

## SECTION 22 30 00 - PLUMBING EQUIPMENT

### PART 1 - GENERAL

#### 1.1 SYSTEM DESIGN REQUIREMENTS

- A. **Installer Qualifications:** All plumbing work at the university shall be performed by a State of Colorado licensed contractor under the supervision of a licensed plumber. Contractors shall verify that plumbers are currently licensed by the State of Colorado and shall supply Project Manager with names and license numbers. Contractors shall have a minimum of 3 years of satisfactory performance in conducting the type of work specified.
- B. **General**
1. Provide a service sink with hot and cold water in mechanical rooms. If a water treatment station is located in the mechanical room, locate the sink within 3 feet, and include a combination emergency eye and body washing station.
  2. Provide electric water coolers and drinking fountains at ADA heights. Provide duplex units with heights meeting ADA requirements and normal heights in public areas. Consider heights for children in special areas.
  3. **Fixtures:** Provide battery operated, electronically sensing flush valves, with manual override, on core public area water closets and urinals.
  4. See section 23 3200 for general information regarding chemical waste.
- C. **Backflow Prevention:**
1. Provide vacuum breakers or backflow protectors on laboratory fixtures and other fixtures that present a hazard for possible contamination.
  2. Review with Design Team, Engineers, EHS and Facilities Management Fluid Group.
  3. Arrange water piping systems so back siphoning or backflow into domestic systems is not possible. Consider any water discharging through a faucet to which a hose would be attached potentially hazardous by reason of possible backflow from contaminated areas to which the open end of the hose might be exposed.
  4. Install backflow prevention on all laboratory faucets and other points where cross contamination may occur in addition to backflow prevention at building supply.
  5. Install backflow preventers on all feed lines to irrigation systems and heating and cooling systems.
  6. Install a bypass BFP on the main building service for mains 1" and greater. It shall be sized to meet all critical building loads and be no less than 50% of the primary BFP.
- D. **Hose Bibs and Wall Hydrants:**
1. Provide a minimum of 1 domestic water, freeze-proof wall hydrant, per exterior wall, with loose key type handles at outside locations near entrances to a building for wash down and the University Grounds use. Wall hydrants shall have integral backflow preventers. These should be located as inconspicuously as possible consistent with accessibility. Provide separate shut off valve inside.
  2. Provide hose bib with integral backflow preventer at all major equipment locations in mechanical rooms, on roofs and close to cooling towers.
- E. **Kitchen Grease Traps:**
1. Avoid interior locations for kitchen grease traps. If required, provide an engineered unit sized to accommodate area served. Locate grease traps outside for easy truck access and servicing, and properly vented.
- F. **Underground Tanks and Sumps:**
1. Underground storage tanks are not permitted without approval of the University Project Manager.
  2. Tanks shall be installed by contractors licensed by the State Oil Inspector.

3. Advance permits from State Oil Inspector are required prior to installation, repair, upgrade, removal or abandonment.
4. Notification forms (EPA) shall be sent to State Health Department and State Oil Inspector upon completion of installation of new tanks.

G. Fuel Tanks (Above Ground):

1. Shall conform to NFPA 30, 31, 54 and 50A (Hydrogen), OSHA 29CFR1910.106, 29CFR1910.110 (LPG) and 29CFR1910.153, NFPA 395 (farm), NFPA 58 (LPG) and UFC Article 79, 80 and 81 (LPG).

H. Domestic Hot Water Heaters: Where steam is available, provide an instantaneous steam heat exchanger. Gas fired, or small electric heaters are acceptable with approval of University Project Manager. See also section 23 5700.

I. Roof Drain Overflow: Overflow drains shall not drain on to sidewalks or areas where water or ice could present a hazard or nuisance.

J. Janitorial Closets:

1. Provide Mop Service Basin. Mop Basin to be constructed of monolithic preformed basin material with stainless steel sill.
2. Mop Basin faucet type to be a/b/e specialty mop sink with pail hook and wall brace.
3. All plumbing connections to be ½ mnps thread.

K. Water meters: See section 23 0900.

## 1.2 QUALITY ASSURANCE

A. Codes and Standards:

1. Meet the requirements of International Plumbing Code.
2. Meet the requirements of national laws regarding ADA accessibility, energy and water conservation.
3. All valves, fixtures and accessories in contact with domestic water shall meet the requirements of NSF/ANSI Standard 61.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Lavatories, Sinks, Service Sinks, Mop Service Basin, Water Closets, Urinals:
  - a. American Standard U.S. Plumbing Products
  - b. Crane Co.
  - c. Kohler Co.
  - d. Eljer
2. Stainless Steel Sinks:
  - a. Elkay Mfg. Co.
  - b. Just Mfg. Co.
  - c. Moen; Div. Of Stanadyne
  - d. Eljer
3. Molded Tubs and Shower Units:
  - a. Fiat Products
  - b. Kohler Co.
  - c. Eljer
4. Faucets:
  - a. Chicago Faucet Co. (preferred)

