SAGE ENTERPRISES, LLC
9 Columbia Circle, Albany, NY 12203 (518) 453 6091 F (518) 453 6092

August 18, 2021

Huntington Memorial Library
62 Chestnut Street
Oneonta, NY 13820

Re: Existing Conditions

The following is Sage Engineering's Mechanical, Electrical and plumbing report for the above-mentioned project based on the site visit conducted on 08/13/2021:

HVAC

HVAC System description:

The HVAC system consists of three gas-fired furnaces with DX air conditioning coils, one steam humidifier, two zone dampers, and exterior condensers. Heated or cooled air is distributed thru the building via sheet metal ductwork to registers located in the ceiling or floors. Temperature of the spaces are controlled by four thermostats located in an office space. The thermostats utilize remote sensors to sense temperature in the spaces served. Furnaces F-1(basement) and F-3 (attic) are vented into the masonry chimney. The masonry chimney is lined with two separate aluminum liners for each furnace operation. Furnace F-2 in the basement is vented into what appears to be an asbestos pipe chimney.

Furnace F-1 and ACC-1, and Humidifier H-1 serve the basement and first floor levels of the library with the exception of the Northwest addition. Furnace F-1 and humidifier H-1 are located in the basement. The Condenser ACC-1 is located in a fenced in area at the East gazebo entrance.

Furnace F-2 and ACC-2 and serves the first, second and third floor of the Northwest addition. Furnace F-2 is located in the basement. The Condenser ACC-2 is located in a fenced in area at the East gazebo entrance.

Furnace F-3, ACC-3, and zone dampers serve the third floor of the library with the exception of the Northwest addition. Furnace F-3 is located in the attic space. There are two zone dampers with controls located in the main supply ducts in the attic space. The condenser ACC-3 is located on the North side of the rooftop.

HVAC Equipment Information:

Furnace F-1 is manufactured by International Comfort Products in 2005.
The furnace is a two-stage gas fired, 80% efficient rated at 125,000 Btu input.
Model# H8MPT125
Serial # A051948783

Condenser ACC-1 is manufactured by International Comfort Products in 2005.
The Condenser is a single stage, R-22 refrigerant rated at 42,000 btu's (3.5 tons) and is 10 SEER efficiency rated.
Model # HAC042
Serial # N/A

Humidifier HU-1 is manufactured by Nortec in 2005. The steam humidifier is rated at 10 lbs per hour.
Model # NHB-010
Serial # N/A

Furnace F-2 is manufactured by International Comfort Products in 2005.
The furnace is a two-stage gas fired, 80% efficient rated at 100,000 Btu input.
Model# H8MPT10F14A1
Serial # A051602653

Condenser ACCU-2 is manufactured by International Comfort Products in 2004.
The Condenser is a single stage, R-22 refrigerant rated at 36,000 btu's (3.0 tons), and is 10 SEER efficiency rated.
Model # HAC036
Serial # E040715044

Furnace F-3 is manufactured by International Comfort Products in May, 2005. The furnace is a two-stage gas fired, 80% efficient rated at 125,000 Btu input.
Model# H8MPT125J20A1
Serial # A051948783

Condenser ACCU-3 is manufactured by International Comfort Products in 2005. The Condenser is a single stage, R-22 refrigerant rated at 36,000 btu's (3.5 tons), and is 10 SEER efficiency rated.
Model # HAC036
Serial # E040715044

Zone Control Panel and dampers are manufactured by EWC controls in 2005.

Control panel:
Model # NCM-300
Serial # N/A

Control dampers
Model # ND
Serial # N/A

The Furnaces, Cooling Coils, Condensers, Humidifier and controls systems are well maintained and are in good operational condition. Modifications to the bypass damper system the zone system has limited the operation of the equipment. The HVAC systems were upgraded and the equipment was installed in 2006. Although the equipment is well maintained it will start to experience more frequent failures due to age.

The following is a list of concerns with the existing HVAC systems:

- Age of existing furnaces – The average useful life of gas-fired furnaces is 20-years. The three, existing furnaces are 16 +/- years of age each, the furnaces will start to have increased maintenance cost due to part failures.

