

22 00 00: GENERAL

1.01 General Requirements

- A. Building utilities are required to be metered & compatible with current SHSU BAS System including but not limited to domestic water and gas. Locate metering equipment inside a mechanical room. Meter runs shall be constructed in accordance with SHSU details. Provide isolation valves to accommodate meter service. Install bypass on water meters. For buildings with mixed occupancy (E&G and non-E&G), provide sub-metering to property allocate utility costs between organizations. Coordinate sub-metering requirements with the University.
- B. For hot water systems that require sub metering individual systems shall be isolated from each other.
- C. 2-1/2", 3-1/2 and 5 inch pipe diameters ARE NOT ALLOWED
- D. Do not locate plumbing piping or equipment in transformer vaults, elevator hoist-ways, elevator equipment rooms, electrical rooms, or telecommunications rooms.
- E. Provide sufficient unions, flanges, and isolation valves to permit removal of equipment.
- F. Provide one-piece stainless steel escutcheons for piping entering floors, walls, and ceilings in exposed spaces.
- G. For equipment providing critical services provide N+1 redundancy for all restaurant and laboratory buildings, to be evaluated during programming.
- H. In all Residence Life Buildings provide a clean-out for each lavatory and /or kitchen drain above flood plane located in wall above counter. Cleanout plug flush with wall so a mirror or access cover can be mounted.
- I. For sanitary piping clean outs must be provided at each change of direction and located at a suitable place for ease of maintenance and clean up. CLEANOUTS SHALL BE 2-WAY & LOCATED AND ACCESSIBLE ON THE EXTERIOR OF THE BUILDING AT ALL CHANGES IN PIPE DIRECTION GEATER THAN 1/8 BEND. MAXIMUM DISTANCE BETWEEN CLEANOUTS SHALL BE 80 FEET.
- J. Pro-Press type fitting are acceptable
- K. PIPING SHALL BE DOMESTICALLY MANUFACTURED.
- L. No pulled Tee's allowed.
- M. No homemade plumbing fittings allowed.
- N. Water Heaters must be manufactured by either A.O. Smith or State.

22 05 00: COMMON WORK RESULTS FOR PLUMBING

1.01 Requirements:

A. Valves:

1. Full throat ball valves only
2. Provide valves with extended stems to be accessible on outside of insulation. Valve body and stem shall be insulated.
3. Provide means of access where valves are not exposed.
4. Provide valve vaults or boxes, as conditions demand, to provide access to valves installed below grade. PIPE DRAIN TO STORM SEWER IF APPLICABLE
5. Valves applied to cold water and piping systems with fluids typically less than ambient temperature shall be constructed with all components exposed to atmosphere of stainless steel or brass. Steel components are not acceptable. For valves 3" or smaller use Stainless steel components with suitable trim on underground valve installations.
6. For all domestic water 4" or larger underground valves must be PRATT groundhog butterfly valves. No substitutions allowed.

B. Hangers and Supports:

1. The use of pipe hooks, chains, or perforated iron piping for support is prohibited.
2. Provide Linkseal (or approved equal) assembly for pipe penetrations through waterproofed walls.

PART 2: PRODUCTS

2.01 Valves:

A. Shutoff and Section Valves:

1. SHSU require Ball Valves or butterfly valves; Watts or Nibco brand, Bronze, full throated.

B. Drain Valves:

1. SHSU require Ball Valves or butterfly valves; Watts or Nibco brand, Bronze, full throated.

C. Check Valves:

1. Provide spring-loaded silent check valves.
 - a. For valves 3" or larger split wafer check valve
2. SHSU require; Watts or Nibco brand, Bronze, full throated.

22 07 00: PLUMBING INSULATION

1.01 Requirements:

- A. Provide pipe insulation continuous through walls, partitions, ceiling openings and sleeves. For penetrations that require link seal insulation no insulation shall be installed in the seal area.
- B. Provide aluminum jackets for exterior & interior pipe and equipment insulation covers, as well as for exposed piping in mechanical rooms subject to wear or abuse. Locate seams on bottom side of horizontal pipe
- C. Provide insulation protection shields fabricated from galvanized steel at all pipe hangers. All insulation at the shields shall be high density appropriate for the load.
- D. Insulate valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut units.
- E. All equipment requiring insulation, the insulation jacket shall be designed to be removable and reused.

