

GENERAL:

1. To provide guidance in the selection of plumbing equipment. Guidance is classified as
 - 1.1. Acceptable manufacturers
 - 1.2. Preferred manufacturers
 - 1.3. Sole Source, no substitutes
2. These standards ensure the plumbing systems function properly, are easy to maintain and provide reliable operation over the life of the facility.

DESIGN GUIDELINES:

1. Backflow Preventers.
 - 1.1. All backflow preventers must comply with Missouri DNR rules and regulations.
 - 1.2. Acceptable manufacturers include the following vendors:
 - 1.2.1. Watts
 - 1.2.2. Zurn/Wilkins
2. Water booster pumps.
 - 2.1. Packaged units are preferred, with pumps, disconnects, controllers all assembled on a common base.
 - 2.2. Preferred manufacturers:
 - 2.2.1. Bell and Gossett
 - 2.2.2. Grundfos
3. Water Softeners.
 - 3.1. Provide a single or duplex media and brine tank(s) and electronic water meter controller as follows:
 - 3.1.1. Control valve shall be a single body, 5 cycle, piston operated valve manufactured by Fleck. Individual diaphragm valves are NOT acceptable.
 - 3.1.2. Provide an electronic water meter to control regeneration schedule.
 - 3.2. Media tank shall be constructed of non-corrosive fiberglass
 - 3.3. Resin shall be a high capacity sulfonated polystyrene media capable of handling common hard water conditions.
 - 3.4. The brine tank shall be made of high density polyethylene to resist corrosion and puncture. Larger tanks are available on all commercial systems. Safety floats standard on all tanks. Salt grids are optional.
4. Water heaters
 - 4.1. The hot water heater package shall be steam fired, vertical pre-insulated tank and internal circulating pump with all necessary controls and piping accessories for a complete and useable hot water generator.
 - 4.2. The storage tank shall be glass lined, constructed and stamped according to ASME specifications for 125 psi working pressure. Water heater shall be capable of entering a mechanical room through a standard 3'-0" x 6'-8" door. Storage tank

- capacity shall be as scheduled. Tank shall be insulated with 3" fiberglass insulation, with an R-value > 12.5. Tank shall be jacketed with heavy gauge steel with a baked enamel finish.
- 4.3. The unit shall be designed to recover the quantity of water in gallons per hour specified in the schedule, a 100°F temperature rise (40°F to 140°F) when supplied with 5 psi steam to the temperature regulator.
 - 4.4. The heating coil shall be constructed and stamped according to section VIII of ASME code. The tube bundles shall be constructed of 3/4" O.D. 20 GA. deoxidized drawn copper tubing.
 - 4.5. Unit shall have an ASME temperature & pressure relief valve.
 - 4.6. The packaged unit shall also include the following:
 - 4.6.1. A temperature regulator to be self actuated, direct acting Spence type E Valve and T124/134 temperature and pressure pilot. No substitutions are permitted.
 - 4.6.2. Main F&T trap, main "Y" strainer and associated black steel pipe.
 - 4.6.3. A bronze integral circulator pump with copper soldered recirculation line and (2) bronze ball valves.
 - 4.6.4. A drain valve and assembly.
 - 4.6.5. Jacket mounted temperature & pressure gauge.
 - 4.6.6. Full length channel base and lifting lugs.
 - 4.6.7. Air vent and vacuum breaker.
 - 4.6.8. A 4"x6" handhole, and 11"x15" manhole.
 - 4.7. Preferred Manufacturers:
 - 4.7.1. AO Smith Corporation
5. Electric Water Coolers
- 5.1. Units shall be a 1 or 2 (high/low) unit design, ADAAG approved with INTEGRAL refrigeration system. REMOTE refrigeration designs are NOT PERMITTED.
 - 5.2. *MU Res Life only*: In lieu of dual level refrigerated drinking fountains, provide two separate wall mounted, vandal resistant, water coolers with at least 1 of the units of the barrier free access design. Units shall be installed with a minimum of six (6) inches of clearance between the two. Each unit shall be furnished with its own electrical duplex outlet, P-trap, and 3/8" cold water connection with stop valve. Water coolers will be supported from wood blocking in the wall cavity, not supported on a metal carrier.
 - 5.3. Unit electric service shall be 110 volt.
 - 5.4. Elkay units are preferred.
 - 5.5. Bottle Fill stations included.
6. Sump pumps
- 6.1. Sewage, effluent pumps shall be a cast iron, oil-filled, non-clogging bronze impeller and U.L. Listed. Pump shall be capable of passing a 2" sphere.
 - 6.2. Grinder pumps shall be cast iron, bronze impeller with a stainless steel cutter and disc.
 - 6.3. For MU E&G Buildings only, pumps shall be purchased WITHOUT controls. MU Maintenance will build the control panels. Power wiring (and raceway for control

wiring if applicable) shall be included in the contract documents. Note that if a duplex sump pump is being used, two (2) separate power feeds are required.

- 6.4. For MU steam manholes, Refer to Division 33, Section 6315 and the campus PM for additional standards.
- 6.5. For elevators, refer to Section 140000 Conveying Systems for sump pump and pit construction. Sump pumps shall be equal to Stancor elevator Pit Oil-minder control system. Size of control and pump system to be determined based on ground water conditions. Be sure that the drawings indicate all work required for discharge piping in accordance with ASME 17.1 elevator standard and applicable plumbing codes.
- 6.6. Approved manufacturers
 - 6.6.1. Zoeller
 - 6.6.2. Gould

REFERENCES
