department. Shortly after our site visit it was recommended to the Town that due to structural concerns, described herein, the Old Fire Station should not be occupied until a more thorough structural evaluation could be performed.

Electrical

The Old Fire Station electrical distribution consists of a 120/240V, single phase power distribution system. Utility power service is being fed from an 200A, 2P circuit breaker located in the Main Distribution Panel in the main garage area. The electrical distribution equipment consists of a main circuit breaker in the 120/240V main distribution panelboard.

Overall, the electrical equipment at the Old Fire Station is in good condition. The electrical equipment appears to have been installed roughly 20 years ago and is getting old, increasingly unreliable, and reaching the end of its useful service life in the next 15 years. As equipment begins to fail, it should be replaced to maintain the reliability of the electrical equipment at the station.

Interior and exterior lighting levels are sufficient, but fixtures are inefficient. As fixtures are replaced in the future, efficient LED fixtures should be installed.

The following issues are code violations and/or safety concerns, and should be addressed:

- The is no existing emergency lighting. Emergency battery-powered LED lighting should be installed where required by code.
- There is no surge protection installed at this facility. Surge protection of at least 120 kA/phase should be installed in the facility to protect the electrical equipment.
- There is insufficient exit signage at the station. Install illuminated exit signs where required by code.
- There is a small electrical box which is missing a cover. Secure all wires inside of box and install a cover where necessary.

- An electrical box housing a receptacle has a gap, exposing the interior electrical components of the receptacle. Replace the electrical box.

The total anticipated cost of the Electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Old Fire Station is **$8,100** not including contingency. Please note that the Old Fire Station is not to be occupied until further structural repairs are complete. Costs do not include necessary structural repairs that will be presented in supplemental Old Fire Station Structural Evaluation

Structural / Architectural

Based on our initial visual structural observation, it was recommended that the space not be occupied until further investigation could occur. Initial structural observations included the following:

- Suspected wood boring insect damage was observed in wall and roof framing members.
- Supplemental framing has been installed in various locations along the roof to redistribute loads from damaged structural members.
- Exterior walls appear visually out of plumb.
- Visual roof sag was noted in areas of supplemental framing, both from exterior and interior.

It appears the building has gone through numerous structural modifications since its original construction, including:

- Concrete coatings over the original foundation
- Steel beams and columns within the existing garage to support the second story framing
- Horizontal steel cables installed below the second story floor framing, between the two exterior load bearing walls
- Supplemental wood framing installed around the roof framing

It was beyond the scope of the initial conditions assessment to evaluate the structural system for its ability to carry anticipated design loads as well as detail, measure, or document any of the as-built conditions. Based on our concerns stated above and the current building use, the Town has requested a more extensive structural investigation be conducted on the Old Fire Station. The results of this more in-depth structural evaluation will be provided to the Town in a separate technical memorandum.

HVAC / Plumbing / Fire Protection

There was no HVAC or plumbing equipment installed in the Old Fire Station. There is fire protection piping in place, however, this will need to be replaced based on future building usage. Currently there is no connection to neighboring Public Safety Building fire pumps. Depending on how the Town uses the Old Fire Station in the future, either rehabilitation or replacement, the HVAC work should be addressed at that time and associated costs developed.

Site / Civil

The Old Fire Station is on the same campus as the Public Safety Building, see recommendations herein, and there is no designated parking area. There is no sewer at the old fire station. Depending on how the Town uses the Old Fire Station in the future, either rehabilitation or replacement, the site / civil work should be addressed at that time and associated costs developed

2.3.3 Houghton Building

The Houghton Building was constructed in 1848 and originally served as the Town's high school. The two-story Houghton Building has been adapted over the years to serve various Town functions including as the Police Station prior to construction of the new Police Station at the Public Safety Building. The Houghton Building currently serves as home to the Bolton Access TV, Conservation Trust, and Friends of the Bolton Library, hosting various public meetings and forums. There is still evidence of smoke staining from a historic fire in the attic of the building.

Electrical

The Houghton Building electrical distribution consists of a 120/240V, single phase power distribution system. Utility power service is being fed from an 200A, 2P circuit breaker located in the Panelboard F in the Friends of Bolton Library room. The electrical distribution equipment consists of four 120/240V panelboards, an automatic transfer switch, and a 40KW diesel powered generator.

Overall, the electrical equipment at the Houghton Building is in good condition. The electrical equipment appears to have been installed roughly 20 years ago and is getting old, increasingly unreliable, and reaching the end of its useful service life in the next 15 years. As equipment begins to fail, it should be replaced to maintain the reliability of the electrical equipment at the station.

Interior and exterior lighting levels are sufficient, but fixtures are inefficient. As fixtures are replaced in the future, efficient LED fixtures should be installed.

The following issues are code violations and/or safety concerns, and should be addressed:

- There is insufficient exit signage. Install illuminated exit signs where required by code.
- There are a number of locations with working space code violations due to equipment storage on or near the electrical equipment. Code required working space (36-inches deep by 30-inches wide minimum) should be established in front of all applicable electrical equipment. Energized work should be prohibited on electrical equipment until code required electrical working space can be established.
- There is evidence of rodents living inside of the wall around Panelboard F. Remove the rodents and seal entries into the building to prevent further damage.
- There is evidence of rodents living inside the generator enclosure. Remove rodents and debris and seal any entry points into the enclosure to prevent further damage.

The total anticipated cost of the Electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building is **$26,800** not including contingency.

Structural / Architectural

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) to the Houghton Building:

- The windows appear to be original with exterior retrofitted aluminum storm windows. Sealants around windows and some screens at grade level are ripped or damaged.
- Deck coating at side entrance should be refinishing and loose boards secured.
- Flashings at base of chimney at slab on grade is falling apart and not functioning.
- The current rails and guards at the stairs and landings on second floor are too low and not compliant with current code. A half wall or railing extensions should be installed.

The total anticipated cost of the Structural / Architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building is **$9,800** not including contingency.

HVAC / Plumbing / Fire Protection

The following are more critical HVAC / Plumbing / Fire Protection related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building:

- Install an exhaust fan in the Janitor's Closet.
- Replace pumps location in mechanical pumping room.
- Water analysis and potential water treatment is recommended to reduce hydronic system pipe corrosion.
- Replace thermostat in Friends of Library room.

The total anticipated cost of the HVAC / Plumbing / Fire Protection deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building is **$7,800** not including contingency.

Site / Civil

The following are more critical Site / Civil related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building:

- A drainage system should be installed behind the rear stone retaining wall. Water currently weeps through the wall and enters the Boiler Room. This would redirect surface and groundwater around the Houghton Building and consist of excavating and install drainage stone, filter fabric, perforated pipe, and outlets through the wall face.
- Paint Accessible Parking Spaces and Associated Access Aisles in driveway. Repaint all markings in driveway.
- Pave missing or compromised sidewalk segments from street to front door sidewalk and from the driveway to the rear door.
- The Access Ramp is not ADA Compliant (Ramp Slope >8.3%; Handrails Lack Extensions; Ramp Lacks 60-inch Level Landing at bottom). A compliant access ramp and handrails need to be installed.

- The granite and wooden fence along the street is missing or has compromised wooden 4x4 fence rails. Multiple granite post are askew. New wooden fence rails and bracket ties should be installed, and the granite posts reset.

The total anticipated cost of the Site / Civil deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Houghton Building is **$30,200** not including contingency.

Table 2-3 provides a summary of the estimated costs by discipline for the Houghton Building.

Table 2-3 Summary of Estimated Costs for Houghton Building

Discipline	Estimated Cost for Each Action Category (2)			
	Immediate	Cat A	Cat B	Total
Electrical	$10,100	$16,700	$70,700	$97,500
Structural / Architectural	$5,000	$4,800	$38,100	$47,900
HVAC / Plumbing / Fire Protection	$2,500	$5,300	$9,000	$16,800
Site / Civil		$30,200	$1,500	$31,700
Subtotal	**$17,600**	**$57,000**	**$119,300**	**$193,900**
Contingency (40%)	***$7,040***	***$22,800***	***$47,720***	***$77,560***
Total	**$24,640**	**$79,800**	**$167,020**	**$271,460**

2.3.4 Town Hall

The Bolton Town Hall was constructed in 1853. The building contains municipal offices and meeting spaces that are used by boards and committees for public meetings, hearings and other activities. The building consists of two main floors and a raised section of the second floor. The building is located on a hill, and as such the upper and lower levels can be accessed from the outside as there are parking spaces near each door, however, there are significant accessibility issues throughout the building for both workers and the public. At present there is no accessible route within the building between the first floor and second floor of the building. Additionally, the raised section or landing inside the second floor off the rear main entrance requires one to traverse a few steps down into many of the second-floor offices; while there is a wall-mounted chair lift assist in traversing these stairs the chair lift is not truly providing an accessible route because it cannot support individuals bound to a wheelchair like an elevator or vertical platform lift would. The Bolton Town Hall is in need of accessibility improvements; a new multistory elevator or vertical platform lift to provide accessibility throughout Town Hall would require structural modifications and could result in a total project cost upwards of $200,000 or possibly more depending on its location.

A downward-sloping wooden bridge connects the rear parking lot to the second floor main entrance, which is in need of repair. The portico on the front of the building was recently renovated.

There are significant file storage issues in Town Hall and limited space for staff and files. While the current Town Hall has served the Town of Bolton well over the years, it is quickly getting to the point when either the Town will outgrow the building, or the costs to maintain an acceptable and accessible working environment will become cost prohibitive.

General maintenance and upgrades to many of the items listed below are manageable, however, when the Town has to address overcrowding, providing more space for offices and storage where none exists, and providing full accessibility throughout the building by installing an elevator (or vertical platform lift), it becomes important to have serious considerations into justifying these costs. The Town may be quickly approaching the point in time when it is hard to justify the expenditure of more money on the existing building. While not in the scope of this project, it is recommended that the Town seriously consider performing a future planning study to look at either a complete renovation of the existing Town Hall, an expansion of the existing Town Hall, or construction of a new Town Hall. This space planning study will help to maximize current and future use of the Town's assets.

Whether a new building, expansion or renovation is selected, the planning process should start now so that a new or renovated facility can be in place within the next 5 years or so. The Town Hall should have at least 50 percent more space than the present building to allow for a suitable arrangement of offices to better serve the public and Town Staff as well as to provide full accessibility and sufficient additional storage.

Electrical

The Town Hall electrical distribution consists of a 120/240V, single phase power distribution system. Utility power service is being fed from an 200A, 1P enclosed circuit breaker located on the exterior of the building. The electrical distribution equipment consists of five 120/240V panelboards, an automatic transfer switch, and a 20KW propane-powered generator.

Overall, the electrical equipment at the Town Hall Building is in good condition. The electrical equipment appears to have been installed approximately 25 years ago and will become increasingly unreliable and is reaching the end of its useful service life in the next 10 years. As equipment begins to fail, it should be replaced to maintain the reliability of the electrical equipment at the station.

Interior and exterior lighting levels are sufficient, but fixtures are inefficient. As fixtures are replaced in the future, efficient LED fixtures should be installed. While there is a fire monitoring system at Town Hall, there does not appear to be a security system in the building. An alarm dialer and door contacts for each door should be installed.

The power and communications cabinet in the basement is disorganized, and several items in the closet are no longer in use. Cleaning up the routing of telephone, signal, and power wiring within the electrical enclosure, replacing wiring and installing in conduit where required is recommended. Any unused wiring and equipment should be safely removed.

