ARCHITECTURAL ASSESSMENT

General Description

101 Mill Row, also known as the Adams / Russell House was constructed in 1816 (Image 1 and 2) and is part of the Chelmsford Historic Commission (Image 3). The Adams / Russell House had been converted into office building space; at one time the Chelmsford Department of Health utilized the space. However, at the time of our study the facility was not being used. There was an addition added to the original 1816 building; the date of such construction is unknown.

Image 1

Image2

The facility has three occupied floors, the attic area was converted into office space but no elevator or lift exists. The building is best described as residential in nature with the structural system generally described as a combination of brick veneer with wood framing and wood siding underneath vinyl siding with wood framing, with non-loadbearing interior and exterior walls. The structure is not fireproofed, and as such best fits the description of a Type V-A construction as defined by the current building code. The building does not feature fire suppression sprinklers throughout.

The occupancy permitted for the converted office building is unknown. Currently the facility appears to be vacant. Continued use or a change of use may need to be re-permitted given this vacancy.

The building survey for this report was conducted on February 17, 2016.

Image 3

GENERAL CODE CONSIDERATIONS

As an unoccupied building, significant code upgrades may be required in order to re-use the building or change its permitted use, unless specifically allowed by the Building Inspector. As the building currently stands, any plans for significant renovations or additions should be planned in awareness of the following limitations.

Should the facility be used for office space or for large meetings, gatherings, or special events, the current code would require that a fire suppression system be installed.

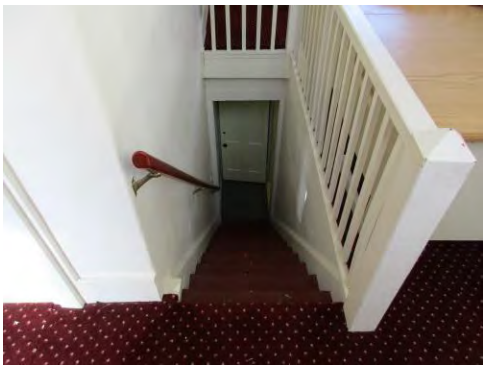

Image 4

Image 5

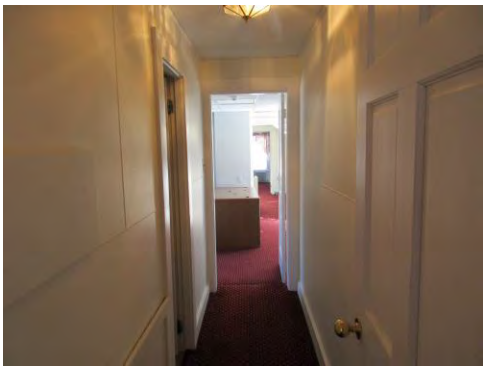

Image 6

Image 7

It is also likely that any planned additions would be required to be separated from the main building by fire walls. Although the building is part of the Chelmsford Historic Commission, the interior has been significantly renovated over the years. In doing so the historic nature of the building has been compromised and therefore, it is our opinion, that any request for relief from invasive work such as the installation of sprinklers, an elevator, or structural upgrades is not likely.

A more in-depth analysis of the building occupancies and strategies to satisfy building height and area limitations would be required to confirm code requirements under any new use or occupancy.

It is recommended that any planned re-use or renovation of this building be reviewed with the AHJ to determine if the building has been vacant or not in use long enough to where any new function, including office space, may be considered a change of use. It is also important to note the residential nature of the abutting neighborhood, which may require special permitting for any new use. Should renovation occur, the building will have to be brought up to the current building code. Any such renovations should consider the following code compliance measures as options:

- There is no accessible entrance into the building. An accessible entrance and exit needs to be made via ramp to enter and exit the building.
- The main entrance vestibule is sunken down 7”. There is currently a step up to access the kitchen and the reception area. The vestibule floor either has to be raised up to be level with the main floor, or somehow a ramp up needs to be made in order to access the building spaces.
- The guardrails at the second floor are not tall enough and will need to be replaced with guardrails that meet current MAAB / ADA code requirements.

ACCESSIBILITY

The building includes multiple conditions that are not accessible. Massachusetts Architectural Access Board Rules and Americans with Disabilities Act (2010) Standards are applicable to the building for any public use, including district office space.

The building includes significant barriers to accessibility as it does not include an accessible entrance or route throughout the building. The basement, first, second and third floors are only reachable by stairs which are not compliant (Image 4 & 5). Under a renovation project the front stair (Image 5) may be exempt given their historic nature. However, a fully compliant set of stairs and an elevator will be required to connect all floors providing services to the public or if considered work spaces.

The toilet rooms, as a whole, are not accessible. The spaces do not provide the required floor space area and fixtures are not ADA compliant (Image 7 & 8). A bathroom is located on each floor; each of these would need to be upgraded to meet accessibility requirements. Given the size of the existing restrooms, some removal of walls will be required to create an accessible space. The removal of tubs and showers in some of the restrooms will add necessary floor area to these rooms. Depending on the proposed use of the facility, additional restrooms may be needed to meet the intended occupancy and use.

A residential style kitchen exists in the facility (Image 9 & 10). Depending on the proposed use of the kitchen (if it remains) renovations will be needed to provide accessibility to counter tops, storage cabinets, sink, microwave, etc.

Doors and doorways throughout the facility do not meet accessibility requirements. Most doors have knob hardware and door openings are not wide enough to meet requirements. Push / pull clearances are not met in most areas throughout the building (Image 11).

Additional specific conditions representing accessibility barriers are noted in the following sections.

