FINAL REPORT

EVALUATION AND ASSESSMENT
TOWN OF SALEM DISTRICT COURTHOUSE
35 GEREMONTY DRIVE
SALEM, NEW HAMPSHIRE

FEBRUARY 10, 2017

The H.L. Turner Group Inc.

ARCHITECTS ▪ ENGINEERS ▪ BUILDING SCIENTISTS

Facility Assessment Report

Salem District Courthouse

On Tuesday, October 11, 2016, The H.L. Turner Group Inc. (TTG) visited the site of the Salem District Court at 35 Geremonty Drive in Salem, NH, to perform a facility assessment of the building and surrounding site. The purpose of this assessment was to identify any existing deficiencies in the building or site that the Town should plan to address. The report is divided into four main sections. The first section gives an overview of the architectural features of the building including the exterior façade, roof, and interior finishes. The second and third sections address the major mechanical and electrical equipment and associated deficiencies, respectively. The final section is an in-depth discussion of the surrounding site, including drainage issues and the wastewater management system.

Accurate and concise condition assessment data is essential for proper planning for maintenance, improvements, and capital improvements. This condition assessment is intended for use by the Town of Salem as a tool for budget planning for the allocation of resources on a priority basis. It is hoped that by determining the nature and extent of problems, and providing options for corrective action, items may be addressed before more serious damage or failure can occur. The purpose of this facility audit is to report conditions that are in need of repairs and upgrade, conditions that do not comply with current building and safety codes, and confirm that the facility operates as designed structurally, mechanically, and electrically.

Project Objectives

- To provide an accurate accounting of all items that may be classified as deferred maintenance or capital repair/improvements.
- To calculate opinions of cost for all identified maintenance and capital improvement items using an established method of construction and cost estimating data.
- To assemble a report and database that identifies a 10-year capital planning cycle to address all identified maintenance items.

It is the intention that the results of this facility audit will ultimately be used to identify a prioritization of capital repair and replacement projects for the Salem District Courthouse.

LIMITATIONS: The H.L. Turner Group Inc. (TTG) has prepared this report for the Town of Salem, New Hampshire, based on visual observations only and therefore it did not involve destructive demolition, scientific testing, or any other tests. The information/data in this report has been provided in general accordance with accepted Engineering/Architectural consulting practices and TTG makes no warrantee, either expressed or implied on the conclusions or cost estimates/opinions of cost provided.

Executive Summary

In general, Salem District Courthouse is a well-maintained facility and the maintenance staff has done an excellent job keeping the buildings operational and in a very presentable condition; however, the building and the building systems are definitely showing their age. Many of the finishes including walls, ceilings, and floors are worn and outdated. The mechanical, electrical, and other systems and equipment have aged and many are at, or have exceeded, their useful life. The following list summarizes what we have judged to be the most critical issues. These issues should be addressed in the next two to three years.

Life Safety Issues

- Emergency and Exit Lighting
- Fire Alarm System

Opinion of Cost

Contractor's Construction Costs (Materials and Labor) $82,500

Engineering and Design Cost $14,500

Mechanical Systems

- Air Handling Units
- Automatic Temperature Controls

Opinion of Cost

Contractor's Construction Costs (Materials and Labor) $330,000

Engineering and Design Costs.....$65,000

Roofing

- Roof replacement including new roof drains
- Chimney repairs
- Skylight replacement

Opinion of Cost

Contractor's Construction Costs (Materials and Labor) $201,500

Engineering and Design $35,000

Electrical

- Update lighting to LED's
- Replace lighting controls

Opinion of Cost

Contractor's Construction Costs Materials and Labor) $220,500

Engineering and Design $38,500

Site Issues

- Pump station upgrades
- Modify force main to prevent freezing
- New oil supply pump
- Repairs to catch basin and trench drains at overhead doors

Contractor's Construction Costs Materials and Labor $88,500

Engineering and Design $17,500

TOTALS

Contractor's Construction Costs.....$923,000

Engineering Studies and Design.....$170,500

TOTAL $1,093,500

Introduction

The Salem District Courthouse was constructed in 1982. It was designed by the Architectural firm of Drummey, Rosane, Anderson, Inc. of Newton, Massachusetts. It is a two-level, brick façade structure, the lower level being partially below grade. The lower level is primarily concrete with a brick façade, while the upper level is light gage metal construction with a brick façade. The building has a gross square footage of approximately 23,000 square feet or approximately 11,500 square feet per level. The building has a loose laid, ballasted-type membrane roof. Since the original construction there have been no additions to the building, nor has the building experienced any major upgrades or renovations. For this report, the building facade fronting Geremonty Drive is referred to as the west side and the portion of the site closest to Salem Town Hall is the north side.

The major spaces on the upper level of the Courthouse include two courtrooms, a clerk's department, a law library, jury room, two judge's chambers, several small conference rooms and offices. The lower level includes space for youth services, a juvenile courtroom, probation department, judge's chamber, space for a future courtroom (currently used for storage) and several other small offices, conference rooms, mechanical space, storage vault and two separate garage spaces for use by police and judges.

Roof

The roof is a loose laid membrane-type roof overlaying rigid insulation. The membrane is held in place by a 1 to 2-inch layer of small diameter river stones or rounded stones. We observed some of the stone ballast had been pulled back from some of the seams and it was reported that these particular seams had been replaced with new seam strips. The roof edges, including the gravel stops/fascia appear to be in fair condition. The brick-faced elevator penthouse which extends about 6 feet above the roof has been a source in the past for water leakage into the building. The reglet flashing around the perimeter, where the brick façade of the enclosure meets the EPDM, has recently been caulked with silicone. This has temporarily stopped the water intrusion. There are two raised roof areas directly over the courtroom ceiling coffers. We noticed standing water in the ballast at both locations. There is a single scupper at each raised roof section, designed to collect the water and direct it toward a downspout and eventually to a roof drain. We suspect debris is preventing the water from properly draining from these raised roof sections or the insulation is not properly sloped to the scupper.

The roof has six interior roof drains. In at least two locations the basket strainers were damaged and many of the drains are surrounded by debris, preventing proper water flow to the drains. The current roof drains have no provision for overflow should the primary drain become blocked. There are two dome-shaped, acrylic skylights over two interior light wells. We noted that the exterior glazing layer is broken on both skylights and moisture/condensation is visible between glazing layers. One skylight has a sizable crack extending from the corner to just beyond the center of the dome. There is a brick-faced chimney that extends about 8 to 10 feet above the surface of the roof. The brick at the top of the chimney just under the precast cap shows signs of moisture intrusion and it should be re-flashed and re-pointed.

It is our understanding, after talking with the building's maintenance manager, that the roof was last replaced back in 1998/1999. In general, based on our observations, the condition of the roof is such that it is fast approaching the end of its useful life and is in need of replacement in the next two to three years. We recommend that the stone ballast be removed and that a new fully adhered EPDM or TPO membrane be installed over new rigid insulation. All the roof drains and strainer baskets should be replaced as well. The replacement roof drains should be the dual overflow-type drain units. By removing the stone ballast from the roof, the live load carrying capacity of the roof will increase by approximately 12 to 15 pounds per square foot, thereby allowing the roof to carry more snow load before overstressing the roof supporting members.

Building Façade

The brick masonry façade is in generally good condition. The caulking in the control joints is in good condition as well. There are weep holes at the base of the wall to allow a path for moisture to exit the cavity between the masonry and the wall structure. However, some of the weeps are buried under the mulch around the shrubs and plants. Each year, mulch gets added to the planting beds, and over time it has built up to the point where it is blocking the weep holes. We also observed a screened wall vent on the south elevation of the building that is full of debris and needs to be cleaned.

The brick arch at the main entry exhibits efflorescence at the soffit. Efflorescence is crystalline salt deposits that form on the surface of porous masonry. The salts are dissolved by a source of water or moisture and are transported to the surface of the brick as the water moves through the brick toward the outside. Once at the surface, the water evaporates leaving the salts behind. The salt source could be attributed to the type of

mortar used. The water source could be attributed to water that has penetrated the shell of the building and is working its way out through the porous brick.

The brick caps on the entry walls are in need of repair. The mortar is deteriorating and receding from the brick edges at the joints. The brick masonry wing walls/planter walls are showing signs of moisture intrusion causing deterioration of the mortar. The mortar is cracking and falling out of the joints. In particular, the planter walls at the main entry exhibit badly deteriorated joints, and joints that are completely open in some locations. A considerable re-pointing effort is needed on this brickwork. The sidewalk is also in poor condition and this is addressed in the Civil/Site section. At the main entry we did observe settlement to the right of the front door. It appears that runoff has penetrated between some of the concrete slab sections adjacent to the building causing soil to washout from underneath the concrete resulting in settlement of the slab sections.

At the lower level entrance, we observed cracked bricks at several of the locations where the steel angle iron lintels bear on the brick. These are the long lintels at the overhanging portion of the building and it appears that there may be insufficient bearing length for the steel on the brick.

The windows throughout the building are generally in good condition. Some of the sealant around the exterior of the window frames is starting to fail. In our opinion, the sealants are quickly reaching the end of their useful life and should be replaced within the next five years.

The doors themselves are in generally good condition. At the front entrance, the entry pad has depressed slightly resulting in a raised threshold at one end of the door sill. At the lower level entry doors there is a large gap between the overhead door jamb trim and the masonry return. The gap should be caulked sooner than later. Allowance should be made in the Capital Improvement Plan for replacement of the doors and storefront in the next 10 to 12 years. Other areas requiring caulking included the wood trim around the lower level garage doors.

Interior

The interior of the Courthouse includes a variety of finishes. The upstairs courtrooms have carpeted floors with wood wainscot, and wallpapered gypsum walls with wood accent panels at the entry to the courtroom. The high ceiling is comprised of spline-type acoustical tiles and the lower ceiling sections are hard gypsum ceilings. Some of the gypsum drywall requires patching in areas where devices that were formally mounted to the ceiling have

been removed. There are water stains in several areas throughout the building including the clerk's department off the main lobby and the juvenile hearing room. The building does not have a sprinkler system.

There are two types of acoustical ceilings throughout the building. There is a spline-type acoustical ceiling with a hidden grid and a conventional exposed grid-type acoustical ceiling. There are several areas where the spline-type acoustical ceiling is in poor condition, with chipped corners and misalignment of the tiles. Although the tile edges are routed and placed in a T-grid, they are routed in such a way that the T-grid fits into the edge of the tile. Each tile butts the adjacent tile and conceals the grid, creating a monolithic look. The disadvantages of this system are in the fact that it is extremely hard to access the space above the tiles. Removal of tiles to get above the ceiling usually results in damage to the tiles because they are so tightly fit together. Also over time, as the building shifts and settles, and after the ceiling has been disturbed by maintenance, the joints between tiles will come apart and some of the tile lines become crooked, creating a very undesirable look. It is recommended that the spline ceilings be replaced with a conventional grid-style, acoustical tile ceiling. At the lower level "emergency room", designated Room G11, we observed the suspended ceiling to be in very poor condition with sections of grid and tiles either missing or falling down. The future courtroom, Room G12, has no ceiling and is currently used for storage.

