

Design Standard Hydronic Pumps

Purpose:

Hydronic pumps are an essential element of the mechanical space cooling and heating systems. This design standard has the purpose of creating a consistent application of hydronic pump requirements throughout the East Side Union High School District, therefore achieving a standard of quality for maintenance, energy efficiency, and reliability throughout all renovation and new building projects.

Design Standard:

Design and specify work to include materials, installation and testing of pumps for a complete and operable system.

- General:
 - Factory-tested pumps cleaned and painted with enamel prior to shipment. Do not install any pumps at Skyline College in contact with the outdoor environment.
 - All pumps shall have bronze impellers.
 - A single gage shall be connected to the discharge and suction side of each pump and across the strainer so that the differential pressure can be observed.
- Pumps – Closed Coupled
 - Closed-coupled pumps are not permitted over 15 hp.
- Pumps – Base Mounted, End Suction
 - Pumps shall be electric-motor-driven, centrifugal, single-suction, single-stage pumps. Pumps shall be bronze fitted, with bronze impeller, with close-grained semi-steel vertically split casing (125 psi), provided with mechanical seals designed for the operating conditions shown on the plans. Pumps shall be provided with sleeve bearings and an oil reservoir. A drop-out coupling shall be provided.
 - Pumps shall have a sleeve bearing, specially selected for quiet operation at 1750 rpm. The motor size shown on the drawing shall be the minimum acceptable. A pump motor should operate within the service factor of the motor, providing that the service factor is acceptable to the pump manufacturer. The motor shall not exceed the nominal hp at the specified delivery and head.

- Discharge increasers shall be concentric and located at the pump discharge nozzle. Suction pipe reducers shall be eccentric, located at the pump suction nozzle and at least five diameters of straight pipe shall be installed before the inlet or along the sweep elbow. (Suction diffusers in lieu of straight pipe section may be used.) A 0.75-in. drain shall be provided from each base plate to the nearest floor drain.
- Pumps shall be selected so that the ratio of impeller diameter to the maximum diameter possible in the casing shall not exceed 0.85 for constant volume systems, for spare capacity. A purge cock shall be provided in the casing and gage tappings shall be provided in pump suction and discharge.
- All piping connections to pumps shall be supported independently so that no strain is imposed on the pump casing.
- Pumps installed on “slab-on grade” shall be mounted on a 6-in. high concrete pad with anchor bolts. The space between pad and base shall be grouted to eliminate all voids.
- Pumps shall have rear pull-out design for removal of the impeller without disturbing the motor alignment or piping.
- Pumps installed on supported slabs shall be provided with concrete inertia subbases with spring isolators.
- In-Line Pumps
 - Pumps shall be centrifugal and single-stage, complete with motor, mechanical seals, bronze fittings, bronze impellers, and a flexible coupler with safety guard. The pumps shall also be dynamically and hydraulically balanced.
 - The pump motor shall be supported independently.

Approved Manufacturers:

- Pumps – Base Mounted, End Suction
 - Bell & Gossett
 - Taco
 - Paco
- In-Line Pumps
 - Bell & Gossett
 - Taco
 - Paco

Substitutes Allowed:

Yes, if performance and quality equivalency can be evidenced.

Associated Design Standards and Construction Specifications

- Division 23 HVAC Design Standards
- 23 05 10 – HVAC Piping Design Standards
- 23 05 53 - Identification for HVAC Piping And Equipment Design Standards
- 23 21 13 - Hydronic Piping Systems Design Standards

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