

PART 1 - GENERAL

- 1.01 Provide floor cleanouts on main waste piping installed above finished spaces at all levels to facilitate maintenance. This requirement is in addition to code required cleanouts.
- 1.02 Consultant shall review the need for acid waste piping and acid neutralization systems with owner prior to specifying these systems. In some cases, a waiver may be sought on this code requirement from the State of Alaska, especially in renovations.
- 1.03 Coordinate selection of allowable domestic waste piping with Facilities Services. Cast iron is preferred, but some projects require copper DWV for space constraints and some will work well for ABS.

PART 2 - PRODUCTS

- 2.01 Sanitary sewer piping, above grade:
 - A. Cast iron pipe: hubless, service weight. Cast iron fittings. Joints: Neoprene gaskets and four band stainless steel clamp-and-shield assemblies.
 - B. Copper pipe: DWV. Fittings: cast bronze, or wrought copper. Solder joints.
 - C. ABS pipe: Schedule 40 ABS DWV where allowed by code; not in spaces requiring non-combustible construction such as plenums, rated shafts, etc.
- 2.02 Sanitary sewer below grade:
 - A. Interior below grade:
 1. Cast iron pipe: hubless, service weight. Cast iron fittings. Joints: Neoprene gaskets and four band stainless steel clamp-and-shield assemblies.
 2. Schedule 40 ABS DWV on approval by FS/DDC
 - B. Exterior below grade: Refer to Division 33
- 2.03 Domestic water piping, above grade:
 - A. Copper tubing: Type L, hard drawn. Fittings: cast bronze or wrought copper. Solder joints.
 - B. Ductile Iron: Schedule 40 cement lined AWWA rated for domestic water service. Joints: Grooved fittings. Refer to Division 21 for piping after backflow preventer for fire service.
 - C. PEX allowed for residential hot and cold water. No polybutylene pipe allowed.

- 2.04 Domestic water pipe, below grade:
- A. Copper type K: soft drawn.
 - B. HDPE: SDR17 or better, sized to pressure class. Joints: welded.
 - C. Ductile Iron: Schedule 40 cement lined AWWA rated for domestic water service. Joints: Bell and Spigot.
- 2.05 Storm water piping, above grade:
- A. Cast iron pipe: CISPI 301, hubless, service weight. Fittings: Cast iron. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.
- 2.06 Storm water pipe, below grade, within 5 feet of building: (refer to Division 33 beyond 5 feet)
- A. Cast iron pipe: hubless, service weight. Cast iron fittings. Joints: Neoprene gaskets and four band stainless steel clamp-and-shield assemblies.
- 2.07 RO (reverse osmosis) and DI (distilled/deionized) water piping, above grade:
- A. Polyvinyl chloride (PVC) pipe and fittings: Schedule 80, socket type, solvent joints.
- 2.08 Acid resistant waste and vent piping, above grade:
- A. Pipe: UL classified flame retardant polypropylene. Use of borosilicate glass is limited to retrofit situations only, as approved by the UAF FS/DDC Project Manager.
 - B. Fittings: same material as pipe.
 - C. Joints:
 - 1. Glass: Compression type bead-to-bead and bead-to-plain end coupling. Outer shell, bolt and nut formed of stainless steel. Inner seal ring of PTFE (Teflon).
 - 2. Polypropylene: Mechanical joints for above grade, fusion joints for below grade.
- 2.09 Compressed air (plant) above grade:
- A. Copper tubing: Type L, hard drawn. Fittings: cast bronze or wrought copper. Joints: brazed preferred, silver solder allowed.
 - B. Galvanized steel pipe: Schedule 40. Joints: Malleable screwed fittings.

2.10 Flanges, unions and couplings:

- A. Pipe size 2 inches and under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.
- B. Pipe size over 2 inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping. Neoprene gaskets for gas service: 1/16 inch thick preformed neoprene bonded to fiber.
- C. Dielectric connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- D. Grooved fittings: Galvanized fittings to accompany galvanized piping. Couplings and fittings: standard manufacture grooved fittings with gaskets compatible to system pressure, temperature range and fluid. Grooved fittings allowed only at water service in mechanical rooms or in utilidor. Victaulic, Gruvlok or equal.

