

## SECTION 422331 – VERTICAL AND HORIZONTAL CENTRIFUGAL BOOSTER PUMPS

## PART 1 - GENERAL

## 1.01 SUMMARY

## A. Section Includes:

1. Vertical in-line, multi-stage centrifugal pumps complete with motor and coupling.
2. Split-coupled end-suction centrifugal pumps complete with motor and coupling.

## B. Related Work:

1. Section 26 29 23- Variable-Frequency Motor Controllers

## 1.02 DEFINITIONS

- A. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

## 1.03 SUBMITTALS

- A. Product Data: For each type of product indicated. Include materials of construction, rated capacities, certified performance curves with operating points plotted on curves, operating characteristics, electrical characteristics, and furnished specialties and accessories.

## 1.04 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For potable water pumps to include in operation and maintenance manuals.

## 1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. UL Compliance: Comply with UL 778 for motor-operated water pumps.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Retain shipping flange protective covers and protective coatings during storage.
- B. Protect bearings and couplings against damage.

- C. Comply with pump manufacturer's written rigging instructions for handling.

#### 1.07 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

#### 1.08 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.

1. American Iron and Steel (AIS)
2. Build America, Buy America Act

- B. See Supplementary Conditions for details.

### PART 2 - PRODUCTS

#### 2.01 VERTICAL IN-LINE MULTI-STAGE CENTRIFUGAL PUMPS

- A. Pump shall be vertical in-line centrifugal pump.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  1. Grundfos Pumps Corp.
  2. Goulds Water Technology; a Xylem brand.
  3. Or equal.
- C. Description: Factory-assembled and -tested, in-line, close-coupled, canned-motor, sealless, overhung-impeller centrifugal pumps.
- D. Pump Construction:
  1. Pump Head: Cast Iron
  2. Base: Cast Iron
  3. Impeller: Stainless steel
  4. Motor: Variable Frequency Controlled, unless otherwise indicated.
  5. Rating: NSF 61 certified.
- E. Furnish and install vertical in-line centrifugal pumps as per plans and pump schedule.
- F. The pump, electric motor, motor support bracket, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. The pump manufacturer shall have complete unit responsibility.

**2.02 HORIZONTAL SPLIT-COUPLED END-SUCTION CENTRIFUGAL PUMPS**

- A. The pumps shall be split coupled, single stage, end suction.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. Grundfos Pumps Corp.
  - 2. Goulds Water Technology; a Xylem brand.
  - 3. Or equal.
- C. Description: Factory-assembled and -tested, in-line, close-coupled, canned-motor, sealless, overhung-impeller centrifugal pumps.
- D. Pump Construction:
  - 1. Housing: Cast Iron
  - 2. Shaft: Stainless Steel
  - 3. Impeller: Stainless steel
  - 4. Motor: Variable Frequency Controlled, unless otherwise indicated.
  - 5. Rating: NSF 61 certified.
- E. Furnish and install end suction split coupled pumps as per plans and pump schedule.
- F. The pump, electric motor, motor support bracket, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. The pump manufacturer shall have complete unit responsibility.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine roughing-in of potable water piping system to verify actual locations of connections before pump installation.

**3.02 INSTALLATION**

- A. Comply with HI 1.4.
- B. Install pumps per manufacturer specifications.
- C. Coordinate suction line elevation with water tank connection. Ensure suction pipe remains level.
- D. Install and secure pumps to a concrete housekeeping pad.

### 3.03 CONNECTIONS

- A. Comply with requirements for piping specified in Section 405020 "Plant Pipes and Fittings." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping to allow service and maintenance.
- C. Install flexible connectors adjacent to pumps in suction and discharge piping of the following pumps:
  - 1. Horizontally mounted, in-line, separately coupled centrifugal pumps.
  - 2. Horizontally mounted, in-line, close-coupled centrifugal pumps.
  - 3. Vertically mounted, in-line, close-coupled centrifugal pumps.
- D. Install shutoff valve on suction side of each pump and shutoff valves on discharge side of each pump. Install check valves and strainers as indicated in the project documents. Install valves same size as connected piping. Comply with requirements for valves specified in Section 400551 "Plant Valves".

### 3.04 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 400597 "Identification for Plumbing Piping and Equipment" for identification of pumps.

### 3.05 STARTUP SERVICE

- A. Engage an authorized representative to perform startup service.
  - 1. Complete installation and startup checks according to manufacturer's written instructions.
  - 2. Check piping connections for tightness.
  - 3. Perform the following startup checks for each pump before starting:
    - a. Verify bearing lubrication.
    - b. Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
    - c. Verify that pump is rotating in the correct direction.
  - 4. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
  - 5. Start motor.
  - 6. Open discharge valve slowly.

### 3.06 ADJUSTING

- A. Adjust domestic water pumps to function smoothly and lubricate as recommended by manufacturer.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

END OF SECTION

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