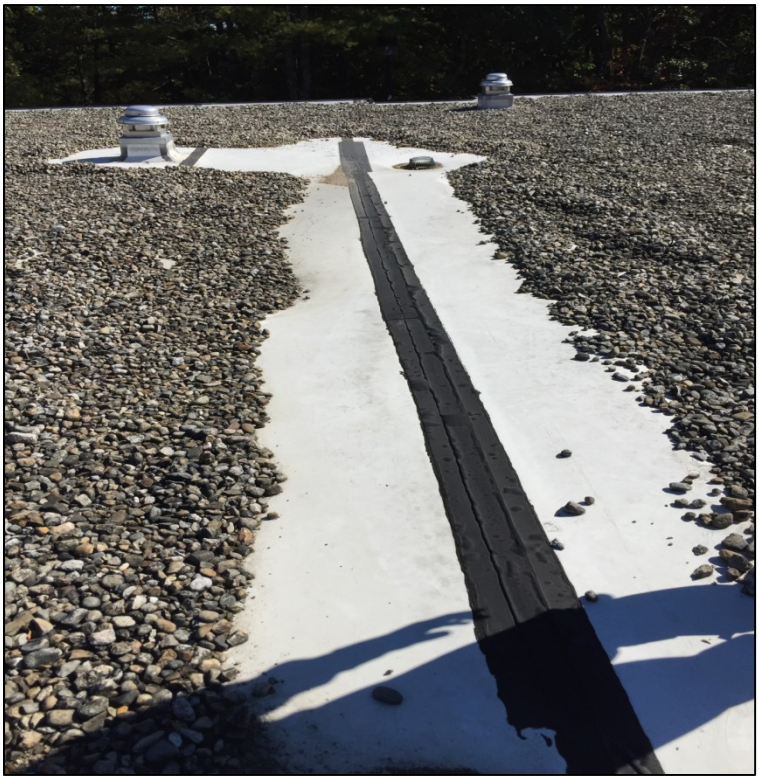
The flooring is a combination of carpeting in the courtrooms, quarry tile in the main vestibule, epoxy flooring in the restrooms and holding cells, and sheet vinyl and vinyl tiles in other rooms. The original architectural plans indicate the vinyl tile to be asbestos tile, but based strictly on observation, they appear to be Vinyl Composition Tiles (VCT). It may be worth testing some of the tiles to be sure. Most of the flooring is in good condition with the exception of some sections of worn out carpeting in the clerk's department on the upper level and youth services department on the lower level. Some sections of the carpeting in the juvenile courtroom and youth services offices also require replacement.

Most of the walls are gypsum, covered with paint or wallpaper. Some walls, such as in the courtrooms and the judge's chambers, there is wood wainscoting and/or wood paneling. Many of the painted walls in the corridors are chipped, scratched, and require new paint, and in some locations, such as the lower juvenile hearing/courtrooms (Courtroom No. 3), the wallpaper is started to peel.

The holding cells are in good condition. However, the painted ceilings are peeling and require repainting. One of the cells has a non-functioning sink that requires repair.

The stairways from the holding cell area to the courtrooms and from the lower level corridor to the back corridor behind the courtrooms, do not meet code in terms of the stair rise to run. The tread to riser ratio is too steep. In addition, the upper and intermediate landings are not wide enough in the direction of travel. The handrails on the stairs throughout the building do not meet certain aspects of the code. The horizontal slats on the stairs to the holding cells are spaced such that a 4-inch sphere is allowed to pass through the slats. The same can be said of the main stair set at the lobby area. The horizontal pipes on the guardrail are positioned such that the clear space between pipes exceeds the 4-inch maximum. The building code states that a 4-inch sphere shall not be allowed to pass through a handrail system. Other violations include no hand rail extensions, both top and bottom, and there are handrails missing on the guardrail side of the stair. The code requires a separate handrail in addition to the top rail of a guardrail system.

The bathrooms throughout the building are in generally good condition. The fixtures comply with ADA accessibility rules, but they are showing their age. We did notice some issues with regard to the lack of proper push/pull clearance at the bathroom doors in those restrooms designated for public use. There are also some minor limitations with respect to maneuvering space inside the bathrooms.



Stone ballasted EPDM or TPO roof membrane. Seams have been re-stripped.

Silicone caulking applied at reglet flashing around base of elevator room to stop leakage.

Raised roof section over courtroom ceiling coffers. Note single drain scupper in foreground.

Typical roof drain with a build-up of debris around strainer.

Top of chimney needs repointing and repairs to concrete cap.

Cracked skylight over main lobby.

Note build-up of condensation in skylight.

Slab has settled resulting in a raised sill at main entry.

Slab at main entry is settling as material is washed out from under slab. Note settlement crack.

Missing mortar between bricks along planter.
Wood timbers placed to retain soil and keep it from washing out adjacent to main entry.

Typical brick façade; caulking in expansion joint in good condition; mulch blocking weeps.

Efflorescence on brickwork under archway at main entry.

Planters at main entry require re-pointing repairs.

Poor condition of planters at main entry. Note caulking in expansion joint is failing.

Caulking around window units is starting to fail.

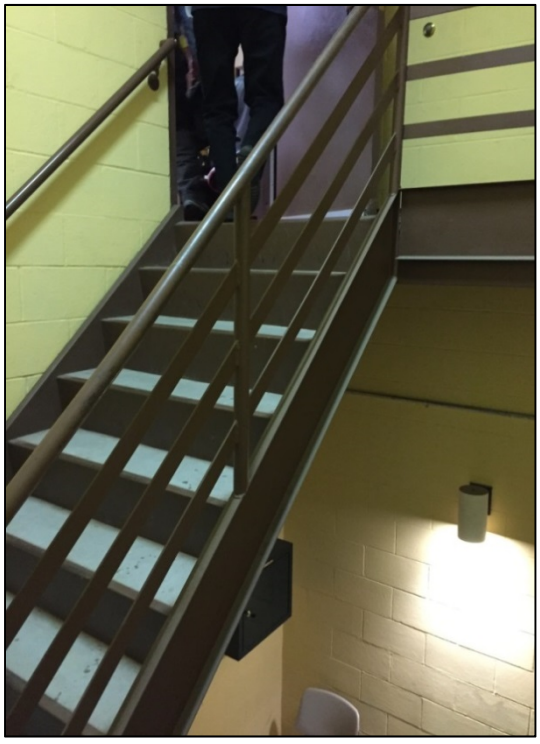
Missing caulking around door at judge's parking garage.

Steel lintel bearing on cracked brick.

Courtroom No. 1.

Ceiling in courtroom requires patching.

Typical holding cell.



Stairs from holding cell to courtroom.

Guardrail at top of stairs.

Spline-type acoustical ceiling. Unable to get tile back into place after maintenance.

Broken corners/edges and misaligned tiles on spline-type acoustical ceiling.

Staining on tiles around air vents.

Peeling wallpaper and grid-type acoustical ceiling in juvenile hearing room.

Grid-type acoustical ceiling in probation department.

Main stairway from lobby.
Note lack of proper handrail on either side and oversized openings in guardrail.

Damaged ceiling in Room G11 on lower level.

Future courtroom at lower level currently used for storage.

Guardrail around floor opening. Note excessive opening between horizontal rails.

Stained ceiling tiles in clerk's department.

Worn out carpeting in the clerk's department.

Judge's chamber.

Mechanical Narrative

Salem District Courthouse

Existing Systems

The heating source for the Salem District Courthouse consists of a Weil-McLain Model 80, oil-fired boiler, located on the lower level. This boiler has a rated output of 785,000 BTU/hour. This boiler is a replacement for the original unit and was reportedly installed in 2008. Fuel oil for the boiler is stored in a 4,000 gallon underground tank outside the boiler room (see Civil/Site section for more discussion on the underground storage tank). The hot water from the boiler is distributed by a single circulating pump to duct heating coils, unit heaters, and fin tube radiators throughout the building.

Cooling and ventilation is provided by four air handling units, three of which are on the roof of the building and were installed when the building was originally constructed in the early 1980s. The air handlers all use direct expansion (DX) cooling. The main air handler is a 40-ton Carrier unit with distribution through variable air volume (VAV) boxes to the majority of the building. Two smaller 3-ton units, also located on the roof, serve office areas on the lower level of the building. An additional air handling unit (approximately 6-ton) is located in the boiler room, with the condensing unit on the roof. This air handler provides cooling and ventilation to the judge's chambers and library areas on the lower and upper levels of the building.

Five exhaust fans are located in the building. Four of these fans are located on the roof which exhausts bathrooms on the lower and upper levels. The fifth exhaust fan is located in the sally port on the lower level and exhausts from the holding cells.

Control systems for the mechanical equipment are rudimentary and mostly date back to the original construction. The controls are unitary (controlling each piece of equipment separately) rather than globally controlling all of the equipment together. Controls are mainly used in this facility to accomplish time scheduling and temperature set point operations.

Plumbing

The water service entrance has a single line through the water meter with a backflow preventer. Bathroom facilities are provided on both floors of the building and consist of single user facilities and gang toilets in the lobby areas. Lavatories and most toilets are wall hung units, while some of the toilets in single user bathrooms are floor mounted. Roof

drains are single connection type. Water fountains are single height units original to the building.

Fire Protection

No fire protection systems (i.e. sprinklers) are currently installed in the building.

Equipment Condition

The Courthouse boiler is in good condition and it can be expected to have approximately 20 years of remaining useful life. A natural, gas-fired condensing boiler would be roughly 10% more efficient, but would require that the terminal units (reheat coils, unit heaters, fin tube radiation) are also changed out to operate with lower temperature heating water (140°F versus the current 180°F). The single boiler heating plant lacks the redundancy that many current buildings employ. Boiler operation is reportedly sensitive to the tank fuel level, which may indicate that an oil pumping system is required to maintain sufficient oil pressure to keep the boiler firing. Further analysis is needed to determine if an oil pumping system is warranted.

The combustion air system in the boiler room has only a single low outlet, while current codes require a high and low outlet for these types of systems. The single hot water circulating pump is in good condition and appears to have been replaced at some point. However, for redundancy a dual pump circulating system would be an improvement. For increased efficiency, variable frequency drives (VFD) should be added to the hot water pumps to allow for reduced pumping power during moderate winter weather.

The air handling units providing ventilation and air conditioning to the building are original to the construction in the early 1980s. These units have exceeded their normal useful life and should be planned for replacement. The VAV boxes have had operating issues over the years. These boxes are also located mainly in inaccessible areas over spline ceilings and stairwells, making maintenance a challenge. In addition, the main air handling unit provides air to the majority of the building. When this unit needs to be shut down for service, it deprives the majority of the building with cooling and ventilation.

The automatic temperature controls are outdated and do not provide any modern ability for remote access or ease of operation. New controls would allow the introduction of alarms for equipment malfunction or lack of temperature control that would improve troubleshooting and maintenance operations.

Plumbing

The plumbing piping within the building appears to be in good condition. The original fixtures (sinks, toilets, water fountains) are dated and should be replaced in the next five to six years. Fixture replacement obviously should take into account the latest ADA (Americans with Disabilities Act) requirements. Likewise, replacement water fountains should be coordinated with architectural requirements for dual height units. Roof drains are showing some signs of damage and should be replaced with dual overflow units when the roof is replaced.

Final Recommendations

The primary focus for mechanical equipment replacement should be the air handling systems, due to their age, condition, and serviceability. We would recommend that several smaller air handling units be installed in place of the large central unit to provide redundancy and ease of service. For instance, separate air handlers could be located on the roof for each of the courtrooms, a unit providing cooling and ventilation to the lobby/atrium area, a unit for the clerk's area, and a unit for the main lower level areas is recommended. This would remove the VAV boxes from inaccessible areas and allow for service on separate units without inconveniencing the majority of the building occupants. Any duct heating coils provided for the air handling units should be sized to use lower temperature water in preparation for the introduction of a new heating plant.

