

SECTION 221329 - SANITARY SEWERAGE PUMPS

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Sewage waste sump pumps.
- B. This Section includes all pumps except where integral with a manufactured piece of equipment.
- C. Pump controls where self-contained.

1.2 RELATED WORK

- A. Section 22 05 23 - General-Duty Valves for Plumbing Piping
- B. Section 22 13 16 – Sanitary Waste and Vent Piping

1.3 QUALITY ASSURANCE

- A. All equipment or components of this specification section shall meet or exceed the requirements and quality of the items herein specified, or as denoted on the drawings.
- B. Ensure pump operation at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate to ANSI/HI 9.6.3.1 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer. The pump NPSH shall confirm to the ANSI/HI 9.6.1-1997 standards for Centrifugal and Vertical Pumps for NPSH Margin.
- C. Ensure pump pressure ratings are at least equal to system's maximum operating pressure at point where installed, but not less than specified.
- D. Equipment manufacturer shall be a company specializing in manufacture, assembly, and field performance of provided equipment with a minimum of 20 years' experience.
- E. Equipment provider shall be responsible for providing certified equipment start-up and, when noted, an in the field certified training session. New pump start-up shall be for the purpose of determining pump alignment, lubrication, voltage, and amperage readings. All proper electrical connections, pump's balance, discharge and suction gauge readings, and adjustment of head, if required. A copy of the start-up report shall be made and sent to both the contractor and to the Engineer.

1.4 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect equipment before, during, and after installation.
- B. Replacement and Repair: All scratched, dented, and otherwise damaged units shall be repaired or replaced as directed by the Architect Engineer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to International Mechanical Code.

- B. Conform to International Building Code.
- C. Conform to International Fire Protection Code.
- D. Conform to National Electric Code NFPA 70.
- E. Conform to applicable ANSI/HL standards.
- F. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.6 SUBMITTALS

- A. Submit shop drawings under provision of Section 013300.
- B. Submit manufacturer's installation instructions.
- C. Submit Product Data including certified performance curves and rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties, and accessories. Indicate pump's operating point plotted on curves. Include NPSH curve when applicable.
- D. Submit Complete Package information Product Data including:
 - 1. System summary sheet (where applicable)
 - 2. Sequence of Operation
 - 3. Shop drawing indicating dimensions, required clearances and location and size of each field connection
 - 4. Power and control wiring diagram
 - 5. System profile analysis including pump curves, system curve, and variable speed pump curves (where applicable)
 - 6. Pump data sheets - Rated capacities of selected models and indication of pump's operating point on curves.
 - 7. Submittals on furnished specialties and accessories
 - 8. Submittals must be specific to this project. Generic submittals will not be accepted

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit Operation and Maintenance information under provisions of Division 22 "Common Work Results for Plumbing" and the provisions of the General Conditions and Division 1.
- B. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts lists.
- C. Under provisions of project closeout documentation; testing of pumps, as well as training of owner's operation and maintenance personnel shall be required.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site in such a manner as to protect the materials from shipping and handling damage. Provide materials on factory provided shipping skids and lifting lugs if required for handling. Materials damaged by the elements should be packaged in such a manner that they could withstand short-term exposure to the elements during transportation.
- B. Store materials in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage.

1.9 WARRANTY

- A. Provide a minimum One (1) year warranty on materials and installation under provision of Section 220500.

1.10 EXTRA MATERIALS

- A. Provide one (1) set of mechanical seals for each model type of primary pump scheduled.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Sewage Pumps
 - 1. Weil
 - 2. Bell and Gossett
 - 3. Goulds
 - 4. Peerless
 - 5. Skidmore
- B. Substitutions: Provide manufacturer and model listed in equipment notes on drawings. No substitutions, except under strict provisions of Section 01 25 00.

2.2 GENERAL

- A. Statically and dynamically balance rotating parts.
- B. Construction to permit complete servicing without breaking piping or motor connections.
- C. Pumps to operate at rpm listed on drawings.
- D. Pump connections to be flanged.
- E. Pump shall be catalog rated to provide at least 10 percent additional head above the selection point.