Image 8

Image 9

Image 10

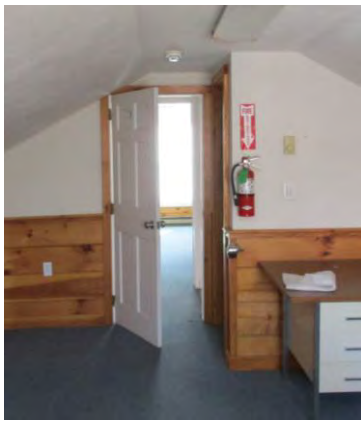

Image 11

Image 11

Image 12

Image 13

Image 14

EXTERIOR

FOUNDATION

Foundations consist of stacked field stone held together with concrete (Image 11). The exposed portion of the foundation walls are parged smooth. The newer addition has CMU block foundation walls. The foundation walls are generally in good condition. Repair work includes concrete piers (Image 12) having been added to older wood columns. It is unknown if there are footings below the piers or the newer CMU foundation wall. It is assumed that the stone foundation walls extend below grade to provide a footing for these walls. The extent and condition of these assumed walls is unknown.

Bulleted List of Specific Issues

- There are some cracks in the foundation wall (Image 13).
- A sump pump is located in the basement to address water infiltration (Image 14).

Bulleted List of Recommendations

- Further investigation is warranted to determine cause of cracking at the foundation wall. It is likely that the building, over the years, has settled which has caused the cracks. Repair should be considered to prevent water infiltration.
- Further investigation is warranted to determine the cause of water infiltration into the basement. It is likely that water is finding its way through some of the cracks in the foundation wall and up through the basement floor. An approach to maintain a dry basement should be developed to prevent the buildup of moisture or mold.

WALLS

The exterior walls on the original 1816 building are a combination of brick veneer with wood framing and drywall, as well as vinyl siding over original wood clapboard siding with wood framing and drywall (Image 1 & 2). The newer addition has vinyl siding with wood framing and drywall.

Bulleted List of Specific Issues

- There is severe cracking occurring in the exterior brick veneer walls (Image 15, & 16).
- The vinyl siding in a few areas has cracks and holes exposing the substrate behind the siding (Image 17, & 18).

Bulleted List of Recommendations

- Further investigation is warranted to determine the cause of cracking brick and a permanent fix. It is likely that water is finding its way behind the brick, freezing and causing brick movement and further damage. Remove areas where brick is in poor condition and replace with new brick. Repoint all exterior brick walls and maintain.
- Remove sections of vinyl siding that have damage and replace with new vinyl siding to match existing. Investigate wall behind the vinyl to assure that moisture damage has not occurred.

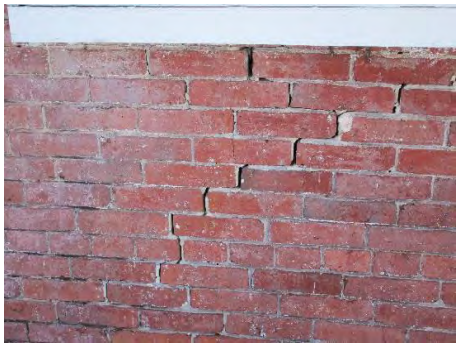

Image 15

Image 16

WINDOWS

The windows are a combination of wood and vinyl clad windows double hung. Wood is the predominate window type. All windows have aluminum storm windows attached to the outside. All windows have wood trim and wood sills. The windows are in fair to good condition.

Image 2

Bulleted List of Specific Issues

- On some of the window sills and window casings the paint is flaking and the wood looks punky or soft (Image 19).
- Some of the windows have been covered in plastic on the inside (Image 20). This is assumed to mean there is air and water infiltration around the windows. It is not known when the plastic cover was installed but this condition prevents the window from being operable.

Image 18

Bulleted List of Recommendations

- At the windows where the paint is flaking off the sills and the trim, scrap all the loose paint and inspect the wood to determine if rot exists. If the wood has rotted, replace, prime and repaint to match existing.

Image 39

- Remove plastic from the windows. If there is air leaking in around the windows remove the interior trim and pack insulation between the window frame and the R.O. framing, reinstall window trim around the window. If water infiltration is occurring, remove window and rebuild around the window and replace with new window. Inspect surrounding walls and cavity to assure that water damage and mold buildup has not occurred.

Image 20

DOORS

The exterior doors are wood construction; some have vision panels and one is fully glazed. The fully glazed door at the back of the building has a locking storm door. The doors are in good condition.

Bulleted List of Specific Issues

- No specific issues with the doors were observed at the time of the site visit.

Image 4

LOUVERS / VENTS / OTHER OPENINGS

There are several cutout openings for air conditioner units and an access hatch at the electrical meter. No water damage was evident on the inside around the air conditioning openings. However, these openings could be a source for loss of heat throughout the colder months (Image 21).

Specific Issues

- Review conditions around the through-wall air conditioning units to identify heat loss
- The access hatch door located by the electrical meter has fallen off, exposing the original wood clapboards beneath to the weather (Image 22).

Image 5

Bulleted List of Recommendations

- Review conditions around the through-wall air conditioning units and provide additional insulation as needed to reduce heat loss.

- Remove the broken door from the access hatch and make new vinyl door to match existing.

ROOF

The roof is made up of architectural asphalt shingles. It is unknown if there is an ice and water shield underlayment. The roof structure consists of wood board sheathing, running with the roof slope, and horizontal wood purlins in between heavy timber roof truss joists (Image 23).

Image23

Bulleted List of Specific Issues

- The architectural asphalt shingles look old and wavy in some places and appear to be starting to curl (Image 21).

Bulleted List of Recommendations

- Remove existing roof system down to the wood board sheathing. Install new drip edge, install ice and water shield underlayment, install new architectural asphalt shingles.

INTERIOR

FLOORING

Carpet is the predominate flooring type in most of the rooms. Wood flooring is used in foyer space and the second floor hallway. There is a combination of sheet vinyl and porcelain tile used in the bathrooms. Quarry tile is used in the mail room. Sheet vinyl is used in the kitchen. Marble tile is used in the main entrance vestibule. The stairs consist of wood stair treads with carpet runners. The basement is a combination of poured concrete and dirt.