When the air handling units are replaced, a new control system should also be installed. The control system should have the ability to be expanded for future equipment changes, like the replacement of the boiler plant. The control system should provide remote access to set points and alarms in order to notify maintenance workers of issues as they happen.

The heating system could be revised to a dual pump, variable speed system immediately, if desired. This would provide more efficient operation, as well as back-up in the event of pump failure. This is the type of hot water distribution that we would recommend for future operation.

The current boiler should have many years of operation remaining. When replaced, we would recommend installing a dual, natural gas, condensing boiler plant, revising the combustion air intake, and replacing the fin tube radiators around the perimeter of the building. Since natural gas is available from a gas line running down Geremonty Drive, the switch to gas would be relatively easy by tapping off an existing gas line in the street and bringing it into the building. However, since there is underlying ledge throughout the site a

careful survey would be required to map out a reasonable route in order to minimize the installation cost. Another advantage to changing to gas will allow for the underground oil tank to be removed or closed per NHDES rules.

As indicated above, the plumbing fixtures and roof drains should be replaced in conjunction with other work in the building (i.e., accessibility upgrades, roof replacement).

Fire protection sprinkler systems should be installed when it is feasible during a renovation that impacts the existing ceilings. Installing a fire protection system would likely require a new water service entrance into the building to achieve the required water flow rates.

For projected costs for these upgrades refer to the spreadsheets.

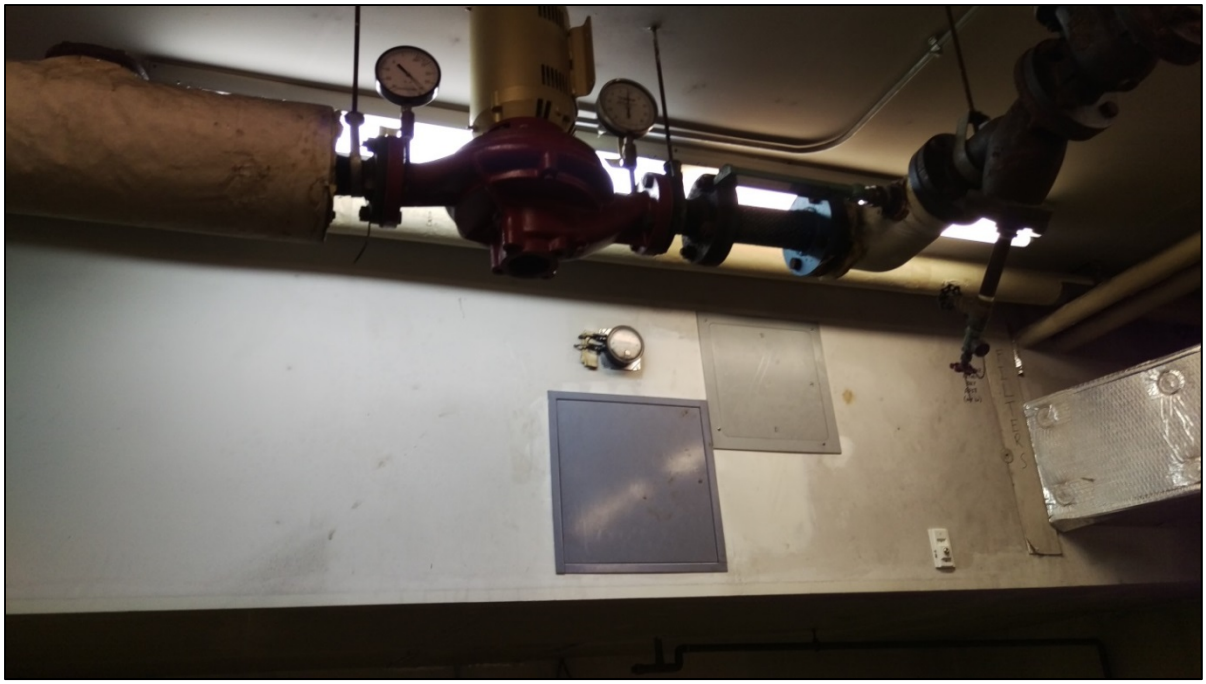
Oil-fired boiler.

Typical fin tube radiators.

Combustion air duct.

Unit heater.

Variable air volume box.

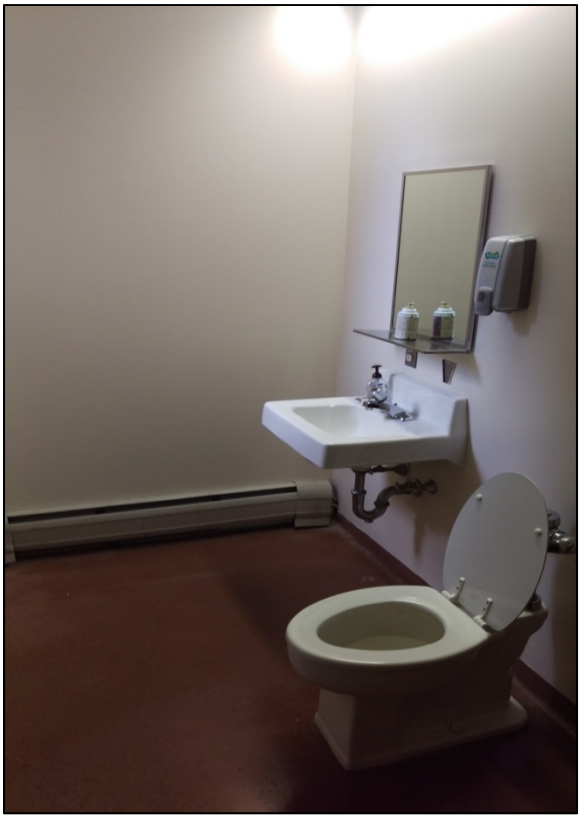


Hot water pump.

Roof mounted air handling units serving the lower level.

Large roof mounted air handling unit. Main unit for Level 1.

Typical temperature controls throughout building.



Typical plumbing fixtures.

ELECTRICAL SYSTEMS

Electrical Service and Distribution

Summary of Existing Conditions and Assessment

The main electrical service is an 800A, 120/208V, 3-phase, 4W. The service enters the main electrical room underground from a padmounted transformer. The electrical switchgear is original service equipment (ca. 1982) and is in good condition and will be reaching its life expectancy in 6 years. The main distribution panel (Square D) MDP contained 800A MCB, branch breakers and had available spaces. The electrical panels include (3) 30-pole Square D panelboards. The panels were in good condition with few spares and spaces. They were also original to the building construction and will be reaching their expected life in 6 years.

Recommendations

It is recommended that the main electrical switchgear and panels be tested for proper operation next year and replaced within 6 years.

Fire Alarm

Summary of Existing Conditions and Assessment

The fire alarm system is a conventional zoned FCI fire alarm control panel located in the main electrical room. The FACP was from the original construction and is well past its expected life. The automatic smoke detection coverage was inadequate. The notification device coverage was inadequate. There is a zoned annunciator located in the main lobby. There are manual pull stations within 5' of exit doors meeting NFPA 72. Bathrooms did not have strobe devices as required by NFPA 72 and ADA. The system is connected to the Salem Fire Department via a Digital Masterbox Digitize RAD-8LS.

It is recommended that the entire system be replaced with a new addressable Fire Alarm system to meet the 2012 IBC, ADA and 2015 International Fire Code.

Lighting

Summary of Existing Conditions and Assessment

The lighting fixture types consisted of inefficient lensed 2x4 and 2x4 parabolic fixtures in offices, surface mounted incandescent track fixtures, and utility strip mechanical rooms. Most of the lighting contained fluorescent T8 lamps and were well past their expected life. Some fixtures contained dirty and cracked fixture lenses.

The site lighting consisted of pole mounted metal halide fixtures for the parking lot. The poles were weathered, fixtures are inefficient, and it was reported that animal had damaged the wiring.

Lighting Controls

The building interior lighting was controlled by manual toggle switches. There were no occupancy sensors. The exterior lighting is controlled by a time clock.

Recommendations

It is recommended that all light fixtures should be replaced with new LED efficient fixtures.

All exterior fixtures should also be replaced with new LED fixtures; the poles should be replaced or refurbished and repainted.

The building did not have any exterior emergency lighting. To meet the International Building Code Section 1006, it is recommended that new self-contained, weather proof emergency light fixtures are provided to meet the illumination levels for the exterior means of egress.

Life Safety/Emergency

Summary of Existing Conditions and Assessment

The emergency lighting consisted of remote heads powered from emergency battery units. There were aged fluorescent exit signs. The signs were past their life expectancy. Some exit signs were no longer illuminated.

Recommendations

It is recommended that all emergency battery units and remote heads be replaced. New LED exit signs should be provided. Proposed new light fixtures should be provided with new emergency drivers.

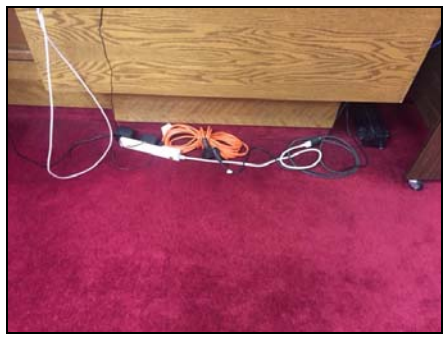
Receptacles

Summary of Existing Conditions and Assessment

There was insufficient quantities of receptacles, as was evidenced by the use of extension cords, in the court rooms.

Recommendations

Provide additional wall and floor receptacles to accommodate the new loads that have been added over the years.



Civil/Site Assessment

Salem District Courthouse

Pedestrian Access and Circulation

Main Entrance

At the main entrance to the facility the concrete slab in front of the vestibule doors appears to have settled, because the door threshold no longer sits flush to the surface and is elevated ½-inch to 1-inch above the concrete. This condition creates a tripping hazard and provides an opening for stormwater and snowmelt to enter, potentially leading to problems relative to freeze-thaw cycles. The entire slab between the stairs and the doors will need to be removed and replaced to correct the condition.

The concrete stairs leading from the concrete sidewalk to the main entrance show deterioration of the risers and of the concrete landings at the top and bottom of the stairs. Metal treads and nosings have been installed to provide a secure walking surface, but the deteriorated areas should be cleaned out and repaired. Additionally, where the stairs meet the brick retaining walls flanking either side, there is evidence of weather-related damage due to water flowing off the stairs and into the joint between the walls and the stairs.

The handrails provided at the stairs to the main entrance do not comply with current regulations and should be replaced.

The concrete landing at the foot of the stairs slopes toward the parking lot at over 5%. A typical sidewalk cross-slope is 1.5%, so this is excessive. However, it is not part of an accessible route to the building. So unless a complete parking lot reconstruction is undertaken, it does not require replacement.

There is an asphalt ramp on the north side of the Courthouse between the parking lot and the main entrance. It is not considered an accessible entrance and is clearly designated as such; however, it is a steep walking surface with no level landings, varying from 7% to 9% slopes along its length. There are no handrails although there is wood curbing on both sides, which is in fair to poor condition. The asphalt surface is in fair condition. TTG recommends installing handrails on both sides, removing the wood curbing to prevent concentrated runoff following the ramp, and eventual replacement of the asphalt surface.

On the right side of the main entrance, a single horizontal pipe functioning as a guardrail blocks off an opening. Current codes require guardrails to provide fall protection beneath

the uppermost member, and the top of the guardrail should be at 42 inches above grade. This guardrail complies with neither of those conditions and should be replaced with one that meets current standards.

