	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: Plumbing Standards	Section: 22 13 29 Sanitary and Storm Pumps
		Date: 08/05/2017
		Author: Office of Facilities
CC: Project Folder		

Date	Description of Change	Pages / Sections Modified	ID
8/5/17	Entire document	-	mgl

PART 1 - INTRODUCTION

1.1 This equipment standard applies to Sanitary and Storm Sewage Pumps.

PART 2 - GENERAL DESIGN GUIDELINES

2.1 GENERAL

- A. Pumps systems shall be duplex type, each pump sized for 100% of the peak design flow affluent.
- B. Local alarms shall be audible, and visual. System alarms shall be integrated into BMS.
- C. Coordinate level alarm strategy with Yale Facility Engineering, see applicable detail.
- D. Provide fully assembled units with flanged pipe connections. Construction shall permit complete serviceability without the necessity of breaking piping or motor connections.
- E. All rotating parts shall be statically and dynamically balanced. Pumps shall operate at 1750 rpm.
- F. Pumps, and floats are to be specially designed to suit temperature and chemical composition of system affluent.
- G. Provide separate electrical feeds for each pump motor with separate disconnecting means to allow for servicing motor without interrupting the operation of the other pump and motor assembly. Control circuits shall likewise be capable of independent operation of each pump, motor, and applicable float switches.
- H. System isolation and directional valves shall comply with University Valve Standards.
- I. Pumps shall be connected to emergency power system.


2.2 MOTORS AND CONTROLS

- A. Motors: Provide with equipment in accordance with Electrical Standards.
- B. Motor Starters: Provided under Electrical Section except when provided within equipment control panels.


PART 3 - MINIMUM PRODUCT REQUIREMENTS

3.1 DUPLEX SUMP PUMP VERTICAL PEDESTAL TYPE PUMPS


- A. Provide duplex vertical suspended centrifugal, open impeller type sump pump. Pump shall be one of the three, substitutes are not allowed.

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1. Approved Manufactures
 - a. Weil,
 - b. ABS
 - c. ITT Flygt.
 - B. Pump shall be fabricated of the following components; pump fluid shall govern requirement.
 1. Minimum Requirements, for Standard Conditions and non-corrosive fluids.
 - a. Provide cast iron strainer, base plate, suction plate, casing and bronze impeller and stainless steel shaft. Unit to be furnished with split floor plate on a vertical shaft and discharge pipe.
 2. Alternate Requirement, for non-standard Conditions
 - a. Provide configuration equal to minimum requirement, pumping system materials of construction rated for minimum and maximum temperature, and chemical composition of fluid.
 - C. Pump to be directly connected by means of a flexible coupling to a TEFC electric motor.
 - D. Provide float switches and high water alarm float switch attached to a vertical support pole with a compression type cable grips mounting plate. Float switches and appurtenances shall be rated for temperature and chemical composition of affluent.
 - E. Provide Weil Pump Model 2613 or approved equal rail type pump removal system.
 - F. Provide a single duplex control panel in NEMA-3 enclosure. Panel shall consist of fusible disconnect switches, magnetic starter(s) with overload relays and quick trip heaters and HOA selector switches. Fused disconnect switch(es) shall have operators extending through panel door and shall be interlocked to prevent opening of panel door. Provide electronic alternator, control circuit transformers with fused secondary, pump running lights, overload reset buttons, alarm bell, silencer for high water conditions and contacts for a remote alarm.
- 3.2 DUPLEX SUMP PUMP SUBMERSIBLE TYPE PUMPS
- A. Provide Duplex submersible type centrifugal sump pump. Pump shall be one of the following three, no substitutions allowed.
 1. Approved manufactures
 - a. Weil Pump Co.,
 - b. Flygt
 - c. Weinman.
 - B. Pump shall be fabricated of the following components; pump fluid shall govern requirement.
 1. Minimum Requirements, for Standard Conditions and non-corrosive fluids.
 - a. Provide cast iron strainer, base plate, suction plate, casing stainless steel shaft, bronze impeller discharge connections and sufficient power cable to reach control cabinet.

