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221343 - Facility Packaged Sewage Pumping Stations

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SECTION 22 1343 – FACILITY PACKAGED SEWAGE PUMPING STATIONS

1.1 SUMMARY

- A. This Section includes wet-well, packaged pumping stations with submersible and submersible grinder sewage pumps. Non-packaged stations may be permissible if the components all meet the University requirements. Acceptance of such non-package stations requires UNH Facilities approval.

- B. See Chapter 5, Division 01, Section 017700.1.1.B.1.i Closeout Procedures - Project Record Documents for equipment list requirements for all equipment provided in this section.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

- B. Comply with HI 1.1-1.2, "Centrifugal Pumps for Nomenclature and Definitions"; HI 1.3, "Centrifugal Pumps for Design and Application"; and HI 1.4, "Centrifugal Pumps for Installation, Operation and Maintenance," for sewage and sump pumps.

- C. Comply with UL 778, "Motor-Operated Water Pumps," for sewage and sump pumps.

1.3 WET-WELL, PACKAGED SEWAGE PUMPING STATIONS

- A. Wet-Well, Packaged Sewage Pumping Stations with Submersible Sewage Pumps:
 - 1. Available Manufacturers:
 - a. Gorman-Rupp Company (The).
 - b. Metropolitan Industries, Inc.
 - c. PumpTech, Inc.
 - d. USEMCO.
 - e. Yeomans Chicago Corporation.
 - f. WEIL Pump Co.

 - 2. Description: Factory fabricated, assembled, and tested with wet well for sewage pumps and collection of sanitary sewage and with sewage pumps and dry equipment chamber for controls and accessories.

- B. Wet-Well, Packaged Sewage Pumping Stations with Submersible Grinder Sewage Pumps:
 - 1. Available Manufacturers:

- a. Environment One Corporation.
- b. Gorman-Rupp Company (The).
- c. Pentair Pump Group; F. E. Myers.
- d. PumpTech, Inc.
- e. USEMCO.
- f. WEIL Pump Co.

2. Description: Factory fabricated, assembled, and tested with wet well for sewage pumps and collection of sanitary sewage and with dry equipment chamber for controls and accessories.

1.4 CONTROLS

- A. Control Sequence of Operation: Cycle each sewage pump on and off automatically to maintain wet-well sewage level. Automatic control operates both pumps in parallel if wet-well level rises above starting point of low-level pump, until shutoff level is reached. Automatic alternator, with manual disconnect switch, changes sequence of lead-lag sewage pumps at completion of each pumping cycle.
- B. Electrode, Float-Switch, Pressure-Switch, or Ultrasonic System: Senses variations of sewage level in wet well. Include high and low adjustments capable of operating on 6-inch (150-mm) minimum differential of liquid level. Alarm circuit shall be wired to UNH Dispatch.
- C. Motor Controllers: Magnetic, full voltage, nonreversing. Include undervoltage release, thermal-overload heaters in each phase, manual reset buttons, and hand-automatic selector switches. Include circuit breakers to provide branch-circuit protection for each controller.
- D. 120-V accessory controls with 15-A, single-phase circuit breakers or fuses for each item.
- E. Control Panel: Enclosure complying with UL 508A and with UL 508A, Supplement SB with separate compartments and covers for controllers, circuit breakers, transformers, alternators, and single-phase controls. Include 20-A duplex receptacle in NEMA WD 1, Configuration 5-20R mounted on exterior of control panel.
- F. Install labels on panel face to identify switches and controls.
- G. Wiring: Tin-copper wiring.
- H. Connection for Portable Generator: Nonautomatic (manual) transfer switch with receptacle matching generator electrical power requirements.

1.5 ACCESSORIES

- A. Lighting: Minimum of 2, UL 1571, heavy-duty, cast-metal, wet-location-type fixtures with 27 Watt CFLS lamps and guards in service area. Locate switches, with pilot lights, at chamber entrance.