Image 24

Image 25

Bulleted List of Specific Issues

- Some of the carpet has minor staining and wear throughout the building. (Image 24)
- The sheet vinyl in the kitchen is severely stained near the radiator, possibly from a leak at the radiator. Damage to the subfloor, if any, was unknown at the time of the survey (Image 25).
- In some of the rooms the carpet has a lot of wrinkles and humps in it. These are considered tripping hazards.
- In some of the bathrooms the floors have some staining.

Image 26

Image 27

Image 28

Image 29

Bulleted List of Recommendations

- All carpets throughout the building needs to be shampooed.
- In the kitchen remove the existing sheet vinyl flooring. Inspect the subfloor by the radiator where the leak occurred. If the subfloor is damaged remove the damaged portion and patch to match adjacent subfloor, then install new sheet vinyl floor.
- In the rooms where the carpet is wrinkled stretch out the carpet towards the exterior walls. Trim any excess carpet at the exterior walls and re-tack the carpet around the perimeter of the room.
- In the bathrooms that have stained floors, a thorough cleaning and scrubbing are needed.
- At the circulation stairs remove the carpet runner and install an adhered track aid, such as grip tape, across the entire stair tread.

WALLS AND PARTITIONS

The interior walls are 2x wood framing with gypsum wall board or plaster. In the kitchen and entrance vestibule the finish is wood paneling. The interior walls are assumed to terminate at the underside of the floor structure. The extent and condition of insulation is unknown.

Bulleted List of Specific Issues

- There are several areas in the building where wallpaper is torn, damaged, and falling from the wall surface (Image 26).
- The second floor dormer is severely damaged from previous roof leaks (Image 27).
- There are a few areas on the second floor where the wall finish has become damaged from previous roof leaks.
- There are a couple of areas where the walls have cracks in them (Image 30).

Bulleted List of Recommendations

- In the areas of the building where the wallpaper is torn or damaged, completely remove the wallpaper, then prime and paint the walls.

Image 30

Image 31

Image 6

Image 7

- Remove all the damaged GWB from the dormer and any other damaged structure. Rebuild dormer with new structure as needed. Replace GWB, tape, mud, and repaint to match existing walls.
- At the various areas of wall damage, patch holes with new drywall of like thickness. Re-tape, mud, sand and repaint to match existing walls.
- In the areas where the wall surface has cracked further investigation is warranted to determine the cause of the cracking and determine a permanent fix.

CEILINGS

The ceiling types in the facility include gypsum wall board / plaster, and 2'-0" x 2'-0" suspended acoustical ceiling tiles, and a few rooms have 9"x9" ceiling tile. Generally, the ceilings are in good condition.

Bulleted List of Specific Issues

- In the kitchen many of the acoustical ceiling tiles are bowed or lifted (Image 31).
- Some of the acoustical ceiling tiles have water stains on them (Image 32, & 33).
- In one of the closets on the third floor where the ceiling and wall meet, there is a crack that has formed that carries in the ceiling (Image 34).

Bulleted List of Recommendations

- In the kitchen remove the bowed ceiling tiles and replace to match existing. Where the tiles are lifted replace them back into the ceiling grid.
- At the areas that have water stained tile remove the tile and replace to match existing.
- In the third floor closet that has the crack, further investigation is warranted to determine the cause of the crack and resolve with a permanent fix.


Image 8


Image 9


Image 10


Image 11

DOORS

The interior doors are a mostly of 6 panel solid core wood doors. Some of the doors are ½ glazed or French style doors with glazed panels. There is a sliding glass door in the office that was formally a garage. (Image 35, Image 36, Image 37). Generally, the doors are in good to excellent condition. The door hardware is not accessible and should be replaced IF building will be used as public space (see accessibility requirements above).

FIXTURES AND FURNISHING (BUILT -IN)

The kitchen casework was recently renovated and there are new kitchen appliances. There are built-in bookshelves in the dining room, and the living room / office, and den / office. There are also fire place surrounds and mantels.

Bulleted List of Specific Issues

- The kitchen casework is in good condition but appears dated.
- Shelving and cabinetry in the former dining and living rooms is in good condition
- The built-in book shelves are in excellent condition. (Image 40)
- Fireplace surround and mantels are in good condition

Image 12

Image 39

Image 13

CIVIL ENGINEERING ASSESSMENT

Nitsch Engineering has performed research of the existing site conditions at 101 Mill Road in Chelmsford, Massachusetts. Nitsch Engineering has used Chelmsford GIS and design drawings provided by the Town. Nitsch Engineering gathered information during a site visit conducted by Brittney Veeck, EIT on February 17, 2016 and a site visit conducted by Dave Conway, PE on March 4, 2016.

GENERAL DESCRIPTION

The existing site is located at 101 Mill Road, Chelmsford, Massachusetts. The site is bounded by Mill Road to the North, town soccer fields to the east, wooded area to the south, and River Meadow Brook and residential areas to the west.

The entrance to site is a paved driveway along the north side of the site on Mill Road. There is a parking lot to the east of the building, and a shed along the southern end of the site.

Image 1

Image 2

EXISTING SITE UTILITIES

STORM DRAINAGE

Chelmsford GIS does not show a closed drainage system in North Road adjacent to the project site.

Stormwater runoff from the roof of the building appears to be collected in downspouts and discharged at grade (Image 1 and 2).

No catch basins were observed onsite. Stormwater runoff from the paved areas likely runs off into the grass areas.

Record plans do not show a closed drainage system onsite and onsite observations support this conclusion.

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

SEWER

There is a town sewer main in Mill Road adjacent to the site and through the adjacent town field property. No sewer manholes were observed onsite; however, sewer service for the building likely connects to either of the two town sewer mains.