The following issues are code violations and/or safety concerns, and should be addressed:

- There are a number of locations with working space code violations due to equipment storage on or near the electrical equipment. Code required working space (36-inches deep by 30-inches wide minimum) should be established in front of all applicable electrical equipment. Energized work should be prohibited on electrical equipment until code required electrical working space can be established.
- The is no existing battery powered emergency lighting. Emergency battery-powered LED lighting should be installed where required by code.

- There is no surge protection installed at this facility. Surge protection of at least 120 kA/phase should be installed in the facility to protect the electrical equipment.
- There are exposed power wires running along the wall with no conduit. Secure all power wires inside of conduit.
- There is a small electrical box which is missing a cover. Secure all wires inside of box and install a cover where necessary.
- Inside the power and communications cabinet in the basement, there is refrigerant piping routed over panelboards, violating dedicated equipment space. As panelboards are replaced, relocate away from refrigerant piping and ensure 6ft of dedicated equipment space.

The total anticipated cost of the Electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Bolton Town Hall is **$146,500** not including contingency.

Structural / Architectural

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) to the exterior of Town Hall:

- The rear entrance ramp to the building's main second floor entrance and the side stairway emergency exit route should be replaced as soon as possible. The railing are patched and the wood stringers are cracked and broken at their tread supports. The post anchors are deteriorating and broken in spots. It is suggested that both be replaced with steel and architectural ADA compliant railings to compliment the historic nature of the building (TH-S-1 at $100,000).
- Trim paint is peeling and should be scraped and repainted.
- The brick veneer should be cleaned and repointed (TH-S-3 at $180,000).
- The boiler room exterior door and frame should be replaced.
- Storm window seals should be repaired.
- There is a large gap between the pavement and concrete landing at side handicap entrance to the first floor.
- The slate roof should be inspected and repaired as appropriate.

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) to the interior of Town Hall:

- There are cracked tiles in the first floor basement
- On the second floor the carpeting is wrinkled and a potential trip hazard. The corridor to public bathroom is crowded by chairs, which is too narrow for someone in a wheelchair to use.
- Flashing and trim around chimney is deteriorating and needs replacement.

The total anticipated cost of the Structural / Architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Bolton Town Hall is **$308,500** not including contingency.

HVAC / Plumbing / Fire Protection

The following are more critical HVAC / Plumbing / Fire Protection related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at Town Hall:

- Replace all piping in the lower floor boiler room.

- Replace the Fin Tube Radiators in Lower Floor File Storage Room and Town Planner Room.
- Install an exhaust fan in the lower level bathroom to comply with code.
- Replace Unit Ventilator in Upper Floor Tax Collector / Treasurer and Town Secretary Offices. These are currently nonfunctional and would serve as backup for the new mini split system.

Though beyond the scope of this project, there were indoor air quality concerns noted during site visits by Town Staff that should be further investigated and addressed. In particular, air quality / ventilation requirements should be assessed in the Selectman's Meeting room and throughout the building's offices and meeting rooms. Air exchange rates may need to be increased or air purification systems potentially installed.

The total anticipated cost of the HVAC / Plumbing / Fire Protection deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Bolton Town Hall is **$49,100** not including contingency.

Site / Civil

The following are more critical Site / Civil related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at Town Hall:

- Replace all rails and brackets along front entrance driveway. Install two new 4"x8" wooden guardrails between existing Granite Posts.
- Surface water runoff currently sheets across the front arched driveway and then down the bank, eroding the bank and compromising the retaining wall along the sidewalk at street level. A new asphalt berm or curb along southern edge of curved front entrance driveway should be installed.
- Surface water runoff compromises the northwest corner of the building envelop causing structural damage. The area should be regraded, and a French drain installed.
- The existing designated accessibility parking space out the side entrance first level door needs to be reconfigured to be compliant to have less than 2% cross slope. The regrading should also include restriping the space and associated access aisle. The walkway needs to be regraded as well so the cross slope is less than 2% and running slope is less than 5%.
- The Access Route and Main Entrance Accessibility Parking Area should be regraded to accommodate a new Van Accessible Parking Space.

The total anticipated cost of the Site / Civil deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Bolton Town Hall is **$36,000** not including contingency.

Table 2-4 provides a summary of the estimated costs by discipline for the Bolton Town Hall

Table 2-4 Summary of Estimated Costs for Town Hall

Discipline	Estimated Cost for Each Action Category (2)			
	Immediate	Cat A	Cat B	Total
Electrical	$ 21,100	$125,400		$146,500
Structural / Architectural	$113,000	$195,500		$308,500
HVAC / Plumbing / Fire Protection	$11,000	$38,100	$18,300	$67,400
Site / Civil	$4,400	$31,600	$22,500	$58,500
Subtotal	**$149,500**	**$390,600**	**$40,800**	**$580,900**
Contingency (40%)	***$59,800***	***$156,240***	***$16,320***	***$232,360***
Total	**$209,300**	**$546,840**	**$57,120**	**$813,260**

2.3.5 Public Library

The Bolton Public Library was originally constructed in 1904. In 2010 the library was significantly expanded with the new section of the library comprised of the circulation desk, meeting rooms, Children's room, large open room with book stacks, and reading space. The original library building contains the town history room, circulation stacks and reading space. The mechanical, electrical, and fire protection equipment in the original building was upgraded during the 2010 expansion project. The Town has experienced electrical, plumbing and architectural issues associated with the 2010 expansion.

Electrical

The Bolton Public Library electrical distribution consists of a 120/208V, three phase power distribution system. Utility power service is being fed from an 800A, 3P circuit breaker located in the Main Distribution Panel in the basement electrical room. The electrical distribution equipment consists of a main circuit breaker in the 120/208V main distribution panelboard, seven 120/208V panelboards, three automatic transfer switches, various VFDs, starters, and disconnect switches, and a 125KW propane powered outdoor generator in a weatherproof enclosure. The generator motor was recently replaced.

Overall, the electrical equipment at the Bolton Library is in good condition with the exception of the lighting system, described further below. Most of the electrical equipment appears to have been installed in 2010 and has an expected working life of 30 years.

There are no labels indicating an arc flash study has been performed at this station. 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 low voltage lighting system at the Bolton Library is based around an existing Payne-Sparkman lighting controls system and has been faulty almost since its installation in 2010. Based on discussion with a Payne-Sparkman lighting representative, troubleshooting on site, and observation of the lighting relay cabinets, it has been concluded that the issues with the Library lighting system likely stem from a combination of things:

- Several lights may not be operational and may need to be replaced.

- Some of the relays may be wired incorrectly, leading to the wrong signals terminating in the wrong locations (this would translate into switches controlling lights they're not designed to, or not responding to switches they're expected to respond to). This issue is resolved by rewiring the lighting controls system where required.
- There is a well-known issue of drivers in the Payne-Sparkman lighting system not responding well to being turned on or off. This issue is resolved by either programming in a delay upon turning on the driver, or by replacing the drivers entirely.

A Payne-Sparkman representative should remotely troubleshoot the lighting system over the network. After remotely troubleshooting to gain information about the system and its known faults, a Payne-Sparkman representative should visit the site for replacement of faulty drivers and rewiring of relay cabinets back to original lighting design. Lights that are not operational should be replaced, and as fixtures are replaced, efficient LED fixtures should be installed.

The following issues are code violations and/or safety concerns, and should be addressed:

- There is no existing battery powered emergency lighting. Emergency battery-powered LED lighting should be installed where required by code.

The total anticipated cost of the Electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library is **$47,200** not including contingency.

Structural / Architectural

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library:

- The interior oak casework of the original portion of the library appears to be dried out and would benefit from a conditioning to rehydrate the wood and finishes. Moisture readings of the casework are recommended to determine whether or not the environment is drying out the interior casework. Conditioning of the surfaces recommended to maintain the original finishes. Dryness is more prevalent closer to the heater in the history room.
- Basement beneath the original portion of the library has some evidence of moisture migration through its fieldstone foundation. No major leaks with active water flow were noted, however, these areas should be monitored to see if conditions worsen and potential exterior drainage may need to be addressed around foundation walls should leaking persist.
- The wood floor in lobby needs to be refinished.
- Ceiling tiles in meeting rooms are sagging, where there are speakers mounted to the tiles. This could create a hazard to patrons were the tiles to fall down due to their deformation. It is recommended the suspended ceiling system be replaced with a full square gird support system to avoid rectangle sag. The speakers and other fixtures should be mounted to supports above suspended ceiling tiles or tiles reinforced with plywood to carry extra weight of fixtures.
- Pest or animal holes were noted on corners of cedar siding. Seal holes when seen to stop bugs from entering cavity. The Town may need to consult pest specialist to diagnose issue further.

- There are isolated areas where finish casework of new portions of the library appears warped and coming off the wall. More substantial wall anchors may be needed to secure trim to wall.
- The upstairs bench seat base support is loose and needs to be secured.
- The Fire Pump Room beneath the new portion of the library is lacking appropriate fire proofing insulation. It appears that the spray insulation was removed to install mechanical hangers. Spray insulation needs to be reapplied over areas where it was removed. In addition, the in the wall assemblies are noted to not be fire rated and will need to be properly sealed according to the rating of the pump room.
- A leak was noted at expansion joint between the original building section and newer building section. It is recommended that a curtainwall contractor or glazer inspect the joint and determine where leak is coming from and repair.
- In the 2010 addition to the building, Town staff have identified more than 60 double hung windows needing repair to eliminate air infiltration between the window frame and sash. Window manufacturer's representative should be contacted to make the necessary repairs.

Although action is not recommended until 6-10 years from now, it should be noted due to the significant cost (**$750,000)** that repairs to the original library windows will be required (L-S-7). This includes the dutchman's and epoxy repairs that are showing signs of continued rot and original members around these repairs as well as the window sills of some of the original window casings. The rot of original members will be chased at repair limits unless members are replaced in entirety. It is recommended that the Town plan for a restoration effort of the window areas, including the timber frames and sill plates. This effort should be led by a firm experienced in historical restorations. The firm could work with Town and Library Trustees to try and secure restoration grant funding and plan out the phasing of the repairs. In the interim until the windows are replaced, further dutchman repairs and fillers can be used to extend the useful life of the window units, however this problem will only continue until the window units have been replaced.

Not including the above-mentioned window repairs estimated to cost $750,000 recommended for work 6-10 years from now, the total anticipated cost of the Structural / Architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library is **$20,500** not including contingency.

HVAC / Plumbing / Fire Protection

The following are more critical HVAC / Plumbing / Fire Protection related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at The Library:

- As discussed in the structural section, all locations in the Fire Pump Room where fire proofing has been damaged or there are penetrations through the wall should be reinsulated with fireproof insulation.
- Install stem extensions to hydronic system valves in the mechanical room in the old building's basement.
- Replace the insulation and provide weatherproof jacket for the refrigerant piping between the condenser and building.
- In the 2010 addition to the building, there have been several sewer back-ups within the building. The Town has identified two areas under the floor slab where the waste line has settled resulting in the back-ups. The Town was working on repairing this at the time of writing this report.

The total anticipated cost of the HVAC / Plumbing / Fire Protection deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library is **$9,100** not including contingency.

Site / Civil

The following are more critical Site / Civil related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library:

- Reset offset curbing and inject mortar between granite curbs where missing in driveway
- Regrade the existing designated accessible parking space and associated access aisle to align with curb cuts
- Regrade and repave at manhole structures where depressions have formed. Bring pavement flush with manhole covers.
- Remove and replace cracked and damaged cement sidewalk
- At the time of building inspection, it was observed that the concrete pavers in the library driveway had failed. The Town has since awarded a contract for removal of these failing concrete pavers scheduled to take place in 2022.

The total anticipated cost of the Site / Civil deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the Public Library is **$26,400** not including contingency.

