

## SECTION 1204

### SUBMERSIBLE PUMPS

#### 1204.0100 GENERAL

**1204.0100 Description of Work.** The work under this section shall consist of furnishing all labor, materials, equipment, and appurtenances required for the installation of submersible pumps and motors, all in accordance with the details shown on the plans and requirements of these specifications.

#### 1204.0102 Related Specifications.

Section 0106 Control of Materials of the standard contract conditions.

**1204.0103 Submittals.** In order to be accepted for incorporation into the work, the manufacturers make and model of submersible pump and motor shall be submitted by the contractor for agency review and approval.

Shop drawing shall be submitted for all submersible pumps.

All submittals shall reference the project plan number.

Drawings and literature submitted shall include, detailed specifications and drawings indicating dimensions, make, style, speed, size, type, horsepower, full-load amps, head capacity, efficiency, NPSH curves, specific materials used, design features, weights and any other information required.

Certified copies of test reports shall be submitted for review with the shop drawing submittal. Certified performance data, in the form of a computer analysis, or a complete initial test on a motor comparable to the one being provided, shall be submitted for review as part of the shop drawing submittal. Complete initial motor test data shall include but not be limited to: Full load heat rise, percent slip, breakdown torque, and locked rotor torque efficiency power factor at full, 3/4 and 1/2 load.

#### 1204.0200 PRODUCTS

These specifications are intended to serve as a guide to the functional requirements needed to assure a quality product without unnecessary or expensive design features. It is the intent of these specifications to obtain a submersible pump of heavy-duty construction for heavy duty, continuous service or for intermittent service, whichever imposes the most severe service on the pump.

#### 1204.0201 Materials.

##### (A) Pump Bowl Assembly, Standard Construction.

(1) Pump bowl housings shall be of closegrained, class 30 cast iron with smooth waterways.

(2) Bowl assemblies shall have 416 stainless steel shafts, SAE 40 polished bronze impellers, and all bearings shall be of SAE 600 bronze. Bowl assemblies shall provide upthrust protection for pump bowls and motor.

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- (3) Impellers shall be securely locked to the shaft yet easily removable.
- (4) The suction bearing and the discharge case bearing shall be permanently lubricated and protected by built-in bronze sand collars.
- (5) Pumps shall be equipped with check valves, the outside diameter of which shall not exceed the outside diameter of the pump.
- (6) The suction area of the pump shall be equipped with a corrosion resistant metal strainer.
- (7) Supplier shall fasten to the pump a metal tag upon which shall be stamped or scribed the Manufacturer, Model and Serial Nos., GPM, TDH, and HP of the pump. Authorization for payment shall be contingent upon compliance with this requirement.

### **(B) Submersible Pump Motors.**

- (1) The motor shall be of the vertical, submersible, squirrel cage, induction type designed for continuous duty underwater operation.
- (2) The motor shall be designed with normal starting torque and low starting current for across the line starting.
- (3) The motor shall have a 1.15 service factor and shall not be loaded in excess of its nameplate rating at design condition, nor shall it be loaded in excess of 110% of its nameplate rating at any condition from zero to maximum capacity of the pump.
- (4) The motor shall be water filled and shall incorporate a mechanical seal to restrict foreign matter from entering.
- (5) The motor thrust bearing shall be of ample capacity to carry the weight of all rotating parts plus the hydraulic thrust and shall be an integral part of the driver.
- (6) The motor case windings shall be covered with a waterproof, non-aging insulation of high dielectric strength.
- (7) The rotor shaft shall be stainless steel and shall be supported by suitable journal bearings.
- (8) Motor must include expansion diaphragm and suitable cable gland. Wire motor leads must be protected by metal shield firmly attached to pump.