On the north side of the building there is an intended pedestrian route from the Town Hall to the Courthouse, evidenced by the footbridge, and the asphalt sidewalk across the island at the middle of the parking lot. Striping crosswalks on the parking lot surface to clearly indicate this path will alert drivers to the potential of pedestrians and provide a clear indication of how to reach the Courthouse entrance for those unfamiliar with the building.

Accessible Entrance

The Courthouse provides four accessible parking spaces, two of which are sized for vans, on the south side of the building, adjacent to an accessible entrance on the basement floor that is also used for jurors. The Americans with Disabilities Act (ADA) mandates that accessible parking spaces should not slope greater than 2% in any direction. Inspections across multiple locations in this parking reveal a range of slopes from 4% to 7%. This lot was initially designed as a vehicle drop-off loop and has been retrofitted for accessible parking. If the parking areas undergo complete reconstruction in the future, these spaces should be regraded to comply with ADA slope regulations. There is an obvious crack in one of the concrete sidewalk panels between the parking spaces and the accessible entrance, which should be cleaned and repaired to prevent damage due to runoff and snowmelt penetrating this opening. In addition, there is a 6±-inch gap in the granite curbing sitting flush with the asphalt that provides an access point for runoff to penetrate beneath the pavement and should be repaired with a new piece of curbing to establish a consistent border between the asphalt and the concrete plaza.

Summary of Recommendations for Pedestrian Access and Circulation

- Remove and replace concrete landing at the main entrance to the Courthouse.
- Remove metal stair treads to clean and repair corroded concrete at the main stairs.
- Repair damaged brick and concrete where the main stairs abut the flanking brick walls.
- Replace stair handrails with ADA compliant rails.
- Remove wood curb along asphalt ramp and install handrails on both sides for the entire length of the ramp.

- Replace the asphalt ramp surface.
- Install ADA compliant guardrail at opening on the right side of the main entrance.
- Stripe crosswalks to indicate pedestrian routes in the north side parking lot.
- Regrade accessible parking spaces to comply with ADA guidelines.
- Repair cracked sidewalk panel on south side of the building leading to accessible entrance.
- Install granite curb at head of accessible spaces to fill the gap where a piece is missing.

Site Drainage

Most runoff flows overland to the perimeter of the site, which consists of mature trees and other vegetation, and there is very little drainage infrastructure on-site. On the east side of the building there is a trench drain in front of an overhead door leading into the basement level. The trench does not span the entire width of the door opening, is greater than 50% full of sediment, and has no grate covering the opening. The concrete sidewalls of the trench are falling apart and there is a 4-inch PVC outlet pipe at the north end of the trench with virtually no cover. The driveway slopes at a steep slope down to this opening (18%) and the trench drain appears undersized to manage all of the runoff that flows into it, particularly with its compromised capacity due to the debris filling the void. TTG recommends cleaning out the debris from this structure, flushing the outlet pipe to ensure its full capacity is available, repairing the trench sidewalls, and installing a grated cover. In the long-term this drain should be replaced with a structure that extends across the full width of the door opening and has a deeper sump. A bituminous Cape Cod berm or shallow swale should be installed at the top of the 18% driveway, to reduce the amount of runoff that flows from the perimeter driveway to the basement level entrance.

There is a second overhead door on the south side of the building with a similar trench drain in front of it, though the slope approaching it is much more gradual. A 4-inch PVC pipe with minimal cover enters the trench from the east side, but it is unclear where it is coming from, because according to the original construction plans the drain outlets to a 12-inch reinforced concrete pipe (RCP) at the west side of the drain. This trench drain is non-functional because it is completely full of sediment. It has grated covers, but they are brittle from corrosion and probably cannot withstand the weight of vehicles driving over them if the trench were not full.

The single catch basin on this site is located at the southwest corner of the accessible spaces. There is a 12-inch RCP entering from the east side, likely from the trench drain noted above, and a 12-inch RCP exiting on the west side of the structure that eventually daylights to a vegetated swale at the southwest corner of the site. The masonry block structure and the visible sections of pipe are in good condition, but the catch basin sump is nearly full of sediment. There are only 6 inches between the bottom of the pipe exiting the structure and the top of the debris in the sump. It needs to be vacuumed clean. The asphalt around the grate has settled so the grate sits at a relative high spot, allowing runoff to puddle around the inlet and cause further degradation of the pavement.

Where the 12-inch pipe from this structure daylights, the outlet is half-full of sediments, reducing the discharge capacity of the pipe, and the masonry headwall is losing some of the stones of which it is constructed. The vegetated outlet swale exhibits adequate cover and is well-maintained. There is sediment accumulating adjacent to this outlet that should be cleaned out of the swale while the pipe is flushed clean. Reconstruct the headwall and secure for stability.

A 12-inch RCP driveway culvert beneath the main entrance to the site conveys runoff along Geremonty Drive. Both the inlet and outlet of this pipe are half-filled with sediments, mostly from road sand flushed off the pavement during storm events. The vegetated swale leading to the culvert inlet on the north side of the driveway is barely definable because of the sediments that have washed into it. The debris and sediment material in the swale and at the ends of the culvert should be removed.

Neither the inlet nor the outlet of the driveway culvert has a headwall constructed around it and the soil cover over the pipe is eroding away from the end of the pipe. TTG recommends installing headwalls at both the inlet and outlet of this pipe to ensure adequate cover, and to maintain the hydraulic performance of the culvert.

Summary of Recommendations for Drainage

- Clean all debris out of the trench drains, the drainage pipes, swales, and catch basin.
- Install new corrosion resistant, traffic-rated grates over the trench drains on the east and south sides of the building.
- Repair the concrete sidewalls of the trench drains.
- In the long-term, replace the existing trench drains at the overhead doors on the east and south sides of the Courthouse, with structures that extend across the entire width of the door opening and extend to a greater depth.
- Regrade the asphalt surfaces adjacent to the catch basin to ensure parking lot runoff flows into the structure.
- Construct headwalls at both ends of the driveway culvert (precast concrete or masonry rubble is acceptable) and rebuild the masonry headwall at the southwest corner of the site.
- There does not appear to be a stormwater inspection and maintenance plan for this site that would detail inspection schedules and maintenance tasks required to ensure the stormwater management measures function as designed. TTG recommends the Town of Salem develop such a plan and implement its recommendations.

Pavement

The parking lot pavement is in poor condition. Despite some attempted repairs at sealing cracks, there is evidence the base gravels are also in poor condition (extensive cracking, uneven settlement, raveling) and do not provide the structural stability required to support traffic. The Town should consider reclaiming the pavement and base gravels, regrading and compacting, and placing new pavement to a minimum depth of 4 inches across the site. The contractor should ensure the site continues to drain properly, in accordance with the original design.

The parking lot on the south side of the Courthouse does not provide a means for vehicles to turn around if they reach the end of the lot and all of the spaces are full. Further, vehicles parked in the final space on either side have a difficult maneuver to exit their spaces, because there is no additional space at the end of the lot to back into. When the lot

is reconstructed, the Town should extend the aisle between the spaces by 10 feet (toward Geremonty Drive) to provide additional space for turning motions.

Summary of Recommendations for Pavement

- Reclaim the parking lot pavement and reconstruct the entire lot.
- Provide additional driveway area for turning movements at the south parking lot.

Landscaping

The site is surrounded by mature, woody vegetation, and most of the landscaping beds have mature vegetation as well. The plantings appear to be maintained regularly and there are not many concerns; however, there are some issues the Courthouse will want to address.

In those areas where mulched landscaping beds directly abut the exterior walls of the building, the mulch is mounded above the lower courses of brick, obstructing the weep holes, which can either prevent moisture from escaping from the wall assembly or allow moisture in the soil to wick up into the wall. Rake the mulch away from the lowest brick courses and redistribute throughout the beds.

At the southeast corner of the building, some arborvitae are growing directly against the exterior brick, and should be trimmed to create separation between the trees and the masonry.

The grass-covered lawn areas on this site have sparse growth and exhibit evidence of losing sediment to washouts during rain events. In particular, the lawn on the west side of the Courthouse, between the parking spaces reserved for police vehicles and the accessible parking spaces, has virtually no grass cover and the soil is flowing via sheet erosion toward the lower parking lot. The site should be aerated, reseeded, and fertilized to restore full grass cover.

On the west side of the building, behind the electrical transformer, the ground slopes steeply, directly to the masonry wall where the elevator mechanical room is located. The soil is very soft in this area and with no drainage measures in place, runoff likely sits against the exterior masonry wall in this location. The Town should construct a diversion or a French drain to intercept runoff before it flows against the building and redirect it to the toe of the slope near the accessible parking spaces.

Summary of Recommendations for Landscaping

- Rake mulch away from masonry courses.
- Trim arborvitae.
- Attend to lawn surfaces and reseed.
- Install drainage measures behind electrical transformer to prevent runoff from flowing directly to exterior wall of building.
- Engage the services of a landscape maintenance company to keep the plants pruned and the grass lush.

Wastewater Management System

Wastewater from the Courthouse flows into a precast duplex grinder pump station located outside the building at its northeast corner. Wastewater is pumped through a 2-¼-inch PVC force main northward, where it eventually ties into a municipal gravity system via a precast sewer manhole on the north side of Town Hall. According to the construction drawings provided to TTG, the force main flows through a blow-off/clean-out valve manhole located on the south side of Town Hall. The Town has also installed a clean-out manhole in the Courthouse parking lot to provide a service point for this line. Town personnel report the sewage force main system is a problem at this site because it freezes during the winter unless they keep a constant flow of water from the maintenance room sink, to ensure the pumps operate with sufficient frequency to prevent effluent from freezing in the pipe. The force main was installed at shallower depths than is typical because of significant amounts of ledge across the site. Town maintenance staff report at the location of the clean-out manhole on the Courthouse site the pipe is approximately 18 inches deep, when 6 feet is typical beneath a paved surface. Although a gravity flow system may create fewer problems, there is no simple way to construct one to service the Courthouse, because the closest manhole allowing access to the existing municipal system is approximately 1,000 feet away, and knowing there are significant amounts of ledge on this site, it would be expensive to install it correctly. The existing force main system can be modified to provide additional protection against freezing. There is an apparent low spot in the force main pipe where it crosses beneath the wetland on the north side of the Courthouse parking lot, between the two manhole structures identified above. TTG's suspicion is when the sewage pumps shut off, any effluent remaining in the line drains from the blow-off back toward the Courthouse and is trapped in this location, where it eventually freezes. The Town should

expose the force main along its entire length from the pump station to the blow-off manhole and install 4 inches of rigid polystyrene insulation horizontally over the pipe, to 2 feet on either side of the centerline of the pipe. Install rigid polystyrene insulation vertically to a depth 12 inches below the force main invert, on either side of the pipe at a distance of 2 feet away from the centerline. The insulation should be installed with a 4-inch thickness. The length requiring insulation is approximately 500 linear feet. The exact alignment of the force main is unknown so a tracer wire will have to be inserted first to identify where it lies, prior to excavation.

The frame and cover of the blow-off manhole are not fastened securely to the precast structure and they are frequently displaced by snow plowing operations. The interior of the structure has sediment deep enough to cover the pipe and clean-out, which are not visible. The blow-off valve is coated in a layer of grit and appears severely corroded. The sediment enters when the frame is displaced. Remove the sediment from the interior of this structure. Test the blow-off valve to ensure it functions properly, and if not, replace it with a new one. Flush the force main from the clean-out to ensure no sand or grit is causing a partial blockage in the pipe. Secure the frame and cover to the precast structure with mortar and install bollards to protect the castings from snowplow impacts.

