



WMU Design Guidelines Instructions: These guidelines are to be used by the Design Professional to inform the design process and outline WMU-specific desires for all University projects. These guidelines have been edited to reflect WMU preferences, and the intent is for the Design Professional to use this information to guide their normal specifications-writing process. Straying from what is indicated in the guidelines is not prohibited, but shall be discussed with WMU during the development of the project.

SECTION 21 3400 – PRESSURE MAINTENANCE PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vertical turbine, pressure maintenance pumps.

B. Related Section:

1. Division 21 Section "Controllers for Fire-Pump Drivers" for pressure-maintenance-pump controllers.

1.2 PERFORMANCE REQUIREMENTS

- A. Pump Equipment, Accessory, and Specialty Pressure Rating: 175 psig minimum unless higher pressure rating is indicated.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, performance curves, electrical characteristics, and furnished specialties and accessories.

- B. Shop Drawings: For pumps, accessories, and specialties. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.



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1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.6 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.

1.7 COORDINATION

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

PART 2 - PRODUCTS

2.1 VERTICAL TURBINE, PRESSURE MAINTENANCE PUMPS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. A-C Fire Pump Systems; a business of ITT Industries.
 - 2. Patterson Pump Company; a subsidiary of the Gorman-Rupp Company.
 - 3. Peerless Pump, Inc.
- B. Description: Factory-assembled and -tested, vertical, multistage, open-line-shaft turbine pump as defined in HI 2.1-2.2 and HI 2.3; with pump motor mounted above pump head.
- C. Pump Construction:
 - 1. Pump Head: Cast iron, for surface discharge, with flange except connections may be threaded in sizes in which flanges are not available.
 - 2. Pump Head Seal: Stuffing box and stuffing.
 - 3. Line Shaft: Stainless steel or steel, with corrosion-resistant shaft sleeves.
 - 4. Line Shaft Bearings: Rubber sleeve, water lubricated.
 - 5. Line Shaft: Steel.
 - 6. Line Shaft Bearings: Corrosion resistant, oil lubricated.
 - 7. Impeller Shaft: Monel metal or stainless steel.
 - 8. Bowl Section: Multiple cast-iron bowls with closed-type bronze or stainless-steel impellers.
 - 9. Column Pipe: ASTM A 53/A 53M, Schedule 40, galvanized-steel pipe with threaded ends and cast-iron or steel fittings, in sections 10 feet or less, with strainer of cast or fabricated bronze or stainless steel at bottom.
- D. Motor: Single speed with permanently lubricated ball bearings. Comply with requirements in Division 21 Section "Common Motor Requirements for Fire Suppression Equipment."
 - 1. Power Cord: Factory-connected to motor for field connection to controller and at least [10 feet] <Insert dimension> long.



- E. Base: Cast iron or steel with hole for electrical cable.
- F. Nameplate: Permanently attached to pump and indicating capacity and characteristics.
- G. Capacities and Characteristics:
 - 1. Rated Capacity: <Insert gpm>.
 - 2. Total Dynamic Head: <Insert feet>.
 - 3. Working Pressure: <Insert psig>.
 - 4. Inlet Column Size: <Insert NPS>.
 - 5. Pump Column Length: <Insert feet>.
 - 6. Outlet Size: <Insert NPS>.
 - 7. Flange: [Class 125] <Insert class>.
 - 8. Suction Head Available at Pump: <Insert feet>.
 - 9. Motor Horsepower: <Insert value>.
 - 10. Motor Speed: <Insert rpm>.
 - 11. Electrical Characteristics:
 - a. Volts: [120] [240] <Insert value>.
 - b. Phases: [Single] [Three].
 - c. Hertz: [60] <Insert value>.
 - d. Full-Load Amperes: <Insert value>.
 - e. Minimum Circuit Ampacity: <Insert value>.
 - f. Maximum Overcurrent Protection: <Insert amperage>.
 - 12. Pump-Start, Pressure-Switch Setting: <Insert psig>.
 - 13. Pump-Stop, Pressure-Switch Setting: <Insert psig>.

2.2 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 21 Section "Common Motor Requirements for Fire Suppression Equipment."
 - 1. Motor Sizes: Minimum size as indicated; if not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 2. Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. NFPA Standard: Comply with NFPA 20 for installation of pressure-maintenance pumps.
- B. Base-Mounted Pump Mounting: Install pumps on concrete bases. Comply with requirements for concrete bases specified in Division 03 concrete section.



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1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.
5. Attach pumps to equipment base using anchor bolts.

C. Install vertical-turbine, pressure-maintenance pumps according to HI 2.4.

3.2 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Pressure-maintenance pumps will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.3 ADJUSTING

A. Lubricate pumps as recommended by manufacturer.

B. Set field-adjustable pressure-switch ranges as indicated.

END OF SECTION 21 3400