- Age of existing Condensing units - The average useful life of air conditioning condensers is 20-years. The three, existing condensers are approximately 16 +/- years of age each. The condensers will start to have increased maintenance cost due to part failures.

- The Air conditioning systems utilize R-22 refrigerant. R-22 Refrigerant has been phased out in 2020 and is no longer manufactured. Refrigerant leaks in the system will be expensive to repair.

- The Humidifier system is 16 +/- years old and will start to experience equipment failures.

- The Zone damper system is 16+/- years old and will start to experience failures. Modifications to the original system have been performed and the system operation is limited.

- The existing HVAC systems have no ventilation air being introduced to the building. Ventilation air is required for occupants' comfort and health.

- The existing HVAC systems are undersized for the spaces served.

- On the rooftop there is an abandoned condenser and Packaged HVAC unit. These unit will eventually be a source of water leaks into the structure.

- Existing condensate pumps are injecting condensate directly into the sanitary mains and do not meet plumbing codes.

- Furnace F-3 in the attic has no secondary condensate drain pan for protection against leaks in the second-floor ceiling.

Recommendations:

- Perform a complete HVAC heat gain/loss calculation of the building to determine proper sizing of gas-fired furnace BTU loads, A/C condenser tonnage, humidity control, outdoor air requirements. The calculation will also determine if the existing duct system needs modifications for calculated CFM (cubic feet per minute) of conditioned air to each space.

- Replace existing furnaces with gas-fired, condensing, variable speed furnaces. The furnaces will be rated at 95%+ efficiency and will provide energy savings. Condensate pumps, condensate removal, and secondary drain pans with overflow safeties will be modified as part of this installation.

- Replace existing condensers and cooling coils with two-speed compressors, and R410a refrigerant. The condensers and cooling coil combination would be rated for a minimum16+ SEER (Seasonal Energy Efficiency Rating) and will provide energy savings and increased comfort..

- Replace humidifier in the First-floor unit. Add Humidifier to F-2 if required. Furnace F-3 is located in attic and a humidifier is not recommended due to possibility of freeze damage.

- Replace Zone damper system if second-floor zoning is still required for upgraded system and library space usage.

- Insulated supply ductwork in basement.

- Install new ventilation system for the building. Utilized energy recovery systems for tempering of outdoor air for energy savings. Utilize gas furnaces and duct system for distribution of the ventilation air to the building spaces.

- Removed abandoned condenser and Packaged HVAC unit on the rooftop. This will require the services of both a HVAC contractor for refrigerant and equipment removal and a General Contractor for repair of the roof.

Plumbing

Hot and Cold water systems:

There is a 1" cold water main serving the building. The main is equipped with a main shut-off valve and water meter without a by-pass system. The condition of the water service entrance is fair.

The hot water is provided by a gas-fired automatic instantaneous water heater manufactured by Takagi. The water heater has been recently installed and is in good condition.

There is no hot water re-circulating pump to provide domestic hot water quickly to the extremes of the system.

The exposed hot and cold-water piping is copper and appears to be in fair condition. There may be galvanized piping concealed in the wall or floors that should be removed when exposed.

Storm System:

The building has a pitched roof and water is directly routed off the roof to the ground. Miscellaneous storm gutters are installed with external down spouts to grade. The gutter and down spouts appear to be in good working condition.

Gas Service:

The building utilizes a 1-1/2" natural gas piping line fed from a NYSEG gas meter located at the Northwest exterior of the building. The gas piping is constructed of schedule 40 steel and is distributed to each of the gas furnaces and the domestic hot water heater located in the basement. The gas piping system appears to be in good condition.

Sanitary system

The sanitary system consists of hub and spigot cast iron piping, and PVC which appears to be in fair condition. There have been many additions and changes to the sanitary piping system over the years. Multiple Fernco (Rubber slip Joint) have been utilized to make transitions from Cast iron to PVC piping. The sanitary main appears to exit at the front of the building to connection to the public sewer system. There is evidence of additional sanitary piping existing the building which may have connected to a different system in the past

Plumbing Fixtures

The basement has a toilet room with a single floor mounted tank style water closet for use by the maintenance staff. In the basement is also a utility sink for maintenance operations.
The first floor has two restrooms for public use. One of the restrooms is designed for ADA use. Each restroom consists of a floor mounted tank style water closet and a wall hung lavatory.
The second-floor rest room is for staff use and consists of a floor mounted tank style water closet and a wall hung lavatory. The fixtures are in good operation condition.

