

220000 Plumbing

220500 Common Work for Plumbing

Provide access panels where maintenance will be required for items behind an enclosed wall or ceiling.

All piping shall be installed with proper pitch and valves to facilitate drainage of the system.

Pipe sizes shall be indicated on drawings at each change in direction and at all branch take-offs.

Electrolysis control between dissimilar materials shall be achieved through the use of dielectric nipples and a non-dielectric union. Dielectric unions shall be avoided whenever possible.

System and equipment drains shall be piped to a floor drain.

All welding shall be performed in accordance with ASME/ANSI B31.9. The contractor shall be responsible for non-destructive testing of all welds as selected by JHU, not to exceed 10% of the total project. Testing will be performed by an owner approved testing authority and shall be either a radiographic or ultrasonic method. In the event of a failure of greater than 25%, it will be the responsibility of the mechanical contractor to replace all failed welds and to test all remaining welds.

Welder must be certified within the past three years from start time on the project. Welders shall stamp/mark all welds for later identification. Employer shall maintain records of each welder and site map of all completed welds for owner's inspection.

All testing on piping shall be complete prior to receiving any insulation. JHU personnel should be notified 24hrs in advance to witness testing.

Installation of water source shall comply with local codes and the City of Baltimore procedures and standards.

Project designs shall be such that the minimum water pressure on the top floor of a building is 20psi at design flow rate at the most remote plumbing fixture.

Domestic water shall not be used for the cooling of equipment except for in an emergency back-up configuration.

Provide backflow prevention of water piping systems to protect water distribution systems against backflow.

Provide pressure reducing valves on domestic water mains or branches where pressure in excess of 70psi is expected. Provide a valved bypass, one pipe size smaller than the main size, around the pressure reducing valve.

Do not install water piping in exterior walls, structural slabs, above ornamental ceilings, transformer vaults, above electrical switchboards, with the exception of fire sprinkler piping.

Avoid runs of water piping in unheated areas.

All new and modified domestic water piping shall be thoroughly sterilized as described in the Baltimore City Plumbing Code.

220523 Valves for Plumbing

General

Provide valves suitable for a minimum of 150 psig and minimum of 200 degrees F.

Gate valves shall only be used on domestic water piping 6" or larger.

Valves located more than 7 feet from floor in equipment room areas shall be provided with chain operated sheaves. Extend chains to about 5 feet above floor and keep clear of walking aisles.

Where piping is insulated, provide valve operator extensions to suit insulation thickness.

Balancing valves shall be provided with a locking device to secure the valve in the balanced position. Balancing valves shall not be used for isolation. Provide additional isolation valves for isolation purposes.

Valves

Check valves shall be MSS SP-80, Class 150, swing check, except sizes 2.5 inches and larger shall conform to MSS SP-71, Class 150. Valves 2 inches and smaller shall be bronze body, horizontal swing, regrinding type Y-pattern, renewable disc. Valves 2.5 inches and larger shall be iron body, renewable seat and disc, bolted bonnet, horizontal swing, flanged ends.

Ball valves shall be, 600 psig, bronze body, full port, stainless steel ball and stem, 2 or 3 piece construction, screwed ends, TFE seats and seals. Provide for isolation and balancing in piping 3" and smaller.

Butterfly valves shall be high performance type, 200 psig bubble tight shutoff, lug body valves suitable for dead end service. Provide butterfly valves for isolation and balancing in piping 4" and larger. All butterfly valves shall be installed with shaft in horizontal position in horizontal runs of piping. Arrange disc to open away from possible sediment buildup.

- Valves 4"- 6" shall be 150 psig, bronze or stainless steel body, aluminum bronze disc, one-piece stainless steel shaft, resilient EDPM seats with rigid backing ring, manual lever and lock.
- Valves 8" and above shall be 150 psi, stainless steel body, extended neck, aluminum bronze disc, one piece stainless steel shaft, reinforced resilient EDPM seat with rigid backing ring and gear operator.

Gate valves shall be 200 psig, outside screw and yoke, resilient wedge, epoxy coated interior and exterior, iron body, flange ends.

Drain valves shall be bronze ball valve with dust cover, chain and hose thread, minimum ¾" for lines up to 2-1/2", 1-1/2" for lines 3" and over.

