

Submersible, Solids Handling, Pumps and Motors

PUMPS:

- A. Pumps shall be submersible type, single stage, centrifugal pumps, as indicated on the Drawings and specified herein. Each pump shall be capable of pumping continuously at the conditions indicated.
- B. All of the pumps shall be solids handling type. The pumps shall be capable of passing a 3" or larger diameter soft solid sphere through the entire body of the pump.
- C. Pump Casings shall be made of high tensile, close-grained cast iron, ASTM 48 Class 30.
- D. Each pump shall use an autocoupling to automatically clamp the pump discharge to the discharge elbow connection when lowered along the guide rails
- E. Discharge elbow shall be cast iron, rigidly bolted to floor, machined to receive yoke and face of the pump discharge; discharge connection also shall hold the lower ends of the guide rails.
- F. Shaft seals shall consist of two mechanical seals mounted in tandem, with an oil chamber between the seals. The faces of the upper seal shall be carbon/ceramic, and the faces of the lower seal shall be tungsten carbide/silicon carbide.
- G. A moisture sensing probe shall be installed in the oil filled seal chamber to indicate leakage due to a lower seal failure.
- H. Submersible motor shall be an air filled, squirrel cage, induction motor, with stator windings insulated with moisture resistant Class F insulation.
- I. Each motor shall be protected from excessive temperature by two built-in, bimetallic thermostats for automatic overload protection. The thermostats embedded in the motor windings shall open when the temperature in motor rises to over 140° C and automatically reset when the temperature drops to safe limit.
- J. Motors shall be of sufficient horsepower for operation anywhere on the pump head-capacity curve without overloading, with a 1.15 service factor based on the nameplate rating.
- K. Power and Control Cables: Each pump shall be furnished with sufficient flexible power and control cable to reach from the pump to the electrical enclosure indicated. A minimum of 50 feet of capable shall be provided. Cable leads shall be epoxy sealed at the motor connection.

- L. Motor shafts shall be AISI-420 stainless steel, designed to withstand the axial and radial loads imposed by the pump.
- M. Motor ball bearings shall be designed for minimum L-10 life of 30,000 hours.
- N. A replaceable ASTM A48, Class 30 Cast Iron wear ring shall be provided. The wear ring shall be of the peripheral design requiring no axial adjustment. The ring shall be press fit into the pump case.
- O. The impeller shall be of heavy section Cast Iron, ASTM A48, Class 30. Impellers will have back vanes to reduce axial thrust and lower the stuffing box pressure. Internal vane edges shall be well rounded to present smooth flow. Impeller shall have a straight non-tapered bore, be statically balanced, keyed to the shaft and further secured with a stainless steel washer and a stainless steel impeller lock screw.
- P. A 316 stainless steel-welded lifting chain shall be provided for each pump. Ropes and lift-out cables shall not be accepted.

LIFT-OUT SYSTEMS:

- A. The autocoupling assembly system shall be self-sealing with a simple up and down motion required to remove and reinstall pumps in the basin.
- B. A pump slide rail assembly shall be supplied for each pump by the pump manufacturer and shall consist of Type 304 stainless steel upper guide rail brackets and pump guide rail assemblies of AISI Type 304 stainless steel structural Tee sections
- C. Each pump shall be fitted with a 316 stainless-steel lifting chain for pump installation and removal, properly rated for the weight of the pump and motor.
- D. Intermediate supports shall be provided for the discharge piping and for the pump slide rail brackets as indicated on the Drawings. Supports shall be fabricated of Type 304 stainless steel.
- E. All fastening hardware, including anchor bolts, shall be AISI Type 316 stainless steel.
- F. Pump slide rail assemblies shall be manufactured by the same manufacturer as the submersible wastewater pumps. Lift-out systems comprised of guide wires shall not be acceptable.

MANUFACTURER'S REPRESENTATIVE SERVICES:

The services of a factory-trained manufacturer's representative shall be provided as specified herein.

1. Observation of installation
2. Certification of proper installation
3. Startup and testing
4. Certify for use and start of warranty

A. The manufacturer's representative shall certify in writing that each submersible wastewater pumping unit has been properly installed.

B. The submersible wastewater pumping units shall be assembled and installed in strict accordance with the manufacturer's recommendations and as approved by the Engineer.

3.01 SPARE PARTS:

Provide a list of all spare and replacement parts and locations where they are available and can be purchased.