WATER

The Town of Chelmsford is split up into three separate water districts: the Chelmsford Water District, the North Chelmsford Water District, and the East Chelmsford Water District.

A water valve was observed in the driveway along Mill Road which indicated the water service for the building is likely fed from a water main in Mill Road (Image 3).

A fire hydrant was observed in a landscaped area to the North of the building along Mill Road (Image 4). The hydrant likely connects to a water main in Mill Road.

NATURAL GAS

There is a gas meter and generator located along the south face of the building behind landscaping (Image 4). A gas valve was observed in the driveway along Mill Road which indicated the gas service for the building is likely fed from a gas main in Mill Road (Image 5).

ELECTRICAL

A utility pole was observed onsite at the northwest corner of the building. Overhead wires run from a utility pole along Mill Road to the utility pole onsite. The overhead wires connect to the northwest corner of the building (Image 7).

EXISTING SITE CONDITIONS

SOILS

Based on the Natural Resources Conservation Service (NRCS) Middlesex County Soil Survey the site of the 101 Mill Road property is on soil classified as Hinckley loamy sand, Merrimac fine sandy loam, and Windsor loamy sand.

Image 9

PAVEMENT/CURBING

The asphalt pavement within the site is in generally good condition with some areas of cracking and isolated areas of ponding/icing (Image 8 and 10).

The walkway onsite is asphalt and appears to be in good condition but was snow covered at the time of the site visit (Image 11).

Curbing onsite is vertical granite curb. The curb is only located at the site entrance and does not extend throughout the entire paved/parking areas (Image 9 and 10). The curb is in good condition.

Image 10

PERMITTING CONCERNS

101 Mill Road is adjacent to a wetland and may require permitting through the Chelmsford Conservation Commission. The site is adjacent to a FEMA Flood Zone A. The site does not appear to be located within a Wellhead Protection Area.

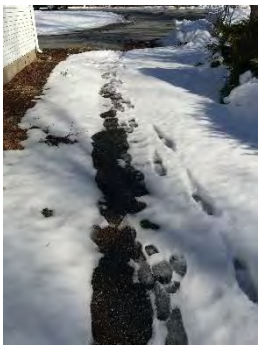

Image 11

RECOMMENDATIONS

- Regrade paved areas to prevent ponding which can lead to ice patches in the cold weather.
- Confirm site is ADA accessible.
- Install curb along driveway to prevent cars from driving onto lawn area.

Image 12

STRUCTURAL – 101 MILL ROAD

The purpose of this report is to assess the structure of the existing building, comment on the existing structure and comment on the structural integrity of the building.

Basis of the Report

This report is based on visual observations during our site visit on February 16, 2016. During the visit we did not remove any finishes or take measurements so our understanding of the structure is limited.

Existing Conditions

The original building is a three-story structure. The building was constructed in the 1800's. An addition was constructed in the 1980's on the east side.

The building's superstructure construction consists of wood framing for the most part.

In general, the structure is in a state of deferred maintenance and the floor framing appears to be undersized.

The roof framing of the original main building consists of wood plank decking spanning between timber purlins supported by sloping main wood girders framing between the center ridge and the eaves.

The stair railings in the upper floors were loose when we pushed on them. The wood staircase leading to the basement was supported by a wood post that was not in contact with the ground. The exterior stringers were cracked at their connections to the first floor framing members.

We observed the first floor framing from the basement level; we noted significant deterioration to the framing members. We observed damage due to wood-boring insects and moisture. Various members were unsupported and cut at some time in the past to accommodate MEPFP renovations.

In the basement, we did not observe positive connections between framing members. Various shims consisting of various materials were used at some time in the past to reinforce the main structure. At one shimmed location, the floor beam above was slightly crushed. Temporary screw-jack shoring posts were observed with no foundations. Additionally, one shoring post consisted of a cast iron sewer pipe.

We observed evidence of past repairs adjacent to the exterior wall in the basement. The repair consists of under-mounted wood beams supported by temporary screw-jack shoring posts with no foundations. The repair appears to have been made to address significant deterioration in the floor framing and the sill. Continued water infiltration has rotted the base of the screw jack posts. Various

past repairs consist of raised concrete pedestals, possibly needed to replace the bottoms of rotted wood posts.

The floor framing, in general, exhibited excessive vibration due to footfall.

The red brick chimney exhibited signs of moderate deterioration as evidenced by debris on the ground below. The chimney mortar joints were significantly deteriorated.

We observed the exterior masonry façade and observed various signs of water staining, deterioration, and 3/8" wide step cracking over the windows and at building corners above the foundation.

Recommendations:

Recommendations must be developed based on intended use.

MECHANICAL ASSESSMENT

The Board of Health Building is a steam heated building. For the most part, all the equipment, with the exception of the boiler plant and one split cooling unit, are all original to the building. The boiler plant was replaced in the 2008. The building mostly consists of cast iron radiators with some supplemental electric heat. There is no dedicated exhaust system for the building and ventilation air is provided through the use of the operable windows. The buildings overall temperature control system is handled by thermostatic control valves located on the steam radiators and the electric heaters are controlled through wall mounted standalone thermostats.

COOLING PLANT:

The building is not provided with a cooling plant. The majority of the spaces are cooled by window air conditioners (Image 1). There is one wall mounted ductless air conditioner/heat pump that is served by a single condensing unit mounted at grade. This unit handles the kitchen area on the lower level (Image 2 and Image 3).