Table 2-5 provides a summary of the estimated costs by discipline for the Public Library

Table 2-5 Summary of Estimated Costs for Public Library

Discipline	Estimated Cost for Each Action Category (2)			
	Immediate	Cat A	Cat B	Total
Electrical	$24,700	$22,500	$14,300	$61,500
Structural / Architectural	$13,000	$7,500	$765,700	$786,200
HVAC / Plumbing / Fire Protection		$9,100	$118,000	$127,100
Site / Civil		$26,400	$3,000	$29,400
Subtotal	**$37,700**	**$65,500**	**$901,000**	**$1,004,200**
Contingency (40%)	***$15,080***	***$26,200***	***$360,400***	***$401,680***
Total	**$52,780**	**$91,700**	**$1,261,400**	**$1,405,880**

2.3.6 Department of Public Works

The Department of Public Works campus consists of a freestanding single story slab on grade Administrative Office Building located next to the Public Works Garage. The Administrative Office Building consists of one large open room that contains a service area, administrative workspace, information table, and restroom; the building also contains an office for the DPW Director. The Public Works Garage includes a break room, restroom, and multi-bay garage for equipment storage and a workshop area. The driveway is unpaved except for the new electrical vehicle charging station parking spaces. There are multiple conex-type storage boxes throughout the property as spacing and storage is extremely limited on the property.

Electrical

The DPW Building electrical distribution consists of a 120/240V, single phase power distribution system. Utility power service is being fed from an 200A, 2P enclosed circuit breaker located on the exterior of the garage building. The electrical distribution equipment consists of four 120/240V panelboards, an automatic transfer switch, and a 20KW propane-powered generator.

Overall, the electrical equipment at the DPW Building is in poor condition. The electrical equipment appears to have been installed roughly 40 years ago and is past the end of its useful service life. The equipment should be replaced to maintain the reliability of the electrical equipment at the station.

There is no security system at the building. An alarm dialer and door contacts for each door should be installed. The operator on site requested that additional receptacles be installed throughout the main garage area.

The following issues are code violations and/or safety concerns, and should be addressed:

- There are a number of locations with working space code violations due to equipment storage on or near the electrical equipment. Code required working space (36-inches deep by 30-inches wide minimum) should be established in front of all applicable electrical equipment. Energized work should be prohibited on electrical equipment until code required electrical working space can be established.
- The is no existing battery-powered emergency lighting. Emergency battery-powered LED lighting should be installed where required by code.
- An electrical box housing a receptacle has a gap, exposing the interior electrical components of the receptacle. Replace the electrical box.
- There are exposed power wires running along the wall with no conduit. All power wires should be secured inside of the conduit.
- Power is currently brought to the water heater through multiple extension cords. The water heater should be hard wired by the Town or Town's electrician.

The total anticipated cost of the Electrical deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the DPW is **$47,200** not including contingency.

Structural / Architectural

The following are structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at DPW:

- The fuel storage roof is covered with moss and should be replaced with a new asphalt shingled cover.
- Exterior paint is beginning to peel and breakdown. CMU and wood portions of the building should be repainted or touched up.

The total anticipated cost of the structural / architectural deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the DPW is **$19,500** not including contingency.

HVAC / Plumbing / Fire Protection

The following are more critical HVAC / Plumbing / Fire Protection related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at DPW:

- There is no gas detection in the garage area which can pose a significant health and safety risk to staff. ***Existing conditions pose a potential health and safety hazard.*** Install an automatic ventilation system with gas detection system for N_2 and CO per IMC 404 as soon as possible.
- Floor drains in garage have been made inoperable as they were filled with concrete. New floor drains should be cut / installed into the floor running to a new 400-gallon Oil Water Separator.
- The garage's bathroom is missing an exhaust, which is required by code. Install new exhaust fan.
- Install a tight tank to receive grey water discharge from the garage. Anticipated size would be 13,500-gallon per CMR 310 15.26.
- The water heater in bathroom has exceeded its useful life and should be replaced.
- Waste Oil Heaters should be replaced with infrared heaters to improve efficiencies in accordance with MassDEP guidelines. Infrared heaters may be propane fired or electrical. Construct a new secure waste oil storage unit.
- Replace fans that have exceeded their useful life.

The total anticipated cost of the HVAC / Plumbing / Fire Protection deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the DPW is **$164,200** not including contingency.

Site / Civil

Although space planning was not included in this project's scope, as noted above, spatial constraints are a serious issue at the DPW complex, both the Administrative Office and garage. This can lead to inefficient operations and equipment maintenance. These constraints also pose a threat to potential safety hazards to workers and possible damage to equipment. Within the DPW Garage, equipment is so tightly packed together that vehicle doors cannot be fully opened for staff to enter, let alone provide service to the fleet when all vehicles and equipment are parked in the garage. The repair bays are too small for maintaining larger pieces of equipment and there was noticeable damage to one of the vehicles due to tight operations and maintenance conditions. There are more pieces of equipment than can simply fit in the space. Some equipment that should be under cover cannot be due to the lack of space.

For employees, the current DPW complex is severely lacking. There are no accommodations for employees who must work long shifts, such as snowplow drivers. Additionally, there are no showering facilities for staff in either of the buildings, and there are no designated female bathrooms nor accessible bathrooms within the DPW complex.

Overall, there is a lack of space for offices and records storage. There is no designated meeting room to adequately accommodate or meet with the public, contractors, vendors, or other visitors.

It is recommended that the Town seriously consider performing a future planning study to look at either a complete renovation and expansion of the existing DPW complex or construction of a DPW complex. This space planning study will help to maximize current and future use of the Town's assets and employees. A new DPW complex should allow for a suitable arrangement of offices and storage to better serve Town Staff and the public, include spacious garage bays for equipment parking and maintenance, as well as providing

adequate breakroom and overnight accommodations, accessible showering facilities and gender specific bathrooms. Whether a new building or renovation and expansion is selected, the planning process should start now so that a new or renovated facility can be in place within the next 5 years or so.

The following are the more critical Site / Civil related deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the current DPW:

- Accessible Parking Does Not Exist. Regrade portion of parking lot to add 1 van accessible parking space, signage and access aisle.
- There is no accessibility into the Administrative Building. A ramp should be installed to overcome interior and exterior step.
- Wastewater from the Administration Building currently enters a tight tank. Wastewater from the garage discharges into a cesspool. It is recommended that a new tight tank be installed to handle domestic wastewater from the Garage and decommission the cesspool.
- Staff complained of dirty water. The well water supply should be tested for water quality and corrective action taken accordingly whether it be treatment or a new source supply.
- The Town should perform a study to look at a complete renovation and expansion of the existing DPW complex to better serve the needs of the Town as the space is currently undersized and inadequate.

The total anticipated cost of the site / civil deficiencies that should be addressed within the next 5 years (Immediate or Category A) at the current DPW is **$49,100** not including contingency.

Table 2-6 provides a summary of the estimated costs by discipline for the Department of Public Works

Table 2-6 Summary of Estimated Costs for DPW

Discipline	Estimated Cost for Each Action Category (2)			
	Immediate	**Cat A**	**Cat B**	**Total**
Electrical	$8,000	$39,200	$26,700	$73,900
Structural / Architectural		$19,500		$19,500
HVAC / Plumbing / Fire Protection	$69,500	$94,700	$14,700	$178,900
Site / Civil	$1,000	$48,100		$49,100
Subtotal	**$77,500**	**$201,500**	**$41,400**	**$320,400**
Contingency (40%)	***$31,000***	***$80,600***	***$16,560***	***$128,160***
Total	**$108,500**	**$282,100**	**$57,960**	**$448,560**

2.3.7 File Storage and Space Planning

The scope of work included making limited recommendation on file storage locations and documenting observations identified by the Town and during site visits. File storage is limited, particularly at Town Hall and throughout the Public Safety Building. The following are recommendations to address file storage limitations at Town Hall:

- Digitize records and transition to electronic cataloging of documents where permissible.
- Move files into attic of Town Hall if a safer set of access stairs or a vertical platform lift installed, and appropriate HVAC upgrades were made to the designated file storage area or room.
- Repurpose available space at Houghton Building for file storage.
- Depending on the rehabilitation plan and future use options for the Old Fire Station, file storage could be incorporated into the space if properly outfitted with an HVAC system and architectural / structural improvements.
- Rent or purchase a storage container equipped with HVAC system, located on Town owned property.

While space planning was not included in this project's scope of work, it is recommended that the Town seriously consider performing a future planning study to look at either a complete renovation and expansion of both the existing Town Hall and DPW complex, or perhaps construction of a new Town Hall and DPW complex. Both facilities are currently or quickly becoming inadequate to support the needs of the Town, its employees, its assets, and the public including those with disabilities. Additionally, the file storage and breakroom accommodations at the Fire Department were spatially concerning and expansion may want to be considered there too, which a space planning study would address. These space planning studies would help to maximize current and future use of the Town's assets.

Whether a new building, expansion or renovation is selected, the planning process should start now so that a new or renovated facilities can be in place within the next 5 years or so.

2.4 Recommended Budget and Follow Up Work

2.4.1 Recommended Budget

Table 2-7 presents a summary of all the recommendations for replacements, rehabilitation, and repairs developed in Section 2, organized by facility and action category. Note that a hazardous buildings materials survey was not performed. See Appendix A – Inventory and Recommendation Cost Table.

Table 2-7 Summary of Estimated Cost Per Building

Location	Estimated Cost for Each Action Category (2)			
	Immediate	Cat A	Cat B	Total
Public Safety Building	$65,500	$733,200	$97,000	$895,700
Old Fire Station(1)	$20,000	$0	$20,500	$40,500
Houghton Building	$17,600	$57,000	$119,300	$193,900
Town Hall	$154,500	$390,600	$40,800	$585,900
Public Library	$37,700	$65,500	$901,000	$1,004,200
Dept. of Public Works	$77,500	$201,500	$41,400	$320,400
Subtotal	**$372,800**	**$1,447,800**	**$1,220,000**	**$3,040,600**

Contingency (40%)	**$149,200**	**$579,200**	**$488,000**	**$1,216,400**
Total	**$522,000**	**$2,027,000**	**$1,708,000**	**$4,257,000**

(1) Old Fire Station is not to be occupied until further repairs are complete. Costs do not include necessary structural repairs that will be presented in supplemental Old Fire Station Structural Evaluation.

(2) 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.

Note 1: Hazardous materials survey not included, the results of which may increase cost estimates.

Note 2: Costs based on March 2022 ENR Construction Cost Index, 12791.43.

