

SECTION 11216 - HORIZONTAL AXIAL FLOW PUMPS

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing heavy-duty, horizontal, axial flow pumps for water, sewage, and sludge service, with drive, support and all necessary accessories for a complete, workable system.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 11175 Pumps, General

1.3 SERVICES OF MANUFACTURER

- A. **Inspection, Startup, and Field Adjustment:** An authorized representative of the manufacturer shall visit the site for not less than [] days.
- B. **Instruction of OWNER'S Personnel:** The authorized service representative shall instruct the OWNER'S personnel for not less than [] days.

PART 2 -- PRODUCTS

2.1 PUMP NAME: [] (P-[] through P-[])

A. General:

- 1. Number of pumping units -[]
- 2. Location -[]
- 3. Service -[]
- 4. Operation (hours per day) -[]
- 5. Type of drive -[constant] [variable] speed
- 6. Mounting angle -[horizontal] [[] degrees from horizontal]

B. Operating Conditions:

- 1. Capacity (gpm)
 - Max -[]
 - at design point -
 - Min -[]

- | | | |
|-----|---|---------------------------|
| 2. | NPSH available at center line of propeller (ft) | -[] |
| 3. | Pump head (TDH-ft) | |
| | at max gpm | -[] |
| | at design point | -[] |
| | at min gpm | -[] |
| 4. | Total discharge head (ft) at min capacity | -[] |
| 5. | Efficiency at design point, min (percent) | -[] |
| 6. | Liquid to be pumped | -[] |
| 7. | Specific gravity of liquid | -[] |
| 8. | Liquid temperature (degrees F) | -[] |
| 9. | Minimum size of spheres passing through pump (in-dia) | -[] |
| 10. | Max pump speed (rpm) | -[] |
| 11. | Max motor speed (rpm) | -[] |
| 12. | Min motor size (hp) | -[] |
| 13. | Power supply | -[-volt] [-phase] [Hz] |

2.2 PUMP REQUIREMENTS

A. General:

1. The pumps shall be controlled by [].
2. Each pump shall be capable of continuous operation at full load with varying suction heads, without cavitation and overheating of the motor.
3. Each pump shall be able to run dry without damage to the pump.
4. The pumps shall fit within the physical limitations indicated.

B. Construction: Construction of horizontal, axial flow pumps shall conform to the following requirements:

1. Casing - [Cast] [fabricated of []-inch plate]
2. Elbow - [Cast] [fabricated of []-inch plate, with reinforcing ribs and gusset plates, in max 15 degree segments with replaceable liners]

- 3. Flange Rating - ANSI [125] [150] []-pound
- 4. Flange size (in) - []
- 5. Suction inlet - [Top with guide vanes] [End]
- 6. Mounting - [Base mounted with expansion joints on pump flanges] [Pipe-suspended]
- 7. Propeller - [Cast][Fabricated] statically balanced and keyed to step-fit shafts
- 8. Shaft - High tensile strength, stress relieved, turned, ground and polished ASME shafting to transmit full load torque plus medium shock load safety factor; fully cantilevered into pump elbows to eliminate need for internal bearings.
- 9. Shaft sleeve - At seal cage, renewable, positively locked by a fitted key and set screw or colletted to shaft
- 10. Seal cage - [Cast] [Fabricated]
- 11. Seal - [Mechanical seal] [Packing]
- 12. Bearings - 3 sets of thrust and radial roller bearings with split bearing housing with min L-10 life of [100,000] hours at full load and continuous operation
- 13. Lubrication - Oil lubricated
- 14. Coupling - Heavy-duty flexible coupling
- 15. Guard - CAL-OSHA approved guard in accordance with Section 11000

C. Materials:

- 1. Casing, elbow - [Cast iron, ASTM A-48] [Stainless steel Type 316] [Corrosion-resistant steel SAE 950 (ASTM A 374)]
- 2. Flanges - Same material as casing and elbow
- 3. Support - [Cast iron, ASTM A-48] [Carbon steel]
- 4. Propeller - [Cast iron, ASTM A-48] [Stainless steel Type 316] [Corrosion-resistant steel SAE 950 (ASTM A 374)]

- 5. Pump Shaft - [Type 316 stainless steel] []
- 6. Shaft sleeve - Stainless steel, Type [416] [316]
- 7. Seal Cage - [Cast iron, ASTM A 48] [Type 316 stainless steel]
- 8. Seal - [High pressure mechanical seal with silicon carbide contact faces] [Large stuffing box with Teflon and non-asbestos rings]
- 9. Bolts, studs, nuts - Stainless steel, Type 316

2.3 PUMP DRIVE

- A. The pump shall be driven by a heavy-duty, high-efficiency, [ODP] [TEFC] horizontal, electric motor, suitable for the indicated arrangement, in compliance with Section 16040. [For variable frequency drive, see Sections 11030 and 11032.]

2.4 TOOLS AND SPARE PARTS

- A. **Tools:** Tools furnished shall comply with Section 11000.
- B. **Spare Parts:** The WORK includes the following spare parts for each pump:
 - 1. 2 sets of all gaskets and O-rings
 - 2. 2 sets of all pump and motor bearings
 - 3. 2 sets of all [mechanical seal] [packing for stuffing box]
 - 4. 2 shaft sleeves
 - 5. 1 coupling

Spare parts shall be stored in tool boxes and identified with the equipment number by means of stainless steel or solid plastic name tags attached to the boxes.

2.5 MANUFACTURERS

- B. Pumps of the type or model indicated shall be manufactured by one of the following (or equal):
 - 1. Duperon Corporation, model []
 - 2. Goulds Pump Inc., model []
 - 3. Lawrence Pumps, Inc., model []
 - 4. M&W Pump Corporation (Couch Pump Co.), model []

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Installation shall comply with Section 11175.
- B. All ferrous surfaces and passages of pumps, motors, and supports shall be coated in compliance with Section 09800.

** END OF SECTION **