

SECTION 43 23 13.27

SAMPLE PUMPS HORIZONTAL END SUCTION CENTRIFUGAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide water sample pumping equipment including the process sample pump complete and operational as shown and specified. Anchorage devices are included in the scope of this Section. This Section includes, but is not limited to the following:
 - a. 7 sampling pumps.
 - b. Pump appurtenances.
 - c. Anchor bolts.
- B. Coordination:
1. Review installation procedures under this and other Sections and coordinate installation of items that must be installed with or before end suction centrifugal sampling pump Work.
- C. Related Sections:
1. Section 40 05 93, Common Motor Requirements for Process Equipment.

1.2 REFERENCES

- A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. American Bearing Manufacturers Association (ABMA).
 2. American Gear Manufacturer's Association (AGMA).
 3. American Society for Testing and Materials, (ASTM).
 4. Standards of the Hydraulic Institute.
 5. National Electric Code, (NEC).
 6. Standards of National Electrical Manufacturers Association, (NEMA).
 7. Institute of Electrical and Electronic Engineers, (IEEE).
 8. American National Standards Institute, (ANSI).
 9. Standards of American Water Works Association, (AWWA).

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
1. Manufacturer shall have a minimum of five years experience producing substantially similar equipment, and shall be able to show evidence of at least five installations, each in satisfactory operation for at least five years.
 2. Pumps shall be supplied by a single pump manufacturer.

3. Appurtenances shall be supplied by a single manufacturer.

1.4 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
 1. Manufacturer's literature, illustrations, specifications and engineering data including: dimensions, materials, size, weight, performance data and curves showing overall pump efficiencies, required net positive suction head, allowable suction lift, flow rate, head, brake horsepower, motor horsepower, speed and shutoff head. Pumps curve shall be full size on 8-1/2 by 11 paper.
- B. Operation and Maintenance Data:
 1. Submit complete Installation, Operation and Maintenance Manuals, including, test reports, maintenance data and schedules, description of operation, and spare parts information.
 2. Furnish Operation and Maintenance Manuals in conformance with the requirements of Section 01 78 23, Operation and Maintenance Data.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements of Section 01 65 00, Product Delivery Requirements, and Section 01 66 00, Product Storage and Handling Requirements.
- B. Packing, Shipping, Handling and Unloading:
 1. Deliver materials to the Site to ensure uninterrupted progress of the Work. Deliver anchor bolts and anchorage devices which are to be embedded in cast-in-place concrete in ample time to prevent delay of that Work.
- C. Storage and Protection:
 1. Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Acceptance at Site:
 1. All boxes, crates and packages shall be inspected by CONTRACTOR upon delivery to the Site. CONTRACTOR shall notify ENGINEER, in writing, if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.1 EQUIPMENT PERFORMANCE

- A. System Description:
 1. Each pump shall be suitable for its intended service.

B. Design and Performance Criteria: Each pump shall comply with the following

Location:	¹ Rapid Mix	Combined DAF Effluent	² Combined Filter Effluent	³ Combined GAC Effluent	Clearwell Influent
Sheet:	I05-01	I05-07	I05-07	I05-07	I07-01
Use:	Sample Pump	Sample Pump	Sample Pump	Sample Pump	Sample Pump
Fluid Pumped:	Coagulated Water	DAF Effluent	Filter Effluent	GAC Effluent	Clearwell Influent
Number Required:	2 (duty/spare)	5 (4 duty/1 spare)			
Discharge Nozzle Dia. (in.):	1	½			
Suction Nozzle Dia (in.)	1	¾			
Motor Size (hp) and Maximum Speed (rpm):	1/3 3450	1/3 3450			
Motor	ODP, 115 VAC, 60 Hz, 1 phase	TEFC, 115 VAC, 60 Hz, 1 phase			
Self-Priming	Yes	No			
Design Flow and Total Head	5 gpm at 50 ft TDH	3 gpm at 42 ft TDH			
Fluid Temperature (deg. F):	35 to 90 ° F				
pH of Fluid Pumped	6 to 9				

¹Sample pump for rapid mix shall be installed in a heated pump enclosure, as specified in this section.

²Sample pump for combined filter effluent shall be installed in a heated pump enclosure, as specified herein

³Sample pump for combined GAC effluent shall be installed in a heated pump enclosure, as specified herein

2.2 DETAILS OF CONSTRUCTION

- A. Type: Horizontal close-coupled, end suction centrifugal pump.
- B. Construction:
1. Casing: Cast iron.
 2. Impeller: Stainless Steel.
 3. Mechanical Seal: Buna-N or Viton.
- C. Motor: Comply with requirements of Section 40 05 93, Common Motor Requirements for Process Equipment
- D. Manufacturer and Model:
1. AMT Pump Company.
 - a. Self-Priming: Model 2851-95
 - b. Non-Self-Priming: Model 368A-95
 2. Or equal.