The cover for the clean-out manhole in the parking lot north of the Courthouse is wedged tight in place and could not be removed on this date, despite repeated and varied efforts. Loosen and remove the cover, clean the frame to ensure it seats properly, and reset the cover. TTG recommends inspecting it monthly to verify it remains operable. While the cover is removed, inspect the interior of the structure, the insulation over the piping, and the condition of the clean-outs. Ensure the concrete is in good condition, the insulation is protecting the piping from freezing, and the clean-out covers seal properly and are removable. If any sediment has accumulated in the manhole, remove it with a vacuum truck. Repair any deficiencies.

As noted above, the pump station is a precast duplex grinder station located outside the northeast corner of the Courthouse. Wastewater flows via gravity to this structure and is then pumped northward through approximately 1,000 feet of 2-¼-inch PVC force main. TTG has no details of the station so we could not verify storage volume, check valve and piping conditions, or proper float settings. A visual inspection of the pump station interior revealed a number of concerns. When the cover is removed from the chamber there is no fall protection, nor is there any signage warning that it is a hazardous space, as is required by current regulations. There appears to be no method of removing the pumps for service without climbing down into the pump station because there are no guide rails or lifting

chains. Since they are submersible pumps, the station needs to be pumped down as far as possible before removing the pumps. As this is considered a confined space there is a specific procedure that must be followed to enter this chamber. The interior steel components, such as the float rack, show a lot of corrosion and should be replaced. There is a junction box inside the pump station with a cover that is partially open, exposing interior wiring to moisture and potentially explosive gases. Electrical components installed in sewer manholes are required to conform to the National Electric Code for installation in areas classified as Class 1, Division 1. The Town needs to confirm that this pump station is in compliance. There are several State requirements regulating pump stations and their control panels, and this station is not in compliance with these regulations (portions of the Code are included with this report). TTG recommends the Town contact a wastewater pump service company with experience installing and servicing these systems, such as AAA Pump Service Inc., (603) 645-8610. The interior components (with the exception of the pumps, assuming they are in fair to good condition), should be replaced, the interior of the structure should be inspected for its integrity, the floats should be tested and adjusted as needed to ensure the pumps operate three to four times per day, and measures should be provided to allow for the removal of the pumps without entering the station. TTG also recommends relocating the vent pipe away from the pedestrian walkway, to a less conspicuous location.

Summary of Recommendations for Wastewater Management System

- Install rigid insulation to protect approximately 500 linear feet of force main pipe.
- Clean out blow-off manhole, confirm the operation of the valve, fasten the manhole frame and cover to the structure, and install two concrete filled galvanized steel bollards between the manhole and the edge of pavement.
- Inspect interior of clean-out manhole and service as required.
- Hire a qualified firm to test and inspect the sewer pump station and all components, including electrical wiring, control panel, pumps, piping, and float operation.
- Install a watertight cover with signage and fall protection.
- Reconstruct pump station to comply with current regulations. The assumption is the existing concrete and piping exterior to the structure can remain, and only the interior components need replacement.

Miscellaneous

Underground Oil Storage Tank

The Courthouse heating system is supplied with heating oil from a double-walled, 4,000-gallon oil storage tank buried adjacent to the exterior east wall of the building. The system has a current State operating permit. A concrete pad surrounds the hatch covers and there is a high-level alarm mounted on the side of the building in a location visible from the fill chamber. The tank vent pipe is mounted against the east side of the Courthouse. Such outlets should be located at least 5 feet from any building opening and 15 feet from a mechanical intake. The end of the vent appears to be closer than 5 feet to an operable window; therefore, TTG recommends extending this pipe further up the side of the Courthouse, above any operable openings and other building intakes.

The pipe entering the boiler room from the tank is a copper tube and there is no apparent return line draining back to the tank. It is unknown whether there is any secondary containment for this supply pipe, or whether there is any continuous monitoring for leaks. TTG recommends replacing the copper tube with a dual-wall flexible supply and return pipe that is directed through an HDPE containment sleeve. Leak monitoring should be provided.

The Courthouse maintenance faculty note the boiler doesn't function properly when the oil level in the tank falls to the approximate halfway point. It is possible the pump at the boiler does not have the power to draw the oil from the tank when it drops to this level. Replacing this pump may correct the problem, or the Town may opt to install a submersible pump in the oil tank and provide a day tank in the boiler room. The Town should have the existing monitoring system tested and inspected to ensure it is working properly.

Note: The Town is in the process of deciding whether it makes sense to convert to natural gas, in which case these modifications are not required, and if the tank is discontinued it should be decommissioned in accordance with NH Department of Environmental Services regulations.

Main Entrance

At the main entrance to the site there is an exposed plastic electrical conduit with wires protruding from it adjacent to the sign. It appears there was once a ground-mounted sign light that has since been removed. If there is no intention to replace the light, the end of the conduit should be permanently capped.

Site Curbing

Much of the granite curbing throughout the site has been displaced and has gaps between sections of stone and/or between the sidewalk and the curbing. It should be reset, in conjunction with a pavement replacement/reconstruction program.

Signage

The signposts at the accessible parking spaces on the south side of the building are unprotected against vehicle impacts. The posts should be encapsulated in a concrete bollard to protect the integrity of the posts.

ADA regulations require accessible parking signage to be a minimum of 7 feet above finished grade. Correct the signs that are not in compliance.

Summary of Recommendations for Miscellaneous

- Extend oil tank vent pipe so it is above and at least 5 feet away from window openings.
- Replace copper oil supply tubing with double-walled, encapsulated piping.
- Install submersible pump in the tank and provide a day tank inside the mechanical room.
- Inspect and test oil system monitoring equipment.
- Replace the entrance lighting or permanently remove and cap the exposed conduit and wiring.
- Reset displaced granite curbing in conjunction with a pavement replacement program.
- Install concrete encapsulation around the sign posts immediately adjacent to the accessible spaces.
- Reset parking lot signage so the bottom of all signs is 7 feet above finished grade.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 704.20 Service Connections.

(a) Service connections shall use sanitary tee or wye fittings for all new sewer construction.

(b) The centerline of all building connections shall enter the top half of the sewer.

(c) Any service connection with a vertical rise up to 4 feet may have the sewer fitting set vertically.

(d) Any service connection with a vertical rise up to 12 feet shall employ non-encased risers that protect against pipe penetration or failure at the fitting by the use of bell-on-bell connections.

(e) For existing sewers where fittings cannot be installed, saddle connections shall be used.

(f) Pressure sewerage shall have an isolation valve or curb stop valve installed at the property line. If a check valve is used at the property line, the valve shall be installed within a vault to facilitate maintenance.

(g) Roof downspouts, exterior or interior foundation drains, sump pumps, or other sources of surface water run-off or groundwater shall not be directly or indirectly connected to a public sewer.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

PART Env-Wq 705 SEWAGE PUMPING STATIONS

Env-Wq 705.01 Sewage Pumping Station Design Requirements: Flooding and Weather Protection.

(a) Sewage pumping stations shall be designed for uninterrupted operation during a 25-year flood, and shall be protected against damage from a 100-year flood. The sewage pumping station shall be readily accessible.

(b) Flood elevations shall be determined using flood maps or in accordance with Env-Wq 1503.09 (f)(1) and (f)(2).

(c) Each sewage pumping station shall be protected against extreme weather conditions, such as excessive heat or humidity or excessively cold temperatures, that could cause the pump station components to stop functioning.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.02 Sewage Pumping Station Design Requirements: Wet Well and Dry Well Construction.

(a) The wet well and the discharge manifold shall be configured to prevent grit from settling back into pump discharge lines of pumps that are not operating.

(b) Wet and dry wells including their superstructure shall be completely separated and sealed.

(c) Wet well design shall avoid vortexing and air entrainment near the pump suction intakes.

(d) A separate sump pump shall be provided in the dry well to remove leakage or drainage, with the discharge above the alarm level of the wet well.

(e) Wet wells for sewage pumping stations of greater than 200 gpm capacity shall have either:

(1) Division walls so that the station can be kept in operation when work is required in the wet well; or

(2) A bypass connection to allow for connection of a pump around the wet well for maintenance, repairs and construction.

(f) The effective capacity of the wet well shall be based on the cycle time of the pumps for constant speed operation so as to prevent short cycling of the pumps.

(g) The wet well floor shall have a minimum slope of 1 to 1 to the hopper bottom.

(h) The horizontal area of the hopper bottom shall be limited to that area required for proper installation and function of the inlet.

(i) Wet wells shall be tested prior to operation using exfiltration testing method ACI 350.1 Method HST-NML in effect at the time the wet well is installed, available as noted in Appendix D. Any visible signs of leakage shall be repaired and retested prior to placing the wet well in service.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.03 Sewage Pumping Station Design Requirements: Allowable Pump Types, Pump Controls and Pump Size.

(a) The following types of sewage pumping stations shall be allowed:

(1) Dry well/wet well type design with pumps and drives located in a separate dry chamber with flooded suctions;

(2) Suction lift type with pumps and drives in a separate dry chamber; and

(3) Submersible type with pumps submerged.

(b) A minimum of 2 pumps, each designed to handle peak hourly flows, shall be provided.

(c) Where 3 or more pumps are provided, they shall be designed such that, with any one unit out of service, the remaining units shall have the capacity to handle peak hourly sewage flows.

(d) The use of jockey pumps shall be evaluated to optimize the efficiency of the pumping station operation.

(e) All pumps shall be protected from damage due to large solid objects.

(f) Pumps shall be capable of passing 3-inch solids, or 2.5-inch solids if preceded by a grinder unit.

(g) Submersible pumps shall be capable of removal without disconnecting pipes or dewatering and reseating using non-corroding guide rails or cables.

(h) Self-priming suction lift pump systems shall be designed such that:

(1) The system's reprime capacity is greater than the static suction head; and

(2) The system's available net positive suction head is at least 6 feet greater than the required net positive suction head.

(i) Pumps shall be protected by check valves from being driven in the reverse direction.

(j) Pump controls shall provide autostart of lag pump should lead pump fail to start.

(k) Flooded suction pumping systems shall be designed such that:

(1) Shut-off valves are provided in the suction piping;

(2) Shut-off valves and check valves are provided in the discharge piping; and

(3) Discharge shut-off valves are located downstream of the check valve.

(l) Shut-off and check valves for submersible pumps shall be placed in a separate chamber for ease of maintenance.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.04 Sewage Pumping Station Design Requirements: Pump Station Access. Sewage pumping stations shall meet the following requirements:

(a) Dry wells shall provide accessibility for the repair and removal of pumps, motors, and other items of equipment that are essential to the sewage pumping process;

(b) Separate exterior entrances shall be provided to both wet wells and dry wells of sewage pumping stations;

(c) For built-in-place sewage pumping stations, access to lower levels shall be by stairways with handrails;

(d) Prefabricated stations may have ladders with less than or equal to a 75 degree slope or spiral stairs;

(e) Vertical distances between floors or rest landings shall not exceed 12 feet;

(f) Safety barriers to prevent falling shall be provided at landings;

(g) Power elevators proposed for all deep stations shall have a capacity limit of not less than 600 pounds;

(h) Lifting equipment shall be provided for submersible pump removal; and

(i) Lifting chains shall be stainless steel or other corrosion resistant material.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.05 Sewage Pumping Station Design Requirements: Flow and Pump Usage Measurement.