- b. American Standard; U.S. Plumbing Products
  - c. Zurn
- 5. Auto Faucets
  - a. Sloan Valve Co (preferred)
  - b. Zurn
- 6. Flush Valves:
  - a. Sloan Valve Co. (preferred)
  - b. Zurn
- 7. Auto Flush Valves
  - a. Sloan Valve Co (preferred)
  - b. Zurn
- 8. Water Closet Seats:
  - a. Bemis Mfg. Co.
  - b. Beneke Corp.
  - c. Olsonite Corp
- 9. Water Coolers:
  - a. Elkay
  - b. Halsey Taylor Div.
  - c. Haws Drinking Faucet Co.
- 10. Fixture Supports:
  - a. JR Smith
  - b. Zurn
- 11. Shower and Tub Trim (Thermostatic):
  - a. Bradley
  - b. Powers
  - c. Speakman
- 12. Shower and Tub Trim:
  - a. American Standard
  - b. Kohler
  - c. Chicago Faucets
- 13. Emergency Showers, And Eye/Face Washes:
  - a. Guardian Equipment
  - b. Haws Drinking Faucet Co.
  - c. Bradley
- 14. Food Waste Disposers:
  - a. In-Sink-Erator
  - b. Waste King
  - c. National
- 15. Hose Bibs and Faucets:
  - a. Zurn
  - b. Woodford
  - c. Watts Regulator Co.
- 16. Venturi Flow Measuring Elements:
  - a. FDI (preferred)
  - b. HCI
  - c. Gerand
- 17. Calibrated Balancing Valves:
  - a. FDI (preferred).
  - b. HCI
  - c. Gerand
- 18. Automatic Balancing Valves
  - a. FDI (preferred)
  - b. Griswold
- 19. Wall and Yard Hydrants:
  - a. Josam Mfg. Co.
  - b. Jay R Smith Mfg. Co.

- c. Woodford Mfg. Co.
- 20. Water Hammer Arresters:
  - a. Woodford
  - b. J.R. Smith Mfg. Co.
  - c. Watts Regulator Co.
- 21. Instantaneous Steam-Water Heaters:
  - a. Leslie (preferred)
  - b. Spirax Sarco
  - c. Graham
- 22. Backflow Preventer Equipment:
  - a. Watts Regulator Co. (Preferred)
  - b. Febco Sales
  - c. Wilkins

## 2.2 MATERIALS, GENERAL

### A. Fixtures and Trim:

- 1. All vitreous fixtures shall be of a quality commercially known as 'Twice-Fired Vitreous China'.
- 2. All enameled ware shall be cast-iron with 'Acid-Resisting Enamel'.
- 3. Reference 11 53 00 for Laboratory Fixtures.
- 4. Water Closets: Wall mounted or wall-hung type. Floor mounted fixtures permitted on a special need basis. Tank type fixtures are not allowed.
  - a. General: White, vitreous china, water saving siphon jet, elongated rim, wall-hung water closet.
  - b. Coordinate the flush valve rates with the University Project Manager.
  - c. Miscellaneous Requirements or Accessories:
    - 1) Seat: White plastic, open front seat less cover, with self sustaining check hinge. Seat shall have an antimicrobial compound as an integral part of the plastic and shall match shape of bowl.
    - 2) Flush valves: Chrome plated valve with vacuum breaker and 1-inch screwdriver stop with vandal resistant protective cap and adjustable tail piece.
    - 3) Carrier: Commercial carrier with adjustable face plate and fittings.
    - 4) Flush valve: Chrome plated valve with vacuum breaker, 1-inch screwdriver angle stop with vandal resistant protective cap and adjustable tailpiece. Limited to dual flush 1.1/1.6 gallons per flushing cycle.
- 5. Urinals:
  - a. General: White, vitreous china, siphon jet urinal with integral extended shields, flushing rim.
  - b. Coordinate the flush valve rates with the University Project Manager
  - c. Miscellaneous Requirements or Accessories:
    - 1) Carrier: Commercial carrier with top and bottom plates.
    - 2) Flush valve: Chrome plated valve with vacuum breaker, 1-inch screwdriver angle stop with vandal resistant protective cap and adjustable tailpiece. Limited to 1.0 gallon per flushing cycle.
- 6. Lavatories:
  - a. General:
    - 1) Vitreous china, self-rimming counter top 20" x 17" lavatory.
    - 2) Vitreous china, self-rimming wall hung 20" x 18" lavatory with back splash.
- 7. Stainless Steel Sinks: 18 gauge 304 stainless, self-rimming, single or double compartment sink.
- 8. Showers:
  - a. Fiberglass: Reinforced plastic shower stall with integral molded base and 2 inch drain fitting and chrome plated strainer. Provide with additional reinforcement for grab bars.
  - b. Terrazzo: Precast terrazzo shower floor with single threshold and 2 inch integrally cast stainless steel drain with removable stainless steel strainer.

