PART 1 - GENERAL

1.01 Large or critical pumping systems: 100% redundancy (primary-secondary pumps, possibly with alternating lead-lag operation). Consider redundancy on other systems on a case by case basis.

1.02 For large hydronic piping systems use base-mounted or vertical in-line pumps.

1.03 Each pump in parallel configuration: valve and pipe to allow for removal without interrupting system operation. Place unions and valves in accessible positions. Install pressure gauges with isolation valves on each side of pumps. Where single pressure gauge serves both suction and discharge sides of pump, install pressure gauge in manifold with isolation valve on each side.

1.04 No Dielectric components, nipples or unions on closed loop systems.

1.05 If radiant in-slab or in-wall heating is used, consultant will place a note on all applicable design drawings and specs warning of the tubing depth. Design of walls and decks with radiant tubing shall allow for the tubing to be at least 1 inch below the surface of the floor surface. Preplan all floor boxes, drains, in-slab conduits, etc, to make allowances for the tubing installation. In no case shall drill in anchors be used if the tubing is less than 2 inches from either the top or bottom side of a slab with radiant tubes with adequate design provisions.

PART 2 - PRODUCTS

2.01 Base mounted, vertical in-line and close-coupled pumps: Bell & Gossett, Taco, or Armstrong. No Alternate Brands, No Substitutions.

2.02 Rubber pump connectors not allowed.

2.03 Pumps with resilient motor mounts not allowed.

2.04 In-line circulators: wet rotor type, Grundfos, Vilo, or Bell and Gosset, No Alternate Brands, No Substitutions.

2.05 Equip all pumps of 3/4 H.P. rating and greater with magnetic motor starters with H-O-A switches and indicators; 208 v 3ph or 480 v 3ph. Use thermally protected integral manual motor starters with all pumps of less than 3/4 H.P. rating; 115 v 1ph. Consult with UAF FS on use of small pumps with integrated VFD.

2.06 Utilize PEX tubing for radiant with Oxygen Barrier, confirm PEX-A with UAF FS Engineering.

2.07 Generally, no grooved end piping on hydronic cooling or heating systems. Copper or Steel piping with soldered or welded joints and fittings. On special case, FS/DDC may consider
Victaulic only for grooved end piping. Must be approved and coordinated with FS/DDC.

2.08 Valves

A. Up to 3”, ball valve

B. Larger than 3”, indicating type

PART 3 - EXECUTION

3.01 Locate isolation valves as close as practical to the isolated equipment to minimize drainage volume.

3.02 Where possible, locate all valves 3 inch size and smaller accessible from floor or working platform.

3.03 Locate valves larger than 3 inches in mechanical rooms where they can be operated from floor. Provide chain operators where valve handles are more than 6 feet-6 inches above floor.

3.04 Install pumps accessible and serviceable from floor or working platforms. Pumps larger than small "canned rotor" pumps shall not require ladder access.

3.05 Constant volume parallel pumps shall be installed with non-slam check valves.

END OF SECTION