22 10 00 PLUMBING PIPING

1.01 Requirements:

- A. Provide sectional valves on each branch and riser, close to main, where branch or riser serves 2 or more plumbing fixtures or equipment connections.
- B. Provide shutoff valves installed on inlet of each plumbing equipment item and on inlet of each plumbing fixture. Residence Life Buildings requires ¼ turn stops McGuire BV2166
- C. Provide drain valves at equipment, bases of risers, and low points in system to completely drain potable water system including
- D. Recommend in-line circulating pumps or close-coupled end suction pumps for low flow circulating systems. Taco, Gorman Rupp, Grundfos & Bell & Gossett.
- E. Provide all booster pumps with a valved bypass line to facilitate maintenance, basis of design Grundfos bp – Grundfos Model MPC-E 3CRE15-2 480/3/60 Triplex Domestic Booster Package.

2.01 Pipes and Pipe Fittings:

- A. Pipe sizes 3/4" to 2" and smaller shall be Type L copper with lead free soldered connections using wrought-copper, solder-joint fittings. Copper Pro Press fittings with rubber o-rings joined using a hydraulic compression tool may be used. Piping smaller than 3/4" shall not be allowed.
- B. Domestic Hot Water return lines shall be Type K
- C. Pipe sizes 3" to 6" shall be Type K copper with soldered silver phosphate connections. Copper piping 4" and larger may be joined using roll grooved fittings or Pro Press. 2 1/2", 3 1/2 & 5" Pipe NOT ALLOWED
- D. Piping larger than 6" shall be ASTM A53 galvanized steel pipe, schedule 40, with rolled grooved ends and mechanical couplings.
- E. One-piece stainless steel riser for will be allowed for below grade under slab water supply.
- F. Below building concrete slab - Tube size 3/4" and larger: type "K" soft - annealed copper coil tubing. Copper tubing installed below building concrete slab on grade shall be installed without any joints.
- G. Underground water main piping systems: NO CAST IRON.

2.02 Piping Specialties:

- A. Provide basket strainers with cast-iron body, 125-psi flanges, bolted type or yoke type cover. Furnish with removable, non-corrosive perforated strainer basket, with 1/8" perforations and lift-out basket handle. Strainer sizes under 2" shall be brass or stainless steel.

2.03 Hydrants:

- A. Recessed Non-Freeze Wall Hydrants: Case-bronze casing, length to suit wall thickness, vacuum breaker, hinged locking cover, 3/4" inlet, hose outlet. Provide 1/4 turn, no key required.

2.04 Backflow Preventers:

- A. Shall be of the reduced pressure zone (RPZ) type. The assembly shall include shutoff valves on inlet and outlet, and strainer on inlet, and drain.
- B. ALL BUILDINGS REQUIRING REDUCE PRESSURE BACKFLOW PREVENTERS SHALL BE N +1 WITH BYPASS – bypass shall be confirmed by code consultant

2.05 Pressure Regulating Valves:

- A. Provide pressure gauge on valve outlet.
- B. Water Pressure Booster System:

1. General: Provide factory-fabricated and tested water pressure booster system consisting of diaphragm type water tank, centrifugal pumps, power and control panels, instrumentation, and operating controls. It is a University Standard to provide pumps with a valved bypass to facilitate maintenance.

PART 3: EXECUTION

2.01 Pipe Testing Procedures:

- A. Domestic water 24 hour test at 1-1/2 times working pressure. Flush water piping systems with clean water following successful testing.
- B. Disinfection of water systems: Disinfect hot and cold water systems as follows: Fill systems with water solution containing 50ppm chlorine (calculated based on total system volume); allow to stand for 8 hours, opening and closing all valves several times during this period; thoroughly flush; refill and place system in service; ensure residual chlorine content of 0.2ppm.

22 13 00: SANITARY SEWAGE

1.0 TESTING

- A. NO PIPING, FITTINGS SHALL BE COVERED BEFORE INSPECTION AND TESTING**
- B. TESTING REQUIRES 10 FT OF HEAD FOR 4 HOURS**

1.01 Requirements:

- A. Provide floor drains in all toilet rooms, janitor closets, and mechanical rooms.
- B. Extend cleanouts to finished floor or wall surface, with access covers installed flush to the finished surface. Ensure clearance at cleanout for rodding of drainage system.
 1. Residence Life Maintenance (RLM) buildings shall locate all cleanouts to exterior of building only.
 2. No main line cleanouts within interior of building with the exception of lavatory/kitchen sink cleanout.
- C. All interior Clean outs shall be above flood rim for inside of buildings unless prior approval by SHSU Plant Operations. Coordinate cleanout locations with Architect.
 1. Residence Life Maintenance buildings shall have main line sewer clean outs located every 75 feet on the exterior perimeter of the building with double cleanouts and popup plugs below flood plane.
- D. Encase exterior cleanouts in concrete with access cover installed flush with grade.

