ELECTRICAL

ASSESSMENT OF EXISTING SYSTEMS:

Existing main distribution has been upgraded and appears to be sufficient for future expansion as described in the feasibility Study. The existing sub panels Sub panels range from 1940's to 1950's vintage and should be replaced but only as those areas are renovated. Disconnects and fuse boxes in the boiler room should be replaced due to exposure to steam. Corrosion of any replaced panel board can be avoided by relocating the panels away from the immediate area of the boilers.

Some of the Lighting on lower levels has been upgraded to LED. When those areas are renovated the fixtures should remain as a functional part of the building systems. These futures may also be relocated if the new Fire Protection work interferes with the lighting layout. As other areas are renovated all fixtures should be upgraded to LED. Control systems should also be implemented in complement with existing switches. Occupancy sensors should be installed for energy savings. Both fixtures and controls would comply with rebate programs available through the utilities. Existing LED fixtures may be relocated and based on any new partitioning.

Some emergency lighting on the lower floors have been replaced with self-contained battery units. Any remaining remotely fed emergency lights should be upgraded to emergency battery units as the areas are renovated. These lights maintain the minimal lighting levels along the egress routes per NFPA 101.

Fire Alarm system while appearing to be in working order it is no longer compliant and must be upgraded to a fully addressable system. A new system will monitor a new fire protection system and be installed in phases to make the building compliant. The new systems can report the exact location of the area reporting an incident and is easier to expand to supply additional devices. The old system may remain to monitor other major areas as they await phased renovation and report to the new panel as a sub-panel.

Wiring was integral to building structure and could not be evaluated. As the existing wiring range from 1940's to 1950's vintage we would expect some damage over the years. These should be inspected during renovations and replaced as required.

As the building is supplied with a single meter, operating expenses for electrical usage could be offset be the implementation of a solar array on the open roof. These systems may also available in utility offered rebate programs.

RECOMMENDATIONS/OUTLINE DESCRIPTION OF NEW ELECTRICAL WORK:

Phase 1 Electrical Work

Provide new local distribution for the new elevator and lobby area. A new panel board will supply power for the Elevator and support systems. Supply shall be fed from the existing switchboard. The panel shall also support the area HVAC, interior lighting, and site lighting and general receptacles for the lobbies all levels.

The First Phase of the work shall include the Fire alarm Panel and new devices in the lobby elevator control and new devices limited to the areas of renovation. The new Fire Protection system shall also be

monitored by this new panel and monitor smoke detection, manual pull stations, water flow and Tamper switches. The new system will include horn strobe units, electric bell and beacons at the Fire Department connection as well as the Fire Department response location. The old fire alarm panel with remaining devices covering the remainder of the building shall report to the new panel as a subpanel. This will allow upgrades by area until the system is fully replaced.

The Limit of work in this phase shall also determine the electrical upgrades. Panel boards that are in these areas shall be replaced and circuits shall be inspected for wear. Areas with new partitions or fixtures like restrooms shall be modified with code compliant receptacles. New HVAC equipment shall be protected with new breakers and feeders.

Site lighting shall be LED based design from four poles and fixtures mounted to the building. The design shall be Dark Sky Compliant. The site lighting shall be connected to an astronomical timer with a photocell to provide energy compliance.

Phase II Electrical Work

Second floor renovations would include the replacement of existing distribution panel and connection existing circuits to remain. New LED lighting would take place of the existing with additional controls like occupancy sensing for energy savings. Any new HVAC equipment will be connected to the new distribution system. Existing Fire Alarm devices shall be replaced as the new system shall be expanded to replace the existing.

Phase III Electrical Work

The third floor would follow suit with the second in feeding new equipment and recircuiting existing devices with the new distribution. The existing wiring will be inspected for damage and corrosion. As the third-floor shows signs of water damage there may be some wiring to be rerun in those areas.

Phase IV Electrical Work

The final Phase would be to replace all exist Fire Alarm devices not yet upgraded from the previous renovations. The scope would include removing the old Fire Alarm panel to leave only the fully functional and reliable system to monitor and report status. New lighting and receptacles will be added based on any new partitioning. A final review of egress paths would be taken to confirm egress lighting and signs are correctly located to usher the occupants through the building in the event of an outage. Commissioning of system and fixtures will ensure proper functioning of the lighting controls and make sure the best rebates are had for the town.

HVAC

ASSESSMENT OF EXISTING SYSTEMS:

The existing lower floors are heated by steam with a boiler located on the first floor. Another older steam boiler exists in the mechanical room, but is currently inoperable. The steam system exhibits much corrosion in its piping. It also lacks efficiency in its controls.

The long term viability of using the steam systems in their current – and certainly their future – condition is doubtful at best. Maintenance and leaking piping will certainly increase in the future, and the overall inefficiencies of the system will worsen. Consideration should be given to implement a phased change over from steam to more efficient hot water systems. These might be implemented as the renovations proceed. The steam system might stay in place until renovations are performed in that area. The existing, non-functioning boiler might be removed and a new hot water boiler installed in its place.

