

SCOPE: Furnish and install _____ submersible vortexsewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH ; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum). The pump motor speed shall be 3450 RPM, _____ HP (maximum) , _____ Phase, 60 Hertz , _____ Volts. The pump (s) shall be manufactured by a company regularly engaged in the manufacture and assembly of similar units. The pump (s) shall be Champion Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and 2 inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 140 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates and motor housing shall be constructed of high quality ASTM A-48 class 20-30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall be of the recessed freeflow vortex impeller design. Discharge connection shall be a standard () 2 inch - () 3 inch NPT in the vertical position. All critical sealing areas shall be of the compression o-ring sealing arrangement and be standard size commercially available.

The impeller shall be ASTMA-536 ductile iron of the vortex design with pump out vanes on the back side.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class F insulation. The motor shaft shall be of 416 stainless steel. The upper and lower bearings shall be of the single ball type to accept radial and thrust loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings and sleeve bearings are not acceptable.

Thermal sensor shall be available on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This can be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type SJOW or SOW power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A chemical bonding adhesive seals the PVC molding to the cable jacket to prevent water from entering the jacket. A terminal block with brass pin inserts shall connect the power cord leads with the motor leads. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

() **SINGLE SEAL:** The unit shall utilize a single mechanical shaft seal Type 21, which will operate in an oil atmosphere. The materials of construction shall be () carbon for the rotating face and ceramic for the stationary face or () silicon carbide faces, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

() **DOUBLE SEAL:** The unit shall utilize a tandem mechanical shaft seal arrangement and shall operate in an oil atmosphere. The materials of construction for the inboard seal shall be carbon for the rotating face and ceramic for the stationary face, silicon carbide faces for outboard seal, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

() An optional moisture sensor detection system consisting of two probes utilized as a positive/negative pole shall be integrated within the oil-filled seal chamber. Units utilizing one probe and grounding through the pump case or a float device are not acceptable.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with SSPMA standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL or CSA criteria.
3. The pump shall be submerged and run to determine that the unit meets pre-determined hydraulic performance points.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data;

Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Typical installation drawing;
- e. Control panel data
- f. Panel wiring schematic;
- g. Accessory data;
- h. Installation & Operation Manuals with Parts List.