2.4.2 Follow Up Work

The following list summarizes recommended follow up work by the Town that was not included in this project's scope of work:

- Perform detailed structural evaluation of Old Fire House (underway at time of this report's revision) to inform future use considerations including potential storage relief from the Fire Department side of the Public Safety Building
- Contract with Payne Sparkman to rectify lighting issues at Public Library
- Perform an indoor air quality analysis at Town Hall
- Perform water quality testing of potable water at DPW Garage
- Perform space planning studies to look at either complete renovation and expansion of both the existing Town Hall and DPW complex, or construction of a new Town Hall and DPW complex

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APPENDIX A - Bolton Municipal Building Conditions Assessment Recommendations Table - FINAL					*Immediate: 0-1 Years, A: 1-5 years, B: 6-10 years*			
Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
Public Safety Building (Police / Fire Station)								
PS-E-1	Public Safety	Throughout facility	Electrical	Arc Flash Study	A	No	Provide arc flash/coordination studies, labels, and training.	$15,000
PS-E-2	Public Safety	Throughout facility	Electrical	Interior Lighting	B	No	As fixtures are replaced, install efficient LED lighting.	$39,200
PS-E-3	Public Safety	Facility exterior	Electrical	Exterior lighting	B	No	As fixtures are replaced, install efficient LED lighting.	$5,100
PS-E-4	Public Safety	Communication Attic	Electrical	Working space violation - Panelboard P3	Immediate	Code violation	There is a working space violation created by items being stored in front of panelboard P3. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment). Panelboard P3 is nearing the end of its useful service life. Monitor its condition and replace as required.	$0
PS-E-5	Public Safety	Electrical Closet	Electrical	Working space violation - Panelboard E & ATS-2	Immediate	Code violation	There is a working space violation created by an item being stored in front of panelboard E and ATS-2. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment). Panelboard E is nearing the end of its useful service life. Monitor its condition and replace as required.	$0
PS-E-6	Public Safety	Throughout facility	Electrical	Emergency lighting	Immediate	Code violation	Install battery-operated emergency lighting as required by code.	$16,000
PS-E-7	Public Safety	Facility exterior	Electrical	Generator	A	No	Generator has mechanical issues and does not function correctly. Replace the generator.	$138,000
PS-E-8	Public Safety		Electrical	Fire Panel A	A	No	Repair space covering for Fire Panel A	$500
PS-S-1	Public Safety		Structural / Architectural	Paint finishes on trim boards, especially around columns at base, failing and peeling. Wide uniform gaps present in PVC trim assemblies, need gaps to be filled/ caulked and painted	A		Caulk/ seal gaps in trim boards, paint exterior trim of building	$14,000
PS-S-2	Public Safety		Structural / Architectural	Portions of the building on the North side that are predominately shaded have algae, fungus build up	A		Power wash siding periodically to slow rate of organic buildup	$1,500
PS-S-3	Public Safety		Structural / Architectural	Entry doors and frames around exterior are beginning to show signs of deterioration at the bottoms, this is likely due to de icing salts	A		Annually, Frames should be cleaned and touched up to slow the rate of deterioration and prolong door and frame replacement	$1,300
PS-S-4	Public Safety		Structural / Architectural	Exterior joint sealants between interior garage slab & concrete exterior slab is failing. Steel pour stop significantly deteriorated and expanding and flaking	A		Pour stop should be cut out and reglet formed and filled with an expansion joint sealant	$15,000
PS-S-5	Public Safety		Structural / Architectural	Steel lintels at masonry openings had minor surface rusting	A		To avoid deterioration of lintels they should be cleaned and painted	$1,300
PS-S-6	Public Safety		Structural / Architectural	Roof access door over police area is to close to roof edge and requires a guardrail be installed on leading edge	Immediate	Safety/ Code Violation	Install guardrail for at least 10ft from access door along roof edge. If hatch is within 15 feet of roof edge, guard also required there	$45,000
PS-S-7	Public Safety		Structural / Architectural	Lobby bathrooms- grout cracking in tile at base of walls to floor interface. Police locker room bathrooms tile grout noted areas of missing grout	A		Remove loose grout and regrout problem areas in bathrooms	$2,500
PS-S-8	Public Safety		Structural / Architectural	Caulks and sealants around toilets and sinks cracking and failing	A		Anchors of side mount toilets should be secured. Perimeter sealants removed and reapplied for all sinks and toilets	$700

APPENDIX A - Bolton Municipal Building Conditions Assessment Recommendations Table - FINAL					*Immediate: 0-1 Years, A: 1-5 years, B: 6-10 years*			
Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
PS-S-9	Public Safety		Structural / Architectural	Ceiling tiles stained from HVAC valve leaks, on-going maintenance item for facility noted in both the police and fire sides of the building	A		Address HVAC issues and replace tiles as required	$1,500
PS-S-10	Public Safety		Structural / Architectural	Leaks were noted by maintenance staff from previous ice dams. This was an isolated event during one winter.	A		Due to the potential for this to happen again, an investigation of the insulation detailing around the eaves of the building may be warranted to ensure protection from future ice dams. Followed up by recommendations on how to improve the detailing of the insulation	$8,500
PS-S-11	Public Safety		Structural / Architectural	Floor tiles within fire side in good condition with isolated areas of tile delamination near washing machines	B		New floors on fire side of building. Monitor loose tiles spot repair/ replace as reqd.	$2,500
PS-S-12	Public Safety		Structural / Architectural	Epoxy floor within police processing and cell areas beginning to show cracks at edges of wall to floor interface	B		Spot repair cracks along wall edges to prevent further breakdown of coating	$3,000
PS-S-13	Public Safety		Structural / Architectural	Cracked mortar on fire station exhaust stack	A		Demo and replace chimney top mortar	$1,000
PS-S-14	Public Safety	Fire Station Garage Roof	Structural / Architectural	Fire Station Garage Spray foam silicone roof noted active leaks after inspection	A		Replace roof with standard EPDM or PVC flat roof system	$300,000
PS-P-1	Public Safety	Exterior - UST	Plumbing	Underground Fuel Storage Tank	A	No	Remove existing underground fuel storage tank that failed pressure test and replace with an above grade fuel storage tank adjacent to stairs at rear of building.	$9,000
PS-P-2	Public Safety		Plumbing	Oil Fired Water Heater	A	No	Replace (life expectancy 12-15 years, considering questionable water quality, recommend planning for replacement)	$8,000
PS-H-1	Public Safety	Throughout	HVAC	Hydronic piping	Immediate	No	Recommend water analysis and potential water treatment to reduce pipe corrosion (signs of pipe deterioration and joint issues; cost estimate for annual contract of water treatment)	$2,000
PS-H-2	Public Safety	Fire truck garage	HVAC	Ventilation based on gas detection	A	Yes, per current code	Upgrade ventilation controls to increase airflow upon detection of CO or N2	see below
PS-H-3	Public Safety	Fire truck garage	HVAC	Ventilation ducts and AHU	A	No	Replace to meet current code and increase efficiency (ducts look original, no access to AHU, but assume original; AHU Life expectancy = 20 years, Recommend redesign systems serving the space in conjunction with gas detection system; Infrared heat could help to improve efficiency.)	$150,000
PS-H-4	Public Safety	Throughout	HVAC	Hydronic piping	A	No	Expect ongoing pipe replacement, chemical treatment might slow down the process; estimate for annual maintenance cost; 100% replacement would be large expensive project	$3,000
PS-H-5	Public Safety	Main Boiler Room	HVAC	Boiler Circulation Pump	A	No	Replace (strong signs of corrosion)	$3,500
PS-H-6	Public Safety	Throughout	HVAC	Return grilles	A	No	Clean grilles	Part of maintenance routines
PS-H-7	Public Safety	Electric Room	HVAC	Minisplit	B	No	Replace due to age and importance of electric room (life expectancy is 15-20 years)	$5,000
PS-H-8	Public Safety	Arms Room	HVAC	Vent hood	A	No	Recommend measuring and possible re-adjustment of fan (airflow appears to be very low, requires determination of fume hood flow requirements - couldn't see fume hood nametag)	$2,500
PS-H-9	Public Safety	Throughout	HVAC	VAV boxes	A	No	Replace as needed or proactively replace on an ongoing basis; only sensible with water treatment (coil or piping near coils appears to have repeated failures; cost estimate per unit; 14 units = total cost around $28,000)	$2,000
PS-H-10	Public Safety	Cell Area	HVAC	HW coils 1-1 and 1-2	A	No	Employ controls contractor to determine if system (valves and coils) operate as intended.	$5,000
PS-H-11	Public Safety	Dispatch Room	HVAC	Supply diffusers	A	No	Replace with different air pattern (occupants getting too cold and have blocked off one grille side with insulation tube)	$400

APPENDIX A - Bolton Municipal Building Conditions Assessment Recommendations Table - FINAL					*Immediate: 0-1 Years, A: 1-5 years, B: 6-10 years*			
Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
PS-H-12	Public Safety	Locker Rooms	HVAC	Air supply and exhaust	A	No	Recommend system recommissioning and balancing to assure proper operation	$10,000
PS-H-13	Public Safety	Roof	HVAC	RTU - above cell area	A	No	Recommend replacement of unit, investigation of control operation and rebalancing of system (life expectancy is 15, issues with controls and leakage)	$15,000
PS-H-14	Public Safety	Roof	HVAC	Duct insulation	A	No	Replace insulation and jacket (insulation damaged, likely fully soaked)	$8,000
PS-H-15	Public Safety	Attic	HVAC	Cooling coil	A	No	Rebuild or replace (signs of drain pan corrosion and leakage)	$5,000
PS-FP-1	Public Safety	Fire Protection Room	Fire Protection	Test Header	B	No	Recommend installation for easier testing	$5,000
PS-FP-2	Public Safety	Fire Protection Room	Fire Protection	Fire Pump	B	No	Recommend regular maintenance and testing, re-assess to determine replacement needs; cost per pump; life expectancy is 20 years	$30,000
PS-C-1	Public Safety	Exterior - Parking Lot	Site / Civil	ADA Compliance - Van Parking Space	A	Yes	Re-grade and re-stripe the existing designated van accessible parking space and associated access aisles.	$1,500
PS-C-2	Public Safety	Exterior - Parking Lot	Site / Civil	Pavement Markings	A	No	Repaint all pavement markings.	$8,000
PS-C-3	Public Safety	Exterior - Parking Lot	Site / Civil	Pavement Spider Cracking Throughout	B	No	Patch and Seal (Approximately 1800 LF)	$7,200
PS-C-4	Public Safety	Exterior - East Side Entrance	Site / Civil	Concrete Sidewalk Damage	A	No	Repair Damaged Concrete Sidewalks and Joints	$1,500
PS-C-5	Public Safety	Exterior - Septic	Site / Civil	E-One Pump	Immediate	No	Replace E-One Control Panel and Control / Power Wiring From E-One Pump	$2,500
							PUBLIC SAFETY SUBTOTAL	**$880,700**
							PUBLIC SAFETY TOTAL (INCLUDES 40% CONTINGENCY)	**$1,233,000**
Old Fire Station								
FS-E-1	Old Fire Station	Main garage area	Electrical	Electrical box cover	Immediate	Safety	An electrical control box is missing a cover. Provide cover for electrical box.	$200
FS-E-2	Old Fire Station	Throughout facility	Electrical	Interior Lighting	B	No	As fixtures are replaced, install efficient LED lighting. Secure power	$9,100
FS-E-3	Old Fire Station	Facility exterior	Electrical	Exterior lighting	B	No	As fixtures are replaced, install efficient LED lighting.	$5,900
FS-E-4	Old Fire Station	Main garage area	Electrical	Exit signs	Immediate	Code violation	Install illuminated exit signs as required by code.	$2,100
FS-E-5	Old Fire Station	Main garage area	Electrical	Emergency lighting	Immediate	Code violation	Install battery-operated emergency lighting as required by code.	$2,100
FS-E-6	Old Fire Station	Main garage area	Electrical	Receptacle box	Immediate	Safety	An electrical box housing a receptacle has a gap, exposing the interior electrical components of the receptacle. Replace the electrical box.	$500
FS-E-7	Old Fire Station	Main garage area	Electrical	Surge Protection	Immediate	Code Violation	Install surge protection of at least 120kA/phase.	$3,200
FS-E-8	Old Fire Station	Main garage area	Electrical	Main panelboard	B	No	Main panelboard is reaching the end of its useful service life. Monitor conditions and replace panelboard when necessary.	$5,500