HEATING PLANT:

There is one (1) gas fired cast iron fin tube steam boiler, manufactured by Burnham, model PIN7SNC-ME2 with an input capacity of 210 MBH and a gross output capacity of 168 MBH producing 5 psi low pressure steam. (Image 4) This boiler was installed in 2008 and is in good condition. The boiler is provided with dual low water cut-offs and all operating and safety controls. The boiler operates using its own controls. The steam distribution piping is a combination of schedule 40 black steel and copper piping. At the connection points between the two different metals there does not appear to be any die-electric fittings (Image 5). This piping system is insulated with what appears to be fiberglass insulation. The condensate return piping is schedule 80 black steel and is a gravity return system insulated with what appears to be fiberglass insulation. Some of the insulation is missing on some of the elbows and on some

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

of the straight sections of pipe (Image 6). There is a pressure reducing valve and bypass on the steam header. Steam traps consist of a mixture of newer orifice traps and older F&T traps. The boiler is vented with single wall galvanized sheet metal, which connects to the original masonry chimney (Image 7).

There does not appear to be any method of introducing combustion air into the basement level other than typical infiltration through the exterior walls. The current method does not meet code compliance.

The basement is provided with a floor mounted residential style dehumidifier to help maintain humidity levels. This appears to be an issue as many of the fittings and flanges on the steam piping are corroded and beginning to rust (Image 8).

Specific Issues:

- Missing piping insulation on elbows and some straight sections.
- Humidity levels in the basement.
- Combustion air requirements for the boiler

Recommendations:

- Replace older steam traps under preventive maintenance schedule.
- Replace all sections of piping insulation that is missing
- Evaluate the steam condensate piping system and replace the sections that have deteriorated due to corrosion.
- Provide additional humidifiers or provide a commercial type of dehumidification system within the basement.

AUTOMATIC TEMPERATURE CONTROLS:

The building is equipped with standalone controls and is not tied into the townwide building management system. Boiler operation is controlled through the use of a wall mounted dial type thermostat. All the radiators are controlled with either hand valves or thermostatic control valves. The electric heating elements are provided with wall mounted dial type thermostats. The one split cooling unit is provided with a digital thermostat (Image 9, 10 and 11).

Image 9

Specific Issues:

- Majority of the hand valves associated with the radiators are not utilized which causes spaces to over or under heat.

Image 10

Recommendations:

- Install a DDC tied to Town Building Management System for optimal control.

Image 11

Image 12

Image 13

EXHAUST SYSTEMS:

Toilet rooms are exhausted through the use of ceiling mounted residential style exhaust fans, which exit the building. The exhaust fan appears antiquated and considerations should be given to replacing it (Image 12).

Recommendations:

- Replace exhaust fan.

Image 14

GENERAL AREAS:

The general areas are provided with floor mounted cast iron radiators and supplemental electric heat (Image 13, 14 and 15). The supplemental electric heat has been added due to issues with the current steam system. The steam system may be having issues due to controllability. Consideration should be given to utilizing a service company to review the existing steam system and provide necessary components to remedy the situation due to the high expense of using electric heat.

Image 15

Specific Issues:

- Lack of heat from the radiators.

Recommendations:

- Convert the existing steam system to hot water, at a minimum correct the current issue with the steam system.

ELECTRICAL ASSESSMENT

EXISTING SYSTEMS

The existing systems of this facility range from fair to good. Existing original murray panels should be replaced. Lighting is not the most efficient and should be replaced. Emergency lights and exit signs should be provided. A new fire alarm system should be provided to include horn/strobe throughout the building.


Image 1 – Utility Pole w/ Secondary Service Drop

ELECTRICAL DISTRIBUTION SYSTEM

A secondary service runs from utility pole overhead to weather heads located outside the building (Image 1, & 2).

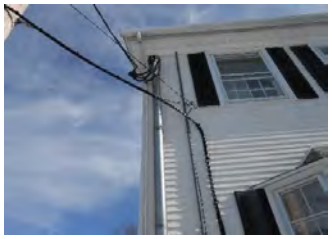
Image 2 – Weather-heads

The service enters an inline exterior meter socket to a 400 ampere rated, Crouse Hinds main distribution panel with a 400 ampere main circuit breaker. The service voltage is 120/208 volt, 3 phase, 4 wire. The old service main breaker Murray panel is back fed from the new main distribution panel. (Image 3, 4, & 5)

Branch circuit panel boards are located throughout the building to serve power, lighting, mechanical and technology loads (Image 6 & 7). Panelboards are manufactured by Siemens.


Image 3 – Electric Meter

INTERIOR LIGHTING

Interior lighting consists of a chandelier at the lobby entrance and matching wall sconce. Some offices and the dining room are provided with 2'x2' recessed prismatic fluorescent fixtures; other offices have surface wraparound fixtures with surface incandescent bowl type fixtures in the kitchen. Toilet rooms have wall mounted incandescent fixtures and above the sink, recessed downlights (Image 8, 9, 10, 11)


Image 4 – Main Circuit Breaker

In general, lighting is controlled with switch style occupancy sensors in offices, line voltage switches in corridors and public spaces (Image 12).

EXTERIOR LIGHTING

Exterior lighting consists of incandescent flood lights mounted to on the building. There is also a pole mounted incandescent lantern. The front entrance and the side entrance have wall mounted traditional lanterns on each side of the door (Image 13, 14, & 15).


Image 5 – Old Main Service Equip.

EMERGENCY STANDBY SYSTEM

No emergency lights or exit signs are provided in the building.

FIRE ALARM SYSTEM

The fire alarm system and security system are combined in one control panel provided by Magnum. System consists of smoke detectors or heat detectors in offices, hallways, corridors, kitchen and basement. Pull stations are provided at the exterior doors. No horn/strobes were found in the building (Image 16, 17, & 18).

LIGHTNING PROTECTION SYSTEM

The facility does not have a lightning protection system.

DATA/TELEPHONE

The telephone service enters the building from overhead utility wiring to the basement. A wall mounted data rack is located in an office with data wiring distributed throughout the building to data jacks (Image 19, 20, & 21).

SECURITY

The building contains an intrusion system which consists of door contacts on exterior doors, motion sensors, and intrusion keypads. The system is manufactured by Magnum (Image 22, 23, & 24).