2.3 SEWAGE PUMPS

- A. Furnish and install where shown on plans, duplex set of Weil Pump model No. 1408 or approve equal.
- B. Impeller: Cast iron.
- C. Casing: Heavy duty cast iron.
- D. Single Mechanical Seals: Ceramic vs. carbon seal faces, stainless steel metal parts, BUNA-N elastomers. Upper and lower tandem mounted shaft seals shall be positioned independently and shall be separated by an oil filled chamber.
- E. Shaft: Air-filled hermetically sealed shaft; 300 series stainless steel.
- F. Motor: Double seal, tandem. Include high grade turbine oil surround of motor for more efficient heat dissipation, permanently lubricated bearings, and mechanical seal for complete protection against outside environment.

- G. Design for Continuous Operation: Pump shall be rated within the motor manufacturer's recommended working limits and shall be capable of operating continuously without damage.
- H. Bearings: Provide upper and lower heavy duty ball bearing construction for precision positioning of parts and capable of carrying thrust loads.
- I. Power Cable: Provide severe duty rated, oil and water resistant rated cable; 25 foot long. Include an epoxy seal on the motor end to provide secondary moisture barrier in case of outer jacket damage, and to prevent oil wicking.
- J. O-ring: Provide O-rings to assure positive sealing against contaminants and oil leakage.
- K. Provide glass fiber basin, 42" diameter by 144" deep. Coordinate size with sump pump manufacturer's recommendations. Provide new steel sump cover for duplex submersible pump system. Cover to include (1) level control opening and plate, (2) motor cable opening and plate, (3) 3" vent opening and vent flange, (4) hinged access door with handle and padlock hasp, (5) upper guide rail bracket mounting holes, and (6) flange kits for above cover discharge pipes.
- L. Controls – Provide complete duplex control panel which shall include:
 - 1. Two fusible disconnect switches with mechanical door interlocks. Mechanical interlocks prevent the door from accidentally being opened when either disconnect is in the ON position. Switches shall be lockable in the OFF position. Fuses are not included, coordinate with electrical division.
 - 2. Two control transformers with fused primary and fused secondary on all three phase and single phase 208 and 230 volt. Alarm circuits shall remain powered even if one disconnect is turned off or one transformer has a blown fuse. Single phase 115 volt shall have a fused control circuit.
 - 3. Two magnetic starters with low voltage protection. Include overload relays with through-the-door resets. Overload heaters included. Heater selection shall be coordinated with the protection requirements of the pumps.
 - 4. Electric alternator.
 - 5. Two industrial grade oil-tight Test-OFF-AUTOMATIC selector switches. Test position shall turn pump on regardless of liquid level. Selector switch shall include a spring return from the test position to prevent unattended operation of pumps in the test mode. Automatic position permits control of pump by the level control.
 - 6. Two industrial grade oil-tight red running lights.
 - 7. Control terminal strip numbered and wired.
 - 8. NEMA-4X enclosure, wiring diagrams and connection information for two pole level controls. CAD generated schematic, panel layout with diaphragm actuated micro switch interconnected diagram.
 - 9. Level Switches: Use two pole 8222 micro switch level controls with one-inch pipe galvanized support pole, mounting clamps, tethered floats, suspension hardware and additional switch for alternating control.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide line sized non-slam check valve and gate valve on discharge.
- B. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
- C. All components shall be installed in accordance with manufacturer's installation instructions.
- D. Lubricate oil-lubricated pumps before start-up.
- E. Proper access space around a device should be left for servicing the component. No less than the minimum recommended by the manufacturer.
- F. Provide an adequate number of isolation valves for service and maintenance of the system and its components.
- G. All wiring shall be performed per manufacturers instruction and applicable state, federal, and local codes.
- H. Control wiring for remote mounted switches and sensor / transmitters shall be performed per manufacturer's instructions and applicable state, federal, and local codes.

END OF SECTION