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Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
FS-S-1	Old Fire Station	Entire Building	Structural / Architectural	Roof and wall sag noted from the outside. Deterioration of sill plates noted where siding boards are loose. Soft pulp wood of sill logs noted to be deteriorated, heart wood left at sill appears sound. Signs of past termite damage noted in many areas of the timber framing. In the attic, the roof framing has been sistered and supported in locations in an effort to redistribute the gravity loads from the roof off of the side walls and onto existing steel beams carrying the attic floor framing. The completeness of the shoring and its effectiveness is beyond the scope of the CIP	Immediate	Safety	Due to the multiple noted areas of termite damage and current conditions of the building, it is recommended that the building not be occupied or utilized by town staff until a full structural evaluation of the building is completed.	$11,900
							OLD FIRE STATION SUBTOTAL	**$40,500**
							OLD FIRE STATION TOTAL (INCLUDES 40% CONTINGENCY)	**$56,700**
Houghton Building								
HB-E-1	Houghton Building	Second floor	Electrical	Panelboard R	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,700
HB-E-2	Houghton Building	Second floor	Electrical	White recessed panelboard	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$4,200
HB-E-3	Houghton Building	First floor	Electrical	Panelboard E	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,700
HB-E-4	Houghton Building	First floor	Electrical	Main Panel F	A	No	There is evidence of rodents inside the wall around panelboard. Remove rodents and ensure the facility is rodent-proof. Panelboard will be reaching the end of its useful service life. Replace panelboard.	$10,200
HB-E-5	Houghton Building	Outside	Electrical	Generator	Immediate	No	There is evidence of rodents living inside the generator enclosure. Remove rodents and debris and ensure that the enclosure is rodent-proof.	$3,000
HB-E-6	Houghton Building	First floor	Electrical	Working space violation - Panelboards E & F	Immediate	Code violation	There is a working space violation created by items being stored in front of panelboards E and F. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment).	-
HB-E-7	Houghton Building	Throughout facility	Electrical	Interior Lighting	B	No	As fixtures are replaced, install efficient LED lighting.	$52,000
HB-E-8	Houghton Building	Facility exterior	Electrical	Exterior lighting	B	No	As fixtures are replaced, install efficient LED lighting.	$3,100
HB-E-9	Houghton Building	Throughout facility	Electrical	Exit signs	Immediate	Code violation	Install illuminated exit signs as required by code.	$7,100
HB-E-10	Houghton Building	Outside	Electrical	Exterior lighting contactor	A	No	Exterior lighting contactor has reached the end of its useful service life. Replace the contactor.	$2,500

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Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
HB-E-11	Houghton Building	First floor	Electrical	Working space violation - ATS	Immediate	Code violation	There is a working space violation created by items being stored in front of the ATS. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment).	-
HB-E-12	Houghton Building	Outside	Electrical	Exterior lighting	A	No	The (4) exterior lighting contactors have reached the end of their useful service life. Replace the (4) contactors.	$4,000
HB-S-1	Houghton Building	Exterior	Structural / Architectural	Exterior wood façade recently painted- good condition w/ isolated areas of peeling paint at the eaves.	B		Prep and paint exterior of building	$23,100
HB-S-2	Houghton Building		Structural / Architectural	Sealants around storm window covers appear to be failing in spots, some screens at grade level by ramp ripped/ damaged	A		Reseal perimeter of storm windows, repair damaged screens	$1,800
HB-S-3	Houghton Building		Structural / Architectural	Deck coating at side entrance need refinishing and 2-4 boards secured	A		Secure deck boards and refinish side deck	$1,500
HB-S-4	Houghton Building	Roof	Structural / Architectural	Roof shingles greater than 10years old, rafter sag visible from exterior	B		Recommend a roof framing inspection prior to reroofing (within 5-10 yrs) understood a fire caused sections of the roof to be rebuilt. Framing may not have brought roof deck to original plane causing sag. Sag is evident in area of extensive repair work, does not appear unstable at time of visit but further repairs could bring roof back to flat plane which will shed snow and water better	$15,000
HB-S-5	Houghton Building		Structural / Architectural	Areas of water spots on ceiling tiles from MEP equipment in ceiling cavity	A		Address mechanical issues and replace tiles as required	$1,500
HB-S-6	Houghton Building		Structural / Architectural	The current half-wall at top of second floor stair landing is too low and not compliant with current code	Immediate	Yes	A half wall or railing extensions should be installed.	$5,000
HB-P-11	Houghton Building	Kitchen	Plumbing	Water Heater	A	No	Replace (15 years old, due to local water quality time to replace, life expectancy 12 years)	$1,200
HB-H-1	Houghton Building	Janitors Closet	HVAC	Exhaust Fan	Immediate	No	Recommend installation of exhaust fan	$2,500
HB-H-2	Houghton Building	Bathroom	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years)	$500
HB-H-3	Houghton Building	Pump Closet	HVAC	Pumps	A	No	Replace	$2,000
HB-H-4	Houghton Building	Throughout	HVAC	Hydronic Piping	A	No	Recommend water analysis and potential water treatment to reduce pipe corrosion (signs of pipe deterioration and joint issues; cost estimate for annual contract of water treatment)	$2,000
HB-H-5	Houghton Building	Pump Closet	HVAC	Hydronic Piping	B	No	Replace hydronic piping (unless transition to different system type)	N/A, Depends on piping layout
HB-H-6	Houghton Building	First Floor Library Room	HVAC	Thermostat	A	No	Replace (life expectancy 20 years - unit appears much older)	$100
HB-H-7	Houghton Building	Men's room	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500
HB-H-8	Houghton Building	Men's room	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500
HB-H-9	Houghton Building	First floor Alex Meeting Room	HVAC	Unit Ventilator	B	No	Replace (for back up heat, life expectancy 20+ years, appear to be old)	$2,000
HB-H-10	Houghton Building	Women's room	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500
HB-H-11	Houghton Building	Mixed Bathroom	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500

APPENDIX A - Bolton Municipal Building Conditions Assessment Recommendations Table - FINAL					*Immediate: 0-1 Years, A: 1-5 years, B: 6-10 years*			
Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
HB-H-12	Houghton Building	Storage/Janitors Closet	HVAC	Grille, Exhaust Fan	B	No	Replace fan, life expectancy 15 years, recommend cleaning of grille	$500
HB-C-1	Houghton Building	Exterior - Rear Stone Retaining Wall	Site / Civil	Lack of Drainage System Behind Stone Wall - Water Currently Weeps Through Wall and Enters Boiler Room	A	No	Install drainage system behind stone retaining wall to redirect surface and groundwater around Houghton Building. Excavate and install drainage stone, filter fabric, perforated pipe, and outlets through wall face.	$10,000
HB-C-2	Houghton Building	Exterior - Parking Lot	Site / Civil	Pavement Spider Cracking Throughout	B	No	Patch and Seal Approximately 300 LF	$1,500
HB-C-3	Houghton Building	Exterior - Parking Lot	Site / Civil	Pavement Markings	A	Yes	Paint Accessible Parking Spaces and Associated Access Aisles. Repaint all markings.	$1,200
HB-C-4	Houghton Building	Exterior - Sidewalk	Site / Civil	Bituminous Concrete Sidewalk Unsuitable	A	Yes	Re-pave missing or compromised sidewalk segments. Street to front door sidewalk (~210 SF) and driveway to rear door (~15 SF)	$2,500
HB-C-5	Houghton Building	Exterior - Access Ramp	Site / Civil	Access Ramp Not ADA Compliant (Ramp Slope >8.3%; Handrails Lack Extensions; Ramp Lacks 60" Level Landing at bottom)	A	Yes	Install Compliant Access Ramp and Handrails	$15,000
HB-C-6	Houghton Building	Exterior - Street front	Site / Civil	Granite and Wood Fence	A	No	Replace missing or compromised wooden 4x4 fence rails (Qty 34) and wood to granite bracket ties. Reset listing granite posts. (Assumes Town to Perform Work)	$1,500
							HOUGHTON BUILDING SUBTOTAL	**$194,400**
							HOUGHTON BUILDING TOTAL (INCLUDES 40% CONTINGENCY)	**$272,200**
Town Hall								
TH-E-1	Town Hall	Electrical Closet	Electrical	Main Distribution Panel	A	No	Panelboard has reached the end of its useful service life. Replace panelboard.	$5,700
TH-E-2	Town Hall	Electrical Closet	Electrical	Panel 2	A	No	Panelboard has reached the end of its useful service life. Replace panelboard.	$55,700
TH-E-3	Town Hall	Basement	Electrical	Submersible Pump Control Panel	A	No	Control panel has reached the end of its useful service life. Replace control panel.	$5,000
TH-E-4	Town Hall	Basement	Electrical	Panel L-I-I	A	No	Panelboard has reached the end of its useful service life. Replace panelboard.	$4,200
TH-E-5	Town Hall	Attic	Electrical	AC Outlet Panelboard	A	No	Panelboard has reached the end of its useful service life. Replace panelboard.	$3,300
TH-E-6	Town Hall	Basement	Electrical	Working space violation - Panelboard L-I-I	Immediate	Code violation	There is a working space violation created by items being stored in front of panelboard L-I-I. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment).	-
TH-E-7	Town Hall	Facility exterior	Electrical	Exterior lighting	A	No	Lighting is old and has reached the end of its useful service life. As fixtures are replaced, install efficient LED lighting.	$5,100
TH-E-8	Town Hall	Throughout facility	Electrical	Interior Lighting	A	No	Lighting is old and has reached the end of its useful service life. As fixtures are replaced, install efficient LED lighting.	$40,400
TH-E-9	Town Hall	Throughout facility	Electrical	Emergency lighting	Immediate	Code violation	Install battery-operated emergency lighting as required by code.	$10,100
TH-E-10	Town Hall	Throughout facility	Electrical	Security Contacts	Immediate	Security	Install door contacts and an alarm dialer at each door.	$4,100
TH-E-11	Town Hall	Throughout facility	Electrical	Surge Protection	Immediate	Code Violation	Install surge protection of at least 120kA/phase.	$3,200
TH-E-12	Town Hall	Electrical Closet	Electrical	Power conductors out of conduit	Immediate	Code violation	There is exposed wiring out of conduit. As old equipment and lighting is replaced, replace old wiring and install new wiring inside of conduit.	$3,500