Recommendations:

- Replace plumbing fixtures when failures occur.
- Provide insulation to traps and water connection under lavatories to maintain ADA requirements.
- Provide hot water recirculation system on timer to maintain hot water to restroom fixtures.
- Insulate exposed hot and cold-water piping in basement.
- Provide tempering valve at hot water heater to prevent excessive water temperatures at fixtures.
- During future projects update sanitary mains to eliminate rubber joints.

ELECTRICAL

Electrical Service

Existing Conditions:

The building currently has a 120/240V 200A single phase service. The service is fed from a pole mounted transformer directly across the street, pole number 53-4. The utility service provider is NYSEG. This service feeds the building overhead using a support pole, pole number 4-1, to hit a riser attached to the front left side of the building. This riser then brings the service underground to the basement where the main service disconnect is.

Recommendations:

The service seems to be properly sized and up to date. There is no recommendation for a service upgrade.

Power/Lighting Panelboards and Feeders

Existing Conditions:

The main service disconnect is covered by an Enclosed Circuit breaker which feeds a wire way in the basement. This room is located behind the stairs to the right. This wireway is then tapped by 2 panels, and another enclosed Circuit Breaker. Panel #1 sub feeds another panel in the basement called LP #3. Panel #1 feeds ACC#1 and ACC#2, along with the majority of the building lighting. Panel LP #3 feeds the fire alarm along with other miscellaneous branch circuiting. Panel #2 is sub feeding an attic panel with no name. Panel #2 also feeds the electric heating, Humidifier and other general-purpose power. The attic panel is feeding the roof top AC units, and corresponding attic mechanical equipment, along with some third and second floor miscellaneous branch circuiting. The Enclosed Circuit Breaker tapped off the wire way is rated for 125A, what it was feeding I was unable to confirm.

Recommendations:

Service receptacles on the roof need to be installed. The existing panels Panel #1 and Panel #2 are in good condition and fairly new, with 3 spares each for future branch circuiting. While the attic panel and LP #3 are completely full. Panel LP #3 is also fairly new. The attic panel is a little older and might need to be replaced soon. Depending on the proposed work this should be enough for a couple added general purpose receptacle circuits and completing the LED retrofit.

Lighting

Existing Conditions:

The lighting in the building primarily consists of fluorescent fixtures. These fixtures are mixed, half in a drop ceiling some recessed and some surface mounted, and the others surface mounted on hard ceilings. There are three rooms that have LED fixtures in them, the entry room on the first floor, the study room on the second floor, and the third-floor room. Along with these three rooms there is 2 extra led fixtures in the second-floor hallway leading to the elevator. The emergency lighting is wall mounted double head units. There are a few decorative fluorescent fixtures on the first floor.

Recommendations:

It was recommended that the drop ceiling on the first and second floor be replaced. Along with this the rest of the fluorescent fixtures should be outfitted with LED.

Branch Circuit Wiring

Existing Conditions:

The wiring that is observed in the building is all metallic cable (MC) type.

Recommendations:

There seems to be a lack of outlets in reading areas. Table top outlets would solve this issue. There should also be some outlets added in areas such as the hallways and the book selves.

Telecommunication System

Existing Conditions:

The building has an analog phone service and fiber with a patch panel. Cat5e feeds all the data drops in the building but the cameras are all fed with co-ax cables. The building also has an existing intercom system.

Recommendations:

The Cameras could be outfitted with Cat6a cable instead of the existing co-ax cables. This along with a camera upgrade could improve the resolution.

Fire Alarm System

Existing Conditions:

The building has an up-to-date Fire Alarm/Security Honeywell system which is in good condition. The system was installed by ZS Security. The panel is located in the basement on the wall directly to the right of the stairs. The fire alarm system has sufficient coverage throughout the entire building. The Security system has the main areas of the building covered by cameras and also the front entrance.

Recommendations:

The owner talked about possibly adding more security cameras, specifically at the other entrances of the building. Fire alarm system does not need any additions and meets current NFPA code.