Image 6 – Panelboards

Image 7 – Panelboards

Image 8 –Chandelier

Image 9 – Wall Sconce

Image 11 – Surface Wraparound

Image 13 – Flood Lights

Image 10 – 2'x2' Recessed

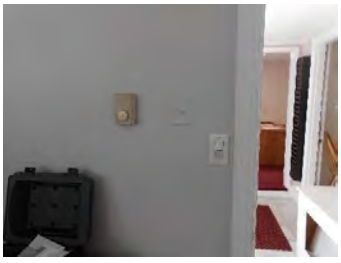

Image 12 – Occupancy Sensor

Image 14 – Pole Mounted Lantern

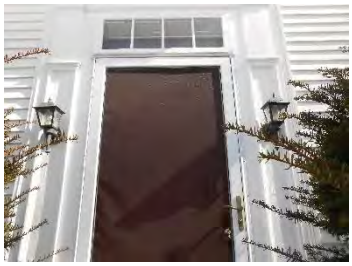

Image 15 – Wall Mounted Lantern

Image 16 – FA/Security Control Panel

Image 17 – Smoke Detector

Image 18 – Pull Station

Image 19 – Telephone Service

Image 20 – Data Rack

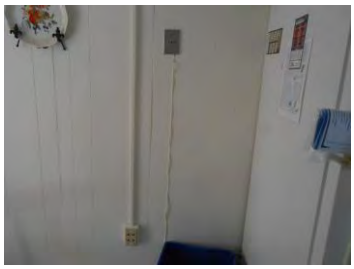

Image 21 – Data and Telephone Jacks

Image 22 – Motion Sensor

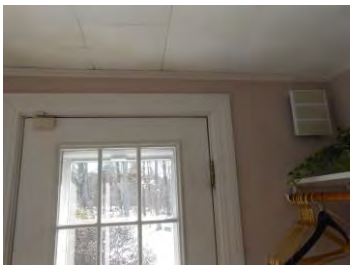

Image 23 – Door Contact

Image 24 – Key Pad

PLUMBING ASSESSMENT

Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the building.

FIXTURES

Water closets are floor mounted vitreous china flush tank water closet. (Image 1).

Lavatories are counter or pedestal vitreous china type lavatories. The lavatories are fitted with hot and cold water faucets (Image 2).

Bathtubs are standard length cast iron with thermostatic shower valve, shower head and bathtub spout diverter (Image 3).

A shower with fiberglass enclosure consist of a thermostatic mixing valve and shower head (Image 4).

The Kitchen sink is a single bowl, stainless steel drop-in type with hot and cold water single lever faucet with vegetable spray (Image 5).

Image 1 – Water Closet

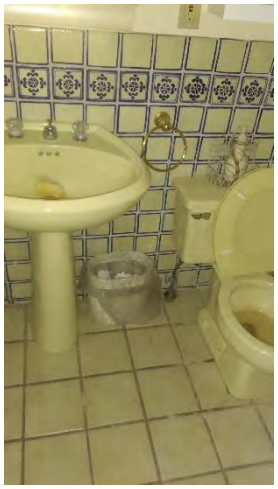

Image 2 – Pedestal Lavatory

WATER SYSTEM

The domestic water service is located in the Basement. The service appears to be 3/4" in size and includes a water meter (Image 6).

Piping is copper tubing with sweat joints. The majority of piping is uninsulated. In general, the gate valves are in fair condition (Image 7).

The main Building domestic hot water is generated through a gas-fired standard efficiency non-condensing water heater. The water heater has a natural gas input of 30,000 BTUH and a water storage capacity of 30 gallons (Image 8).

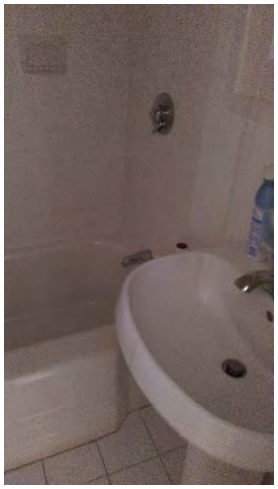

Image 3 – Bathtub

A thermostatic mixing valve is not provided for the building domestic hot water system. The domestic hot water system is not recirculated. There is no expansion tank on the cold water make-up to the water heater.

GAS

Building is serviced by an elevated pressure natural gas service. The gas service, regulator and meter is located on the exterior in a caged area. Gas main distribution is 1-1/4" in size. (Image 9).

Gas piping is black steel with threaded joints.

SANITARY DRAINAGE SYSTEM

In general, cast iron is used for sanitary drainage. Piping and fittings above slab are no-hub with coupling joints and bell & spigot. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper for waste (Image 10).

ROOF DRAINAGE SYSTEMS

The sloped roofs are collected by a gutter system. A sump pump is located in the Basement for ground water conditions. This installation looks relatively new (Image 11).

RECOMMENDATIONS

1. Plumbing fixtures meet current code for water conservation. However, new high-efficiency low flow fixtures could be installed to reduce water consumption.
2. In general, existing cast iron drainage piping can be re-used if sized appropriately. We recommend video inspection of existing drains to confirm integrity.
3. Install a high efficiency water heater including master mixing valve, recirculated hot water and expansion cold water make-up line.