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TH-E-13	Town Hall	Electrical Closet	Electrical	Refrigerant piping routed over panelboards, violating dedicated equipment space	B	Code Violation	As panelboards are replaced, relocate away from refrigerant piping and ensure 6ft of dedicated equipment space.	$0
TH-E-14	Town Hall	First Floor	Electrical	Electrical box cover	Immediate	Safety	An electrical control box is missing a cover. Provide cover for electrical box.	$200
TH-E-15	Town Hall	Outside	Electrical	Interior lighting contactor	A	No	The interior lighting timer/contactor located outside has reached the end of its useful service life. Replace the contactor/timer.	$2,500
TH-E-16	Town Hall	Electrical enclosure	Electrical	Enclosure wire routing	A	No	Clean up routing of telephone, signal, and power wiring within the electrical enclosure. Replace wiring and install in conduit where required. Remove unused wiring and equipment.	$3,500
TH-S-1	Town Hall	Main Entrance (Rear, Upper Level)	Structural / Architectural	Back entrance handicap ramp and side access stairs are deteriorating and reaching the end of their useful life. Railing are patched, wood stringers are cracked and broken at tread supports. Post anchors are deteriorating and broken in spots. Side stair also does not have a proper, code compliant landing	Immediate	Safety/ Code Violation	Replacement recommendation for both would be steel replacements, architectural ADA compliant railings to compliment the historic nature of the building.	$100,000
TH-S-2	Town Hall		Structural / Architectural	Trim paint isolated areas of peelings	A		Prep and paint building eaves and window trim	$12,000
TH-S-3	Town Hall		Structural / Architectural	Brick staining throughout exterior, missing mortar observed	A		Brick repointing and surface cleaning of brick	$180,000
TH-S-4	Town Hall	Boiler Room	Structural / Architectural	Boiler room exterior door frame deteriorating door not operable	Immediate	Safety	Egress concern with door not being operable, door and frame should be replaced.	$5,000
TH-S-5	Town Hall		Structural / Architectural	Sealants around storm window covers appear to be failing in spots	A		Reseal perimeter of storm windows	$3,000
TH-S-6	Town Hall	Exterior - Side Entrance	Structural / Architectural	Large gap between pavement and concrete landing at side accessibility entrance to bottom floors.	Immediate	Safety/ Accessibilit	Gap size exceeds ADA walking surface limits, fill joint with an expansion joint or cold patch.	$500
TH-S-7	Town Hall		Structural / Architectural	Carpeting on second floor wrinkled and loose, potential trip hazard, cluttered access to public bathrooms	Immediate	Safety	Remove chairs from access path to bathrooms, replace loose carpeting	$8,000
TH-S-8	Town Hall		Structural / Architectural	Flashing and trim around chimney deteriorating and needs replacement	Immediate		Replace trim and flashing around chimney, re-anchor chimney brace	$4,500
TH-S-9	Town Hall	Lower Level Bathroom	Structural / Architectural	Cracked or damaged tiles	A		Replace compromised floor tiles	$500
TH-H-1	Town Hall	Upper Floor - Conservation Commission	HVAC	Fin Tube Radiator	B	No	Replace (fair condition, life expectancy 20 years)	$800
TH-H-2	Town Hall	Water Heater Room	HVAC	Fin Tube Radiator	B	No	Replace (fair condition, life expectancy 20 years)	$500
TH-H-3	Town Hall	Boiler Room	HVAC	Circulation pump	A	No	Good condition, mfr appears to be 2006, life expectancy 10-15 years	$1,000
TH-H-4	Town Hall	Throughout	HVAC	Hydronic Piping	Immediate	No	Recommend water analysis and potential water treatment to reduce pipe corrosion (signs of pipe deterioration and joint issues; cost estimate for annual contract of water treatment)	$2,000
TH-H-5	Town Hall	Boiler Room	HVAC	Hydronic Piping	A	No	Replace all piping (recommend scheduled replacement, to avoid emergency calls); rough guess on piping length and cost	$35,000
TH-H-6	Town Hall	File Storage Room	HVAC	Fin Tube Radiator	A	No	Replace (unknown if operational, life expectancy 20 years)	$700
TH-H-7	Town Hall	Town Planner	HVAC	Fin Tube Radiator	A	No	Replace (unknown if operational, life expectancy 20 years, upgrade controls to provide sufficiently heated work environment. Split system doesn't seem to reach space.)	$700
TH-H-8	Town Hall	Storage Room	HVAC	Fin Tube Radiator	A	No	Replace (unknown if operational, life expectancy 20 years)	$700
TH-H-9	Town Hall	Toilet	HVAC	Exhaust Fan	Immediate	Yes	Install ASAP to provide code required exhaust	$2,000
TH-H-10	Town Hall	Toilet	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$700

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TH-H-11	Town Hall	Meeting Room	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$2,000
TH-H-12	Town Hall	Tow Accountant/Treasu	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$2,200
TH-H-13	Town Hall	Building Inspector/HR	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$2,200
TH-H-14	Town Hall	Main Stairwell	HVAC	Cabinet Unit Heater	B	No	Replace (due to estimated age; life expectancy about 15 years; operational, but requires cleaning); cost per unit	$2,500
TH-H-15	Town Hall	Tax Collector Treasurer	HVAC	Unit Ventilator	Immediate	Yes	Replace (not functional, recommend replacement as backup for split system); required for code ventilation; if units are not re-instated another supply of ventilation per code is required.	$3,500
TH-H-16	Town Hall	Hallway behind bathroo	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$2,200
TH-H-17	Town Hall	Town Secretaries	HVAC	Unit Ventilator	Immediate	Yes	Replace (not functional, recommend replacement as backup for split system); required for code ventilation; if units are not re-instated another supply of ventilation per code is required.	$3,500
TH-H-18	Town Hall	Town Administrator	HVAC	Fin Tube Radiator	B	No	Replace (life expectancy 20 years)	$2,200
TH-H-19	Town Hall	Public Restroom	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500
TH-H-20	Town Hall	Employee Restroom	HVAC	Exhaust Fan	B	No	Replace fan (life expectancy 15 years) - unit inaccessible, therefore cost is guessed	$1,500
TH-C-1	Town Hall	Exterior - Entrance Driveway	Site / Civil	Guardrail rails missing or compromised	Immediate	Yes	Replace All Rails and Brackets. Install two new 4"x8" wooden guardrails between existing Granite Posts. (Assume Work Can Be Complete By Town)	$4,400
TH-C-2	Town Hall	Exterior - Entrance Driveway	Site / Civil	Surface runoff across front arched driveway eroding front hill and compromising retaining wall along sidewalk at street level	A	No	Install new asphalt curb along southern edge of curved front entrance driveway	$2,000
TH-C-3	Town Hall	Exterior - Entrance Driveway	Site / Civil	Surface and groundwater runoff compromising northwest corner of building	A	No	Regrade and Install French Drain	$12,500
TH-C-4	Town Hall	Exterior - Entrance Driveway	Site / Civil	Stonewall along Main Street	B	Yes	Reset wall and install drainage system on upland side	$22,500
TH-C-5	Town Hall	Exterior - Entrance Driveway	Site / Civil	Basement Entrance Parking Accessibility	A	Yes	Regrade the existing designated accessibility parking space to have less than 2% cross slope and restripe space and associated access aisle.	$3,000
TH-C-6	Town Hall	Exterior - Entrance Driveway	Site / Civil	Basement Entrance Walkway	A	Yes	Regrade walkway so cross slope is less than 2% and running slope is less than 5%.	$6,000
TH-C-7	Town Hall	Exterior - Entrance Driveway	Site / Civil	Access Route and Main Entrance Accessibility Parking	A	Yes	Add 1 New Van Accessible Parking Space. Regrade accessibility parking location and route to be less than 5% slope and not coincide with vehicular travel.	$8,100
							TOWN HALL SUBTOTAL	**$585,900**
							TOWN HALL TOTAL (INCLUDES 40% CONTINGENCY)	**$820,300**
Library								
L-E-1	Library	Throughout facility	Electrical	Emergency Lighting	Immediate	Code Violation	Install battery-operated emergency lighting as required by code.	$21,000
L-E-2	Library	Throughout facility	Electrical	Arc Flash Study	A	No	Provide arc flash/coordination studies, labels, and training.	$15,000
L-E-3	Library	Throughout facility	Electrical	Faulty Lighting Control System	Immediate	No	Bring in Payne Sparkman lighting consultant to diagnose and fix lighting control system. Reach out to Carter Payne at carter@paynesparkman.com for technician coordination.	$3,700
L-E-4	Library	Throughout facility	Electrical	Interior Lighting	B	No	Some bulbs are not operational, exacerbating issues with the lighting system. Replace bulbs as required.	$14,300
L-E-5	Library	Throughout facility	Electrical	Controls	A	No	Controls/Miscellaneous equipment	$7,500

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L-S-1	Library	Basement	Structural / Architectural	Basement of original library has some evidence of moisture migration through its fieldstone foundation. No major leaks with active water flow were noted.	B		Areas should be monitored to see if conditions worsen and potential exterior drainage may need to be addressed around foundation walls.	$0
L-S-2	Library	Lobby	Structural / Architectural	Lobby wood floor worn and finish breaking down	A		Sand and refinish lobby floor	$7,500
L-S-3	Library	Meeting Room	Structural / Architectural	Ceiling tiles in meeting room are sagging, speakers mounted to tiles	B		Recommend replacing suspended ceiling system with full square gird support system to avoid rectangle sag. Speakers and other fixtures should be mounted to supports above suspended ceiling tiles or tiles reinforced with plywood to carry extra weight of fixtures.	$15,700
L-S-4	Library	Exterior	Structural / Architectural	Pest or animal holes noted on corners of cedar siding	Immediate		Seal holes when seen to stop bugs from entering cavity. May need to consult pest specialist to diagnose issue further.	$500
L-S-5	Library	Fire Protection Room	Structural/ Mechanical*	Fire Pump Room: Spray applied Fire Proofing insulation removed to attach mech hangers, spray insulation needs to be reapplied over areas where it was removed. Also penetrations in the wall assemblies are noted to not be fire rated and will need to be properly sealed according to the rating of the pump room.	Immediate		Repair all locations where steel fire proofing has been damaged and properly fireproof all penetrations in pump room	$2,500
L-S-6	Library	Exterior	Structural / Architectural	Leak noted at expansion joint between original and new addition	Immediate		_Perform initial patch using a curtain wall contractor. _Long term solution should include inspection of the joint and determining where leak is coming from in order to develop a repair detail. Recommend work be performed by a Forensic Building Envelope Consultant (i.e. SGH)	$10,000
L-S-7	Library	Exterior	Structural / Architectural	Repairs to original library windows including dutchman's and epoxy repairs showing signs of continued rot or original members around these repairs as well as the window sills of some of the original window casings.	B		Rot of original members will be chased at repair limits unless members are replaced in entirety. Recommend a restoration effort of the window areas, including the timber frames and sill plates, lead by an architectural firm experienced in historical restorations. Restoration architect working with the Library's Board of Trustees to secure restoration grant funding and plan out phasing of repairs	$750,000
L-P-1	Library	Both Levels	Plumbing	Drinking Fountain	A	No	Replace (life expectancy is 7-10 years; cost for each unit)	$6,000
L-P-2	Library	Janitors Closet	Plumbing	Water Heater, upstairs (Rinnai R94LS, condensing, tankless)	B	No	Replace (life expectancy 15 years)	$3,000
L-P-3	Library	NE of old library entrance	Plumbing	Outdoor Gas Piping	A	No	Recommend to treat and paint rusty components	$1,000
L-P-4	Library	Backside of bldg.	Plumbing	Downspout	A	No	Some outlets bent and sheet onto sidewalk. Should be replaced / rerouted beneath sidewalk similar to downspouts on side of building.	$1,000
L-H-1	Library	HVAC room, basement, old part of library	HVAC	HW circulation pumps (4)	B	No	Replace at end of life expectancy of 15-20 years	$10,000
L-H-2	Library	HVAC room, basement, old part of library	HVAC	Hydronic Piping	A	No	Install stem extension to valves and improve insulation to extend valve life expectancy (rust due to condensate during cooling mode operation; stem extension can be an ongoing process); cost per valve	$100
L-H-3	Library	HVAC room, basement, new part of library	HVAC	Air Handling Unit	B	No	Appears to be in good condition, re-assess later, life expectancy 20 years	$50,000
L-H-4	Library	Exterior	HVAC	Refrigerant piping between condenser and bldg.	A	No	Replace insulation and provide whether-proof and UV resistant jacket	$1,000

