

# SECTION 11223 - CENTRIFUGAL CHOPPER PUMPS

## City of San Diego, CWP Guidelines

### PART 1 -- GENERAL

#### 1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing horizontal centrifugal chopper/cutter pumps, with horizontal electric motors and all appurtenant work.

#### 1.2 RELATED SECTIONS

- A. The WORK of the following Section 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:** Horizontal chopper pumps shall conform to the following requirements:

- 1. Number of pumping units - [ ]
- 2. Location - [ ]
- 3. Service - [ ]
- 4. Operation (hours per day) - [ ]
- 5. Drive - [Constant] [variable] speed

- B. **Operating Conditions:**

- 1. Capacity (gpm)
  - max. - [ ]
  - at design point - [ ]
  - min. - [ ]
- 2. NPSH available at suction (ft) - [ ]

3. Pump head (TDH-ft)
  - at max. gpm - [ ]
  - at design point - [ ]
  - at min. gpm - [ ]
4. Total discharge head (ft)
  - at min. capacity - [ ]
5. Liquid to be pumped - see Paragraph 2.2
6. Size of solids to pass (in) - [ ]
7. Specific gravity of liquid - [ ]
8. Liquid temperature (degrees F) - [ ]
9. Min pump efficiency at design point (percent) - [ ]
10. Max pump speed (rpm) - [ ]
11. Min motor size (hp) - [ ]
12. Max motor speed (rpm) - [ ]
13. Power Supply - [480 volt] [3-phase] [60-Hz]

**C. Pump Dimension:**

1. Min size of suction flange (in) - [ ]
2. Min size of dschrg. flange (in) - [ ]
3. Flange rating (psi) - [ ]

**2.2 PUMP SERVICE CONDITIONS**

- A. The pumps shall be capable of continuous operation while pumping raw unscreened sewage or sludge slurries containing up to 6 percent solids, hair, rags and other fibrous materials. The solids to be encountered will be those typically found in municipal wastewater influent. The solids are expected to be heterogeneous mixtures of inorganic and organic solids.
- B. The materials shall be chopped/macerated and conditioned by the pumps as an integral part of the pumping action. The pump must have demonstrated the ability to chop and pump high concentrations of solids such as plastics, heavy rags, grease and hair balls, wood, paper products, and stringy materials without plugging, both in tests and field applications.
- C. The pump must be capable of passing or breaking down a 2-inch diameter sphere.

**2.3 PUMP REQUIREMENTS**

- A. **General:** All components shall be designed to safely withstand forces resulting from flow reversals up to 125 percent of maximum speed within the pump during shutdown caused by power failure.
- B. **Construction:** Construction of chopper pumps shall conform to the following requirements:
1. General: Provide lifting lugs or eye bolts. All exposed nuts, bolts, and hardware shall be stainless steel. Alignment of all pump components from the motor through the impeller shall be maintained by machined fits and concentric bores.
  2. Casing - Ductile iron, ASTM A 536, of semi-concentric design with centerline discharge.
  3. Impeller - ASTM A 148 Gr. 90-60 heat-treated cast alloy steel with minimum 550 Brinell hardness, 3-bladed with pump out vanes and sharpened leading edges.
  4. Cutter Bar Plate - Same material as impeller, funnel shaped and recessed into pump bowl.
  5. Shaft - AISI 1144 stressproof steel.
  6. Shaft Sleeve - Nickel-chrome-boron-coated Type 316 stainless steel.
  7. Bearings - 2 back-to-back single row angular ball bearings and 2 back-to-back single row radial bearings with 100,000 hours L-10 life.
  8. Coupling - Heavy duty elastomeric type.
  9. Seal - Mechanical seal with Alloy 20 bellows and silicon carbide faces.
  10. Lubrication - Oil bath
  11. Pump Base - Cast iron or steel pan with drain, piped to nearest drain.
- C. **Drive:** Direct drive with horizontal, heavy-duty, TEFC, electric motor suitable for [ ]-volt, [ ]-phase, 60 Hz ac power supply, in accordance with Section 16040.

## 2.4 SPARE PARTS

- A. The following spare parts shall be provided with each pump:
1. One impeller
  2. One cutter bar or cutter plate
  3. One set of impeller fastening hardware
  4. Five cutter bar shims or cutter plate equivalent
  5. One shaft sleeve

## 2.5 MANUFACTURERS

- A. Horizontal or vertical pedestal mounted (as specified) chopper pump as manufactured by

Vaughan Co. Inc., or equal.

**PART 3 -- EXECUTION**

3.1 INSTALLATION

- A. Pumping equipment shall be installed in accordance with approved procedures submitted with the shop drawings and as indicated.
- B. General installation requirements shall be as indicated in Section 11175.

**\*\* END OF SECTION \*\***