There are a number of in-wall mounted unit ventilators in the building as well. These are heating only, and a number of them are inoperable. We would expect to remove these as the building renovations proceed.

Cooling and ventilation are provided by gas fired roof top units added in 1984. The ductwork from these units passes through the unoccupied third floor with no regard for future uses of the third floor. This indiscriminately located ductwork and the roof top units will likely have to be moved to accommodate the new interior layout. These rooftop units will need replacement as well.

Three newer gas fired roof top units provide heating and cooling on the newer NORTH wing (Town meeting wing). These could be re-used and supplemented.

All new ductwork will be fabricated, sealed, installed, and supported in accordance with SMACNA HVAC Duct Construction Standards. Ductwork will have a 2-inch (minimum) pressure class rating and sealed in accordance with seal Class A.

Insulation for ducts that are concealed above ceilings or in duct chases will be 1½-inch thick, ¾-pound density, fiberglass all-service duct wrap with factory laminated reinforced foil/craft (FSK) vapor retarder facing. Exposed ductwork in areas that are not air conditioned will be insulated with 1½-inch thick, 3-pound density, and fiberglass duct board with factory laminated reinforced foil/craft (FSK) vapor retarder facing.

Hot water piping 2-inches and smaller will be Type L copper, with cast brass or wrought copper solder joint fittings. Piping 2½-inches and larger will be schedule 40 steel.

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Piping 1-1/2" and smaller shall be covered with 1-1/2" thick, two-piece heavy density fiberglass pipe insulation. Insulation for larger piping shall be 2" think.

RECOMMENDATIONS/OUTLINE DESCRIPTION OF NEW HVAC WORK:

Phase 1 HVAC Work

To phase out the existing steam systems, a new, gas-fired hot water boiler would be installed in place of the existing, inoperable steam boiler. Hot water mains would be installed with risers to the third floor. New hot water radiation would be installed on the third floor with associated controls and appurtenances.

Two new packaged rooftop units would be installed and ducted to serve the third floor spaces. The units are expected to be nominal 10-ton systems. The existing rooftop units serving the second floor of this wing would be replaced in-place, and duct work serving both lower floors would either be "boxed in" or relocated to suit the new 3rd floor partitioning.

A new, nominal 5-ton rooftop unit would be installed and ducted to serve the new Lobby/elevator core.

The new rooftop units would be electric (DX) cooling, gas-fired heating. Given the envelope energy efficiencies (additional insulation, window replacement, etc.) being undertaken as part of this project, and given the higher efficiencies available in today's more modern HVAC equipment, we would expect that the operating costs of the HVAC system would decrease significantly.

Minor duct redistribution would be performed in the areas of the second floor impacted by the work performed under Phase I.

Chase space would be set aside for the ductwork slated to serve the lower floors in future phases.

Phase II HVAC Work

As work proceeds to the second floor renovations, we would expect that a new packaged rooftop unit would be required to serve the "Gym" areas (Recreation department). That system would be a nominal 7-ton system.

The new hot water radiation piping would be extended into the second floor and be piped to new baseboard radiators as suited for the new partitioning.

The existing rooftop units serving the second floor offices areas are, as noted previously, relatively newer. We would expect that these units will be reused and branch ductwork renovations made to suit the new partitioning.

Phase III HVAC Work

The new hot water heating system would continue to be expanded to serve first floor radiation.

Two new nominal 10-ton packaged rooftop units would be installed to serve the first floor spaces. The units would connect to ductwork run in the shafts/chases set aside under Phase I. Duct distribution would be provided to suit the new partitioning.

Phase IV HVAC Work

The new hot water heating system would continue to be completed to serve second floor radiation.

Two new nominal 10-ton packaged rooftop units would be installed to serve the first second floor. The units would connect to ductwork run in the shafts/chases set aside under Phase I. Duct distribution would be provided for the new partitioning.

PLUMBING/ FIRE PROTECTION

ASSESSMENT OF EXISTING SYSTEMS:

The current building is not sprinklered however based on the proposed renovation and it's likely that building code will require the building be fully sprinklered . The proposed sprinkler system would require a new 6" fire service. Based on current water flow observations a fire pump for this building is unlikely. A Flow test must be performed to confirm our findings.

The current gas service that enters the building is a 5" low pressure gas. Currently gas feeds the existing boiler, 40 gallon water heater and the HVAC Heating units on the roof. Current gas supply could support some additional HVAC units but full evaluation would be required once further design criteria is developed.

The current water supply to the building is 4" and enters in the mechanical room. The current piping is steel pipe and has shown a tremendous amount of pitting and corrosion. We would recommend that a new 2" domestic water service be brought into the building. 2" service for this type of facility is common. Also the water pressure appears to be more than adequate.

Plumbing piping systems including waste, vent, water piping that have been in place since the building was built are showing signs of ongoing failure. Waste and vent piping (cast iron) is cracking, piping leaks have occurred and have been patched. There is some evidence of more updated piping in some areas where replacement was done due to failure and or minor renovation project occurred.