PART 2: PRODUCTS

2.01 Above Ground Drainage and Vent Pipe And Fittings

- A. Heavy Duty Couplings for Hubless Cast-Iron Soil Pipe: Hubless Clamps, heavy weight, stainless steel bands. Clamps shall be constructed and tested per ASTM C-1277. For pipe sizes 1-1/2" through 4" minimum four (4) bands and for pipe sizes 5" through 15" minimum six (6) bands.

2.02 Underground Drain Pipe And Fittings

- A. Cast-Iron Soil Pipe: ASTM A74, Service weight, hub-and-spigot soil pipe and fittings
- B. Neoprene Compression Gaskets: ASTM C564.
- C. Sewer Pipe and Fittings: Conform to ASTM D2729 for pipe and fittings.

2.03 Drainage Piping Specialties

- A. Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1, countersunk head.
- B. Floor Cleanouts: EXTERIOR ONLY - Cast-iron body and frame, with cleanout plug and adjustable round nickel bronze top. Do not utilize floor cleanouts on interior of buildings without prior approval from SHSU Plant Operations.
- C. Wall Cleanouts: Cast-iron body adaptable to pipe with cast-bronze or brass cleanout plug; stainless steel cover including screws.

2.04 Floor Drains

- A. Floor drains shall be provided with deep seal "P" traps at all floor drains.
- B.. There shall be adequate floor drains to provide drain for all equipment requiring same; one per piece of equipment, to eliminate excessive drain piping across floors.
- C. Floor Drain (corridors): Stainless steel body with flashing collar, ty-seal or caulked outlet and adjustable strainer head, stainless steel round strainer with satin finish.
- D. Floor Drain (mechanical rooms, storage rooms and other remote areas) shall be provided with a central piped primer system which automatically primes traps building wide using a single timed valve for one minute every 24 hours (adjustable).
 - 1. TRAP GUARDS ARE ACCEPTABLE WHEN APPLICABLE IN RESI LIFE
 - 2. GRAVITY FED TRAP PRIMERS ARE PREFERRED

2.05 Roof Drains

- A. Roof Drain (General Purpose): Cast-iron body with combined flashing collar and gravel stop, cast-iron dome.
- B. Roof Drain (controlled flow): Cast-iron body, combined flashing collar and gravel stop, cast-iron dome with adjustable flow rate control assembly
- C. Roof Drain (parapet roofs): Cast-iron body, flashing device, loose set grate.

2.06 Installation Of Piping Specialties

- A. Do not install backwater valves in sanitary building drain piping.

22 40 00: PLUMBING FIXTURES

1.01 Requirements:

- A. Floor mounted Urinals are not allowed
- B. Residence Life NO Garbage Disposers

PART 2: PRODUCTS

2.01 Fixtures:

1. Manufacturers: Where applicable, provide products by the following:
 - a. Water Closet (3-bolt) Blowout Action: Crane Water Closet (4-bolt) Siphon Jet Action: Kohler, Toto, Crane, Gerber, American Standard, Sloan and Eljer.
 - b. RLM requires American Standard, Toto
 - c. Flush Valve FV-2 Piston type (Automatic with sensor) 1.28 GPF: Auto Sloan Optima, battery-powered only.
 - d. Flush Valve FV-2 Diaphragm type, (Automatic with sensor) 1.28 GPF: Auto Sloan Optima
2. Toilet Seat: Solid-plastic, water-closet seat with bumpers and hardware, compatible with water closet and as follows:
 - a. Color: White.
 - b. Class: Commercial, Standard.
 - c. Size: Elongated/round
 - d. Pattern: Open front without cover or same as existing.
RLM requires closed front with lid
 - e. Hinge Type: Check (CK).
 - f. Provide with anti-microbial agent formed into the plastic.
3. Electric Water Cooler Wall Mounted ADA (ADA Compliant): With Hydration stations
4. Hose Bibs Toilet Rooms (HB-1): *No hose bibs in toilet rooms*
5. Wash Down Hose Station (WS-1): For Hot and cold water service, thermostatically controlled mixing valve with dial-in temperature setting, temperature limit stop and temperature gauge