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2. Alternate Requirement, for non-standard conditions
 - a. Provide configuration equal to minimum requirement, pumping system materials of construction rated for minimum and maximum temperature, and chemical composition of fluid.
 - C. Provide cast iron strainer, base plate, suction plate, casing stainless steel shaft, bronze impeller discharge connections and sufficient power cable to reach control cabinet.
 - D. Motors to be hermetically sealed dry running type, TEFC electric motor.
 - E. Provide float switches and high water alarm float switch attached to a vertical support pole with a compression type cable grips mounting plate. Float switches and appurtenances shall be rated for temperature and chemical composition of affluent.
 - F. Provide Weil Pump Model 2613 or approved equal rail type pump removal system.
 - G. Provide a duplex control panel in NEMA-3 enclosure. Panel shall consist of fusible disconnect switches, magnetic starters with overload relays and quick trip heaters, and HOA selector switches. Fused disconnect switches shall have operators extending through panel door and shall be interlocked to prevent opening of panel door. Provide electric alternator, for duplex systems control circuit transformers with fused secondary, pump running lights, overload reset buttons, alarm bell, silencer for high water conditions and contacts for a remote alarm.
- 3.3 DUPLEX SEWAGE EJECTOR - VERTICAL (PEDESTAL) PUMPS
- A. Provide Duplex vertical sewage ejectors, Pump shall be one of the following three, no substitutions allowed.
 1. Approved Manufactures
 - a. Weil Pump Co.,
 - b. ABS
 - c. Fleet.
 - B. Provide two vertical non-clog sewage ejectors with lubrication system and drip-proof ball bearing type, flexibly coupled electric motors. Motors shall be designed of ample capacity to perform the duty without overloading.
 - C. Each pump shall have a fully enclosed, two port, non-clog impeller capable of passing 3" solid matter and rated for affluent.
 - D. Pump shall be fabricated of the following components; pump fluid shall govern requirement.
 1. Minimum Requirements, for Standard Conditions and non-corrosive fluids
 - a. Each pump shall be constructed with bronze impeller; stainless steel shaft; bronze pump casing and suction plate; intermediate bearing and housing; ball thrust bearing; pressure grease fitting and lube pipe; flexible coupling steel leg and discharge pipe with expansion joints.
 2. Alternate Requirement, for non-standard Conditions

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- a. Provide configuration equal to minimum requirement, pumping system materials of construction rated for minimum and maximum temperature, and chemical composition of fluid.
 - E. Provide float switches and high water alarm float switch attached to a vertical support pole with a compression type cable grips mounting plate. Float switches and appurtenances shall be rated for temperature and chemical composition of affluent.
 - F. Provide Weil Pump Model 2613 or approved equal rail type pump removal system.
 - G. Provide a Duplex control panel in NEMA 3 enclosure. Panel shall consist of fusible disconnect switches, magnetic starters with overload relays and quick trip heaters and HOA selector switches. Fused disconnect switches shall have operators extending through panel door and shall be interlocked to prevent opening of panel door. Provide electric alternator, control circuit transformers with fused secondary, pump running lights, overload reset buttons, alarm bell and silencer for high water condition & contact for remote alarm. Provide weighted horizontal swing check valve in pump discharge and University approved isolation valve downstream of each check valve.
- 3.4 DUPLEX SEWAGE EJECTOR - SUBMERSIBLE PUMPS
- A. Provide Duplex submersible sewage ejectors. System shall be one of the following three, no substitutions allowed.
 - 1. Approved manufacture's
 - a. Flyght,
 - b. Weil Pump Co
 - c. Weinman.
 - B. Provide pumps capable of passing 3" solids, with 300 Series stainless steel shafts, cast iron impeller, double mechanical seals, discharge connections and power cable of sufficient length to reach control panel.
 - C. Motors hermetically sealed dry running type with Class F. insulation.
 - D. Provide mercury flat switches and high water alarm float switch attached to a vertical support pole with a compression type cable grips mounting plate.
 - E. Provide Weil Pump Model 2613 or approved equal rail type pump removal system.
 - F. Provide a Duplex control panel in NEMA I enclosure. Panel shall consist of fusible disconnect switches, magnetic starters with overload relays and quick trip heaters and HOA selector switches. Fused disconnect switches shall have operators extending through panel door and shall be interlocked to prevent opening of panel door. Provide electric alternator, control circuit transformers with fused secondary, pump running lights,, overload reset buttons, alarm bell and silencer for high water condition & contact for remote alarm.
 - G. Provide weighted horizontal swing check valve in pump discharge and gate valve downstream of each check valve. Valves shall meet requirements of valve paragraph of this section.

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PART 4 - INSTALLATION REQUIREMENTS:

4.1 Quality:

- A. All equipment and components supplied by the equipment manufacturer shall be warranted for a period of two (2) years from date of start-up.

4.2 Commissioning:

- A. A start-up report shall be issued at turn-over to the owner. The start-up report shall include testing of all equipment, and confirmation of sequence of operation. Each item will be itemized and indicate the testing was completed and passed. Additionally, all critical set-points will be logged.

END OF SECTION