(a) Sewage pumping stations with capacities of more than 250 gpm or equipped with variable speed pumps shall have continuous flow recording and totalizer capability.

(b) Sewage pumping stations equipped with constant speed pumps with capacities of 250 gpm or less shall have:

(1) A running meter that indicates the cumulative running time of each pump; or

(2) The continuous flow recording and totalizer capability as per (a), above.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.06 Sewage Pumping Station Design Requirements: Potable Water Restrictions and Protection.

(a) Where potable water is used for pump sealing purposes, the potable water supply shall be protected by a break tank or reduced pressure zone back flow preventer.

(b) Water ejectors connected to a potable water supply shall be prohibited.

(c) All floor and walkway surfaces shall slope to a point of discharge.

(d) Connections between raw, partially treated, or fully treated sewage and potable water shall be prohibited unless adequate backflow prevention equipment is installed.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.07 Sewage Pumping Station Electrical Requirements.

(a) Submersible pumps for sewage pumping stations shall conform to the NEC requirements adopted by reference in the state building code pursuant to RSA 155-A:1, IV, for installation in areas classified by the NEC as class I, division 1.

(b) Electrical systems and components, including motors, lights, cable, conduits, switch boxes, and control circuits shall be protected from flooding in accordance with Env-Wq 705.01.

(c) Electrical systems and components including motors, lights, cable, conduits, switch boxes and control circuits in enclosed or partially enclosed spaces where flammable mixtures occasionally may be present, including raw sewage wet wells, shall be certified by their manufacturer as:

(1) Complying with the NEC requirements adopted by reference in the state building code pursuant to RSA 155-A:1, IV, for class I, division 1 locations; or

(2) Being rated for class I division 2 requirements where mechanical ventilation is provided in accordance with the NFPA as adopted by reference in the state fire code in Saf-C 6000.

(d) All electrical equipment and work shall comply with the requirements of NEC as adopted by reference in the state building code pursuant to RSA 155-A:1, IV, and NFPA as adopted by reference in the state fire code in Saf-C 6000 in effect at the time of installation.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.08 Sewage Pumping Station Ventilation Requirements.

(a) Mechanical ventilation for personnel and equipment shall be provided for all occupied spaces within sewage pumping stations in accordance with the NFPA as incorporated by reference in the state fire code in Saf-C 6000.

(b) Mechanical ventilation for below-grade dry wells shall be provided, so arranged as to independently ventilate the dry well and the wet well.

(c) There shall be no interconnection between the wet well and dry well ventilation systems.

(d) Switches for operation of ventilation equipment shall be marked and located conveniently.

(e) Dehumidification shall be provided in below-ground dry wells.

(f) Ventilation of wet wells shall provide at least 30 air changes per hour if the ventilation system is operated intermittently, or at least 12 air changes per hour if the ventilation system is operated continuously.

(g) Fans installed within the wet well structure shall be suitable for a class I, division 1, group C and D environment.

(h) Ventilation of submersible pump chambers or suction lift wet wells where there is no occupancy for regular maintenance purposes may be by gravity ventilation.

(i) Ventilation exhaust from wet wells shall not cause an odor nuisance to the public or surrounding occupied buildings.

(j) Access doors to wet wells shall have warning signs on the underside which read, "Warning - Hazardous Area, enter only with proper equipment" or "Confined Space, Entry by Permit Only", as appropriate.

(k) The ventilation system of the dry well shall be capable of continuously providing at least 6 air changes per hour when the facility is occupied, and at least 3 air changes per hour when not occupied.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.09 Sewage Pumping Station Alarm Systems.

(a) Alarm systems meeting the requirements of (b) through (j), below, shall be provided for all sewage pumping stations.

(b) The alarm signal shall be activated in any one of the following circumstances and in any combination of the following circumstances:

(1) High water in the wet well;

(2) Low water in wet well;

(3) Loss of one or more phases of power supply or severe voltage drop;

(4) High water level in the pump room sump;

(5) Loss of the alarm transmission capability;

(6) Standby generator application, if applicable;

(7) Pump malfunction, including shaft seal failure;

(8) Loss of air pressure in a bubbler tube system;

(9) Level sensing malfunction or failure;

(10) Loss of ventilation in areas classified as class 1 division 2 and using mechanical ventilation per the NFPA as incorporated by reference in the state fire code in Saf-C 6000;

(11) Intrusion; or

(12) Temperature outside normal operating ranges.

(c) The high water and low water alarm triggers shall be separate devices, independent of the pump wet well level control system and set at elevations above and below the lag pump on and off elevations, respectively.

(d) Operation of the alarm system shall be indicated on a panel with a light which lights up upon activation of the alarm system.

(e) The power source for the alarm system shall be:

(1) An independent battery with continuous charge; or

(2) Main line power with a back-up battery system, which shall be connected automatically should main power fail.

(f) The alarm signal shall be transmitted through a 24 hour per day, 7 day per week notification system to the appropriate utility operator.

(g) The alarm shall include a local audible enunciator and a light.

(h) Provision shall be made to permit silencing of the audible enunciator manually, after the alarm has been sounded, but the light shall continue until the alarm condition has been rectified.

(i) Alarm signals for privately-operated sewage pumping stations shall be transmitted to the responsible maintenance person directly or via an answering service.

(j) If a central supervisory control and data acquisition (SCADA) system exists at the WWTP, the pumping station alarms shall be connected to the SCADA system using programmable logic controller (PLC) technology.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.10 Sewage Pumping Station Operation and Maintenance Manual.

(a) The owner shall submit an operation and maintenance manual that provides information and guidance for day-to-day operation of each sewage pumping station to the department within 60 days following substantial completion of construction of the pump station.

(b) The operation and maintenance manual required by (a), above, shall include all information that is necessary to operate and maintain the specific equipment at the pumping station, including but not limited to the following:

(1) Information on process design assumptions;

(2) Unit process information that includes detailed process descriptions, control measures and monitoring procedures for processes, if applicable;

(3) Start-up procedures for each unit operation as applicable and each piece of equipment;

(4) Maintenance management systems;

(5) Laboratory test procedures;

(6) Safety procedures;

(7) Organizational structure and administrative procedures;

(8) Troubleshooting procedures;

(9) Emergency operation plan;

(10) Staffing requirements;

(11) Process and instrumentation diagrams;

(12) Checklists for systems and components for the operator's use in developing a maintenance program for pump stations;

(13) Utility emergency contact information;

(14) Staff training and licenses necessary for the chief operators and assistant operators;

(15) A list of each chemical used at the pump station and what the chemical is used for, together with the applicable material safety data sheet (MSDS); and

(16) Equipment supplier manuals.

Source. (See Revision Note at chapter heading for Env-Wq 700) #8590, eff 3-25-06; ss by #10693, eff 10-15-14

Env-Wq 705.11 Sewage Pumping Station Emergency Operation.

(a) The engineer shall recommend emergency operation procedures to prevent the back-up, overflow, or other unpermitted discharge of wastewater from the sewage pumping station.

(b) An independent engine-generator type source of electric power shall be provided for electrically-driven pumps. This source shall be automatically activated by failure of any phase of power supply or upon any fluctuation in voltage, the amount or duration of which would cause damage to the motors. Installations shall comply with all applicable requirements of the NEC and the state fire code in Saf-C 6000.

(c) The emergency power generator shall be permanently secured in place, with provisions for removal to facilitate generator repair or replacement.

(d) Provisions shall be made for automatic and manual start-up and cut-in. The controls shall be such that upon automatic start-up under emergency conditions, shut-down shall be accomplished automatically on restoration of utility power with controlled shut-down of unit. Manual shut down shall also be provided. Provision shall be made to allow pumps to run down before re-energizing on transfer of power.

(e) The emergency power generator shall be sized to sequentially start and operate all pumps needed to handle design maximum waste flows, plus lighting, ventilation, controls, screening, and, if applicable, grinding.

(f) The emergency power generator shall be located above grade with ventilation of exhaust gases.

(g) All emergency power generation equipment shall be provided with instructions for routine exercising, load testing, and maintenance.

(h) The generator engine controls shall be equipped with an automatic exerciser which can be set on any selected schedule to start the generator, run the generator under no-load or load conditions by selection, and shut the generator off without actuating the alarm system.

(i) Subject to (j), below, the owner shall provide each emergency generator with enough fuel for the generator to run under full load or peak station flow for at least 48 hours or under normal operating conditions for at least 96 hours, whichever requires the greater amount of fuel.

(j) Alternatives to a generation set may be provided in the following circumstances:

(1) Sewage pumping stations with capacities of 100 gpm or less may use wet well storage over and above normal operating system storage provided that:

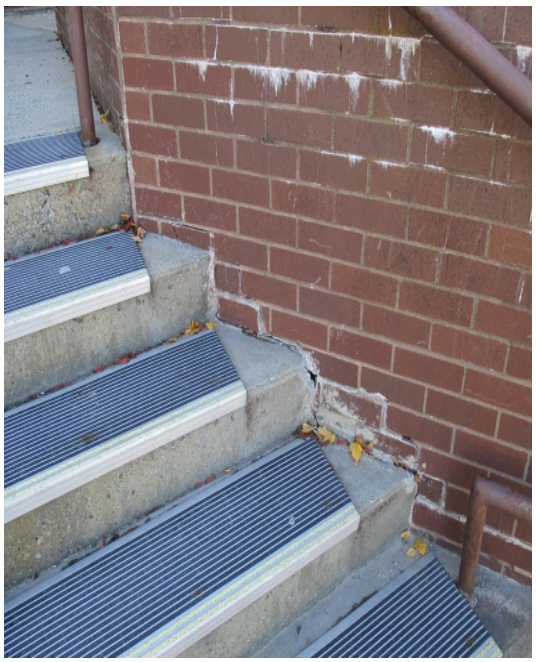
a. The additional wet well storage volume below all entering and exiting piping shall provide at least 6 hours of flow detention at average daily flow; and

b. A suitable receptacle shall be included in the electrical supply panel for connection to a portable generator with manual transfer; and

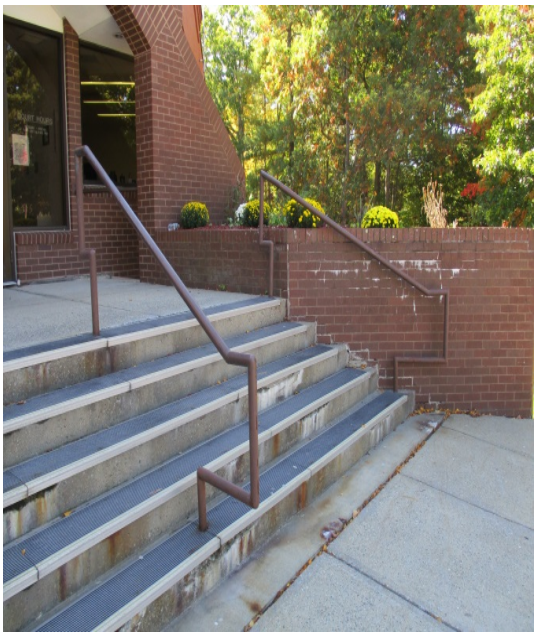
(2) For sewage pumping stations with duplex pumps, a standby engine drive system which automatically starts on power loss to drive one pump may be furnished as an alternative to a permanent generator.

Pedestrian Access and Circulation

Concrete deterioration at main entrance stairs.