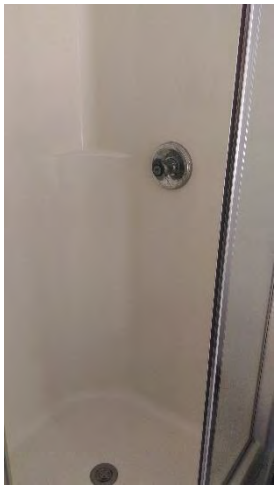

Image 4 – Shower

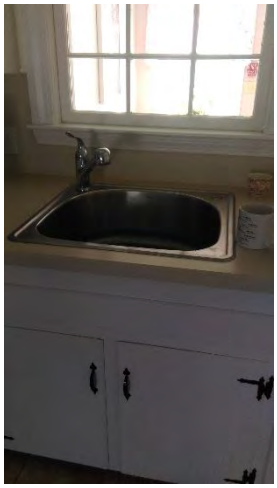

Image 5 – Kitchen Sink

Image 6 – Water Meter

Image 7 – Water Piping

Image 8 – Water Heater

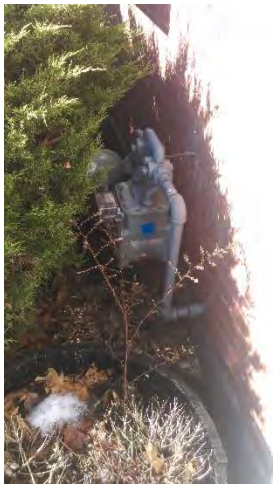

Image 9 – Gas Meter

Image 10 – Cast Iron Drainage

Image 11 – Sump Pump

1.0 INTRODUCTION:

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

As part of the proposed renovation and demolition project, UEC was contracted by Dore & Whittier Architects to conduct the following services at the 101 Mill Road, Chelmsford, MA:

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

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

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

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation. Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with EPA standard. Bulk samples were collected by Massachusetts licensed asbestos inspector Mr. Jason Becotte (AI-034963) and analyzed by a Massachusetts licensed laboratory EMSL, Woburn, MA.

Refer to samples results.

2.0 FINDINGS:

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

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

Number of Samples Collected

Sixteen (16) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Paper over boiler
2. Paper over boiler
3. Ceiling plaster
4. Ceiling plaster
5. Wall plaster
6. Wall plaster
7. Textured wall skim coat at first floor
8. Textured wall skim coat at first floor
9. 2' x 2' Suspended acoustical ceiling tile at first floor
10. 2' x 2' Suspended acoustical ceiling tile at first floor
11. White/black sink coating at kitchen
12. Green 9" x 9" vinyl floor tile under carpet at second floor
13. Green linoleum floor covering under carpet at second floor
14. Vermiculite insulation at chimney
15. Exterior window glazing caulking
16. Exterior window glazing caulking

Samples Results

Type and Location of Material	**Sample Result**
1. Paper over boiler	60% Asbestos
2. Paper over boiler	60% Asbestos
3. Ceiling plaster	No Asbestos Detected
4. Ceiling plaster	No Asbestos Detected
5. Wall plaster	No Asbestos Detected
6. Wall plaster	No Asbestos Detected
7. Textured wall skim coat at first floor	No Asbestos Detected
8. Textured wall skim coat at first floor	No Asbestos Detected
9. 2' x 2' Suspended acoustical ceiling tile at first floor	No Asbestos Detected
10. 2' x 2' Suspended acoustical ceiling tile at first floor	No Asbestos Detected
11. White/black sink coating at kitchen	No Asbestos Detected
12. Green 9" x 9" vinyl floor tile under carpet at second floor	No Asbestos Detected
13. Green linoleum floor covering under carpet at second floor	No Asbestos Detected
14. Vermiculite insulation at chimney	No Asbestos Detected
15. Exterior window glazing caulking	No Asbestos Detected
16. Exterior window glazing caulking	No Asbestos Detected

3.0 OBSERVATION AND COST ESTIMATES:

OBSERVATIONS:

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

1. Paper over boiler was found to contain asbestos.
2. Vermiculite insulation was found not to contain asbestos. However, per DEP the insulation must be disposed as asbestos. The ACM was found falling through cracks around chimney into kitchen from the attic space.
3. All remaining suspect materials were found not to contain asbestos.

4. Underground sewer pipe was assumed to contain asbestos.
5. Roofing materials were assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle.
6. Painted surfaces were assumed to be LBP. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations.
7. Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's. Tubes, thermostats, exit signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill.
8. Caulking materials were assumed to contain PCB's.

COST ESTIMATES:

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

Location	Material	Approximate Quantity	Cost Estimate ($)
Basement	Paper Over Boiler	20 SF	900.00
	Miscellaneous Hazardous Materials	Unknown	1,500.00
Attic/Wall Cavities	Vermiculite Insulation	Unknown	15,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	5,000.00
	Roofing Materials	2,500 SF[2]	5,000.00
PCB's Remediation[2]			2,000.00
Estimated costs for ACM Inspection and Testing Services			1,500.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			4,100.00
		Total:	**35,000.00**

[1]: Part of Total Demolition and Excavation.
[2]: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

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

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

5.0 LIMITATIONS AND CONDITIONS:

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

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

Inspected By:

Jason Becotte
Asbestos Inspector (AI-034963)

	101 MILL ROAD	Health, Safety & Welfare	Code Compliance	Functional Use of Building or Site	Handicap Accessibility	Extending the Life of the Building (Maintenance)	Energy Efficiency / Energy, Water Saving	Hazardous Material Abatement	Estimated Project Cost (5/2016 $)
	GSF 3,727								
1	**Site & Civil**								
1.01	Regrade paved areas to prevent ponding which can lead to ice patches in the cold weather.					X			$7,590
1.02	Regrade and install walkways to meet ADA guidelines.				X	X			$15,180
1.03	Install curb along driveway to prevent cars from driving on lawn area.					X			$38,557
1.04	Re-grade paved areas to provide accessible parking near the front entrance								$7,286
	Total								$68,614
2	**Structural Elements**								
2.01	Install properly sized floor framing.	X							$84,864
2.02	Secure wood railing at second floor.	X							$759
2.03	Install proper support for the basement stairs.	X							$759
2.04	Install proper additional support to floor framing. Exterminate pests and control moisture to prevent additional deterioration.	X							$28,288
2.05	Repair and repoint chimney.					X			$2,277
2.06	Repair and repoint exterior façade. Install additional support for brick at masonry openings.					X			$132,825
	Total								$249,772
3	**Exterior Architectural Elements**								
3.01	Provide accessible front entrance								$60,720
3.02	Remove sections of the wall where brick is in poor condition. Replace brick wall and repoint existing walls								$22,770
3.03	Repair crack in foundation walls								$3,036
3.04	Investigate source of water in basement, develop approach to provide a dry basement								$1,518
3.05	Remove sections of vinyl siding where damage has occurred. Investigate backup wall to assure moisture has not infiltrated. Replace vinyl siding with new to match.								$3,036
3.06	Replace window sills that are punky or soft								$4,099
3.07	Repaint window sills and trim where flaking								$1,366
3.08	Review condition of water and air infiltration around windows that have been covered in plastic. Provide insulation around window. If leaking replace window. Investigate walls around window to assure water damage or mold has not occurred								$32,789
3.09	Install insulation at through-wall air conditioning units to prevent heat loss								$759
3.10	Replace access panel by electrical meter								$380
3.11	Remove existing roofing and install new ice and water shield and new roofing shingles								$94,875
	Total								$225,347