2.11 Gate valves:

- A. Up to 3 inches: Not permitted; use ball valves for isolation service.
- B. Over 3 inch: Use butterfly or gate valves.

2.12 Globe valves:

- A. For throttling service.

2.13 Ball valves:

- A. Up to 3 inches: Bronze two piece body, full port, and forged brass, chrome plated ball, Teflon seats and stuffing box ring, lever handle, solder or threaded ends.
- B. Over 3 inches: Cast steel, two piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged. Seat material to be compatible with liquid handled.
- C. RO and DI water: Polyvinyl chloride (PVC) end entry, or socket type for 1 inch and smaller, with Teflon seats and viton seals.
- D. FNW Valves: Not allowed.

2.14 Swing check valves:

- A. Up to 2 inches: Bronze swing disc, solder or screwed ends.
- B. Over 2 inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends.

- 2.15 Spring loaded check valves:
- A. Iron body, bronze trim, spring loaded, renewable composition disc, screwed, wafer, or flanged ends.
- 2.16 Water pressure reducing valves:
- A. Up to 2 inches: Bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded and single union ends.
 - B. Over 2 inches: Cast iron body, bronze fitted, elastomer diaphragm and seat disc, flanged.
- 2.17 Relief valves:
- A. Bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.
- 2.18 Lab Process Piping:
- A. Interior Propane: Steel pipe, ASTM A53, scheduled 40 black. Fittings: ANSI/ASME B16.3 malleable iron. Joints: Threaded up to 2-inch, welded above 2-inch.
 - B. Exterior Propane: Steel pipe, ASTM A53, scheduled 40 black. Fittings: ASTM A234 forged steel welding type. Joints: Welded to ASME B31.9. Provide jacket meeting AWWA C105, two layers of 10-mil polyethylene tape.
 - C. Lab Vacuum: Copper tubing: Type L, hard drawn. Fittings: cast bronze or wrought copper. Joints: brazed.
- 2.19 Circulation Pumps: Wet Rotor

PART 3 – EXECUTION

- 3.01 Provide cleanouts for water closets, urinals, drinking fountains, janitor sinks, lavatories, floor drains, sinks, etc. Wall cleanouts are preferred. Cleanouts may be provided at the end of ganged runs such as urinals, water closets, lavatories where appropriate.
- 3.02 Provide cleanouts for water closets and urinals approximately 6-inch above the flood rim of the highest device in the gang served.
- 3.03 Where cleanouts are installed with nipples (barrel fittings), where trap arms are to be used for cleanouts, and where horizontal waste piping connects to vertical waste piping, provide wye and combo wye fittings to facilitate maintenance. Santee's and fixture fittings are not allowed where wye's and combo wye's will fit.

- 3.04 At floor mounted mop sinks, extend the vent up the wall in size equal to the waste pipe to an accessible wall cleanout, then reduce vent to size appropriate for fixture.
- 3.05 Make every effort to avoid offset vents below the floor. To the greatest extent possible follow the guideline to route waste piping from floor drain to the vent, then to the waste main. Where the floor drain is within five feet of the vent take-off, oversize the vent take-off same as for mop sink and provide cleanout in wall.
- 3.06 Install plumbing piping to maintain minimum 1 inch clear from all other piping and ductwork. Where piping or ductworks are insulated this requirement applies to surface of insulation.
- 3.07 Below grade, 4 inches and larger waste piping may be run at 1/8 inch per foot with the approval of the AHJ. Suspended waste piping of all sizes must be run at 1/4 inch per foot.
- 3.08 Isolation valves:
- A. Provide isolation valves in all domestic and lab piping at each bank of toilets, break rooms, individual toilet rooms, laboratories, and other areas as prudent for service isolation.
 - B. For multi-story buildings, provide isolation on each different system at each floor level and if appropriate, each zone or wing of the building.
- 3.09 Hot water circulation:
- A. Provide hot water circulation lines to ends of hot water mains and provide flow adjustment valve on each recirculating line branch. Minimum pipe size: 3/4 inch. Minimum flow: 1/2 gpm. Size combined hot water circulating piping for maximum 4 foot/second flow velocity.
 - B. Balancing or flow control valves shall be NSF approved.

END OF SECTION