Concrete and brick deterioration at main entrance.

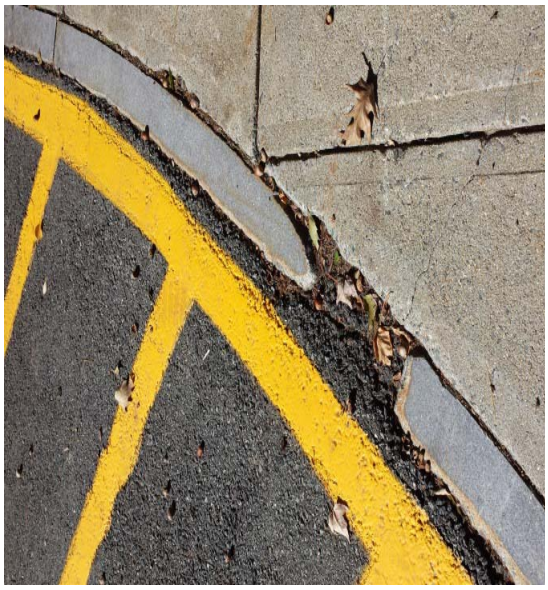


Railings at main entrance.

Asphalt ramp to main entrance.

Guardrail to the right of the entrance.

Discontinuous crosswalk at parking lot.



Missing curbing at accessible parking.

Accessible spaces.
Note sign posts and sign height.

Drainage

Trench drain on east side of Courthouse.

Trench drain on south side of Courthouse.

Catch basin with full sump.

Catch basin at relative high point.

Obstructed drainage pipe outlet and crumbling retaining wall.

Culvert outlet at driveway entrance.

Culvert inlet at driveway entrance. Note sediment in swale.

Pavement

Failing pavement.

Failing pavement.

Failing pavement.

Extend driveway to provide turnaround.

Landscaping

Mulch piled over masonry weeps.

Arborvitae growing against building.

Sparse grass-cover (typical of many locations).

Steep slope behind transformer toward building.

Wastewater Management System

Interior of blow-off manhole.

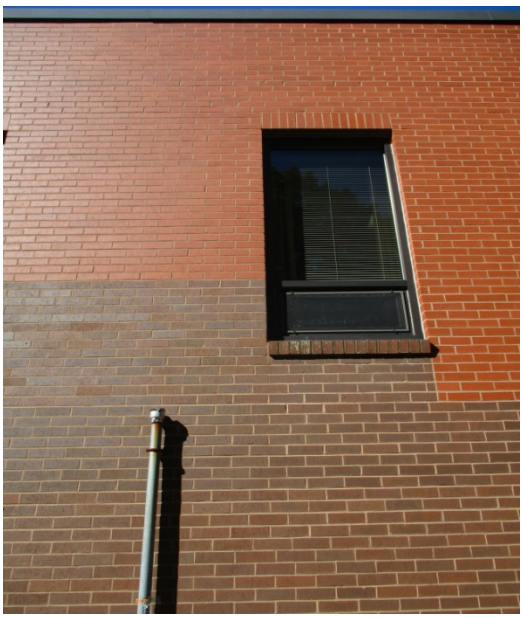
Clean-out manhole.

Pump station interior - general condition.

Pump station junction box and float rack.

	
Pump station and vent pipe.	Pump station control panel.

Miscellaneous



Oil tank vent pipe.

Oil supply piping. Note capped line.

Exposed wiring and conduit at main entrance.

Displaced curbing.

Recommended Improvements and Upgrades

Town Wide Facilities Assessment

Town of Salem, New Hampshire

District Courthouse

Cost Summary Sheet for Repairs and Renovations

Discipline Category	Short-Term	Mid-Term	Long-Term
Architectural	$249,000	$49,250	$58,500
Mechanical	$340,000	$55,000	$275,000
Electrical	$336,700	-	$31,000
Civil/Site	$118,200	$263,700	$31,850
TOTALS	**$1,043,900**	**$367,950**	**$396,350**

Definitions

Short-Term: Items or systems that should be repaired, upgraded or replaced within the next two to three years.

Mid-Term: Items or systems that should be repaired, upgraded or replaced within the next three to five years.

Long-Term: Items or systems that should be repaired, upgraded or replaced within the next ten to twelve years.

Short-Term Repair Summary

Architectural

- Replace roof membrane
- Replace roof drains
- Skylights – replace cracked skylights
- Repair chimney extending above roof
- Repointing of brick wing walls and planter walls at main entry
- Caulking gap at lower level doors
- Replace acoustical ceilings
- Replace wallpaper

- New carpeting
- New paint in holding cells

Mechanical – HVAC

- Replace air handling units
- Replace automatic temperature controls
- Install new dual roof drains with overflow

Electrical

- Replace pole mounted site lighting
- Provide new emergency exit exterior lighting
- Electrical main service - testing
- Electrical panels - testing
- Panelboard feeders - Megger testing
- Upgrade all lighting
- Replace and upgrade all emergency and exit lighting
- Replace fire alarm system
- Replace lighting controls
- New receptacles to replace wiremold, extension cords

Civil/Site

Pedestrian Access & Circulation

- Repair concrete stairs at main entrance
- Replace horizontal guardrail across opening at right side of main entrance
- Paint crosswalks at pedestrian routes across parking lots
- Patch cracked concrete sidewalk panel between accessible spaces and juror entrance

Site Drainage

- Clean out culverts, trench drains, swales and catch basin sumps
- Replace overhead door trench drains
- Replace depressed pavement around catch basin
- Develop a stormwater inspection and maintenance plan

Landscaping

- Lower mulch in landscape beds
- Trim arborvitae vegetation
- Aerate lawn surfaces
- Install drainage measures at lawn between transformer and Courthouse

Wastewater Management System

- Insulate buried force main pipe
- Clean and test blow-off valve in manhole – replace if needed
- Clean-out manhole
- Comprehensive inspection of pump station
- Replace pump station cover

Miscellaneous

- Replace oil supply – pump
- Perform a comprehensive inspection of the oil supply – system
- Cap exposed electrical conduit at main entrance – sign

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ARCHITECTURAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Roof membrane	Roof is at the end of its useful life and should be slated for replacement.	Install new fully adhered membrane roof with new rigid insulation. Discard existing stone ballast and gain 10 to 12 PSF of load carrying capacity.	2 to 3 years	$180,000		
Roof drains	Many roof drains are damaged.	Replace present roof drains at time of re-roofing project. Install dual overflow type drains.	2 to 3 years	$10,000		
Skylights	One of the Plexiglas domes is cracked and should be replaced.	During the roof replacement the two Plexiglas skylights should be replaced.	2 to 3 years	$7,500		
Chimney extending above roof	The brick at top of chimney requires repointing. Repair precast chimney cap.	Repair chimney as required.	2 to 3 years	$4,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ARCHITECTURAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Brick wing walls and planter walls at main entry	Mortar is cracking and spalling from moisture intrusion. Joints are badly deteriorated.	Rake out joints and repoint joints.	2 to 3 years	$7,500		
Caulking around windows and doors	Some of the caulking is starting to dry out and crack.	Install new caulking around windows and doors.	< 5 years		$10,000	
Entry doors and storefront	Currently doors are in good condition. Slight deterioration of sills and frames.	Long-term replacement of doors and storefront should be considered.	10 to 12 years			$50,000
Masonry control joints	Presently the sealants in the joints are in good condition.	The sealants will require replacement in the future.	< 10 years			$8,500
Lower level doors	Large gap between overhead door jamb trim and masonry return.	Caulk the open joints to prevent water intrusion.	N/A	$500		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ARCHITECTURAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Acoustical ceiling	Many tiles in the grid-type ceiling are discolored, stained and/or have broken corners or edges.	Replace all ceiling tiles. Grids may remain in place. 5,500 square feet of tiles at $3.50/sf.	3 to 4 years		$19,250	
Acoustical ceilings	Concealed spline ceilings are damaged due to previous removal and tiles do not work well with maintaining systems above the ceiling.	Remove existing concealed spline ceilings and replace with conventional 2 x 2 suspended grid system. 4,000 sf at $7.00/sf.	None	$28,000		
Wallpaper	Much of the wallpaper in lower level, juvenile hearing room is starting to peel.	Replace wallpaper with new paper or strip paper and repaint walls.	2 to 3 years	$3,500		
Flooring	Worn out carpeting in clerk's department, youth services and probation department.	Replace carpeting in these areas.	< 1 year	$7,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ARCHITECTURAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Stairway handrail/guardrail system	Handrail/guardrails on three stairs do not meet code in terms of spacing and lack of a proper handrail.	Retrofit stair rails/guardrails to meet code requirements.	N/A		$20,000	
Holding cells	Peeling paint on ceiling and non-functioning sink in one cell.	Paint ceiling in holding cell area, fix non-functioning sink.	< 1 year	$1,000		
		TOTALS		**$249,000**	**$49,250**	**$58,500**

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

MECHANICAL – HVAC			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Air handling units	The five air handling units are original to the building and due to age, condition, and serviceability, should be replaced.	For redundancy and ease of service, install several smaller AH units. This will remove the VAV boxes from inaccessible areas.	At the end of their useful life.	$220,000		
Automatic temperature controls	Control system is old and rudimentary in that there is a separate control for each piece of equipment.	Install a new, expandable control system that controls the equipment globally with remote access of set points and alarms.	At the end of their useful life.	$110,000		
Hot water pumping	There is only a single hot water pump in the system and it operates at a single speed.	Revise the heating system to include a dual pump system with a variable speed drive for more efficient operation and a back-up in case of pump failure.	Existing pump is fairly new and has a 20+ life expectancy.		$25,000	

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

MECHANICAL – HVAC			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Plumbing fixture and drinking fountains	Plumbing fixtures in the bathrooms are original to the building and are need of an upgrade. Currently they meet the majority of ADA requirements. Drinking fountains are not dual height.	Replace all plumbing fixtures with new modern water efficient fixtures that are in full compliance with ADA requirements.	5 to 6 years		$30,000	
Roof drains	Roof drains show signs of damage.	Replace existing roof drains at the time the roof is replaced. Install dual overflow units.	2 to 3 years	$10,000		
Boilers	Although current boiler still has 20 years, the unit has only a low level outlet. Single boiler has no redundancy.	Install multiple gas-fired condensing boilers for efficiency and redundancy. Add high level outlet.	20 years on boilers			$100,000

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

MECHANICAL – HVAC			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Radiators	Current units operate at 180°F and are inefficient. Adding new boilers would require the change over.	Install new terminal units to operate at lower temperatures.	15 years			$50,000
Fire protection	Currently the building is not sprinkled.	Install a new sprinkler system and new water service entrance to achieve the required water flow rates.	N/A			$125,000
		TOTALS		**$340,000**	**$55,000**	**$275,000**

PROJECT NO. 4465 ~ SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ELECTRICAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Metal Halide Pole Site Lighting	Fixtures are original to 1982 construction. Poles are weathered, fixtures are not energy efficient; reported bad wiring/animal infestation.	Replace fixtures with new LED energy-efficient fixtures, new poles, provide new branch circuitry.	Approaching end of their expected life.	$12,000		
Emergency Exit Exterior Lighting	None existing. Required to meet International Building Code Section 1006.	Provide new exterior wall-mounted emergency LED self-contained battery fixtures.	N/A	$7,200		
Electrical Main Service	800 Amp, 208 Volt Square D panelboard, original to 1982 construction.	Panel appears in good working condition. Provide testing of breakers and bussing. Replace in 6 years.	40 years – 6 years remaining	$1,000 for testing		$8,000
Electrical Panels	200 Amp, 208 Volt 3-phase Square D panels.	Panels appear in good working condition. Provide testing of breaker sand bussing. Replace in 6 years.	40 years – 6 years remaining	$2,000 for testing.		$18,000

