



INNOVATIVE ENGINEERING
SERVICES, LLC
AN INTEGRATED ENGINEERING + DESIGN FIRM

OLD LYME SENIOR CENTER

26 Town Woods Road Old Lyme, CT 06371

MECHANICAL PLUMBING AND ELECTRICAL NARRATIVE

Prepared For:

Point One Architecture

101 Shore Road

Old Lyme, CT 06371

Prepared By:

Innovative Engineering Services, LLC

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Introduction

We have been retained to provide an existing systems narrative, to be used for master planning of the site for future renovations.

Mechanical systems

1. The existing Mechanical system is combination of hydronic radiant floor, as primary heat and air system, as secondary heat, by AHUs, located on attic and HPs, located outdoor. Air distribution system is supply and return ductwork, located on attic:
 - AHU-1 - Exercise room and Dining room, "Trane", Model TEM6AOD60, 1,980 cfm, $\frac{3}{4}$ HP-208/230-1PH with axillary electric heater.
 - AHU-2 - Lobby and Craft room," Trane", Model TEM6AOD60, 1,980 cfm, $\frac{3}{4}$ HP-208/230-1PH with axillary electric heater.
 - AHU-3 – Dining room, "Trane", Model TEM6AOD60, 1,980 cfm, $\frac{3}{4}$ HP-208/230-1PH with axillary electric heater.
 - AHU-4 – Kitchen, "Trane", Model TEM6A0D36.
2. AHU/HP systems updated in year 2017 and in good condition.
3. The original hydronic radiant floor system is combination of underground floor piping, manifolds, mixing valve, in-line pumps and serving the following zones:
 - Zone #1- Bathrooms, Craft room, Lobby, Offices
 - Zone#2 – Kitchen, Dining room
 - Zone #3- Exercise room
4. The existing hydronic system served by boiler, located in Mechanical room- "Viessmann", Model Vitocrossal 300 CU2A, 276 MBH, propane.
5. Existing boiler installed in year 2020 and sized for radiant floor heating system only. The boiler is in good condition.
6. The additional split system (2 AC units and outdoor CU) installed in year 2021 and serving Offices.
7. The Kitchen exhaust fan was replaced in 2000 and requires periodically cleaning.
8. Recommendations: In general, all the equipment appeared to be in good condition and care has been taken during subsequent renovations. Existing systems do not have extra capacity for new addition.

Plumbing systems

1. Existing Plumbing Systems:
 - a. Domestic Water Systems: The building is provided with a 1 1/4-inch domestic water service that enters the south side of the building and into the existing utility space on the north side of the building. Service is supplied from a private well on the south side of the building. Well pump is located at a depth of 200 feet in the well casing, well depth is 450 feet. Well pump is Goulds model # 7GS05, $\frac{1}{2}$ hp, 7 GPM, 220 feet of head. Incoming water pressure on gauge at the service entrance is 39 psi. Pipe material is polypropylene. The service entrance incorporates a hydro pneumatic tank, pressure sensor, water meter,

sediment filter and UV Filter. Well tank size is 251 gallons. Smooth bore inspection ports are also provided.

- b. Sanitary Waste and Vent Systems: The building is provided with sanitary waste and vent piping that serve all plumbing fixtures. Pipe material is PVC. Buried sanitary waste pipe exits the building on the north side of the building to a septic tank and pump chamber on site. From that point, the wastewater discharges to leaching fields on the north side of the building. Plumbing vent system terminates through the roof in multiple locations.
- c. Propane Gas System: The building is provided with propane gas service supplied from a 1,000-gallon buried propane tank located on the west side of the building. The existing buried gas line from the tank enters the building on the northwest corner of the building. Propane gas serves the emergency generator, kitchen stove/oven and boiler. Gas regulator is located at the buried propane tank, it is assumed that the incoming pressure is low pressure (7"-14" w.c.).
- d. Domestic Hot Water: The building is currently provided with a 42-gallon indirect water heater. Hot water is provided from the existing gas fired boiler. Water heater is Viessmann "Vitocell" model # 300-W EVIA. Water heater appears to be in good working condition.
- e. Storm Water System: The buildings storm water system consists of gutters and downspouts on the building exterior. Gutters are missing on the north side of the building. Down spouts piped to underground storm system and assumed piped to rip rap or wetland area on site.
- f. Existing Plumbing Fixtures:
 - i. Water closets, Vitreous china, floor mounted, elongated bowl, tank type with left side trip lever, 1.6 gpf. Some are designated handicapped accessible and are intended for handicap use.
 - ii. Lavatories, Vitreous china, wall hung, single lever faucet designated for handicap use.
 - iii. Urinals, Vitreous china, wall hung with piston style flush valve.
 - iv. Drinking fountain, wall hung surface mounted, front and side push bars, 8 GPH chilled water designated for handicap use.
 - v. Crafts room sink, Stainless-steel drop-in double bowl countertop sink with single lever kitchen faucet and hose spray.
 - vi. Janitors sink, wall hung laundry basin with two lever faucet, no integral vacuum breaker. Faucet also supplies chemical feed system and has no backflow preventer.
- g. Existing Kitchen
 - i. Three bowl pots and pans sink, stainless steel with side drain boards, one faucet mounted in the backsplash, hot and cold water supply. Grid drain with stops are provided. All waste piping from the three bowls are tied to one pipe manifold to one pipe trap and piped to a grease interceptor located on site. Grease interceptor is 1,000 gallon.
 - ii. Commercial grade under countertop stainless steel dishwasher, hot water supply, discharge to standpipe for indirect connection.