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L-H-5	Library	Program Room	HVAC	AHU w cooling coil and gas fired section	B	No	Replace at end of life (chiller life expectancy is 15-20 years)	$8,000
L-H-6	Library	Electric Room	HVAC	Minisplit	B	No	Replace due to age and importance of electrical room (life expectancy is 15-20 years,)	$5,000
L-FP-7	Library	Fire Protection Room	Fire Protection	Fire Pump	B	No	Recommend regular maintenance and testing, re-assess to determine replacement needs; cost per pump; life expectancy is 20 years	$40,000
L-FP-8	Library	Fire Protection Room	Fire Protection	Fire Sprinkler Air Compressor	B	No	Replacement to be considered due to importance of FP system (life expectancy is 20 years,)	$2,000
L-C-1	Library	Exterior - Parking Lot	Site / Civil	Granite Curbing missing mortar in joints.	A	No	Reset offset curbing and inject mortar between granite curbs where missing	$2,400
L-C-2	Library	Exterior - Parking Lot	Site / Civil	Pavement Spider Cracking Throughout	B	No	Patch and Seal (Approximately 250 LF)	$1,000
L-C-3	Library	Exterior - Parking Lot	Site / Civil	Bituminous Concrete Berm Damage	B	No	Asphalt repair / patch compromised berms (appears to be plow damage)	$2,000
L-C-4	Library	Exterior - Parking Lot	Site / Civil	Van Accessible Parking Space Does Not Exist. Access aisle does not align with curb cut.	A	Yes	Re-grade the existing designated accessible parking space and associated access aisle to align with curb cut	$3,000
L-C-5	Library	Exterior - Parking Lot	Site / Civil	Bituminous Driveway Settling near Stormwater Retention Basin and Water Separator Manhole Covers.	A	No	Regrade and repave at manhole structure. Bring pavement flush with manhole covers.	$6,000
L-C-6	Library	Exterior - Main Entrance	Site / Civil	Cement Sidewalk Damage	A	No	Remove and replace cracked and damaged cement sidewalk (Approximately 250 SF)	$15,000
							LIBRARY SUBTOTAL	**$1,004,200**
							LIBRARY TOTAL (INCLUDES 40% CONTINGENCY)	**$1,405,880**
DPW								
PW-E-1	DPW	Electrical Closet	Electrical	Panel 1	A	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,800
PW-E-2	DPW	Electrical Closet	Electrical	Panel 2	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,700
PW-E-3	DPW	Main garage area	Electrical	Panel 3	A	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,700
PW-E-4	DPW	Main garage area	Electrical	Working space violation - Disconnect switch	Immediate	Code violation	Working space violation in front of disconnect switch. Restrict energized work until the items have been relocated and code required electrical working space has been restored (minimum 36-inch depth by 30-inch wide in front of equipment). Clean out debris from enclosure and add a gasket to the enclosure. Disconnect switch will be reaching the end of its useful service life. Monitor the conditions and replace the disconnect switch when necessary.	$2,600
PW-E-5	DPW	Addition	Electrical	Panel 4	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard.	$5,700
PW-E-6	DPW	Throughout facility	Electrical	Emergency lighting	Immediate	Code violation	Install battery-operated emergency lighting as required by code.	$4,100
PW-E-7	DPW	Throughout facility	Electrical	Security Contacts	A	Security	Install door contacts and a communication system.	$3,000
PW-E-8	DPW	Electrical Closet	Electrical	Power conductors out of conduit	A	Code violation	As equipment is replaced, evaluate the condition of the wiring and consider replacing with new wire in conduit to better protect wiring.	$1,900
PW-E-9	DPW	Main garage area	Electrical	Disconnect switch	A	No	Critical equipment disconnect switch will be reaching the end of its useful service life. Replace disconnect switch.	$2,800
PW-E-10	DPW	Main garage area	Electrical	Small electrical box	Immediate	Safety	An small electrical box has a gap, exposing the interior electrical components. Replace the electrical box.	$800
PW-E-11	DPW	Main garage area	Electrical	Additional Receptacles	B	No	Install additional convenience receptacles throughout the main garage area, including conduit and wire.	$7,600

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PW-E-12	DPW	Main garage area	Electrical	Panel backed up by generator "Left Side"	B	No	Panelboard will be reaching the end of its useful service life. Replace panelboard. As it is replaced, consider the installation of MC cable or power wiring in conduit to better protect cables.	$7,700
PW-E-13	DPW	Wood Chipper Garage Bay	Electrical	Water heater located in loft is powered by multiple extension cords.	Immediate	Yes	The Town or the Town's electrician should hard wire the water heater per code.	$500
PW-E-14	DPW	Throughout facility	Electrical	Miscellaneous repairs	A	No	The entire facility needs miscellaneous electrical repairs. New conduit and wire, replacement receptacles and boxes, etc.	$20,000
PW-S-1	DPW	Exterior	Structural / Architectural	Generator roof moss covered	A		Replace generator roof w/ new asphalt shingles	$1,500
PW-S-2	DPW	Exterior	Structural / Architectural	Exterior paint beginning to peel and breakdown	A		Touchup/ repaint exterior CMU and wood portions of the building	$18,000
PW-P-1	DPW	Garage Area	Plumbing	Floor Drains Inoperable (Filled with Concrete). No oil / water seperator.	Immediate	Yes	Install 400 gallon Oil Water Separator and cut in / install new floor drains throughout garage.	$50,000
PW-P-2	DPW	General	Plumbing	Garage waste	A	No	Install tight tank to receive grey water discharge, 450GPD for design per bay based on gas station (310 CMR 15.203), 6 vehicles; 500% of GPD per CMR 310 15.26 --> - tank aprox 13,500 gallon	$50,000
PW-P-3	DPW	Bathroom	Plumbing	Water Heater	A	No	Replace (manufacturing date 2012, life expectancy 10-12 years)	$2,000
PW-P-4	DPW	Breakroom	Plumbing	Water Heater	A	Yes	Change installation to meet code requirements. Current installation drains onto breakroom ceiling and is connected with extension cord.	$1,500
PW-H-1	DPW	Garage Area	HVAC	Waste Oil Heaters (CB2800, CB2500) and Waste Oil Storage Tank	A	No	Install new waste oil storage tank and install new infrared heaters to improve efficiencies and environmental footprint. Infrared heaters may be propane fired or electrical.	$40,000
PW-H-2	DPW	Garage Area	HVAC	Vehicle Exhaust System	B	No	Replace Fan at failure	$8,000
PW-H-3	DPW	Garage Area	HVAC	Gas Detection	Immediate	Yes	Install automatic ventilation system with gas detection system for N2 and CO per IMC 404	$18,000
PW-H-4	DPW	Garage Area	HVAC	Destratification Fans (3)	A	No	Replace as needed, life expectancy 5-10 years	$1,200
PW-H-5	DPW	Bathroom - Garage	HVAC	Boiler, ET, auxiliaries	B	No	Remove, obsolete. Garage unit heater to be replaced with direct fired propane unit heater. Hydronic unit heater in breakroom replaced with split system.	$1,500
PW-H-6	DPW	Bathroom - Garage	HVAC	Garage Bathroom Exhaust	Immediate	Yes	Install Exhaust Fan (not existent, required by code to have a bathroom exhaust)	$1,500
PW-H-7	DPW	Garage near Breakroom and Breakroom	HVAC	Unit Heaters	B	No	Remove UH in breakroom; replace UH with infrared heater in garage	$3,000
PW-H-8	DPW	Office	HVAC	Window AC	B	No	Consider removal & disposal	$500

$78,500

APPENDIX A - Bolton Municipal Building Conditions Assessment Recommendations Table - FINAL					*Immediate: 0-1 Years, A: 1-5 years, B: 6-10 years*			
Item No.	**Location**	**Room/Space/Area**	**Discipline**	**Item Description**	**Recommended Action Category**	**Code Violation / Safety / Security**	**Proposed Improvement**	**Estimated Capital Cost**
PW-H-9	DPW	Office	HVAC	Electric Wall Heaters (2)	B	No	Replace (as back up for split system, life expectancy 10 years; cost per unit)	$1,200
PW-H-10	DPW	Bathroom - Office	HVAC	Bathroom fan	B	No	Replace as needed (life expectancy 15 years)	$500
PW-C-1	DPW	Exterior - Parking	Site / Civil	Accessible Parking Does Not Exist	A	Yes	Regrade portion of parking lot to add 1 van accessible parking space, signage and designated access aisle.	$3,100
PW-C-2	DPW	Office Bld Entrance	Site / Civil	No accessibility into office	A	Yes	Install ramp to get into DPW Office Building to Overcome Interior and Exterior Step	$15,000
PW-C-3	DPW	Exterior	Site / Civil	Garage - Septic System	A	No	Replace cesspool (serving garage) with a new tight tank for domestic wastewater storage.	$30,000
PW-C-4	DPW	Exterior	Site / Civil	Water quality complaints	Immediate	Yes	Perform a water quality test of the well water. Based on findings treat or identify new water source.	$1,000
PW-C-5	DPW	Garage & Admin Building	Site / Civil	Existing builidng is undersized and inadequate for the needs of the Town. Office space is limited, bathroom facilities are inadequate, and the repair bays for the Town equipment are too small for maintaining larger pieces of equipment.	A	No	Perform a study to look at a complete renovation and expansion of the existing DPW complex to better serve the needs of the Town	-
							DPW SUBTOTAL	**$321,400**
							DPW TOTAL (INCLUDES 40% CONTINGENCY)	**$450,000**

Site Photographs: Public Safety Building

C	Civil/Site
S	Structural / Architectural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: Photo of E-One Grinder Pump Control Panel. Power wiring and the control panel need replacement.

Photo C2: Compromised side entryway sidewalk damage in need of repair.

Photo S1: Guardrails needed on roof. Door too close to edge without fall protection.

Photo S2: Trim joints to be caulked and repainted.

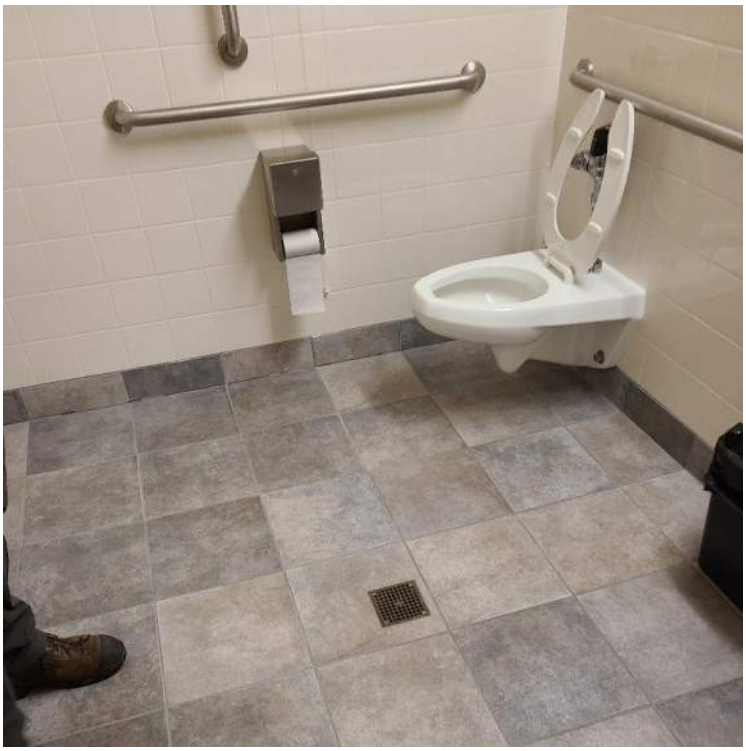

Photo S3: Regrout bathroom tiles in Police Station bathrooms.