PROJECT NO. 4465 ~ SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ELECTRICAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Panelboard Feeders	Not observed/covered.	Provide meggar testing to check for insulation degradation.	50 years – 14 years remaining	$1,500		
Lighting	The lighting types varied but generally fixtures were inefficient incandescent or fluorescent; lenses missing or showing age/discoloring/broken.	Replace all light fixtures with new LED energy efficient fixtures; fixtures have exceeded their 20 year expectancy.	Passed their 20 years.	$187,500		
Emergency and Exit Lighting	Old fluorescent exits signs; emergency battery units with remote lighting heads. Some exit signs not illuminated. Batteries recently replaced.	Replace all exit signs with LED self-contained signs. Replace all EBU's and remote heads. Provide new LED fixtures with integral battery drivers.	Passed their 20 years.	$12,500		
Fire Alarm System	12 Zone FCI Fire Alarm control panel; inadequate coverage; past its life expectancy.	Replace system in its entirety to meet 2012 IBC 2015 International Fire Code, with a new addressable system.	Passed its 20 years.	$70,000		

PROJECT NO. 4465 ~ SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

ELECTRICAL			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Life Expectancy***	**Short-Term**	**Mid-Term**	**Long-Term**
Digital Masterbox Digitize RAD-8LS	Masterbox is relatively new, in good working condition.	No work required at this time.	20 years – 15 years remaining			$5,000 in year 2031
Lighting Controls	All light fixtures are presently controlled with manual wall-mounted switches. No automatic controls present.	Replace wall switches with wall occupancy sensors, ceiling sensors, day light sensors, lighting, control panel.	40 years – 6 years remaining	$33,000		
Wiremold, Extension Cords	Inadequate receptacle coverage. Use of wiremold strips.	Provide new receptacles to eliminate the use of wiremold and extension cords.		$10,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
PEDESTRIAN ACCESS & CIRCULATION						
Concrete landing at main entrance	Appears to have settled; evidence of deterioration at the edges.	Replace.	2 - 5 years		$10,000	
Concrete stairs at main entrance	Corrosion at risers, treads and along sides where they meet adjacent masonry walls.	Repair corroded concrete sections. Repoint brick wall and seal gaps between stairs and wall.	< 2 years	$7,500		
Stair handrails at main entrance	Railings do not comply with ADA requirements.	Remove and replace with ADA compliant handrails.	> 5 years			$8,000
Asphalt ramp to main entrance	Steep slope, no landings or handrails, wood curb is starting to deteriorate, asphalt is starting to show its age (fair condition).	Remove wood curb, install metal handrails on both sides of ramp, remove asphalt surface and repave.	2 - 5 years		$14,000	

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Horizontal guardrail across opening at right side of main entrance	Guardrail does not comply with ADA standards, presents a possible fall hazard.	Replace existing railing with an ADA compliant metal guardrail.	< 2 years	$1,000		
Pedestrian routes across parking lots	No crosswalks to alert drivers to possible pedestrian traffic.	Paint a crosswalk to indicate pedestrian routes across parking lots.	< 2 years	$1,500		
Accessible parking spaces	Grade of spaces exceeds ADA requirement of 2% maximum slope in all directions. A section of flush granite curbing is missing and should be replaced.	Remove pavement and regrade parking spaces. This should be completed in conjunction with a more global parking lot reconstruction plan.	> 5 years			Varies, conditional upon scope of parking lot replacement.
Cracked concrete sidewalk panel between accessible spaces and juror entrance	The crack will lead to further degradation of the sidewalk if left unattended.	In the short-term (immediately) clean out the crack and patch it with a mortar or grout mix. The Town may consider replacing the panel in its entirety as a long-term repair.	< 2 years	$500 (crack repair)		$2,000 (panel replacement)

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
SITE DRAINAGE						
Culverts, trench drains, swales, and catch basin sumps	There is a lot of accumulated sediment and debris in these locations, reducing the capacity and effectiveness of the measures.	Clean out sediment from drainage culverts, catch basin sump, trench drains, and swales. Flush drainage pipes.	< 2 years	$800		
Overhead door trench drains	Grates are missing or corroding; side walls are failing; shallow cover over outlet pipes; trenches do not extend across width of doors; trenches are shallow.	Repair concrete sidewalls and install new traffic rated, corrosion resistant grating (short-term). Replace trench drains with new structures that are deeper and extend across the full width of the openings (long-term).	< 2 years > 5 years	$5,000		$12,000
Catch basin	The pavement surrounding the catch basin has settled, preventing some runoff from entering inlet.	Remove the settled pavement, replace the base gravels, and grade the area to drain properly and repave.	< 2 years	$3,500		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE			$ Opinion of Cost			
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Driveway culvert	Headwalls were never provided at the inlet and outlet of the RCP culvert and the ground is eroding away from the end of the pipe, reducing the effective cover.	Install precast concrete or masonry headwalls at the inlet and outlet of the driveway culvert.	> 5 years			$9,000
Culvert to swale on south side of building	The headwall is starting to fall apart.	Replace/reset stones that have fallen out of headwall.	> 5 years			$850
Stormwater inspection and maintenance plan	The site does not appear to have a plan in place detailing regular inspection and maintenance items for the maintenance of the stormwater system.	Develop a plan that includes required inspection tasks, inspection intervals, maintenance items, inspection logs, etc. for routine maintenance, cleaning and inspection of the components of the stormwater management system.	< 2 years	$1,500		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
PAVEMENT						
Parking lot pavement	The pavement is in poor condition in much of the site and based on the cracking it appears the base gravels have lost much of their structural capacity.	Reclaim pavement and regrade. Repave site.	2 - 5 years		$175,000	
South parking lot	The travel lane does not extend beyond the end of the parking spaces, making it difficult to back out of the end-most spaces or to turn around.	Extend the circulation lane to provide greater ease of turning movements. The best time to do this is during parking lot reclamation and repaving, because the cost can be captured in that amount.	2 - 5 years		Cost captured in amount listed above.	

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
LANDSCAPING						
Landscape beds	Mulch-filled landscaping beds against the exterior building walls typically have mulch piled over the lowest masonry courses, obstructing the weep holes.	Rake mulch away from the lowest masonry courses	< 2 years	$500		
Arborvitae	The arborvitae at the southeast corner of the Courthouse are growing against the exterior masonry.	Trim the vegetation to provide separation from the exterior building wall.	< 2 years	$100		
Lawn surfaces	There are many areas across the site with sparse grass coverage.	Aerate the lawns, fertilize, and reseed. Stabilize the surfaces so the grass seed remains in place and irrigate until the coverage is at 90% or greater.	< 2 years	$1,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Lawn between transformer and Courthouse	The ground slopes steeply from the transformer to the exterior wall and is a potential site for water intrusion to the building interior.	Install drainage measures, such as a French drain, to intercept runoff from this slope and channel it away from the Courthouse.	< 2 years	$2,500		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
WASTEWATER MANAGEMENT SYSTEM						
Buried force main pipe	An approximate 500-lf section is prone to freezing because it is buried at a shallow depth, due to the presence of ledge.	Expose pipe in the 500± ft section between the clean-out and blow-off manholes. Install 4" thick rigid insulation over the top and along the sides of this line.	< 2 years	$15,000		
Blow-off valve manhole	This structure is full of sand and dirt because the frame is not secured to the structure. The pipes and clean-out access are buried and the valve is coated in dirt.	Clean out the structure and test the performance of the valve (replace if needed). Inspect clean-out cover and replace if needed. Flush the line to ensure there is no grit in the pipe. Secure the frame to the structure with mortar and install bollards between the pavement and the structure to protect it from snowplow impacts.	< 2 years	$5,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Clean-out manhole	The interior of the structure could not be assessed because the cover cannot be removed.	Loosen cover and clean rim so it remains operable if needed. Inspect condition of insulation, clean-outs, and pipes and provide any necessary repairs. Ensure any sediments are removed from the structure.	< 2 years	$500		
Pump station	The sewer pump station does not conform to current State regulations and electrical codes.	Hire an experienced pump station installation and service firm to provide a comprehensive inspection of the entire wastewater pump system, including condition of pumps, corrosion of components, installation inside the wet well, wiring, conduits, junctions, float operations, control panel, etc.	< 2 years	$5,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Pump station	Pending inspection of system, there will likely be a number of recommendations to replace and modify out of compliance components.	Reconstruct/apply modifications as recommended by inspection company.	< 2 years	$25,000		
Pump station cover	The cover is not watertight. Once open, there is no fall protection and there is no signage warning the interior is a hazardous environment.	Replace the cover with a lockable, watertight hatch. Provide interior fall protection and the signage required by State regulations.	2 - 5 years	$10,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
MISCELLANEOUS						
Underground oil tank	Vent pipe is below and within 5 feet of an operable window.	Extend the pipe above the window. The pipe end should be at least 5 feet away from building openings and 15 feet away from mechanical intakes.	2 - 5 years		$700	
Copper supply piping (oil feed)	There appears to be a single copper supply line from the tank to the boiler (a visible capped pipe indicates a possible abandoned return line). It is unknown whether there is any secondary containment for this piping.	Replace copper tube with a double wall supply line and also provide a return line. Both pipes should run through a secondary containment sleeve. Install monitoring measures for line leak detection.	2 - 5 years		$7,500	

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Oil supply - pump	It was reported the system functions poorly when the stored oil drops to approximately 2,000 gallons (half-full tank).	The existing pump at the boiler may be undersized to pull oil from the tank once the level drops. Install a submersible pump in the exterior tank and provide a day tank inside the mechanical room. If a more powerful pump to replace the existing is available, that may be an acceptable alternative.	< 2 years	$30,000		
Oil supply - system	Knowing there are some problems with the operation of the system, it makes sense to have it inspected thoroughly.	Hire an experienced installation and inspection company to assess the entire system (components, electronics, alarms…) to review compliance with regulations and functioning of system.	< 2 years	$2,000		

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Main entrance - sign	There is an electrical conduit with exposed wiring protruding from the ground at the entrance sign.	There was likely a ground light mounted on this conduit at one time. It should be reinstalled or the conduit should be cut off below grade and capped with a watertight seal.	< 2 years	$300		
Granite curbing	Vertical granite curbing is becoming displaced in several locations. The sloped granite curbing at the main entrance is in good condition.	Reset vertical granite curbing in conjunction with a parking lot reclamation project. The cost for this can be captured with that other work, but the price indicated in this row is the cost to perform this work on its own, not combined with another paving project.	2 - 5 years		$50,000	

PROJECT NO. 4465 - SALEM DISTRICT COURT BUILDING AND SITE ASSESSMENT

CIVIL/SITE				$ Opinion of Cost		
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	***Remaining Useful Life***	**Short-Term**	**Mid-Term**	**Long-Term**
Accessible parking signs and sign posts	These sign posts are in a vulnerable position and can be easily bent over or broken by snow plows or other vehicles. Some of the signs are mounted lower than required by ADA.	Encapsulate the sign posts in a concrete bollard to protect them. Remount the signs so the bottom of the signs are a minimum of 7 feet above finished grade.	2 - 5 years		$6,500	
		TOTALS		**$118,200**	**$263,700**	**$31,850**

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