SCOPE

Furnish (QTY____) Stancor™ S3000-TS4P electric submersible trash vortex pump(s) capable of delivering a maximum capacity of____ GPM at____ feet of TDH when operated by 30 HP, 1750 RPM____ volt, ____ phase, 60Hz motor. The motor shall be an integral part of the pumping unit and shall not exceed ______ HP and ______ amps at ______ volts. The pump discharge size shall be ______ inch bolted. Pump shall be operated with a manual or automatic control panel and be equipped with ______ feet of power cable between the pump and control panel. Strain reliefs shall be provided at each cable entry into the pump.

PUMP DESIGN

The pump(s) shall be designed to handle large flows of water with 3in solids at medium heads. There is an optional stainless steel inlet screen that only allows 2in solids to prevent large solids from entering the impeller. Pump weight must not exceed 600 lbs (without cable).

PUMP CONSTRUCTION

Major pump components shall be of ASTM A-48 Class 35B Cast Iron with smooth surfaces devoid of porosity or other irregularities. All exposed fasteners shall be AISI type 304 stainless steel. Critical mating surfaces where a watertight seal is required shall be machined and fitted with NBR o-rings. Sealing will be the result of controlled compression of rubber o-rings without requiring a specific torque on fasteners to accomplish sealing. Rectangular cross sectioned gaskets requiring specific fastener torque to achieve compression shall not be considered adequate or equal. No secondary sealing compounds shall be used or required.

Impeller: The impeller shall be of the vortex type and constructed of ASTM A-48 Class 35B Cast Iron. Other materials are available for different applications. Each impeller shall be dynamically balanced to insure vibration-free operation. The impeller shall be positively keyed to the shaft and secured with a stainless steel bolt.

Pump Volute: The volute shall be constructed of ASTM A-48 Class 35B Cast Iron. Other materials are available for different applications.

Suction Strainer: The pump shall sit on an ASTM A-48 Class 35B Cast Iron stand designed to support the weight of the pump. The strainer is made out of AISI type 304 stainless steel that has openings that are 2in in diameter. Strainer is optional depending on the solid size that is being pumped.

Shaft & Rotating Assembly: The common motor/pump shaft that is in contact with pump's mechanical seals shall be of 416 stainless steel material and shall have a polished finish and accurately machined shoulders to accommodate bearings, seals and impeller. Carbon steel shafts shall not be considered adequate or equal. The rotating assembly (impeller, shaft and rotor) shall be dynamically balanced such that undue vibration or other unsatisfactory characteristics will not result when the pump is in operation.

Pump Discharge: The pump discharge shall be ASTM A-48 Class 35B Cast Iron and configurable to provide a vertical or horizontal connection. The discharge shall be 4in ANSI Class 125 F.F.bolted. Other materials are available for different applications.

Dual Seal System: Each pump shall be equipped with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The mechanical seals shall be of non-proprietary design, and shall be manufactured by a major independent manufacturer specializing in the design and manufacture of mechanical seals. The lower, primary seal unit, located between the pump and the lubricant chamber, shall be a pusher seal with SiC/SiC seal faces. The upper, secondary seal unit, located between the lubricant chamber and motor housing, shall be a rubber bellow seal with Carbon/Ceramic seal faces. Each seal interface shall be held in contact by its own spring system. The seals shall not require routine maintenance, or adjustment, and shall not be dependent on the direction of rotation for proper sealing. Each pump shall be provided with a lubricant chamber for the shaft sealing system which shall provide heat transfer and maximum seal cooling. The lubricant chamber shall be designed to prevent overfilling, and to provide lubricant expansion capacity. The drain and inspection plug shall have a positive anti-leak seal, and shall be easily accessible from the outside of the pump. The seal system shall not rely upon the pumped media for lubrication and shall not be damaged when the pump is run dry. Seals of proprietary design, or seals manufactured by other than major independent seal manufacturing companies shall not be considered equal.

Bearings: Each pump shaft shall rotate on high quality permanently lubricated, greased bearings. The upper bearing shall be a deep grooved ball bearing and the lower bearings shall be a heavy duty double row angular contact ball bearing. Bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize shaft deflection. L-10 bearing life shall be a minimum of 50,000 hours at flows ranging from ½ of BEP flow to 1½ times BEP flow (BEP is best efficiency point). The bearings shall be manufactured by a major internationally known manufacturer of high quality bearings, and shall be stamped with the manufacturer's name and size designation on the race. Generic or unbranded bearings from other than major bearing manufacturers shall not be considered acceptable.

Motor: The motor shall be housed in a water-tight ASTM A-48 Class 35B Cast Iron enclosure capable of continuous submerged operation to a depth of 20 meters (65 feet). The motor shall be of the squirrel-cage induction design, NEMA type B and shall have an IP68 protection rating. The copper stator windings shall be insulated with moisture resistant Class F insulation materials, rated for 155ºC (311ºF). The stator shall be press fitted into the stator housing. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is unacceptable. The rotor bars and short circuit rings shall be made of cast aluminum. The motor shall be designed for continuous duty. The maximum continuous temperature of the pumped liquid shall be 40ºC (104ºF). The motor shall be capable of handling up to 10 evenly spaced starts per hour without overheating. The service factor shall be 1.15. The motor shall be able to resist a voltage deviation of +/- 10% from nominal, and a phase to phase voltage imbalance tolerance of 1%. The motor shall be capable of operating, completely submerged, partially submerged, or unsubmerged.

Overload Protection: The motor shall be protected by an internally mounted motor overload protection and sized per the NEC code.

Thermal Protection: Each phase of the motor shall contain a normally closed bi-metallic temperature monitor switch imbedded in the motor windings. These thermal switches shall be connected in series and set to open at 130ºC +/- 5ºC (266ºF). They shall be connected to the motor starter, and used in conjunction with, and supplemental to, the motor overload protection.

Power Cable: The power cable shall be sized according to NEC and CSA standards and shall be of sufficient length to reach the junction box without requiring splices. The outer jacket of the cable shall be oil and water resistant thermoplastic elastomer.

Cable Entry/Junction Chamber: The cable entry design shall not require a specific torque to insure a watertight seal. The cable entry shall consist of cylindrical elastomer grommets, flanked by stainless steel washers. A cable entry cap incorporating a strain relief and bend radius limiter shall mount to the cable entry boss, compressing the grommet ID to the cable while the grommet OD seals against the bore of the cable entry. Cable entry designs which utilize potting compounds to provide a watertight seal, or those which do not allow the cable to be easily changed in the field shall not be considered equal. The junction chamber shall be isolated and sealed from the motor chamber by o-rings. Electrical connections between the power cables and motor leads shall be made via a compression type grommet sealing each motor cable lead individually.