2.3 APPURTENANCES – INSULATED AND HEATED ENCLOSURES

- A. Type: Heated pump enclosure.
- B. Construction:
 - 1. Acceptable Materials:
 - a. Laminated fiberglass.
 - b. Gel coated fiberglass mat.
 - 2. Insulation shall be polyisocyanurate foam, which shall be spray applied, frothed in place, or board stock laminated between two layers of fiberglass mat. The insulation shall have the following properties.
 - a. Dimensional stability - less than 2% linear change.
 - b. Comprehensive strength - 20 PSI.
 - c. Water absorption - less than 1% by volume.
 - d. Density - nominal 2.0 lbs. per cubic foot.
 - e. Flame spread -25.
 - f. Service temperature - 100 degrees F to 250 degrees F.
 - g. Insulation thickness shall be minimum 1".
 - h. Adhesive applied board stock or material secured by mechanical fasteners shall be cause for rejection.
 - 3. Structural members shall be aluminum or fiberglass.
 - 4. No wood or particle board is allowed in the assembly.
- C. Components:
 - 1. The enclosure shall be securely attached to its concrete base with stainless steel anchor brackets installed on the interior of the enclosure, through the flange base of the enclosure itself or through a stainless steel anchor hinge
 - 2. Access panels shall be provided to allow easy access for operation, maintenance, and testing of sample pump and valves without removal of the assemblies.
 - 3. Access panels shall be secured with padlock hasps and staples.
 - 4. Drain openings shall be designed to remain closed except when the pump is discharging water into the enclosure. Drain openings shall be designed to accommodate the maximum discharge of the device, and shall protect against intrusion of wind, debris and animals, through the use of separate aluminum screen and wind flaps.
- D. Heating Equipment:
 - 1. Heating equipment shall be furnished and designed by the manufacturer of the enclosure to maintain an interior temperature of +40 degrees F with an exterior outside temperature of -30 degrees F and a wind velocity of 15 mph.
 - a. The factory assembled heating equipment shall be UL, ETL, or CSA certified.
 - b. Field assembled heater parts shall be cause for rejection.
 - 2. Electric power source for heat and accessories shall be G.F.I. protected, with 18 inches of clearance from receptacle base to grade.

3. Provide in the enclosure a thermostat that, when the ambient air temperature inside the enclosure is at or below the thermostat setpoint the heater is activated. The thermostat shall be provided by the enclosure manufacturer and shall be compatible for its intended use.
- E. Mounting Hardware:
1. Mounting hardware shall be furnished and shall be stainless steel.
 2. All assembly fasteners shall be stainless steel or aluminum.
 3. Anchor hardware shall be adjustable up to 1.5" vertically to accommodate uneven concrete slabs.
- F. Manufacturer and Model:
1. Hot Box.
 - a. RM Sample Pump Enclosure: HB1
 - b. FE and GACE Sample Pump Enclosure: PL044053044/PG4000FH
 2. Or equal.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine conditions under which products are to be installed and notify ENGINEER in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install products in conformance with manufacturer's instructions and recommendations, and the Contract Documents.
- B. Anchorages:
1. Install pumps on concrete bases. Provide anchorages in new or existing concrete, as applicable, per equipment manufacturer's recommendations and the Contract Documents. Equipment manufacturer shall supply templates to facilitate location of anchorages for equipment. CONTRACTOR shall coordinate with Supplier to assure timely receipt of required templates.
 2. For pumps installed in dry pit applications, install grout between pump and concrete base per recommendations of pump manufacturer.
- C. General:
1. Perform all fitting required for installation. Set products accurately in location, alignment, and elevation, plumb and true.
 2. Provide utility connections per the Contract Documents. Support piping and valves independent of pump. Verify that utilities and valves are tested and operational before placing equipment into operation.

3. Align and adjust products and piping in presence of ENGINEER
4. Provide for initial operation lubricants recommended by equipment manufacturer
5. Prior to energizing motor driven equipment, rotate drive motor by an external source to demonstrate free operation of mechanical parts. Do not energize equipment until safety devices are installed, connected, and functional.

D. Conform to Section 01 75 11, Checkout and Startup Procedures.

3.3 FIELD QUALITY CONTROL

A. Site Tests:

1. Following installation, CONTRACTOR shall conduct operating tests of all equipment, functions, and controls at Site, in presence of ENGINEER. Should tests result in malfunction, make necessary repairs, revisions, and adjustments and restart test from beginning. Repeat tests and repairs, revisions, and adjustments until, in opinion of ENGINEER, installation is complete and equipment is functioning properly and accurately, and is ready for permanent operation.
2. Field Operating Test:
 - a. Field test equipment and its controls. Demonstrate that each part and component of system individually and all parts and components together function properly in manner intended. Total duration of testing shall be 8 hours, continuous and uninterrupted. All testing equipment and manpower shall be by CONTRACTOR.

++ END OF SECTION ++