- iii. Worktable with sink, stainless steel construction, gooseneck faucet and two lever handles, 4-inch centers, hot and cold water supply, waste to funnel drain for indirect waste connection.
- iv. Commercial grade kitchen hood with Ansul wet chemical fire extinguishing system, 4 spray nozzles located over cooking area.
- v. Propane gas supply to 8 burner stove and oven with emergency gas shutdown on propane gas line.
- vi. Steamer with hot water supply and drain to standpipe for indirect waste connection.
- vii. Handwash sink, vitreous china, wall hung, single lever handle faucet, 4-inch centers.
- h. Other notable items:
 - i. One sprinkler provided in the utility room over the boiler, upright brass with fusible line. Water supply is from the domestic water system and is provided with an isolation valve and flow switch. It is assumed that the flow switch is wired to the building security system.
 - ii. Condensate drain piping serving mechanical units in the attic, all gravity piping. Pipe material is PVC. Condensate pump provided at drain for boiler located in the utility room.
 - iii. Floor drains provided in the Men's and Women's bathrooms.
 - iv. Water distribution piping is provided with pipe insulation.
 - v. Cold water make-up to the boiler is provided with a backflow prevention device.
 - vi. Hose bib provided on each side of the building and is provided with integral vacuum breaker.

2. Recommendations: In general, all the equipment appeared to be in good condition, however some of the water and waste piping connections are in violation of plumbing code and health code:

- a. Laundry tub located in the janitor's closet requires a faucet with integral vacuum breaker. Water supply to the chemical feed system installed on wall above the laundry tub requires a reduced pressure backflow preventer on the water supply.
- b. Kitchen, three bay sink requires an air gap at each bowl drain.
- c. Sprinkler connection to the domestic water system requires a backflow preventer.

3. Existing utilities (water, gas, sewer) appear to have capacity to serve any future expansion but must be reevaluated once future expansion of the building is determined.

Electrical systems

1. Existing Electrical system:

- a. Utility Service Entrance: The existing electrical service runs underground from the utility pole on Town Woods Road and extends to a pad mounted transformer on the north side of the building. Conduit runs underground from the transformer to the main disconnect switch. The main disconnect for the building is a 400-amp enclosed circuit breaker

mounted to the building adjacent to the Eversource utility meter. System voltage is 208/120v, 3 phase, 4 wire.

2. Normal Distribution Equipment:

- a. Distribution with-in the building is achieved from a 400A, 3 phase, 42 circuit breaker panel manufactured by Murray. This Main Distribution Panel (MDP) feeds (2) other panels labeled PP1 and PP2 via 100A, 3 pole circuit breakers. There are no future breaker positions left in this panel.
- b. Panel PP1 is a 100A, 3 phase, 24 circuit, main lug only panel. It appears to have been installed after PP2 in order to provide power to supplemental kitchen equipment. There is future circuit breaker space in this panel. PP1 is located in the same room as MDP
- c. Panel PP2 is a 100A, 3 phase, 30 circuit, main lug only panel located in the common room. There is no circuit space available within this panel. There is a 40A, 2 Pole circuit breaker in PP2 that is labeled PP3. It is believed that PP3 is located in the storage shed on the west side of the senior center. There is a conduit penetration at both buildings and there is lighting and receptacles on and shed.

3. Emergency Distribution Equipment:

- a. There is a Kohler (50RZ282) 55kW, 208/120v, 3 phase, 4 wire, propane fired generator located near the utility transformer. The generator is assumed to be provided with a 200A, 3 pole output circuit breaker.
- b. A single-phase load center with a 100A main circuit breaker is located on the building exterior between the main disconnect switch and the ATS. It provides power to the generator battery charger and block heater. It is assumed that this panel is tapped off the service entrance conductors in the ATS.
- c. The Automatic Transfer Switch (ATS) is located adjacent to the main disconnect at the exterior of the building. An Emergency Power Off (EPO) button is located adjacent to the main service disconnect switch.

4. Fire Alarm System: The existing fire alarm system is by Fire Lite Alarms. The main panel is in the entry vestibule. (Model MS-5024)

- a. The entire building is protected by heat and smoke detectors.
- b. Notification and annunciation devices appear to be all located in a code compliant manner.

5. Lighting and Power: Lighting throughout the space is a mix of fluorescent and LEDs with occupancy sensors in many locations. Receptacle placement seems to be adequate and typical for this use. GFI receptacles are installed in areas where required.

6. Site Lighting: consists of bollards and coach style pole lights. Control is by (2) time clocks located in the electrical/mechanical room.

7. Recommendations: In general, all the equipment appeared to be in good condition and care has been taken during subsequent renovations to adhere to code and install items in a neat and workmanlike manner including labeling of circuit breakers which often goes unaddressed.

- a. We were provided with a utility bill during our site visit for the month of May. Demand kW for that month was 13.7kW, which is approximately 40 amps of the 400-amp service. Missing from the electric bill was a full year graph of demand we normally see. Future

renovations would warrant a review of electric bills for a full year, but capacity for any renovation should be possible without impact to the existing electrical service.

- b. Current code requires that a smoke detector is required at the fire alarm control panel location. I did not see one in the vestibule; this should be corrected.
- c. A problem with the wiring at the ATS was observed. The “Normal” lugs on the transformer had (2) feeder wires under a single lug for each phase of the utility. This is a code violation that should be corrected. Supplemental lug kits may be available from the manufacturer for this ATS or a single larger feeder for each phase must be provided from the main

End