220700 Plumbing Insulation

General

Insulation requirements shall conform to the latest adopted energy conservation code.

All pipe insulation shall be continuous through walls, partitions, ceiling openings, and sleeves.

Insulation on all cold surfaces must be applied with a continuous vapor seal. Hangers, supports, etc., that are secured directly to cold surfaces must be insulated and sealed to prevent condensation.

Raw edges of insulation shall be sealed to prevent moisture from penetrating the insulation.

Provide insulation protection shields fabricated from galvanized steel at all pipe hangers and supports.

Special protection shall be considered for insulation subject to abuse, moisture, weather, etc.

221000 Plumbing Piping, Pumps and Specialties

Piping

Domestic Cold water below grade shall be cement lined ductile cast iron class 350 with mechanical joints and retained fittings.

Domestic cold water above ground shall be Type L hard drawn copper with soldered fittings for 2-1/2" and under and brazed fittings 3" and larger. Mechanical joints are not acceptable.

Non laboratory storm and sanitary piping below grade shall be extra heavy cast iron, hub and spigot, with neoprene push on joints.

Non laboratory sanitary, vent and storm water above ground shall be standard weight cast iron with hub and spigot fittings for piping 3" and above and no-hub service weight cast iron or DWV copper waste. No hub couplings shall have a minimum of four bands per joint. Horizontal piping for sinks shall be a minimum of 2" and 4" for water closets.

Lab waste and vent shall be schedule 40 DWV polypropylene, with mechanical joints for piping above grade and fused joints for piping below grade.

Laboratory gas (vacuum, compressed air, nitrogen, special gases) shall be type L copper hard tempered, factory cleaned with ends sealed. Joints shall be brazed while nitrogen is trickled through to eliminate oxidation.

Natural gas piping shall be schedule 40 steel with threaded joints, 2-1/2" and smaller and welded joints for 3" and larger.

RO/DI water piping shall be propylene with fused joints.

Provide identification and directional flow arrows at intervals not greater than 20 feet.

Specialties

Floor drains shall be lacquered cast iron with nickel bronze strainers. Unless drains are regularly receiving drainage, pressure type trap primers should be used. Floor drains should not be provided in lab spaces.

Provide backflow preventers where required by code. Provide reduced pressure zone type except on sprinkler systems.

Cleanouts shall be provided at all 90 degree bends on sanitary and storm drain lines.

Water hammer arresters shall be provided on water piping to toilet rooms where flush valves are installed or where fast acting valves are installed such as emergency eyewashes.

222300 Plumbing Equipment

Domestic Hot Water Heaters

Domestic hot water heaters shall be instantaneous type and storage tanks will not be acceptable on the Homewood campus with the exception of the dormitories and athletic facilities. Preferred manufacturer for domestic water heaters on the Homewood campus is Leslie.

224000 Plumbing Fixtures

General

Plumbing fixtures for restrooms shall be as indicated in the Restroom design guidelines.

Laboratory sinks shall be epoxy under mount type, with stainless steel grid strainer, flexible supply's and polypropylene tailpiece and trap. Faucets shall be gooseneck with vacuum breaker and serrated nozzle. Handles shall be coordinate with user/department preference.

Emergency fixtures shall be provided in accordance with HSE requirements. All emergency fixtures shall be supplied with either a dedicated mixing valve or tied into a building/floor tepid water system.

Emergency eyewashes shall be deck mounted, hand held hose type, dual angled spray heads with device to hold flow on.

Emergency fixtures shall be installed with backflow preventers on supplies.

226000 Gas and Vacuum Systems for Laboratories

General

Natural gas, vacuum, and compressed air shall be designed to provide services to the lab facilities of the building.

Where distribution services exist, connect to the existing mains at a point having sufficient capacity for current and new loads.

Provide maintenance isolation valves where any new piping is connected to bulk mains and at the end of new mains where it would be feasible to extend them in the future.

Gases such as nitrogen, O₂, CO₂, ect will be provided by the lab users. Provide bottle storage locations, manifolds and distribution piping to meet the specific needs of the lab.

Vacuum systems that consume domestic water should not be used