

## **22 00 00 – PLUMBING**

### **SECTIONS INCLUDED:**

22 00 00 – PLUMBING GENERAL  
22 10 00 – PLUMBING PIPING  
22 30 00 – PLUMBING EQUIPMENT  
22 40 00 – PLUMBING FIXTURES

### **22 00 00 – PLUMBING GENERAL**

#### **GENERAL**

- Most University buildings will be served via University owned mains
- Design of buildings should include exterior fire hydrants, interior fire protection when required, main line tap and valve, main building shutoff valve (inside and outside), and distribution piping.
- Exterior water valves shall have a concrete collar around them 18"x18"x4".
- Plumbing Contractor shall be required to clean and disinfect all domestic hot and cold-water systems. For occupied buildings the procedures shall be modified to accommodate the occupants. Final water quality must be approved by the Weld County Health Department.
- Provide proper backflow prevention on all systems including feed lines for heating and cooling systems, laboratory faucets, hose bibs and faucets that may have a hose attached.
- Backflow preventors to be manufactured by Febco or Watts. Double check type backflow preventors for fire systems may be by Ames.
- Backflow prevention for the building main water service shall include a 1" bypass line with a RPBFP to allow for maintenance without service interruption. Install main service backflow preventor at grade level if possible to allow for a gravity drain to the exterior. If not possible, suggest a concrete retention basin and automatic shutoff valve with alarm via the building automation system.
- Dielectric nipples with steel unions shall be provided between dissimilar metals in all piping systems. Do not specify dielectric unions.
- Provide a meter for the main building water service. Meter must be tied into Building automation system. Refer to 23 09 00 for more details.

- Provide a hose bib in all mechanical rooms and in shower / locker rooms.

## **22 10 00 – PLUMBING PIPING**

### **SANITARY & STORM SEWER**

- \* Interior clean-out caps and plugs will be located such that they can be utilized without damaging the floor or floor covering. Provide cleanouts at the base of all sanitary and storm stacks.
- \* Exterior grade cleanouts shall be set in a 12" x 12" x 8" concrete collar. Riser to grade shall be cast iron with a concrete base under riser wye. Exterior cleanout to include a substantial steel or brass lid.
- \* Clean-outs shall be located so that long lines can be entered from both ends. Plugs shall be lubricated prior to installation.
- \* Provide floor drains in all restrooms and mechanical rooms.
- \* Interior below grade sanitary and storm sewer lines shall be service weight cast iron with cast iron fittings to a point 5'-0" outside of the building. Joints shall be hub and spigot with neoprene gaskets.
- \* Interior above grade sanitary and storm lines shall be service weight cast iron pipe with no hub fittings with neoprene gaskets and heavy duty stainless steel clamp and shield assemblies.
- \* Sewage ejectors are not to be specified without prior approval from Facilities Management. Where used, provide duplex type units with high water alarms connected to the building automation system.
- \* Storm water sump pumps shall be duplex type with alternating capability and high water alarms connected to the building automation system.
- \* Perimeter drain systems shall either daylight or connect to a duplex pump system as specified above for storm water systems.
- \* Roof drainage shall be connected to storm sewer where possible. Downspouts discharging to grade may be considered only where adequate drainage away from the building exists.

### **DOMESTIC WATER PIPING**

- \* Provide type "L" for all water distribution inside building, with wrought copper fittings and couplings. Copper lines installed below grade shall be type "K" with brazed joints.
  - \* Viega Pro-press acceptable alternative.
- \* Shock absorbers shall be placed in water lines to equipment or fixtures having quick closing or flush valves and any equipment that might produce water hammer.
- \* Cold water freeze proof hose bibs shall be provided at outside locations around the building for cleaning and grounds maintenance. Provide with separate shut-off valve.
- \* Approved manufacturers: Woodford

#### Process Piping Materials

- |                     |                               |
|---------------------|-------------------------------|
| * Vacuum piping     | – Copper with soldered joints |
| * Laboratory Air    | – Copper with brazed joints   |
| * DI/RO water       | – Sch 80 PVC                  |
| * Acid waste & vent | – polypropylene               |

## 22 30 00 – PLUMBING EQUIPMENT

### DOMESTIC HOT WATER HEATERS

- Generally where HTHW is available, water heating will be done by one of the following methods:
  - Instantaneous heater – **Preferred**
    - Approved manufacturers: Cemline, Patterson Kelley
  - HTHW tube bundle and storage tank - prefer epoxy lined tanks. Please note food grade for domestic applications.
- Final selection will be based on space requirements, hot water requirements, HTHW availability and installation cost.
- Refer to converter requirements listed under hot water heating systems below for guidelines.

## 22 40 00 – PLUMBING FIXTURES

### PLUMBING FIXTURES AND TRIM

- \* All water closets shall be specified as wall hung.
- \* Provide fixture supplies and stops on every individual fixture or appliance
- \* All plumbing fixtures and trim shall be low flow type. Specific flow rates to be determined by Owner.
- \* Stops shall be compression by compression types, with handles and flexible tube risers.
- \* Shower control valves to have integral screw driver stops.
- \* Flush valves, supplies and stops shall be anchored rigidly behind walls
- \* All wall and floor mounted fixtures shall be caulked with non-hardening white adhesive elastomeric sealant
- \* Pumps for water circulation shall be lead free.
- \* Provide a tempered emergency eye / body wash unit in mechanical rooms containing chemical feed or water treatment equipment.
- \* Provide a hose bib in all mechanical rooms and near all cooling towers.
  - \* Consider hose bib near all DX cooling equipment or common area if used.
  - \* Hose bibs at each level of roof with equipment
- \* Approved manufacturers for various fixtures:
  - \* Enameled steel, cast iron, vitreous china: Kohler - American Standard – Eljer - Crane
  - \* Electric Water Coolers: Elkay - Haws
  - \* Flush Valves: Sloan Royal – Zurn
  - \* Flush valves (electronic): Hydrotech Autoflush toilet flushometer valve, 1.6 GPF
  - \* Faucets (lavatory electronic sensing): Toto – **Zurn**;
  - \* Faucets ( std. two handle): Delta - American Standard – **Symmons** – Chicago Faucets

- \* Faucets (lever handle): Delta commercial – **Symmons** Lever handled faucets to have metal stems. Levers shall be as short as possible (2 ¾") to reduce breakage.
- \* Service sink faucets: Central brass - American Standard – Delta Commercial. Service sink type faucets to be industrial grade with metal stems wherever possible. Furnish with hose and wall clip.
- \* Shower control valves (Pressure Balancing): Leonard – Powers - Symmons