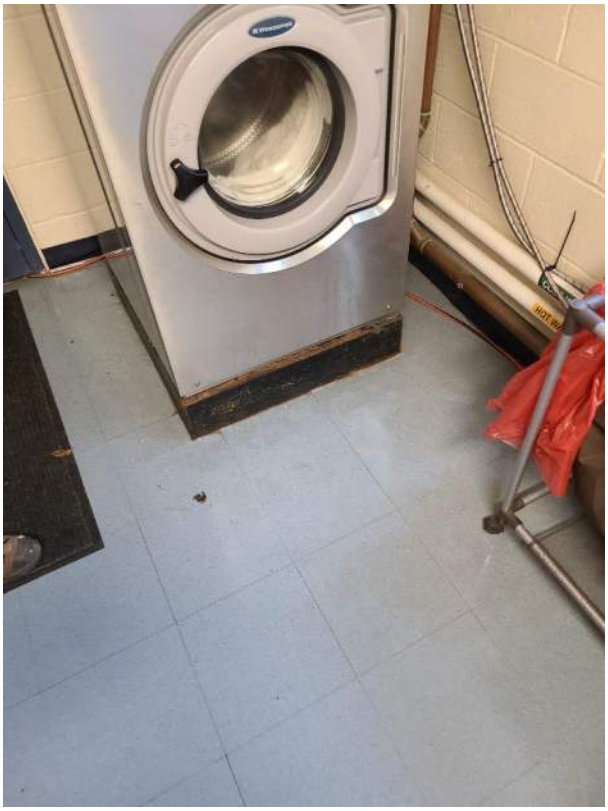

Photo S4: Delamination on Fire Station Side floor in laundry / boiler room.

Photo H1: Gas detection for NO_2 and CO is needed in garage. Upgrade ventilation controls based on gas level.

Photo H2, H3: Photo of boiler room and fire suppression equipment.

Photo E1: Backup generator is having mechanical issues and will likely require replacement in the next 5 years.

Photo E2,E3: Electrical panels. Ensure stored items cleared from front of panelboards to avoid working space code violation.

Site Photographs: Old Fire Station

C	Civil/Site
S	Structural / Architectural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: Driveway and sidewalk at Old Fire Station.

Photo C2: Rear lawn and unknown storage vault at Old Fire Station.

Photo S1: Patched and sistered structural framing in compromised old Fire Station.

Photo S2: Supplemental header for roof rafters.

Photo S3: Cable bracing in first floor of Old Fire Station.

Photo S4: Original framing and siding in Old Fire Station second floor.

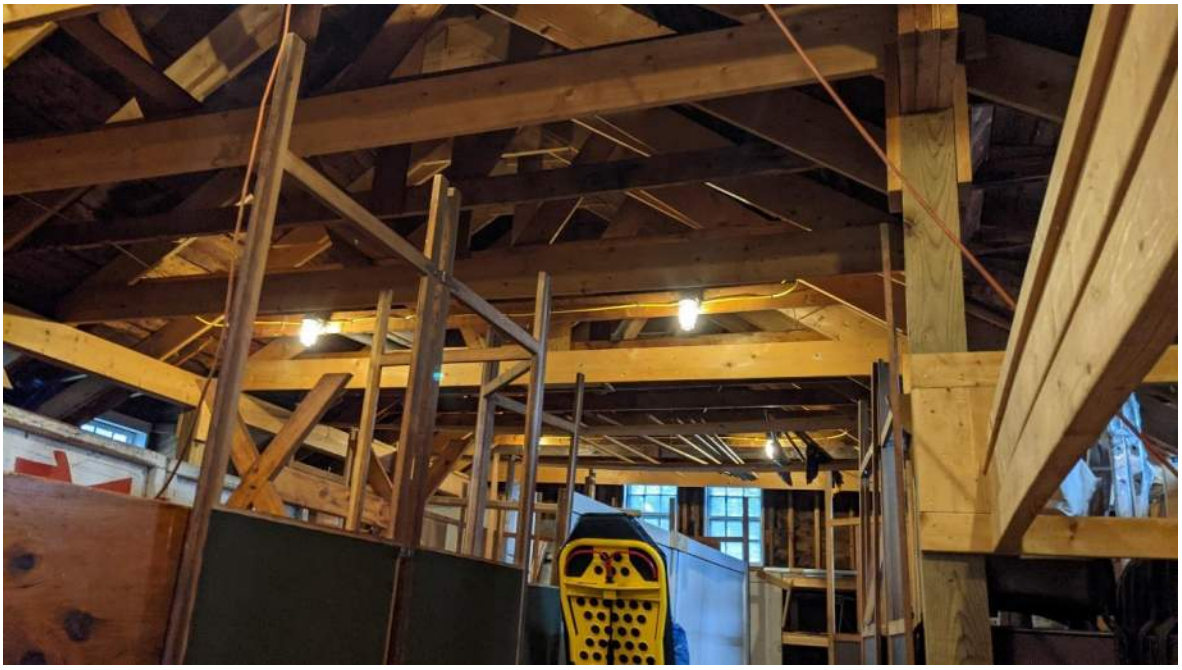

Photo E1: Second floor lighting. Building is lacking illuminated exit signs and emergency lightening, which are code violations.

Photo E2: Electric panel. Install surge protection, code violation.

Site Photographs: Houghton Building

C	Civil/Site
S	Structural / Architectural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: View of boiler room and stone wall behind building. Water weeps into building at this point. Investigate installation of either a drainage system installed behind wall to direct flow around building or an interior or exterior cutoff drain below boiler room floor elevation.

Photo C2: Entry ramp is not ADA compliant. Too steep (>8.3%), no handrail extensions, lacks landing (60" level required).

Photo S1: Eve and siding paint chipping.

Photo S2: Rebuilt roof rafter and decking after fire.

Photo S3: Secure and refinish side entrance deck and stairs.

Photo S4: Half-wall is too low at top of stairs. Safety risk. Increase height.

Photo H1: Installation of exhaust fan in janitor closet recommended.

Photo H2: Boiler room subject to water inflow and resultant moisture issues. See Photo C1.

Photo E1,E2: Evidence of rodents in backup generator. Clean and make rodent-proof

Photo E3,E4: Working space violation in front of panelboards. Remove stored items.

Site Photographs: Town Hall Building

C	Civil/Site
S	Structural / Architectural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: View of the front driveway. Guardrails compromised, need replacement. New curb required to prevent surface runoff down bank, behind retaining wall and onto street.

Photo C2: Surface runoff compromising SW corner of building. Regrade and install drainage.

Photo S1: Rear entry ramp compromised and in need of replacement. Top view.

Photo S2: Rear entry ramp (underside view) and wood side stairway compromised.

Photo H1/P1: Existing Boilers. Recommend water analysis and possible treatment to reduce hydronic system piping corrosion.

Photo H2,H3: There are air quality concerns in Town Hall; improved ventilation or air purification may be required. Photo of ductless mini-splits distribution box in attic.

Photo E1,E2: View of the existing main distribution panel at end of useful life. Provide minimum 30-inch wide by 36-inch depth clear working space in front of electric panels.

Photo E3: Automatic transfer switch and main feed.

Site Photographs: Public Library

C	Civil/Site
S	Structural / Architectural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: Sidewalk damage at main entrance. Granite curbing missing grout throughout.

Photo C2: Bituminous concrete settling around manhole covers throughout driveway.

Photo S1: Expansion join between original building and addition is leaking.

Photo S2: Foundation moisture in basement of original library should be monitored.

Photo S3: Rot on sills of small double hung windows. Sill rot throughout building.

Photo S4: Holes in cedar siding from bugs or pests need to be sealed.

Photo P1: Fire pump room and suppression system. Fireproof insulation needs to be installed in rooms' penetrations. See item L-S-5 of Appendix A.

Photo H1: Condenser. Replace insulation and provide weather-proof UV resistant jacket.

Photo E1: Backup generator. New motor recently installed after 10 years of operation.

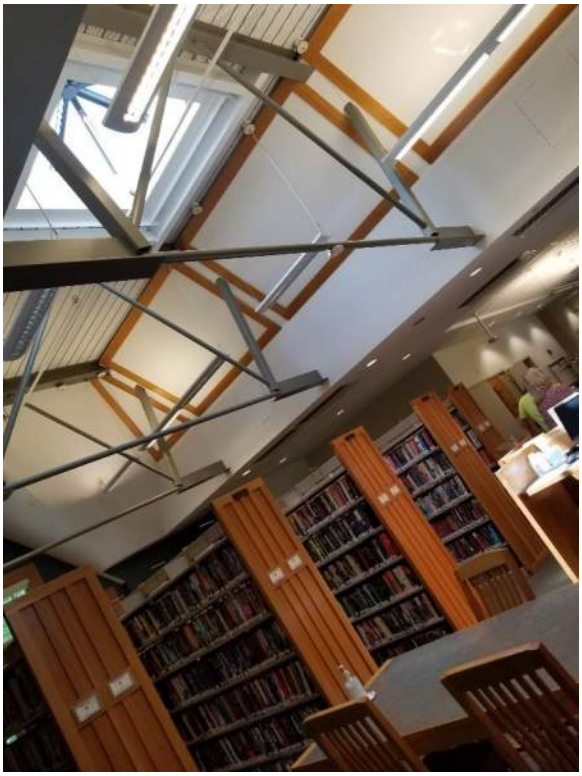

Photo E2,E3: Low voltage Payne Sparkman lighting control system is problematic. Electrical panels. System diagnosis by manufacturer required.

Site Photographs: DPW Building

C	Civil/Site
S	Structural
P	Plumbing
H	HVAC
E	Electrical

Photo C1: View of the existing conditions of DPW parking lot. No ADA to Admin Building.

Photo C2: View of parking lot and vehicle storage at DPW Garage. Limited space. Moss on lower section of roof.

Photo S1: Exterior Paint Peeling on Garage. Typical of Admin Building too.

Photo S2: Oil tank shelter shingles covered in moss.

Photo H1: DPW Garage lacking automatic ventilation and gas detection is safety hazard. Need gray water tight tank, floor drains and an oil water separator. Lack of adequate spacing between vehicles for adequate operations and maintenance activities.

Photo P1: Garage bathroom needs exhaust fan. No showers for employees and no female-specific bathroom. Replace cesspool with tight tank.

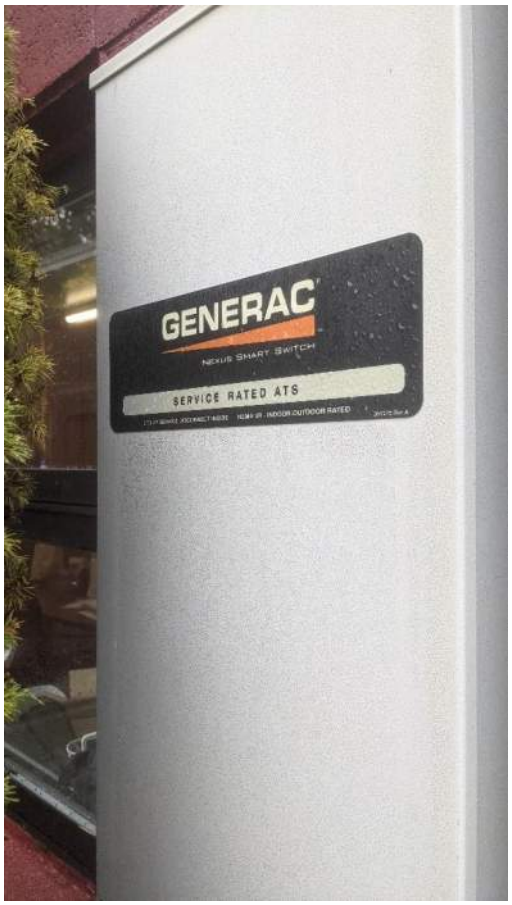

Photo E1,E2: View of the existing panelboard and ATS. Nearing end of useful life.

Photo E3: Install emergency lighting with battery backup (as shown in photo) where lacking throughout facility.

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