

DIVISION 22 PLUMBING

Section 22 11 23 – Domestic Water Pumps

PART 1: GENERAL

1.01 Purpose:

- A. The design guidelines contained herein includes the requirements for pumps utilized for plumbing systems at Texas State University. It is the intention of this document to provide a standard for plumbing pump systems at Texas State University to provide the highest level of quality and consistency possible; it is not intended to be a guide specification.
- B. Texas State University has standardized the use of end suction pumps in lieu of horizontal split-case pumps. Any deviation from this standard must be authorized in writing by Texas State University Project Manager at the beginning of concept design. Types of pumps referred to in this section include the following:
- C. In-Line Re-circulation Pumps.
- D. Water Pressure Booster Systems.
- E. Duplex Pedestal Type Sump Pumps.
- F. Power supply wiring from power source to power connection on pumps. The Mechanical Contractor shall include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer.
- G. Interlock wiring between pumps; and between pumps and field-installed control devices shall be included as Division 23 HVAC.
- H. Interlock wiring specified as factory-installed is work of Division 23 HVAC.
- I. Control wiring between field-installed controls, indicating devices, and pump control panels is a part of Division 23 HVAC.

1.02 Quality Assurance:

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing pumps with characteristics, sizes, and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards:
 - 1. HI Compliance: Design, manufacture, and install plumbing pumps in accordance with HI "Hydraulic Institute Standards".
 - 2. UL Compliance: Design, manufacture, and install plumbing pumps in accordance with UL 778 "Motor Operated Water

3. UL and NEMA Compliance: Provide electric motors and components, which are listed and labeled by Underwriters Laboratories, and comply with NEMA standards.
4. SSPMA Compliance: Test and rate sump and sewage pumps in accordance with SUMP and Sewage Pump Manufacturers Association (SSPMA) and provide certified rating seal.
5. HI Compliance: Design, manufacture, and install plumbing pumps in accordance with HI "Hydraulic Institute Standards".
6. UL Compliance: Design, manufacture, and install plumbing pumps in accordance with UL 778 "Motor Operated Water Pumps".
7. UL and NEMA Compliance: Provide electric motors and components, which are listed and labeled by Underwriters Laboratories, and comply with NEMA standards.
8. SSPMA Compliance: Test and rate sump and sewage pumps in accordance with SUMP and Sewage Pump Manufacturers Association (SSPMA) and provide certified rating seal.

1.03 Submittals:

- A. Product Data: Submit manufacturer's pump specifications, installation and start-up instructions, and current accurate pump characteristic performance curves with selection points clearly indicated to Texas State University-San Marcos Project Manager for distribution to the appropriate parties.
- B. Shop Drawings: Submit accurate and complete manufacturer's assembly-type shop drawings indicating dimensions, weight loadings, required clearances, and methods of assembly of components.
- C. Wiring Diagrams: Submit maintenance data and parts lists for each type of pump, control, and accessory; including "trouble-shooting" maintenance guide. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual; in accordance with requirements of Division I.

PART 2: PRODUCTS

2.01 Pumps:

- A. General: Provide pumps of same type by same manufacturer.

2.02 In-Line Re-Circulation Pumps:

- A. General: Provide in-line re-circulation pumps where indicated, and of capacities as scheduled.
- B. Type: Maintenance-free circulator designed for 125psi working pressure 225°F continuous water temperature and specifically designed for quiet operation.
- C. Body: Stainless steel fitted construction with iron body.
- D. Shaft: Steel, ground and polished, metal impregnated carbon thrust bearing.

- E. Motor: Non-overloading at any point on pump curve, open, drip proof, sleeve bearings, quiet operating, rubber mounted construction, built-in thermal overload protection.
- F. Coupling: Self-aligning, flexible coupling.
- G. Manufacturer: Subject to compliance with requirements, provide in-line re-circulation pumps are as follows:
 - 1. Grundfos Pumps Corp.
 - 2. Engineer-approved equivalent

2.03 Water Pressure Booster System:

- A. General: Provide factory-fabricated and tested water pressure booster system consisting of diaphragm type water tank, centrifugal pumps, power and control panels, instrumentation, and operating controls. It is a Texas State University-San Marcos Standard to provide all booster pumps with a valve bypass to facilitate maintenance.
- B. Pumps: Provide 2 constant speed, single stage, end-suction design, cast-iron; bronze fitted centrifugal pumps with mechanical shafts seals. Mount pumps on vibration insulators. Provide temperature probe and electric purge valve immediately upstream of each PRV. Provide drip-proof motors, with variable speed drives.
- C. Water Tank: Provide factory pre charged diaphragm type water tank with replaceable flexible membrane. Construct in accordance with ASME Code and provide ASME stamp for 125-psi minimum.
- D. System Controls: Maintain system pressure with pilot-operated diaphragm type combination pressure regulating and non-slam check valve on each pump discharge line.
 - 1. Provide low system pressure switch located on discharge header to sense drop in system pressure, and to activate alarm and automatically start standby pump.
 - 2. Provide adjustable vane type flow switch to sequence lag pump.
- E. Control Panel: Provide UL-listed, NEMA I, hinged door, lockable control panel containing the following:
- F. For Each Pump:
 - 1. Fused disconnect switch
 - 2. Motor starter with 3-leg overload protection.
 - 3. Running light.
 - 4. Multiple position motor control switch.
 - 5. Discharge pressure gage.
- G. For System:

1. 115-V control transformer.
 2. Control power switch.
 3. Indicating lights.
 4. Relays.
 5. Visual alarm system.
 6. Suction pressure gage.
- H. Prefabrication: Factory-prefabricate booster system, mount all components on common structural stand, provide interconnecting piping, isolation valves on suction and discharge of each pump, suction and discharge piping manifolds, shutoff cocks for gages and pressure switches, and factory-wiring.
- I. Factory-Test: Provide electrical and hydraulic test on assembled unit prior to shipment. Provide system operating flow test from 0 to 100% design flow rate at scheduled suction and discharge pressure conditions. This test shall be witnessed by personnel assigned by the Texas State University-San Marcos Project Manager.
- J. Manufacturer: Subject to compliance with requirements, provide water pressure booster systems, but are not limited to the following:
1. Tiger Pump Mark5
 2. Armstrong Pumps, Inc.
 3. SyncroFlo, Inc.

PART 3: EXECUTION

3.01 Installation Of Pumps:

- A. General: Install plumbing pumps in accordance with manufacturer's published installation instructions, complying with recognized industry practices to ensure that plumbing pumps comply with requirements and serve intended purposes. **Provide valve bypasses around all booster pumps to facilitate maintenance.**
- B. Access: Provide access space around plumbing pumps for service as indicated, but in no case less than that recommended by manufacturer.
- C. Support: Install base-mounted pumps on minimum of 4" high concrete base equal or greater than 3 times total weight of pump and motor, with anchor bolts poured in place. Set and level pump, grout under pump base with non-shrink grout.
1. Install in-line pumps, supported from piping system.
- D. Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer.

1. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 Electrical sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- E. Piping Connections: Refer to Division-22 plumbing piping sections. Provide piping, valves, accessories, gages, supports, and flexible connections as indicated.

END OF SECTION 22 11 23