Domestic water piping is a combination of original piping encapsulated (one could assume that both brass and copper piping exists as well as copper piping which was installed most recently in a few renovated

areas. Original water shut off valves appear not to be functioning properly which based on the age of the valves would be anticipated.

Plumbing fixtures in the building are original as well updated. The original plumbing fixtures which appear in the large public bathrooms on the upper floors include floor mounted toilets with flush valves, floor type urinals with flush valves and wall mounted china sinks with individual cw/hw faucets. There are some ADA fixtures in the larger toilet rooms. Some plumbing fixtures on the first floor have been replaced in the larger toilet rooms Newer upgraded fixtures are located in the lower level where ADA toilet rooms were installed which includes floor mounted tank type toilets and drop in lavatory sinks with wrist blade and gooseneck faucets. In general the fixtures, while functioning, are not water saving devices. These might be replaced as renovations are made.

Original roof drainage, waste and vent piping systems should be replaced form the roof down to the exit of the building. The original piping systems have exceeded its life expectancy and continued maintenance on piping will be required if the systems are not updated. New chase space down through the building will be required to accomplish this work. Where possible, the risers might run in the new elevator/lobby addition. To accomplish this work utilizing some existing piping systems temporarily maybe required until such time all new work is completed thru the phased construction areas.

New plumbing fixtures should be installed with water saving low usage types and electronic hands free type typical for this type of public building application.

As mentioned the existing water service to the building needs to be upgraded. New (Cw,Hw,Hwc)water piping systems starting from the Mechanical room should be installed up thru the building and shall supply all new plumbing fixtures and any current plumbing fixtures that will remain.

From a plumbing infrastructure type it would be recommended that replacement of systems commences at the top floor and work its way down thru the building. This is the most economical and least disruptive approach for phased construction.

RECOMMENDATIONS/OUTLINE DESCRIPTION OF NEW PLUMBING WORK:

Phase 1 Plumbing Work

To facilitate the proposed Phase 1 work, new plumbing scope to support these services will be required. New central domestic water risers and gas riser should be installed in one central location starting at the Lower level Mechanical Room and terminating on Level 3. These may be run up through the new elevator/lobby core. Valves and capped services of each service should be provided at each floor. New services can be extended horizontally at each floor to any proposed area of renovation. It is likely that there will be some disruption to proposed construction phases 2,3 &4 in the beginning of construction to allow this work depending on the location of the new water risers. New gas piping will be required to reconnect to the gas supply serving existing rooftop hvac units and any new hvac units to be provided.

New sanitary and vent risers should be installed as well up thru the building. Locations should be determined based on the proposed renovation areas. Stacks should start at Lower level and terminate with vent stacks piped thru the roof. Provide capped connections on each floor on both sanitary and vent stacks.

This will allow new waste and vent piping for new plumbing fixtures to be installed with minimal disruption to other areas of the building.

New plumbing fixtures should include vitreous china fixtures, (low flow toilets 1.6gpf) automatic hands free faucets. Floor drains and hose bibbs to be installed in all new toilet rooms. Sinks in Lunch Rooms, Staff Rooms, Break Rooms to be stainless steel drop in sinks with gooseneck faucets and wrist blade handles. New housekeeping janitor sinks will be floor mounted with wall mounted faucets surrounded by FRP splash guards and drinking fountains where installed will be bi level electric type and will include a bottle filler.

All new water piping to be insulated with fiberglass insulation.

New 60 gallon domestic gas water heater to be installed in the Mechanical Room and will provide hot water to the building.

New 2" Domestic Water Service will be required to be brought into the existing Mechanical Room. The new service will be extended to the exterior and connected to the current water main on the property. The 2" water service will be adequate to serve the entire building current and future water demand.

Phase II Plumbing Work

As work proceeds to the second floor renovations, services will be extended to the new plumbing fixtures. Work would be necessary on the floor below to run waste and vent piping. This work may be accomplished off hours.

Gas piping would be run to the new rooftop units.

Phase III Plumbing Work

The plumbing work included in Phase III would consist of the further extension of services to serve the new bathrooms and sinks.

Gas piping would be run to the new rooftop units.

Phase IV Plumbing Work

Plumbing work in Phase IV is expected to be minimal.

FIRE PROTECTION

The current building is not sprinklered. In order to provide a new sprinkler system to this building a new 6" fire service, 6" backflow preventer, main alarm valve and fire dept connection at grade will be required. These fire protection components can be located in a dedicated room or can be located in the current Lower Level Mechanical Room adjacent to the new elevator machine room. A new combination standpipe/sprinkler riser will be extended from the sprinkler room up thru the building stairwell. At each level a floor control valve sprinkler assembly will be installed that will serve sprinklers on that floor. Sprinkler protection will include design densities for light hazard (168 /sq. ft.) and ordinary hazard (130 sq.ft.) occupancies. A fire dept connection will be required at grade level.

Sprinkler piping and heads will be extended from the stairwell floor control valve assembly to each portion of the building during Phases 1,2,3&4.

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