2.02 Faucets:

A. Faucet (Type-A): ADA Compliant manual faucet. Polished chrome plated cast brass, 4" center set, 4" spout with chrome-plated constant flow aerator .35 GPM, single-wing handles indexed "HOT" and "COLD", and 1-1/2" waste with grid drain strainer. Provide supplies, angle valves and vinyl covers specified in the Articles below.

1. When new construction or renovation of plumbing fixtures of this designation are indicated, use products by Manufacturers' listed below or an approved equivalent (subject to compliance

with requirements).

- a. Chicago Faucet 802-317CP – dual lever with Quatern repairable disc.
- b. RLM requires Lavatory faucet Symmons model #S-20-0, PO plugs to be chrome plated brass grid strainer with IPS option.

B. Faucet (Type-B): ADA Compliant electronic BATTERY TYPE sensor-operated hand wash faucet for tempered hot and cold water with below sink mounted control module. Polished chrome plated cast brass, 4" center set trim plate, 5" spout with chrome-plated, pressure compensating flow control 0.35 GPM spray head (Aerator).

C. ADA Compliant Shower Faucet (Type-E):

1. RLM Requires Symmons II S-9603-PLR-CH
2. Shower Head: RLM requires Kosdo inc. Airjet model #KSAJ-150 max 1.25gpm chrome or approved equal

2.03 Flush Valves:

- A. Flush Valve (FV-1): **No Manual Flush Valves Unless approved by SHSU - Fixed volume Piston Type for (Water Closet)** exposed closet flush valve, chrome plated, metal oscillation non-hold-open handle, 1" I.P.S. screw driver operated combination angle check and stop valve with protective cap, adjustable tailpiece, vacuum breaker flush connection and spud coupling for 1-1/2" top spud flanges, 1.28 G.P.F. Mount ADA compliant flush valve handle to wide side of toilet stall, if no stall is incorporated, install to wide side of open area within room. Manufacturers: Sloan only. Must be battery powered only.

2.04 Fixtures Supports:

- A. Water Closet Supports:
- i. RLM requires Closet Knockout plastic flange with stainless steel ring Sioux Chief # 884-PTM.

2.05 Fittings, Trim, and Accessories:

- A. Supplies and Stops for Lavatories and Sinks: Polished chrome-plated, loose-keyed heavy commercial ¼ turn ball angle stop with wall flange having 1/2" inlet and 3/8" O.D. x 12" long stainless steel flexible supply riser tubing outlet, and brass chrome-plated escutcheon.
- i. RLM requires McGuire brand model BV2165 angle stop. Supply lines to be flexible stainless steel braided style
- B. Supplies and Stops for Tank Type Water Closets: Polished chrome-plated loose-keyed heavy commercial ¼ turn ball angle stop with wall flange having 1/2" inlet and 1/2" O.D. x 12" long stainless steel flexible supply riser tubing outlet with collar, and escutcheon.
- i. RLM requires McGuire brand model BV2165 angle stop. Supply lines to be flexible stainless steel braided style
- C. Traps for Lavatories: Cast brass, 1-1/2" adjustable "P" trap with cleanout and waste to wall.
- i. RLM requires P-trap without cleanout.
- D. Traps for sinks: Cast brass, 1-1/2" adjustable "P" trap with cleanout and waste to wall.

- i. RLM requires P-trap without cleanout
- E. ADA trap covers: Molded resilient vinyl lavatory p-trap and angle valve antimicrobial insulation covers secured with snap-clip flush fasteners.
- F. Tub Waste and Overflow Fittings: Concealed lever operated pop-up bath waste and overflow; chrome plated waste spud with universal type outlet connection suitable for 1-1/2" I.P.S., or 1-1/2" O.D. tubing, or 1-1/2" solder-joint outlet connection on waste tee.
 - i. RLM requires heavy duty lift and turn stopper assembly.
- G. Shower Head: RLM requires Kosdo inc. Airjet model #KSAJ-150 max 2.0gpm chrome or approved equal
- H. Escutcheons: Chrome-plated cast brass with set screw.

END OF STANDARD