9. Utility Sink: Acid resistant, enameled cast iron, wall mounted high back sink with wall hangers and stainless steel rim guard; 3 inch cast iron P-trap with enameled interior, painted exterior, floor bracket and chrome plated brass sink strainer with open grid drain.
  10. Mop Service Basin: Precast terrazzo, service basin with 3 inch integrally cast brass or stainless steel drain with removable strainer. Provide stainless steel guards on all sides.
  11. Emergency Eye Wash: Wall mounted, vitreous china or stainless steel receptor with mounting bracket, twin chrome plated heads angled to direct water flow into eyes and ocular face area. Provide flag push-type ball valve to stay open until manually closed. Water delivered by Eye Wash shall be tepid (lukewarm). Installation shall meet or exceed the provisions of ANSI Z358.1 (latest version).
  12. Emergency Shower: Ceiling mounted, 10 inch diameter deluge shower head. Rigid triangular pull-rod to actuate instant-action stay-open ball valve. Water delivered by the Emergency Shower shall be tepid (lukewarm). Installation shall meet or exceed the provisions of ANSI Z358.1 (latest version).
  13. Combination Emergency Shower and Eye Wash: Floor mounted, free standing, all chrome plated brass construction with 10 inch diameter deluge shower head and eye wash bowl. Shower shall have rigid pull rod to actuate instant-action stay open ball valve. Eye wash shall have twin anti-squirt heads angled to direct water flow into eyes and ocular face area with flag push-type ball valve actuator, valve to stay open until manually closed. Water delivered by the Emergency Shower and Eye Wash shall be tepid (lukewarm). Installation shall meet or exceed the provisions of ANSI Z358.1 (latest version).
- B. Water Coolers:
1. Self-contained, wall mounted, stainless steel, mechanically cooled, drinking fountain. Minimum cooling capacity of 8 gallons per hour of 50 degree F drinking water at the inlet water and room ambient temperatures of 80 degree F with adjustable water temperature control. Equip drinking fountains with handicapped fittings. Care shall be taken to specify fountains with basins and spouts to minimize dripping, etc. on floor. Provide with commercial carrier.
- C. Trap Primers: Bronze body valve with automatic vacuum break and 1/2-inch connection to domestic water. Operation shall be by time clock initiation of electric solenoid valve.
1. Neoprene sleeve trap guards are not acceptable
  2. Pressure differential style primers are not acceptable.
- D. Automatic Flow Control Valves (Flow Limiting Devices)
1. The GPM for the automatic flow control valves shall be factory set and shall automatically limit the rate of flow to within 5% of the specified amount.
  2. For 1/2" - 2", the flow cartridge shall be removable from the Y- body housing without the use of special tools to provide access for regulator change-out, inspection and cleaning without breaking the main piping. (Access shall be similar to that provided for removal of a Y-strainer screen).
  3. The maximum pump head for the automatic flow control valve shall be limited to 7 feet.
  4. Each valve shall have two P/T ports.
  5. All automatic flow control devices shall be supplied by a single source and certified flow tests, witnessed by a professional engineer, shall be available.
  6. Five year product warranty and free first year cartridge exchange.
- E. Manual Calibrated Flow Control Valves
1. Manual balancing devices shall be venturi type as recommended by ASHRAE.
  2. Devices shall have a precision formed throat and have a stated catalog accuracy of 3% F.S.
  3. The induced differential reading (flow signal) shall be greater than two feet water column at the design flow with the valve in the wide open position.
  4. The permanent pressure loss at design flow shall not exceed two feet of water in the wide-open position.
  5. The valves are to have differential readout ports fitted with check valve and protective cap, and are to have a memory stop to allow complete shut-off and return to set position without losing the set-point.

- F. Spare Parts: Refer to Section 01 78 46 – Extra Stock Materials.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. All exposed piping serving plumbing fixtures that may be used for ADA purposes shall have traps and supplies insulated per ADA requirements.
- B. Install flushing mechanism for both ADA accessible flush valves and flush tanks to the side of water closet that has the most floor space per ADA requirements.
- C. Provide a tempering valve that conforms to ASSE 1070 for all lavatories and sinks used as a public hand wash facility.

#### 3.2 TESTING, CLEANING, AND CERTIFICATION

- A. Provide copies of State backflow preventer certification tests.
- B. Adjusting: After cleaning and flushing operations are accomplished, adjust flush valves, faucets, showers, bubblers for proper flow.

**END OF SECTION 22 30 00**