SECTION 232223 - STEAM CONDENSATE PUMPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Single-stage, centrifugal steam condensate pumps with floor-mounted receiver.
 - 2. Multistage, centrifugal steam condensate pumps with elevated receiver.
 - 3. Single-stage, centrifugal steam condensate pumps with elevated receiver.
 - 4. Vertical, wet-pit-mounted steam condensate pumps.
 - 5. Pressure-powered steam condensate pumps.

1.2 DEFINITIONS

- A. PPE: Polyphenylene ether.
- B. PPO: Polyphenylene oxide.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. For each type of steam condensate pump.
 - a. Include certified performance curves and rated capacities, operating characteristics, furnished specialties, and accessories.
 - b. Indicate pump's operating point on curves.
 - c. Include receiver capacity and material.
- B. Shop Drawings: For each pump/receiver.
 - 1. Show pump layout and connections.
 - 2. Include setting drawings with templates for installing foundation and anchor bolts and other anchorages.
 - 3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Data: Certificates for steam condensate pumps/receivers, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

- 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
- 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For pumps.
 - 1. Indicate actual installed items by marking submittals with an arrow or box.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of pump from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. ASME Compliance: Fabricate and label steam condensate receivers to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and use.
- C. Seismic Performance: Steam condensate pumps/receivers to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - 2. Component Importance Factor: 1.5.

2.3 SINGLE-STAGE, CENTRIFUGAL STEAM CONDENSATE PUMPS WITH FLOOR-MOUNTED RECEIVER

- A. Roth Pump Company or approved equal.
- B. Description: Factory-fabricated, packaged, simplex, electric-driven pumps; with receiver, float switch(es), control panel and controls, and accessories suitable for operation with steam condensate up to 200 deg F.
- C. Receiver:
 - 1. Floor mounted.
 - 2. Material: Cast iron or Carbon steel or Stainless steel.
 - 3. Externally adjustable float switch for each pump.

- 4. Flanges for pump mounting.
- 5. Water-level gauge and dial thermometer.
- 6. Pressure gauge at each pump discharge.
- 7. Isolation valve between pump and receiver.
- 8. Lifting eyebolts.
- 9. Vent and overflow.
- 10. Inlet strainer with vertical self-cleaning bronze screen and large dirt pocket.

D. Pumps:

- 1. Centrifugal, close-coupled, vertical design.
- 2. Permanently aligned.
- 3. Impeller: Bronze
- 4. Mechanical seals rated at 250 deg F.
- 5. Mounted on receiver flange.

E. Motor:

- 1. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 230500 "Common Work Results for HVAC."
- 2. Enclosure: Open, dripproof
- 3. Enclosure Materials: Cast iron, cast aluminum, or rolled steel.
- F. Control Panel:
 - 1. NEMA 250, Type 12 enclosure with hinged door and grounding lug, mounted on receiver.
 - 2. Combination magnetic starter with fused disconnect for each pump, and cover interlock.
 - 3. Factory wired between pump(s) and float switches, for single external electrical connection.
 - 4. Provide fused, control-power transformer if panel exceeds 120 V ac.
 - 5. Hand-off-auto selector switch for each pump.
 - 6. Momentary-contact "TEST" push-button on cover for each pump.
 - 7. All power and control wiring prewired for single external electrical connection.
 - 8. Numbered terminal strip.
 - 9. Disconnect switch.
- G. Capacities and Characteristics: See Mechanical Schedules Sheet.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine equipment foundations and anchor-bolt locations for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before pump installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF STEAM CONDENSATE PUMPS

- A. Install pumps to provide access for periodic maintenance, including removing motors, impellers, couplings, and accessories.
- B. Support pumps and piping separately so piping is not supported by pumps.
- C. Install thermometers and pressure gauges.
- D. Equipment Mounting:
 - 1. Install pumps on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 2. Comply with requirements for vibration isolation and seismic-control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

3.3 PIPING CONNECTIONS

- A. Comply with requirements for piping specified in Section 232213 "Steam and Condensate Piping" and Section 232216 "Steam and Condensate Heating Piping Specialties."
- B. Where installing piping adjacent to machine, allow space for service and maintenance.
- C. Install a globe and check valve at inlet of each pump and a gate and check valve at pump outlet.
- D. Install pressure gauge at each pump discharge.
- E. Pipe drain to nearest floor drain for overflow and drain piping connections.
- F. Install full-size vent piping to outdoors, terminating in 180-degree elbow.

3.4 ELECTRICAL CONNECTIONS

- A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. For units with single-phase motors and without control panel, wire float switch in series with each motor.
- C. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
 - 1. Nameplate to be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least 1/2 inch high.

3.5 CONTROL CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."

3.6 SYSTEM STARTUP

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks in accordance with manufacturer's written instructions.
 - 2. Clean strainers.
 - 3. Adjust steam condensate pump controls.
 - 4. Adjust pump controls for automatic start, stop, and alarm operation.
 - 5. Perform the following operational checks before starting:
 - a. Set float switches to operate at proper levels.
 - b. Check motors for proper rotation.
 - c. Test pump controls and demonstrate compliance with requirements.
 - d. Replace damaged or malfunctioning pump controls and equipment.
 - e. Verify that pump controls are correct for required application.
 - 6. Start steam condensate pumps in accordance with manufacturer's written startup instructions.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain steam condensate pumps.

END OF SECTION 232223