4 Interior Architectural Elements

	4.01	Provide accessible path from entrance to main level (ie ramp from mudroom entrance up to the main level, approximately 10")								$7,362	
	4.02	Install elevator to connect all three usable floor levels									NOT INCLUDED IN COST
	4.03	Renovate three restrooms (one per level) to meet accessibility requirements								$136,620	
	4.04	Install additional restrooms to meet proposed use - assume one per level								$227,700	
	4.05	install new stair with correct rise and run to connect all levels (including basement)								$182,160	
	4.06	Renovate kitchen to provide accessibility								$22,770	
	4.07	Renovate kitchen to meet commercial grade requirements for new use or remove all cooking equipment and renovate for new use								$227,700	
	4.08	Renovate door locations to provide wider doors to meet accessibility guidelines								$45,540	
	4.09	Install new doors in the renovated openings. Replace existing doors and door hardware to meet accessibility requirements								$2,884	
	4.10	Clean and stretch the existing carpet or replace with new flooring								$16,986	
	4.11	Replace existing kitchen flooring								$7,590	
	4.12	Replace bathroom flooring								$6,831	
	4.13	Replace carpet on stairs								$6,072	
	4.14	Remove and replace wallpaper in all rooms where the wall paper is peeling, stained, damaged or aged								$15,180	
	4.15	Patch and repair drywall where there are holes or damage								$15,180	
	4.16	Investigate reason for cracking in the drywall near the beam. Repair cracked drywall								$1,518	
	4.17	Replace bowed ceiling tiles in the kitchen, install washable ceiling tiles in this area								$5,313	
	4.18	Replaced stained ceiling tiles throughout								$30,967	
	4.19	Investigate crack in ceiling on the third floor, repair as required								$759	
		Total								$959,133	

5 Mechanical - HVAC

	5.01	Replace older steam traps under preventive maintenance schedule.					X			$33,000	
	5.02	Replace all sections of missing piping insulation.					X			$19,800	
	5.03	Replace sections of steam condensate piping that have deteriorated due to corrosion.					X			$13,200	
	5.04	Install additional dehumifiers or a commercial type of dhimmification system within the basement.					X			$33,000	
	5.05	Provide a complete DDC control system for optimal control and comfort and tie it into the town wide building management system.			X		X	X		$28,288	
	5.06	Replace exhaust fans at toilet rooms.					X			$26,400	
	5.07	Convert existing steam system to hot water.			X			X		$19,802	
	5.08	Correct the issue of lack of heat (and supplemental electric heat) with the current steam system.			X			X		$11,315	
		Total								$184,805	

6	**Electrical**									
	6.01	Replace existing original murray panels.			X			X		$14,144
	6.02	Replace lighting with more efficient options.						X		$25,459
	6.03	Install emergency lights and signage.	X					X		$2,829
	6.04	Install a new fire alarm system with horn and strobe throughout the building.	X	X						$14,144
	6.05	Install a lightning protection system.	X							$2,829
		Total								$59,405
7	**Plumbing**									
	7.01	Install new high-efficiency low flow fixtures to reduce water consumption.						X		$227,700
	7.02	Confirm integrity and proper sizing of waste piping with video.					X			$7,590
	7.03	Install a high efficiency water heater including master mixing valve, recirculated hot water and expansion cold water make-up line.						X		$53,130
		Total								$288,420
8	**Fire Protection**									
	8.01	Install sprinkler system throughout facility								$19,287
		Total								$19,287
9	**Hazardous Material**									
	9.01	Remove paper over boiler that was found to contain asbestos.							X	
	9.02	Replace vermiculite insulation that does not contain asbestos, but must be disposed as asbestos. Asbestos containing materials were found falling through the cracks from the attic.							X	
	9.03	Replace underground sewer pipe that was assumed to contain asbestos.							X	
	9.04	Replace roofing materials that were assumed to contain asbestos.							X	
	9.05	Remove and repaint due to painted surfaces assumed to be lead based paint.							X	
	9.06	Remove and replace caulking materials assumed to contain PCBs.							X	
	9.07	Replace various equipment such as tubes, thermostats, exit signs and switches that were assumed to contain mercury.							X	
		HAZMAT ALLOWANCE								$48,300
		Total								$48,300

GENERAL NOTES

1. Refer to each section of the Report for more detailed information. Before moving forward with a specific project, a detailed review of the scope of work and a re-assessment of the cost estimate for that scope should be performed.
2. Some items should be completed in combination with other items. Some of these suggestions may be noted above. We recommend that once a scope of work is desired to be pursued, a mini-study should be done to confirm which work should be done together. See the next general note
3. Due to the conceptual nature of these recommendations and estimates and the complexity of existing conditions, several solutions may be provided to achieve the end result. Existing conditions in some areas may limit the ability to fully implement the proposed scope of work. Part or all of this