- B. Submersible Sump Pump:
 - 1. Discharge Size: NPS 1-1/4 (DN 32) minimum.
 - 2. Pump End Bell and Motor Shell: Cast iron.
 - 3. Motor: 1/3 hp, 1750-rpm, hermetically sealed, capacitor-start, with built-in overload protection. Premium Efficiency.
 - 4. Impeller: ASTM B 584, cast bronze or ASTM B 36/B 36M, brass.
 - 5. Shaft: Stainless steel.
 - 6. Bearings: Grease-lubricated, factory-sealed ball bearings.
 - 7. Seals: Mechanical.
 - 8. Accessories: Inlet strainer.
 - 9. Controls: Float switch.

- C. Dehumidifier: Electric refrigeration system, adjustable humidistat, reverse-acting thermostat for low-temperature cutoff controls, and condensate pump with drain piping to sump.
 - 1. Dehumidification system capacity adequate to remove at least 15 pints (7 L) of water per day from service area air that is 80 deg F (27 deg C) with a relative humidity of 60 percent.

- D. Ventilation: Electrically powered ventilation system. Include centrifugal blower with 4-inch- (100-mm-) round exhaust vent designed to keep out rain, insects, and other foreign matter; limit switch to start blower if entrance door or lid is opened; 0- to 15-minute timer; and separate manual switch.
 - 1. Ventilating system capacity to change air in dry equipment chamber every two minutes.

- E. Heater: Electric, 1.5 kW minimum, with fan and thermostat control.

- F. High-Water Audio Alarm: Horn for audio indication of station high-water level, energized by separate level-detecting device. Include alarm silencer switch and relay in station.

- G. Remote Alarm Circuit: Include contacts for connection to remote alarm wired to UNH Dispatch.

1.6 PACKAGED SEWAGE PUMPING STATION FABRICATION

- A. Fabricate shell from fiberglass with structural-steel reinforcement.
 - 1. Attach structural-steel reinforcement to top and bottom heads.
 - 2. Fabricate shell with continuous joints to make watertight and gastight construction.
 - 3. Attach air vent to pump chamber and entrance tube.
 - 4. Ladder: Steel or Fiberglass.

- B. Install sump, 18 inches (450 mm) in diameter by 10 inches (254 mm) deep in dry-chamber floor. Slope floor toward sump and fasten rubber mat to floor walkway with cement.
- C. Entrance tube may be furnished separately for field installation.
- D. Entrance Cover: Waterproof and corrosion resistant, with lock. Include way to open cover from inside tube if cover is locked.
- E. Air Vent: Duct fabricated from corrosion-resistant material, extended to above grade, outlet turned down, and with insect screen in outlet.
- F. Factory fabricate piping between unit components.
 - 1. Use galvanized-steel pipe and cast-iron fittings or ductile-iron pipe and fittings.
 - 2. Use fittings for changes in direction and branch connections.
 - 3. Flanged and union joints may be used instead of joints specified.
 - 4. Use dielectric fittings for connections between ferrous- and copper-alloy piping.
- G. Piping Connections: Unless otherwise indicated, make the following piping connections:
 - 1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment having NPS 2 (DN 50) or smaller threaded pipe connection.
 - 2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
- H. Valves: Ferrous alloy.
 - 1. Sewage Pump Piping: Include gate valve on each pump inlet and gate and check valves on each discharge pipe.
 - 2. Sump Pump Piping: Include ball or gate and check valves on discharge pipe.
- I. Wiring: Tin-coated copper.

1.7 SOURCE QUALITY CONTROL

- A. Test and inspect sewage and sump pumps according to HI 1.6, "Centrifugal Pump Tests." Include test recordings that substantiate correct performance of pumps at design head, capacity, suction lift, speed, and horsepower.
- B. Test accessories and controls through complete cycle. Include test recordings that substantiate correct performance.

END OF SECTION 22 1343